CITY OF WATSONVILLE

PEDESTRIAN SAFETY ASSESSMENT

Issues, Opportunities, and Enhancement Strategies

Evaluation Team:
Mark A. Bowman, PE
Debbie C. Yueh, AICP

April 2011

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

1301 South 46th Street, Building 155, Richmond, California 94804 • www.techtransfer.berkeley.edu
26 April 2011

Murray A. Fontes  
Principal Engineer  
City of Watsonville  
250 Main Street  
Watsonville, CA 95076

RE: Pedestrian Safety Assessment for City of Watsonville

Dear Mr. Fontes:

The Technology Transfer Program (Tech Transfer) of the Institute of Transportation Studies at the University of California, Berkeley is pleased to present to the City of Watsonville the final report for the Pedestrian Safety Assessment (PSA) completed for your city. On behalf of our safety expert evaluators, Mark Bowman and Debbie Yueh, we would like to thank you and the other local stakeholders involved for your cooperation and commitment in making this effort a success.

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

In a few weeks from now, you will receive a feedback survey form from Tech Transfer. We would appreciate it very much if you would complete the form and return it to us at your earliest convenience. Your feedback will ensure that the PSA program continues to meet its original mission: to promote pedestrian safety in California communities.

Sincerely,

Eduardo C. Serafin, PE, AICP
Technical Program Manager

cc: Lisa Dixon, California Office of Traffic Safety  
    Laura Melendy, Technology Transfer Program (no enclosure)
CITY OF WATSONVILLE
PEDESTRIAN SAFETY ASSESSMENT

FINAL REPORT

APRIL 2011

EVALUATION TEAM

Mark A. Bowman, PE
Dowling Associates, Inc.
180 Grand Avenue, Suite 250
Oakland, CA 94612
510. 839. 1742 x 117
MBowman@dowlinginc.com

Debbie C. Yueh, AICP
Dowling Associates, Inc.
180 Grand Avenue, Suite
250 Oakland, CA 94612
510. 839. 1742 x 126
DYueh@dowlinginc.com
The Regents of the University of California. This report was produced in cooperation with the City of Watsonville. Funding for this program was provided by a grant from the California Office of Traffic Safety, through the National Highway Traffic Safety Administration. Opinions, findings, and conclusions are those of the authors and not necessarily those of the University of California and/or the agencies supporting or contributing to this report. This report does not constitute a standard, specification, or regulation. The agency that is subject of this report is hereby granted a non-exclusive right to copy and distribute this report for its own or its stakeholders' non-commercial use. All other uses of this report require written permission from the Technology Transfer Program.
# TABLE OF CONTENTS

**Executive Summary** .............................................................................................................................................. i

Benchmarking Analysis of Policies, Programs, and Practices ....................................................................................... i

Walking Audit Suggestions for Improvements ............................................................................................................... ix

1. **Introduction** ..................................................................................................................................................... 1

   1.1 Objective ......................................................................................................................................................... 1

   1.2 Evaluation Approach ........................................................................................................................................... 1

   1.3 Organization of this Report .............................................................................................................................. 1

   1.4 Acknowledgements ............................................................................................................................................. 2

   1.5 Disclosures ......................................................................................................................................................... 2

2. **Background** ...................................................................................................................................................... 3

   2.1 Pedestrian Safety Overview for Watsonville ....................................................................................................... 3

   2.2 High Pedestrian Collision Locations ............................................................................................................... 5

3. **Benchmarking Analysis Results and Suggestions** .............................................................................................. 7

   3.1 Key Strengths ....................................................................................................................................................... 10

   3.2 Enhancement Areas ........................................................................................................................................... 16

   3.3 Opportunity Areas ............................................................................................................................................. 30

4. **Walking Audit Results and Suggestions** .......................................................................................................... 33

   4.1 General Citywide Suggestions ............................................................................................................................ 35

   4.2 Focus Area 1: Downtown Area ............................................................................................................................ 36

   4.3 Focus Area 2: Freedom Boulevard ....................................................................................................................... 44

   4.4 Focus Area 4: Airport Boulevard at Freedom Center .......................................................................................... 56

   4.5 Focus Area 5: Pajaro Valley High School ........................................................................................................... 58

   4.6 Focus Area 6: Watsonville High School ............................................................................................................... 59

**Appendix A: Glossary of Pedestrian Improvement Measures** .................................................................................. 61

**Appendix B: Resource List** ........................................................................................................................................ 71
LIST OF FIGURES

Figure 2-1: Watsonville Pedestrian Collision Frequency and Severity (2005-2010) .................. 6
Figure 3-1: Fatal Injury Rates by Vehicle speed, by Pedestrian Ages .................................. 11
Figure 4-1: Walking Audit Locations ........................................................................................ 34
Figure 4-2: Main Street and Freedom Boulevard Intersection ............................................... 38
Figure 4-3: Pedestrian Desire Line .............................................................................................. 39
Figure 4-4: Example of Midblock Crosswalk Treatment ......................................................... 40
Figure 4-5: Watsonville Transit Center - Option 1 ................................................................. 41
Figure 4-6: Watsonville Transit Center - Option 2 ................................................................. 43
Figure 4-7: Freedom Boulevard Corridor .................................................................................. 45
Figure 4-8: Freedom Boulevard and Lincoln Street – Existing Conditions ......................... 47
Figure 4-9: Freedom Boulevard at Sydney Avenue
Suggested Example for Uncontrolled Marked Crosswalks ........................................ 48
Figure 4-10: Freedom Boulevard at Lincoln Street – Option 1 ........................................... 50
Figure 4-11: Freedom Boulevard at Lincoln Street – Option 2 ............................................ 51
Figure 4-12: Lake Avenue at Palm Avenue/Manor Avenue – Option 1 ............................ 53
Figure 4-13: Lake Avenue at Palm Avenue/Manor Avenue – Option 2 ............................ 55
Figure 4-14: Airport Boulevard at Freedom Center – Suggestions ..................................... 57

LIST OF TABLES

Table 2-1: Watsonville Summary Statistics .............................................................................. 4
Table 2-2: Watsonville Traffic Collisions and Rankings, 2009 .................................................. 4
Table 2-3: Top Pedestrian-Vehicle Injury Collision Locations along
in or near downtown Watsonville, April 2005 – March 2010 ............................................. 5
Table 3-1: Summary of Programs, Policies, and Practices
Benchmarking Analysis for Watsonville .............................................................................. 7
EXECUTIVE SUMMARY

The City of Watsonville requested that the Technology Transfer Program of the Institute of Transportation Studies at University of California, Berkeley conduct a Pedestrian Safety Assessment (PSA) study. A team of two pedestrian safety experts conducted the PSA field visit for City of Watsonville in January 2011 and prepared this report. The objectives of the PSA are to improve pedestrian safety and to enhance walkability and accessibility for all pedestrians in Watsonville.

The City of Watsonville has been striving to accommodate both existing and future pedestrian demand, with efforts including:

- Regularly conducting speed surveys on arterials and collectors and considering local conditions when setting speed limits
- Development of a dedicated team of traffic safety officers that perform education as well as enforcement duties and prioritize pedestrian-related issues in their efforts
- Working with regional and local agencies to develop and implement pedestrian safety outreach programs and campaigns.
- Assessing impact fees on new developments that fund traffic improvements including pedestrian facilities
- Clearly defining open space requirements for residential and non-residential land uses

The PSA focused on identifying opportunities that could build on these existing efforts and offering ideas for potential enhancements.

Watsonville has a population of approximately 52,000 residents. Based on the 2009 California Office of Traffic Safety (OTS) safety rankings of California cities, Watsonville ranked 4th out of 104 California cities in the same population group for the number of pedestrians collisions by average population in the “number of collisions involving pedestrians” category, with 1st being the worst and 104th the best. This ranking is based on rate of collisions per “1000 daily-vehicle-miles-of-travel”. During the five-year period between April 1, 2005 and March 31, 2010, there have been three pedestrian fatalities in the city.

Chapter 2 provides an overview of collision data for the City.

The remainder of this report presents the findings and suggestions derived from:

- Benchmarking analysis of the City’s existing pedestrian programs, policies, and practices (Chapter 3)
- Field walking and windshield audit (Chapter 4)
BENCHMARKING ANALYSIS OF POLICIES, PROGRAMS, AND PRACTICES

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 Watsonville. This interview formed the basis for a benchmarking process that categorized the City's programs, practices, and policies into three groups:

- Key Strengths (areas where the City is exceeding national best practices)
- Enhancement Areas (areas where the City is meeting best practices)
- Opportunity Areas (areas where the City may not meet best practices)

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

A discussion of the City's pedestrian safety policies, programs, and practices, and ideas for enhancement is presented in Chapter 3.

Key Strengths

- Pedestrian Oriented Speed Limits and Speed Surveys
- General Plan: Densities and Mixed Use Zones
- Enforcement
- Pedestrian Safety Education Program
- Open Space Requirement
- Historic Sites
- Adoption of Newspaper Rack Ordinance
- Use of Street Furniture Requirements
- Collision History and Collision Reporting Practices

Enhancement Areas

Implementation of ADA Improvements and ADA Transition Plan

- Consider inclusion of detailed deficiency inventory and implementation plan for public right-of-way in addition to public buildings in the next update of the ADA Transition Plan public buildings to reflect current ADA best practice standards
• Consider settings goals and develop a mechanism to track the implementation progress of the Transition Plan.

• Require that all new traffic signals installed feature audible pedestrian signals.

**Pedestrian Traffic Control Audit**

• Develop a crosswalk inventory by conducting audits of the adequacy of current crosswalks. Seattle’s inventory of its marked crosswalks may serve as a model. (see [http://www.seattle.gov/transportation/cwp_back.htm](http://www.seattle.gov/transportation/cwp_back.htm))

• Ensure that locations with pedestrian desire lines have crosswalks. The crosswalk policy mentioned below in the Crosswalk Installation, Removal, and Enhancement Policy section (3.2(k)) can help determine the appropriate crossing treatment at uncontrolled locations without marked crosswalks.

• Work with Caltrans to replace existing pedestrian signals on state highway such as Route 152 and Route 129 to countdown signals.

• Identify the highest priority signal locations for replacement with countdown signals and a funding source.

• Begin using Pedestrian Lead Intervals (LPIs) in areas with high levels of pedestrian activity.

• Require that all new traffic signals be installed according to current MUTCD standards including countdown signals and LED bulbs.

• Develop a proactive monitoring program for traffic control devices.

**Pedestrian-Oriented Traffic Signal and Stop Sign Warrants**

• Consider developing City-specific signal and stop sign warrants for adoption by City Council and subsequent application.

• Consider individual circumstances when evaluating signal and stop sign warrants.

**Proactive Approach to Institutional Challenges**

• Actively pursue not only transportation-related grant opportunities but also health-related grants particularly for non-capital improvement projects such as educational program.

• Enhance outreach opportunities to increase awareness of pedestrian safety, such as the relations between vehicle speed and pedestrian injury severity and to provide pedestrian volume and collisions and vehicle speed statistics citywide and specific locations slated for pedestrian improvements. Also seek ways to increase understanding of pedestrian safety tools available in the city and residents as an effort independent from project implementation such as adding a category or subcategory to the City’s website dedicated to pedestrian topics.
Consider developing a formal process for residents to petition for neighborhood safety improvement measures.

**Safe-Routes-to-School Program and Grant Funding**

- Continue applying for grant funding; apply for non-infrastructure as well as infrastructure projects. Some of the suggestions in this report may be eligible.
- Continue to work with the Community Traffic Safety Coalition to develop Safe-Routes-to-School maps for all Watsonville schools.
- Consider developing a comprehensive citywide Safe-Routes-to-School program that encourages walking to school and highlights preferred walking routes. Such a program may involve schools, advocates, parents, City staff, community health representatives and other stakeholders. A coalition may be developed for the program, with committees for mapping/data collection, outreach, education and encouragement, enforcement and engineering, and traffic safety. School-specific committees may also be considered. Consider scheduling regular, ongoing meetings to maintain stakeholder involvement.

**Neighborhood Traffic Management Programs (NTMP)**

- Consider implementing suggestions presented under Section 3.2(d) Proactive Approach towards Institutional Cooperation.

  - Consider expanding the Neighborhood Traffic Plan to include best practice resources for traffic calming, including the sites:

    - [www.trafficcalming.org](http://www.trafficcalming.org)

    - [Traffic Calming Guidelines from the City of Danville](http://www.danville.ca.gov/Your_Community/Traffic_Concerns.aspx)

    - [Traffic Calming Guidelines from the City of Anaheim](http://www.anaheim.net/article.asp?id=1703)

    - [Traffic Calming Guidelines from the City of La Habra](http://www.ci.la-habra.ca.us/article.cfm?id=191)

**Pedestrian Safety Program and Walking Audits**

- Consider including regular walking audits in the citywide pedestrian safety program, based on the suggestions of this PSA. This effort could complement other programs within the City to improve health and safety or to enhance sustainability.

**Pedestrian/Bicycle Coordinator**

- With a population of approximately 50,000, Watsonville may consider formally designating a current staff member as the role of Pedestrian/Bicycle Coordinator to
include interdepartmental coordination, grant writing, and staff liaison to local non-profits, advocacy groups, and schools. This staff member would spend approximately 30% of their time on pedestrian/bicycle related issues.

Design Policies and Development Standards

- Develop a countywide Streetscape and/or Landscape Architecture Master Plan.
- Consider form-based zoning to influence the “look and feel” of neighborhoods throughout the City.

Crosswalk Installation, Removal, and Enhancement Policy

- Develop a crosswalk policy that reflects best practices and recent research with respect to the installation, removal, and enhancement of crosswalks, which includes removing crosswalks only as an option of last resort and providing midblock crossings where they serve pedestrian desire lines. This policy may consider adopting the “triple four” crosswalk striping treatment as used in Sacramento and other jurisdictions in California.
- Include criteria for installing crosswalk enhancements, such as flashing beacons, in-roadway warning lights, or in-roadway pedestrian signs.

General Plan: Provision of Pedestrian Nodes

- Identify pedestrian nodes in future updates to General Plan
- Consider an overlay district for pedestrian nodes with special pedestrian-oriented guidelines, such as suspending auto Level of Service standards. Prioritize sidewalk improvement and completion projects in these nodes.
- Consider additional opportunities for including pedestrian orientation in new mixed-uses development within the General Plan.

Specific Plans, Redevelopment Areas, and Overlay Zones

- Consider areas with TOD, mixed-uses, walkability, bikability, and pedestrian orientation as a high priority for redevelopment.
- Incorporate pedestrian-friendly policies throughout the planning process.
- Create a pedestrian-orientation project checklist for the development review process.
- Identify priority pedestrian areas in the city, and ensure that they are focus areas in future specific plans.
- Develop pedestrian design guidelines for the TOD corridor and city-wide.
Pedestrian Master Plan

- Develop a Pedestrian Master Plan and include policies and suggestions in the Pedestrian Master Plan to prioritize and implement capital and maintenance projects, which could address the following:
  - Development of a comprehensive, Citywide crosswalk policy and toolbox
  - Pedestrian connectivity
  - Prioritization of sidewalks and other pedestrian facility improvements
  - Opportunities and barriers to pedestrian travel
  - Public safety and "eyes on the street" design guidelines
  - Consistency of treatments
  - Interdepartmental coordination

Adoption of Bicycle Parking Requirements

- Ensure implementation of the bicycle parking requirement in the development review process.

- Consider enhancing the Bicycle Parking Ordinance to require bicycle parking in the city that distinguishes between and includes provisions for both long-term and short-term bike parking such as the Oakland bicycle parking ordinance (http://www.oaklandpw.com/AssetFactory.aspx?did=3337). The Bicycle Parking Guidelines, published by the Association of Pedestrian and Bicycle Professionals (APBP), is a resource for best practices in bicycle parking design (see http://www.bfbc.org/issues/parking/apbp-bikeparking.pdf). Additional information on bicycle parking is summarized on www.bicyclinginfo.org and http://www.bicyclinginfo.org/engineering/parking.cfm

- Consider implementation of "branded" racks for the City (with a unique design or City symbol) such as the branded rack program in San Diego and Davis.

- Consider adopting a Bicycle Master Plan to prioritize bicycle projects. Adoption of a Bicycle Master Plan also establishes eligibility for grant funding through the Bicycle Transportation Account for implementation of bike projects.

Adoption of Street Tree Requirements

- Reconsider the adoption of a Street Tree Ordinance to specify where and how often street trees could be planted/replaced, and specify which types of trees are appropriate. The ordinance could also allow trees in the parking lane, like those on Castro Street in downtown Mountain View, where sidewalk widths do not support the additional street trees
• Incorporate trees into broader thermal comfort considerations placing trees in areas and along paths of travel.

Adoption of Routine Accommodations for New Development

• To support Complete Streets policies, the City may consider codifying their subdivision and development requirements by establishing a Complete Streets Policy and accommodating all modes in standard cross-sections for collectors and arterials. This policy could include a checklist for use during development application review.

• MTC’s Routine Accommodation Checklist, which documents how the needs of bicyclists and pedestrians are considered in the process of planning and designing for projects considered for regional transportation funds, may be a model:

http://www.mtc.ca.gov/planning/bicyclespedestrians/routine_accommodations.htm

• Consider adopting a Multi-Modal Level of Service methodology for transportation analysis in the City. A resource is the Complete Street Level of Service Multimodal LOS Toolkit: http://www.dowlinginc.com/CompleteStreetsLOS.php.

Public Involvement and Feedback Process

• Consider adding a category or subcategory to the City's website (dedicated to pedestrian topics. This category or subcategory may allow residents to file comments or complaints for traffic control devices or potential safety concerns.

• Consider holding public meetings with established forums in the community such as churches, senior centers, or schools.

• Consider a tracking number process for Active Citizen Request, so that community members can track their requests.

Economic Vitality

• Consider establishing business improvement districts in downtown and other commercial areas to generate funds specifically for pedestrian-related improvements.

• Consider adding overlay zones, such as transit-oriented zones, to the Zoning Code such as the City of Palo Alto's Pedestrian and Transit Oriented Development Combining District Regulations in §18.34 of the Municipal Code (see: http://www.amlegal.com/nxt/gateway.dll/California/paloalto_ca/title18zoning*/chapter1834pedestrianandtransitorientedd).
Use of Leading Pedestrian Intervals

- Consider installing LPIs in areas of high pedestrian activity throughout the City.
- Provide a right-turn-on-red restriction as necessary per recent research findings\(^1\).

Use of Neighborhood-sized Schools

- Consider working with the local school districts to establish a policy on neighborhood-sized and oriented schools as part of a Safe-Routes-to-School policy.

Formal Advisory Committee

- Consider establishing a citywide citizen’s advisory committee to exclusively address Watsonville’s pedestrian and bicycle needs and to help steward the potential implementation of the Bicycle Master Plan and Pedestrian Master Plan. Consider a disability representative for the committee.

Coordination with Health Agencies

- Seek opportunities for technical collaboration and funding with public health and health care professionals.
- Consider coordinating with local hospitals as another source of collision data.

Opportunity Areas

Collection of Pedestrian Volumes

- Consider routinely collecting pedestrian and bicycle volumes by requiring them to be conducted in conjunction with manual intersection turning movement counts.
- Geo-code pedestrian volume data with GIS software along with other data such as pedestrian control devices and collisions to analyze data for trends or hotspots related to pedestrian safety.

Attention to Crossing Barriers

- Consider adoption of design standards for the accommodation of pedestrian and bicyclists at highway interchanges, railroad crossings and bridges.
- Identify and create a geocoded inventory of pedestrian barriers.
- Develop policies for reducing the barriers through prioritizing projects and requirements with future development.

Transportation Demand Management Program

Continue to work with PVTMA to support TDM policies and programs. As part of a comprehensive TDM program:

- Identify a part-time TDM Coordinator among City staff
- Develop a TDM policy which:
  - Incentivizes non-auto travel options (e.g., commuter checks, parking cash-out programs, transit passes, etc.)
  - Creates support for major employers to implement a TDM program (e.g., emergency ride home programs)
  - Involves METRO transit service in major decisions
- Create a TDM website with separate pages for employees, residents, and visitors.
- Establish a Transportation Management Association (TMA) for key commercial and business areas to coordinate parking, transit, and other TDM strategies and policies.

Inventory of Sidewalks, Informal Pathways, and Key Pedestrian Opportunity Areas

- Inventory and geocode sidewalks in the City and add informal pathways and key pedestrian opportunity areas.
- Consider additional sidewalk funding mechanisms, such as requirement to provide or repair sidewalks with each property sale.

Walking Audit Suggestions for Improvements

A walking audit was conducted at six focus areas in Watsonville as determined in coordination with City staff:

1. Downtown including Main Street and Transit Center
2. Freedom Boulevard
3. E. Lake Avenue (SR-152) at Palm Avenue Manor Avenue
4. Airport Boulevard at Freedom Center
5. Watsonville High School
6. Pajaro Valley High School

These focus areas were visited, and the walking audit identified positive practices, as well as pedestrian safety and accessibility opportunities.
The observations made during the walking audit were used to suggest policies and physical improvements that could enhance pedestrian safety and accessibility. Key suggestions from the Watsonville walking audit include:

- Implement a citywide pedestrian education campaign
- Initiate a systematic assessment program for all uncontrolled marked crosswalks
- Install high-visibility marked crosswalks at uncontrolled locations
- Install new fluorescent yellow green (FYG) signage at all uncontrolled marked crosswalks
- Install pedestrian refuge islands
- Install curb extensions

A narrative description of walking audit observations and suggestions for enhancements (with graphics) are summarized in Chapter 4.

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

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

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

1.1 OBJECTIVE

The City of Watsonville requested that the Technology Transfer Program of the Institute of Transportation Studies at University of California, Berkeley conduct a Pedestrian Safety Assessment (PSA) study for various locations within the city. The objectives of the PSA are to improve pedestrian safety and to enhance walkability and accessibility for all pedestrians in Watsonville.

1.2 EVALUATION APPROACH

Prior to visiting the City of Watsonville, the PSA Team (Team) conducted a pre-visit telephone interview with City staff on November 16, 2010. The results from this interview provided input into the benchmarking analysis. The Team visited the City on January 18, 2011. A meeting was held with the City staff to discuss initial results from the benchmarking analysis and logistics for the field visit.

The Team conducted walking field audits at a number of locations in Watsonville including the Main Street and Freedom Boulevard corridors as well as other areas of pedestrian concerns. Walking audit participants included City staff from the Planning Department, Public Works Department, and Police Department. Representatives from the Pajaro Valley Unified School District and the Santa Cruz County Regional Transportation Commission, and a member of the public also participated. The Team held an exit meeting with participants from the walking audit at the end of the visit. This meeting included a presentation of the draft concepts for site-specific improvements based on the results of the walking audits.

1.3 ORGANIZATION OF THIS REPORT

Chapter 2 presents background information on pedestrian safety in Watsonville, including the safety rankings for the city, the locations of the highest pedestrian-involved collisions, and locations where pedestrian fatalities occurred from 2005 to 2010. Chapter 3 presents the findings and suggestions from the benchmarking analysis. Chapter 4 presents the findings and suggestions from the walking audit.

There are two appendices at the end of the report: Appendix A presents a glossary of pedestrian improvement measures, and Appendix B is a resource list.
1.4 ACKNOWLEDGEMENTS

Watsonville staff members contributed to the wide range of topics addressed in this report. In particular, they organized a successful field visit, which included several City staff members as well as representatives from Santa Cruz County Regional Transportation Commission, Pajaro Valley Unified School District, and the public:

- Murray Fontes, City of Watsonville, Public Works
- Maria Esther Rodriguez, City of Watsonville, Public Works
- Suzi Aratin, City of Watsonville, Planning
- Michael Ridgway, Traffic Sergeant, Watsonville Police Department
- Terry Traub, City of Watsonville, Police Department
- Michael Stone, City of Watsonville, Public Works
- Peggy Bumatay, Pajaro Valley Unified School District
- Karena Pushnik, Santa Cruz County Regional Transportation Commission
- Dobie Jenkins, former City Planning Commissioner and Park and Recreation Commissioner

1.5 DISCLOSURES

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

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

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

The city of Watsonville is a mostly suburban community with approximately 52,000 residents. The city is located along Cabrillo Highway (Highway 1) in Santa Cruz County. The City of Watsonville has been striving to accommodate both existing and future pedestrian demand, with efforts including:

- Regularly conducting speed surveys on arterials and collectors and considering local conditions when setting speed limits
- Development of a dedicated team of traffic safety officers that perform education as well as enforcement duties and prioritize pedestrian-related issues in their efforts
- Working with regional and local agencies to develop and implement pedestrian safety outreach programs and campaigns
- Assessing impact fees on new developments that fund traffic improvements including pedestrian facilities
- Clearly defining open space requirements for residential and non-residential land uses

2.1 PEDESTRIAN SAFETY OVERVIEW FOR WATSONVILLE

Based on the California Office of Traffic Safety (OTS) ranking statistics, the City ranked 4th out of 104 California cities for the number of pedestrian collisions per daily vehicle miles traveled in 2009 (with 1st position being the worst ranking). During the five-year period between April 1, 2005 and March 31, 2010, there have been three pedestrian fatalities in the city.

The Office of Traffic Safety (OTS) collision rankings facilitate funding decisions and identify emerging traffic safety problem areas. The rankings allow cities to compare themselves to other cities with similar-sized populations and help them identify their potential disproportionate traffic safety problem(s). Please note that OTS rankings are only indicators of potential problems; there are many factors that may either understate or overstate a city ranking.

Victim and collision data for the rankings is taken from the latest published California Highway Patrol (CHP) Statewide Integrated Traffic Records System (SWITRS) report. OTS provides two types of rankings: victim and collision rankings and DUI arrest rankings.

Victim and collision rankings are based on rates of victims killed and injured or fatal and injury collisions per "1,000 daily-vehicle-miles-of-travel" (2009 CALTRANS) and per "1,000 average population" (2009 Department of Finance) figures. Pedestrian, bicyclist and motorcycle victim rankings do not take into account the size or demographics of a city or county's pedestrian/bicyclist/motorcyclist population.

Population groups using 2009 SWITRS data\(^2\) are as follows:

\(^2\) Reference: California Office of Traffic safety.  
http://www.cts.cqa.gov/Media_and_research/Rankings/Explanation.asp
Population Group  | Collisions and Victims Rankings
---|---
A = over 250,000  | 13 cities ranked
B = 100,001 to 250,000  | 56 cities ranked
C = 50,000 to 100,000  | 104 cities ranked
D = 25,001 to 50,000  | 98 cities ranked

For victim and collision rankings, a Population Group Ranking of "1/104" would be assigned to the city with the highest number of victims/collisions per 1,000 residents in population group C, while a ranking of "104/104" would be assigned to the city with the lowest number of victims/collisions per 1,000 residents in population group C.

The 2009 OTS safety rankings for Watsonville are shown in Tables 2-1 and 2-2.

**TABLE 2-1: WATSONVILLE SUMMARY STATISTICS**

<table>
<thead>
<tr>
<th>Year</th>
<th>City</th>
<th>Population</th>
<th>Population Group</th>
<th>Daily Vehicle Miles Traveled (VMT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>Watsonville</td>
<td>52,230</td>
<td>C</td>
<td>368,173</td>
</tr>
</tbody>
</table>

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

**TABLE 2-2: WATSONVILLE TRAFFIC COLLISIONS AND RANKINGS, 2009**

<table>
<thead>
<tr>
<th>Type of Collision</th>
<th>Victims Killed and Injured</th>
<th>Ranking by Daily Vehicle Miles Traveled (of 58 counties)</th>
<th>Ranking by Average Population (of 58 counties)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Fatal and Injury</td>
<td>172</td>
<td>35/104 (34 percentile)</td>
<td>60/104 (58 percentile)</td>
</tr>
<tr>
<td>Alcohol Involved</td>
<td>13</td>
<td>66/104 (63 percentile)</td>
<td>65/104 (82 percentile)</td>
</tr>
<tr>
<td>HBD (Had Been Drinking) Driver &lt; 21</td>
<td>2</td>
<td>34/104 (33 percentile)</td>
<td>49/104 (47 percentile)</td>
</tr>
<tr>
<td>HBD Driver 21 - 34</td>
<td>1</td>
<td>98/104 (94 percentile)</td>
<td>98/104 (94 percentile)</td>
</tr>
<tr>
<td>Motorcycle</td>
<td>6</td>
<td>33/104 (32 percentile)</td>
<td>52/104 (50 percentile)</td>
</tr>
<tr>
<td>Pedestrians</td>
<td>32</td>
<td>4/104 (4 percentile)</td>
<td>4/104 (4 percentile)</td>
</tr>
<tr>
<td>Pedestrians &lt; 15</td>
<td>8</td>
<td>5/104 (5 percentile)</td>
<td>4/104 (4 percentile)</td>
</tr>
<tr>
<td>Pedestrians 65+</td>
<td>1</td>
<td>49/104 (47 percentile)</td>
<td>54/104 (52 percentile)</td>
</tr>
<tr>
<td>Bicyclists</td>
<td>21</td>
<td>14/104 (13 percentile)</td>
<td>22/104 (21 percentile)</td>
</tr>
<tr>
<td>Bicyclists &lt; 15</td>
<td>5</td>
<td>8/104 (8 percentile)</td>
<td>16/104 (15 percentile)</td>
</tr>
<tr>
<td>Speed Related</td>
<td>41</td>
<td>18/104 (17 percentile)</td>
<td>36/104 (35 percentile)</td>
</tr>
<tr>
<td>Nighttime (9:00pm - 2:59am)</td>
<td>8</td>
<td>74/104 (71 percentile)</td>
<td>94/104 (90 percentile)</td>
</tr>
<tr>
<td>Hit and Run</td>
<td>19</td>
<td>11/104 (11 percentile)</td>
<td>15/104 (14 percentile)</td>
</tr>
<tr>
<td>DUI Arrests</td>
<td>229</td>
<td>N/A</td>
<td>76/103 (73 percentile)</td>
</tr>
<tr>
<td>Composite</td>
<td>-</td>
<td>32/104 (31 percentile)</td>
<td>56/104 (54 percentile)</td>
</tr>
</tbody>
</table>

Source: California Office of Traffic Safety, [www.ots.ca.gov/Media_and_Research/Rankings/default.asp](http://www.ots.ca.gov/Media_and_Research/Rankings/default.asp)
Based on these rankings, the areas of highest concern for traffic safety in Watsonville in 2009 were:

- Pedestrians collisions in general
- Pedestrian collisions, including those involving children under 15 years old
- Bicycle collisions in general
- Bicycle collisions, including those involving children under 15 years old
- Hit and Run collisions
- Speed Related

This assessment and report emphasize safety issues associated with pedestrians, including a focus on older and younger pedestrians through suggested treatments such as road diets, bulbouts, and median refuge islands. Many of the suggestions in this report may also improve safety for bicyclists in Watsonville.

2.2 HIGH PEDESTRIAN COLLISION LOCATIONS

Pedestrian-vehicle collision data for the City of Watsonville for the period from April 1, 2005 to March 31, 2010 was taken from the Statewide Integrated Traffic Records System (SWITRS). The locations of the collisions are shown on Figure 2-1. As mentioned previously, three pedestrian fatalities occurred in Watsonville during this period at the following locations:

- On East Lake Avenue (Route 152) about 3 feet east of Palm Avenue in October 2007
- At the intersection of Bridge Street and Beck Street in January 2008
- On Airport Boulevard about 357 feet west of Pajaro Lane in October 2009

Based on the collision data, the location with the highest number of pedestrian injury collisions occur along Main Street and nearby roadways in downtown Watsonville. Locations with three or more injury collisions are presented in Table 2-3.

<table>
<thead>
<tr>
<th>TABLE 2-3: TOP PEDESTRIAN-VEHICLE INJURY COLLISION LOCATIONS ALONG IN OR NEAR DOWNTOWN WATSONVILLE, APRIL 2005 – MARCH 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intersection</td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>Main Street and 5th Street</td>
</tr>
<tr>
<td>Main Street and Lake Avenue</td>
</tr>
<tr>
<td>Main Street and Beach Street</td>
</tr>
<tr>
<td>Union Street and E Lake Avenue</td>
</tr>
<tr>
<td>Rodriguez Street and 2nd Street</td>
</tr>
</tbody>
</table>

Source: California Highway Patrol

Notes: This list is based on number of collisions and does not adjust for vehicle or pedestrian volumes (exposure)
Notes: Midblock collisions were assigned to the nearest intersection.
Figure 2-1: Watsonville Pedestrian Collision Frequency and Severity (2005-2010)

Note: Midblock collisions are assigned to the nearest intersection
3. BENCHMARKING ANALYSIS RESULTS AND SUGGESTIONS

Prior to the field visit to the City of Watsonville, the PSA team conducted an in-depth telephone interview on November 16, 2010 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 highlighted cell represents the closest match). The City’s policies, programs, and practices were compared with national best practices. The benchmarking analysis categorized the City's programs, practices, and policies into three groups:

- Key Strengths (areas where the City is exceeding national best practices)
- Enhancement Areas (areas where the City is meeting best practices)
- Opportunity Areas (areas where the City appears not to meet best practices)

The items in Table 3-1 are further elaborated in the following sections. The City may select strategies for implementation based on local priorities. The PSA Team presented the results of this benchmarking analysis to City staff during the field visit.

<table>
<thead>
<tr>
<th>Benchmark Topic</th>
<th>Key Strength</th>
<th>Enhancement</th>
<th>Opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian-Oriented Speed Limits and Speed Surveys</td>
<td>Employs comprehensive practice to proactively review speed limits such as USLIMITS</td>
<td>Reviews data only in response to reported concerns or frequent collisions</td>
<td>Does not have set practices for speed limit reviews</td>
</tr>
<tr>
<td>General Plan: Densities and Mixed Use Zones</td>
<td>Has moderate to high densities in the CBD and mixed use zones</td>
<td>Has moderate densities with separate uses</td>
<td>Has low densities with separate uses</td>
</tr>
<tr>
<td>Enforcement</td>
<td>Police Department conducts sustained pedestrian safety-related enforcement efforts, which may include resource sharing with neighboring cities</td>
<td>Police Department conducts some pedestrian safety-related enforcement activities</td>
<td>Police Department does not have Traffic Safety Officer(s)</td>
</tr>
<tr>
<td>Pedestrian Safety Education Program</td>
<td>In addition to pedestrian safety curriculum in schools, provides brochures and/or conducts education campaigns</td>
<td>Has pedestrian safety curriculum in schools and/or Community Centers</td>
<td>Does not have pedestrian safety education programs</td>
</tr>
<tr>
<td>Adoption of Open Space Requirement</td>
<td>Has an ordinance that improves pedestrian safety</td>
<td>Does not have an ordinance</td>
<td>N/A</td>
</tr>
<tr>
<td>Historic Sites</td>
<td>Cultural and Historic Preservation Plans include a wayfinding and walkability focus</td>
<td>Cultural and Historic Preservation Plans require pedestrian accommodations</td>
<td>Cultural and Historic Preservation Plans do not address pedestrian needs</td>
</tr>
<tr>
<td>Adoption of Newspaper Rack Ordinance</td>
<td>Has an ordinance that improves pedestrian safety</td>
<td>Does not have an ordinance</td>
<td>N/A</td>
</tr>
<tr>
<td>Use of Street Furniture Requirements</td>
<td>Has an ordinance that improves pedestrian safety</td>
<td>Does not have an ordinance</td>
<td>N/A</td>
</tr>
<tr>
<td>Benchmark Topic</td>
<td>Key Strength</td>
<td>Enhancement</td>
<td>Opportunity</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Collision History and Collision Reporting Practices</td>
<td>Creates annual reports or employs other comprehensive monitoring practice</td>
<td>Reviews data only following fatalities or other high-profile incident</td>
<td>Does not have set practices for data review</td>
</tr>
<tr>
<td>Implementation of Americans with Disabilities Act (ADA) Improvements and ADA Transition Plan for Streets and Sidewalks</td>
<td>Uses state-of-the-practice ADA improvements with consistent installation practices</td>
<td>Has clear design guidelines but no regular practices for ADA compliance</td>
<td>Has minimal design guidelines and practices related to ADA requirements</td>
</tr>
<tr>
<td>Pedestrian Traffic Control Audit (Signs, Markings, and Signals)</td>
<td>Maintains an inventory of pedestrian signs, markings, and signals</td>
<td>Does not have an inventory of signs, markings, and signals</td>
<td>N/A</td>
</tr>
<tr>
<td>Pedestrian-Oriented Traffic Signal and Stop Sign Warrants</td>
<td>Uses relaxed warrants for traffic signals and/or all-way stops</td>
<td>Uses MUTCD Warrants</td>
<td>N/A</td>
</tr>
<tr>
<td>Proactive Approach to Institutional Challenges</td>
<td>Has identified obstacles and has implemented efforts to overcome barriers</td>
<td>Has identified obstacles</td>
<td>Does not have any identified obstacles</td>
</tr>
<tr>
<td>Safe-Routes-to-School Program and Grant Funding</td>
<td>Has a Safe Routes to Schools program and funding for recent projects</td>
<td>Has a Safe Routes to Schools program but has not obtained funding for recent projects</td>
<td>Does not have a Safe Routes to Schools program</td>
</tr>
<tr>
<td>Traffic Calming Programs</td>
<td>Has a significant traffic calming program with a dedicated funding source</td>
<td>Has a traffic calming program but no dedicated funding source</td>
<td>Does not have a traffic calming program</td>
</tr>
<tr>
<td>Pedestrian Safety Program and Walking Audits</td>
<td>Has significant and ongoing programs which include Walking Audits</td>
<td>Has some programs and may have conducted a Walking Audit</td>
<td>Does not have pedestrian safety programs</td>
</tr>
<tr>
<td>Pedestrian/Bicycle Coordinator</td>
<td>Has a Coordinator on staff who manages the City Pedestrian Program</td>
<td>Occasionally uses a contract Coordinator</td>
<td>Does not have a Pedestrian Coordinator</td>
</tr>
<tr>
<td>Design Policies and Development Standards</td>
<td>Has a Streetscape Master Plan</td>
<td>Has minimal design policies</td>
<td>Does not have a Streetscape Master Plan or design policies for pedestrian treatments</td>
</tr>
<tr>
<td>Crosswalk Installation, Removal, and Enhancement Policy</td>
<td>Has a crosswalk policy that reflects best practices for signalized and uncontrolled crosswalk treatments</td>
<td>Has a crosswalk policy but it is not comprehensive or up to date with best practices</td>
<td>Does not have a crosswalk policy</td>
</tr>
<tr>
<td>General Plan: Provision for Pedestrian Nodes</td>
<td>Pedestrian nodes are identified and pedestrian-oriented policies are in place for these nodes</td>
<td>Pedestrian nodes are identified but pedestrian accommodations are not</td>
<td>Pedestrian nodes are not identified</td>
</tr>
<tr>
<td>Specific Plans, Redevelopment Areas, and Overlay Zones</td>
<td>Pedestrian-oriented design, &quot;walkability&quot;, or place-making is stressed in the Plans</td>
<td>Plans require pedestrian accommodations</td>
<td>Plans do not address pedestrian needs</td>
</tr>
<tr>
<td>Benchmark Topic</td>
<td>Key Strength</td>
<td>Enhancement</td>
<td>Opportunity</td>
</tr>
<tr>
<td>-----------------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Preparation of a Pedestrian Master Plan</td>
<td>Has a recently-updated Plan and pedestrian projects have been completed recently</td>
<td>Has a Pedestrian Master Plan but it may be outdated and/or no recent projects from the Plan have been completed</td>
<td>Does not have a Pedestrian Master Plan</td>
</tr>
<tr>
<td>Adoption of Bicycle Parking Requirements</td>
<td>Requires bicycle parking with new development</td>
<td>Does not require bicycle parking</td>
<td>N/A</td>
</tr>
<tr>
<td>Adoption of Street Tree Requirements</td>
<td>Has an ordinance that improves pedestrian safety</td>
<td>Does not have an ordinance</td>
<td>N/A</td>
</tr>
<tr>
<td>Adoption of Routine Accommodations for New Development</td>
<td>Has Routine Accommodations Policy that applies to the development review process and assesses impact fees</td>
<td>Has Routine Accommodations Policy for public works projects only</td>
<td>Does not have a Routine Accommodations Policy</td>
</tr>
<tr>
<td>Public Involvement and Feedback Process</td>
<td>Has a formal, active public feedback process (web-enabled)</td>
<td>Has an ad-hoc public feedback process</td>
<td>Does not have a public feedback process</td>
</tr>
<tr>
<td>Economic Vitality</td>
<td>Has several business improvement districts, an established façade improvement program, and/or aggressive downtown parking policies</td>
<td>Has a business improvement district, façade improvement program, or downtown parking policies</td>
<td>Does not have business improvement districts, façade improvement program, or downtown parking policies</td>
</tr>
<tr>
<td>Use of Leading Pedestrian Intervals</td>
<td>Has installed LPDs at appropriate locations</td>
<td>Has not installed LPDs</td>
<td>N/A</td>
</tr>
<tr>
<td>Use of Neighborhood-sized Schools</td>
<td>Has a policy to encourage neighborhood sized schools</td>
<td>Does not have a policy to encourage neighborhood sized schools</td>
<td>Does not have a policy to encourage neighborhood sized schools and recent schools have been “mega schools” on the periphery</td>
</tr>
<tr>
<td>Formal Advisory Committee</td>
<td>Has a formal, active Pedestrian Committee</td>
<td>Has an ad-hoc Pedestrian Committee</td>
<td>Does not have a Pedestrian Committee</td>
</tr>
<tr>
<td>Coordination with Health Agencies</td>
<td>Health agencies are involved in the planning of pedestrian facilities and/or programs and collection of collision data</td>
<td>Health agencies have programs to promote healthy lifestyles through active transportation</td>
<td>Health agencies are not involved in pedestrian safety or active transportation</td>
</tr>
<tr>
<td>Collection of Pedestrian Volumes</td>
<td>Collects pedestrian volumes routinely with intersection counts</td>
<td>Collects some pedestrian volumes, but not routinely</td>
<td>Does not collect pedestrian volumes</td>
</tr>
<tr>
<td>Attention to Crossing Barriers</td>
<td>Has a recently updated policy and comprehensive inventory of barriers</td>
<td>Has an outdated policy</td>
<td>Does not have a policy for pedestrian crossings at railroads, freeways, etc.</td>
</tr>
<tr>
<td>Transportation Demand Management Programs</td>
<td>Has extensive TDM programs and enforces parking cash out, etc.</td>
<td>Has basic TDM programs (Commuter Checks, Guaranteed Ride Home)</td>
<td>Does not have a Travel Demand Management program or policy</td>
</tr>
</tbody>
</table>
3.1 KEY STRENGTHS

(a) Pedestrian-Oriented Speed Limits and Speed Surveys

As shown in Figure 3-1, pedestrian fatality rates increase exponentially with vehicle speed. Thus, reducing vehicle speeds in pedestrian zones may be one of the most important strategies for enhancing pedestrian safety.

A recent policy directive from the California Department of Transportation, pursuant to the California Vehicle Codes (CVC) and resulting in changes to the California Manual on Uniform Traffic Control Devices (MUTCD), provides state and local municipalities with the authority to reduce the posted speed limit if an engineering and traffic study demonstrates that a different (lower) speed limit should be a better fit based on local conditions. The allowable reduction is five miles per hour from what the posted speed limit need to be based on the 85th percentile speed of free-flowing traffic. However, school zone speed limits are de facto 25 miles per hour or under. Also, the Vehicle Code was recently amended to allow local municipalities to reduce the school zone speed to 15 miles per hour without a traffic study if the road approaching the school is in a residential district, has a maximum of two lanes, and a regular speed limit of 30 miles per hour or less. Under these conditions, municipalities also have the option of extending a 25 mile per hour school zone to 1,000 feet from the school instead of only 500.

In Watsonville, speed surveys follow the CVC and are conducted by City staff on an on-going basis. The most recent survey was conducted in 2010. The speed limit on local streets is 25 mph; while speed limits on collectors and arterials are generally set at 85th percentile levels. However, the speed may be reduced by five mph as allowed per local conditions. Speed limits signs are typically posted on arterials and collectors.

Suggestions for Potential Improvement

- Consider pedestrian volumes when setting speed limits and employ traffic calming strategies in locations where speed surveys suggest traffic speeds are too high for pedestrian areas.
- Consider establishing 15 MPH school zones.
(b) General Plan: Densities and Mixed-Use Zones

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

In Watsonville, zoning districts are established in a traditional manner. Form-based zoning is not used. Residential land use is classified into three different categories: low density with 7.99 units per acre or less, medium density with 8 to 13.99 units per acres, and high density with 14 units per acres or more. Furthermore, a mix of upper level residential and ground-floor retail commercial uses is permitted under two of the four commercial land use categories (General Commercial and Central Commercial) as a conditional use. Different zoning districts are spread throughout the city but the highest density developments are concentrated in the downtown area. Accessory units are allowed in all zoning districts.

Off-street parking requirement for residential land use is determined based upon the type of units and the number of bedrooms. In general, two spaces, including one enclosed space per unit, are required for single family and duplex units with up to three bedrooms. For multi-family land use, one space per four bedrooms for developments up to 75 units in size, one space per six bedrooms for developments between 75 and 125 units, and one space per eight bedrooms where there are more than 125 units. The off-street parking requirement for commercial land use is determined based on floor area of the facilities with varying standards among different
types of establishments. There is no provision for shared parking between uses or for unbundled parking.

**Suggestions for Potential Improvements**

- Within the City's General Plan, identify existing and future priority pedestrian areas in the City, where varied densities and mixed-uses could accommodate or attract pedestrian activity.

- Consider defining opportunities for mixed-uses by ordinance, particularly in pedestrian districts/nodes and transit-priority areas.

- Enhance pedestrian-friendly goals, policies, and actions defined in the City's General Plan, possibly through the development of a Pedestrian Master Plan and establishing transit and auto vehicle policies that support a balanced multi-modal transportation network.

- Consider incorporating form-based zoning and policies for transit oriented development (TOD) into the next General Plan update.

**Enforcement**

Enforcement of pedestrian right-of-way laws and speed limits is an important complement to engineering treatments and education programs. The Watsonville Police Department has a dedicated team of traffic safety officers. The four officers and one sergeant are responsible mainly for enforcement particularly around Watsonville High School during lunch time. They dedicate the first few days of each semester to pedestrian violation enforcement and education. The officers sometimes use enforcement as an opportunity for education by distributing pedestrian safety pamphlets in lieu of, or in addition to, citations.

A radar gun check-out program has long been a part of the City's enforcement program for trained community volunteers to record speeding vehicles' license plate numbers.

The Police Department is a part of the BADGES program, which stands for "before aggressive drivers get everyone stop". Traffic officer resources are shared among the five participating cities in Santa Cruz County one day a month to work on different issues in each city. In Watsonville, the main issue is pertaining to pedestrian violations.

The Police Department is involved in the planning of pedestrian facilities through the development review process, when each City department is provided with opportunities to comment on the projects.

**Suggestions for Potential Improvement**

- Continue to conduct periodic pedestrian stings at unmarked crosswalk locations with pedestrian activity where motorists frequently fail to yield to pedestrians.

• Reinforce pedestrian safety enforcement principles to officers not limited to the traffic safety officers. 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/pedestrian_grants.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).

(d) Pedestrian Safety Education Program

Education is a critical element for a complete and balanced approach to improving pedestrian safety. Education campaigns may target pedestrians of all ages, especially emphasizing education of school children where safe walking habits may be instilled as lifelong lessons. While the City does not have its own pedestrian safety education program, its Parks and Community Services Department would respond to school’s request to conduct safety education. In general, pedestrian safety education program is done through Santa Cruz County Health Services Agency, which outreaches to schools and provides traffic education and other offerings such as helmet fitting. Bilingual pedestrian and walking safety brochures are available.

The Watsonville Police Activity League (PAL) hosts an annual kids’ carnival, which includes bike rodeo and other activities, as a means for the police to connect with kids and family.

The City has occasionally conducted pedestrian safety education campaigns including television commercials and public service announcement, and participated in education campaigns through the South County Bicycle and Pedestrian Work Group, which entails newspaper advertisement.

Suggestion for Potential Improvement

• Continue to work with Santa Cruz County Health Services Agency and the South County Bicycle and Pedestrian Work Group on regional and local pedestrian educational efforts for all ages. The following resources and sample program/materials may be considered:
  – The Street Smarts program in San José, California, provides a model pedestrian safety education program (see www.getstreetsmarts.org for more information). 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 Bicycle Transportation Alliance has developed a pedestrian safety curriculum for 2nd-3rd graders, which incorporates physical education, health, and social responsibility (refer to: www.bta4bikes.org/docs/PedSafetyCurriculumFinal.doc).

Other safety curriculum resources are available at: www.saferoutespartnership.org/state/5638/5722.


Apply for grant funding to implement the campaign discussed above.

(e) Open Space Requirements

Residents typically rate open space as among a jurisdiction’s key assets and needs. Open space may encourage walking, especially for recreational trips. The General Plan Recreation and Parks Element and the City of Watsonville Parks and Recreation Facilities Master Plan (2009) establish standards for open space (i.e. five acres per 1000 residents). The General Plan also specified focused effort to develop parks at the neighborhood- and community serving level. They defined the types of parks and established a service area policy of ½ miles for neighborhood parks and ¼ miles for vest pocket parks. The City also subject residential, commercial and industrial projects to either dedicate land to parks and open space or pay park in-lieu fees.

According to the Master Plan, there are three planned parks in the city totaling approximately 41 acres.

Suggestion for Potential Improvement

- None

(f) Historic Sites

Historic walking routes, such as the famous Freedom Trail in Boston, encourage walking and enhance economic vitality.

A historic ordinance was adopted in the 1980’s which allowed for listing of properties with historic importance in local and national registers. Watsonville has fourteen historic sites including ten that are listed on the National Register of Historic Places: Redman House, Godfrey M. Bockius House, Jose Joaquin Castro Adobe, Judge Lee House, Lottuich Building, Madison House, Mansion House Hotel, Stoesser Block and Annex, Watsonville City Plaza and Watsonville-Lee Road Site. The City published a brochure to guide walking and driving tour through historic Main Street.

Suggestion for Potential Improvement

- In addition to the walking tour brochure, other historic documentation materials could be made available online. Way finding signs, maps, brochures and plaques could also be provided throughout the City.
(g) Adoption of Newspaper Rack Ordinance

Newspaper racks may obstruct walkways and reduce accessibility and pedestrian conspicuity when ordinances are not in place. A Newspaper Rack Ordinance improves the pedestrian realm by reducing clutter and organizing sidewalk zones. It details size, location, and maintenance requirements. Watsonville has a Newspaper Rack Ordinance that governs the size and placement of news racks on public streets.

**Suggestion for Potential Improvement**

- None

(h) Use of Street Furniture Requirements

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

**Suggestion for Potential Improvement**

- None

(i) Collision History and Collision Reports

Identifying and responding to collision patterns on a regular basis is an important reactive approach to pedestrian safety (which may be combined with proactive measures).

Pedestrian collision data are scrutinized by the Police Department and are reviewed by Watsonville’s Traffic Committee when addressing particular issues but they are not regularly examined.

A field inventory of collision locations is mapped to track problem locations. Crossroads software is used as a tool to monitor pedestrian collisions in the city.

**Suggestions for Potential Improvement**

- An inventory of pedestrian volume counts could enhance comprehensive monitoring. 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).

- Regularly collaborate with Caltrans to review pedestrian-vehicle collisions on state highways and identify improvement measures.
3.2 ENHANCEMENT AREAS

(a) Implementation of ADA Improvements and ADA Transition Plan

Compliance with the Americans with Disability Act (ADA) guidelines is important not only to enhance community accessibility, but also to improve walking conditions for all pedestrians.

Watsonville does not have city-specific design guidelines for ADA improvements, but uses Caltrans Standards for ADA curb ramp facilities. Approximately 50 curb ramps are upgraded to meet the latest ADA standards annually as part of an ongoing City program. Furthermore, curb ramp upgrades are also included in all roadway improvement projects and are required in new developments. Each installation is evaluated to determine if directional or 45 degree ramps are more appropriate. Truncated domes are included in new installations.

Audible pedestrian signals are installed in key pedestrian areas, such as locations near metro stations and senior/disabled living, as well as per request by residents.

Few areas in the city have on-street handicapped parking spaces. They are restricted to areas with diagonal parking. No on-street handicapped parallel parking space is provided.

An ADA Transition Plan sets forth the process for bringing public facilities into compliance with ADA regulations. An ADA Transition Plan could address public buildings, sidewalks, ramps, and other pedestrian facilities. An ADA Coordinator is typically responsible for administering an ADA Transition Plan. Watsonville has an ADA Transition Plan that was last updated in 2004. The Plan includes detailed deficiency inventory and implementation plan for public buildings. The Assistant City Manager is designated as the ADA Coordinator in the Plan; however, in practice, the role is shared by the City’s Principal Engineer, who is responsible for ADA matters in the public right-of-way, and the Chief Building Inspector, who is responsible for those pertaining to public buildings.

Suggestion for Potential Improvement

- Consider inclusion of detailed deficiency inventory and implementation plan for public right-of-way in addition to public buildings in the next update of the ADA Transition Plan public buildings to reflect current ADA best practice standards

- Consider setting goals and develop a mechanism to track the implementation progress of the Transition Plan.
- Require that all new traffic signals installed feature audible pedestrian signals.

(b) Pedestrian Traffic Control Audit

The 2009 federal Manual of Uniform Traffic Control Devices (MUTCD) requires the installation of countdown pedestrian signals for all new signals. Replacing traffic signal bulbs with LED bulbs is also suggested to increase visibility and improve efficiency.

Watsonville has an inventory of traffic signals and signs in spreadsheet (EXCEL) and GIS formats. However, the inventory does not include markings. The City also conducts regular assessment of traffic control devices. All pedestrian signals in the city have LED displays. Further, it has applied for a grant to replace all City-operated signals with countdown signals. This grant would hasten the replacement effort that has already begun. Any new pedestrian signal installation will have countdown displays.

Suggestions for Potential Improvement

- Develop a crosswalk inventory by conducting audits of the adequacy of current crosswalks. Seattle’s inventory of its marked crosswalks may serve as a model. (see http://www.seattle.gov/transportation/cwp_back.htm)

- Ensure that locations with pedestrian desire lines have crosswalks. The crosswalk policy mentioned below in the Crosswalk Installation, Removal, and Enhancement Policy section (3.2(k)) can help determine the appropriate crossing treatment at uncontrolled locations without marked crosswalks.

- Work with Caltrans to replace existing pedestrian signals on state highway such as Route 152 and Route 129 to countdown signals.

- Identifying the highest priority signal locations for replacement with countdown signals and a funding source.

- Begin using Pedestrian Lead Intervals (LPIs) in areas with high levels of pedestrian activity.

- Require that all new traffic signals be installed according to current MUTCD standards including countdown signals and LED bulbs.

- Develop a proactive monitoring program for traffic control devices.

(c) Pedestrian-Oriented Traffic Signal and Stop Sign Warrants

Providing all-way stop or signal control at an intersection may improve pedestrian safety by reducing speeds and controlling pedestrian-vehicle conflicts. The MUTCD defines warrants for installing signals and stop signs; however, jurisdictions may choose to define relaxed installation criteria to encourage pedestrian safety. Best practices for stop-sign warrant application include:

- Requiring a collision history of three instead of five collisions based on routine underreporting

- Reducing traffic volume thresholds based on latent demand
Providing consideration for school children, pedestrians and traffic speeds

Watsonville follows MUTCD requirements for both stop sign and signal warrants. However, unwarranted signals are sometimes installed per request from City Council.

**Suggestion for Potential Improvement**

- Consider developing City-specific signal and stop sign warrants for adoption by City Council and subsequent application.
- Consider individual circumstances when evaluating signal and stop sign warrants.

**(d) Proactive Approach to Institutional Challenges**

Numerous agencies have jurisdiction over components of Watsonville's transportation network, including Caltrans and Santa Cruz Metro. Institutional coordination associated with multiple agencies is necessary because of non-local control of right-of-way and differing policies regarding pedestrian accommodation. For example, Caltrans policies have historically discouraged proposals for bulbouts, wider sidewalks, and other pedestrian-oriented improvements. Recent Context Sensitive Solutions and Routine Accommodations policies within Caltrans (refer to the revised Deputy Directive 64: [www.calbike.org/pdfs/DD-64-R1.pdf](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 may work with Caltrans and other agencies to identify new opportunities for joint planning of transportation facilities.

The City has identified limited funding as an obstacle to improving pedestrian environment. Additionally, new and novel traffic solutions, such as installation of traffic circles sometimes encounter strong community resistance particular from elderly residents. For example, the Neighborhood Traffic Plan, described under Neighborhood Traffic Management Programs below, is unpopular among residents; thereby hindering implementation.

**Suggestions for Potential Improvement**

- Actively pursue not only transportation-related grant opportunities but also health-related grants particularly for non-capital improvement projects such as educational program.
- Enhance outreach opportunities to increase awareness of pedestrian safety, such as the relations between vehicle speed and pedestrian injury severity and to provide pedestrian volume and collisions and vehicle speed statistics citywide and specific locations slated for pedestrian improvements. Also seek ways to increase understanding of pedestrian safety tools available in the city and residents as an effort independent from project implementation such as adding a category or subcategory to the City's website dedicated to pedestrian topics.
- Consider developing a formal process for residents to petition for neighborhood safety improvement measures.
(e) Safe-Routes-to-School Program and Grant Funding

Safe-Routes-to-School programs encourage children to safely walk or bicycle to school. The Marin County Bicycle Coalition was an early champion of the concept, which has spread nationally (refer to best practices at www.saferoutestoschools.org). 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 morning peak hour traffic). Best practices include:

- Developing a comprehensive city-wide Safe-Routes-to-School program that encourages walking to school and highlights preferred walking routes. Such a program may involve schools, advocates, parents, City staff, community health representatives, and other stakeholders. A Coalition may be developed for the program, with committees for mapping/data collection, outreach, education and encouragement, enforcement and engineering, and traffic safety. School-specific committees may also be considered.

- Form a steering committee for the program (or each school) comprised of City staff, school district staff, PTA leaders, and other stakeholders.

- Scheduling regular, ongoing meetings to maintain stakeholder involvement.

- Applying for grant funding for non-infrastructure as well as infrastructure projects.

Funding for Safe-Routes-to-School programs and/or projects is available at the state (see: http://www.dot.ca.gov/hq/LocalPrograms/saferoutes/sr2s.htm) and federal levels (see: http://www.dot.ca.gov/hq/LocalPrograms/saferoutes/sr2ts.htm).

Watsonville has successfully applies for state and federal grant funding for several Safe Routes to School projects. The projects included installation of speed feedback signs, countdown pedestrian heads, enhanced crossings, pedestrian path installations and other traffic calming features, such as speed hump. Watsonville is also a member of the Santa Cruz County Community Traffic Safety Coalition, which supports safe-route-to-school programs. Its efforts have resulted in Safe Routes to School maps for Mintie White Elementary School, MacQuiddy (T.S.) Elementary School and Ann Soldo Elementary School in Watsonville. The Coalition continues to support Safe Routes to School activities including identification of safe bike and pedestrian routes, advocacy for improvements, parent education and outreach, organizing walk pools, bike pools and walking school buses, promote parent bicycle helmet use, and participating in Walk a Child to School Day.

Suggestions for Potential Improvement

- Continue applying for grant funding; apply for non-infrastructure as well as infrastructure projects. Some of the suggestions in this report may be eligible.
- Continue to work with the Community Traffic Safety Coalition to develop Safe-Routes-to-School maps for all Watsonville schools.

- Consider developing a comprehensive citywide Safe-Routes-to-School program that encourages walking to school and highlights preferred walking routes. Such a program may involve schools, advocates, parents, City staff, community health representatives and other stakeholders. A coalition may be developed for the program, with committees for mapping/data collection, outreach, education and encouragement, enforcement and engineering, and traffic safety. School-specific committees may also be considered. Consider scheduling regular, ongoing meetings to maintain stakeholder involvement.

(i) Neighborhood Traffic Management Programs

Neighborhood Traffic Management Programs (NTMP) and policies set forth a consensus threshold on neighborhood requests and approvals, as well as standard treatments and criteria. Best practices resources for traffic calming include the site: [www.trafficcalming.org](http://www.trafficcalming.org) as well as the Traffic Calming Guidelines from the City of Anaheim ([http://www.anaheim.net/article.asp?id=1703](http://www.anaheim.net/article.asp?id=1703)) and the City of La Habra ([http://www.ci.la-habra.ca.us/article.cfm?id=191](http://www.ci.la-habra.ca.us/article.cfm?id=191)).

The City of Watsonville has adopted a Neighborhood Traffic Plan in 2001 that aims to apply a three tier progressive approach to address neighborhood traffic problems expressed by residents, such as speeding. The first tier generally includes measures such as additional police enforcement, radar trailer, and improvement of traffic control devices. The second tier involves a formalized process with the establishment of a Neighborhood Monitoring Program upon signed agreements with neighborhood groups. The second tier entails measures such as neighborhood awareness meetings, public education and neighborhood speed watch. If necessary, a third tier is implemented that would require engineering study and City Council approval. Traffic calming devices such as speed humps, pavement striping, chokers, median barriers, turn restrictions and raised intersections may be installed. However, as discussed under Proactive Approach towards Institutional Coordination, implementation of the Neighborhood Traffic Plan faces opposition; therefore, installation of traffic calming measures is generally limited to school areas.

![Image](image-url)

**Suggestion for Potential Improvement**

- Consider implementing suggestions presented under Section 3.2(d) Proactive Approach towards Institutional Cooperation.

- Consider expanding the Neighborhood Traffic Plan to include best practice resources for traffic calming, including the sites:
www.trafficcalming.org

Traffic Calming Guidelines from the City of Danville
(http://www.danville.ca.gov/Your_Community/Traffic_Concerns.aspx)

Traffic Calming Guidelines from the City of Anaheim
(http://www.anaheim.net/article.asp?id=1703)

Traffic Calming Guidelines from the City of La Habra
(http://www.ci.la-habra.ca.us/article.cfm?id=191)

(g) Pedestrian Safety Program and Walking Audits

Walking audits provide an interactive opportunity to receive feedback from key stakeholders about the study area as well as discuss potential solutions and their feasibility. They can be led by City staff, advocacy groups, neighborhood groups, or consultants. The City has conducted a walking audit with Caltrans about three years ago around City Hall and Administrative building in downtown about three years ago. As a result of the audit, Caltrans upgraded traffic signals and pavement and made other pedestrian safety improvements on State Route 152, which runs through the downtown area. While there is no regularly scheduled walking audit, periodic pedestrian observation studies are performed by the City.

The City is an active member of the South County Bicycle and Pedestrian Work Group, a subcommittee of the Community Traffic Safety Coalition. The Group implements activities that improve pedestrian safety. Some of the activities include: hanging a bilingual “Share the Road” banner across Main Street in Watsonville, distributing traffic safety educational materials at community events, supporting bike to work/school effort, conducting Walkability Survey as needed, and distributing public service announcements about pedestrian safety.

Suggestion for Potential Improvement

- Consider including regular walking audits in the citywide pedestrian safety program, based on the suggestions of this PSA. This effort could complement other programs within the City to improve health and safety or to enhance sustainability.

(h) Pedestrian/Bicycle Coordinator

In a sampling of pedestrian-oriented California cities, a full-time pedestrian/bicycle coordinator is typically provided at a ratio of one per 100,000 population. Watsonville does not have a formal Bicycle/Pedestrian Coordinator. However, the Principal Engineer of the City represents the City on the South County Bicycle and Pedestrian Work Group and acts as the de facto Bicycle/Pedestrian Coordinator of the City.

Suggestion for Potential Improvement

- With a population of approximately 50,000, Watsonville may consider formally designating a current staff member as the role of Pedestrian/Bicycle Coordinator to include interdepartmental coordination, grant writing, and staff liaison to local non-profits, advocacy groups, and schools. This staff member would spend approximately 30% of their time on pedestrian/bicycle related issues.
(i) 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. The City does not have a citywide streetscape master plan. However, design guidelines are incorporated in individual specific plans, such as the Manabe-OW Business Park Specific Plan (December 2010) and the Atkinson Lane Specific Plan (March 2009). The City intends to develop a citywide streetscape plan in the future.

The General Plan identifies general policies regarding landscape requirements. However, there is no detailed design policy. City staff encourages pedestrian-oriented development through internal review of projects on a case-by-case basis.

Suggestion for Potential Improvement

- Develop a countywide Streetscape and/or Landscape Architecture Master Plan.
- Consider form-based zoning to influence the “look and feel” of neighborhoods throughout the City.

(ii) Crosswalk Installation, Removal, and Enhancement Policy

A formal policy for crosswalk installation, removal, and enhancement provides transparency in decision-making and adopts best practices in pedestrian safety and accommodation.

The City currently does not have a formal crosswalk policy in place. The City makes decisions regarding crosswalks on a case by case basis. In general, crosswalks are installed at traffic signals. While there are existing marked crosswalks at uncontrolled locations, such crosswalks are no longer installed.

Suggestion for Potential Improvement

- Develop a crosswalk policy that reflects best practices and recent research with respect to the installation, removal, and enhancement of crosswalks, which includes removing crosswalks only as an option of last resort and providing midblock crossings where they serve pedestrian desire lines. This policy may consider adopting the “triple four” crosswalk striping treatment as used in Sacramento and other jurisdictions in California.
- Include criteria for installing crosswalk enhancements, such as flashing beacons, in-roadway warning lights, or in-roadway pedestrian signs.
Crosswalk policy resources include:

- Sacramento Crosswalk Policy:  

- Stockton Crosswalk Policy:  

- Federal Highway Administration Study on Marked versus Unmarked Crosswalks:  

- National Cooperative Highway Research Program Report on Crosswalks at Uncontrolled Locations:  

- Caltrans/UC Berkeley Study on Pedestrian/Driver Behavior at Marked versus Unmarked Crosswalks:  

![Standard Crosswalk Marking Patterns](image-source: FHWA, Planning and Designing for Pedestrian Safety Course, 2008)

**General Plan: Provision of Pedestrian Nodes**

As noted above, a city's General Plan is a key opportunity to establish the framework for pedestrian orientation. The Circulation Element of the Plan typically assigns roadway typologies, which can include a layered network approach with prioritized corridors for transit, pedestrian, bicycle, and auto travel.

The City's current General Plan does not identify pedestrian nodes. City staff has identified various pedestrian nodes near activity centers such as library, transit center, the city's two high schools and downtown and along Freedom Boulevard near Green Valley Road where commercial land use concentrates.

**Suggestions for Potential Improvement**

- Identify pedestrian nodes in future updates to General Plan
- Consider an overlay district for pedestrian nodes with special pedestrian-oriented guidelines, such as suspending auto Level of Service standards. Prioritize sidewalk improvement and completion projects in these nodes.

- Consider additional opportunities for including pedestrian orientation in new mixed-uses development within the General Plan.

**(l) Specific Plans, Redevelopment Areas, and Overlay Zones**

Transit-Oriented Development (TOD) includes mixed-use, walkable areas centered on transit stations and/or along transit corridors. When mixed-use development is convenient to transit service, long-distance travel can be accommodated on buses or trains, while short-distance travel is accommodated by bicycling or walking. TOD in turn has the potential to reduce automobile dependency and usage, and can result in reduced vehicle-miles traveled. A number of TOD projects have been or will be constructed near bus stations in the downtown area.

A significant portion of the city has been designated as two redevelopment areas: Central Downtown Project Area, which encompasses most of commercial downtown area, and Westside Industrial Project Area. There is no planned project in these areas.

Overlay zones have been applied in a few large-scale residential projects in the past ten years. City staff recognizes the importance of walkability throughout the project area and pedestrian accommodation is accessed on case by case basis during development review process.

The City also has a number of specific plans, which provides for pedestrian needs. For example, the design guidelines contained in the Manabe-Ow Specific Plan detailed the sidewalk and pedestrian walkway requirements and stated that trees should be planted in parking lots in order to provide shade for pedestrians. It also specified pedestrian-oriented signage be provided.

**Suggestion for Potential Improvement**

- Consider areas with TOD, mixed-uses, walkability, bikability, and pedestrian orientation as a high priority for redevelopment.

- Incorporate pedestrian-friendly policies throughout the planning process.

- Create a pedestrian-orientation project checklist for the development review process.

- Identify priority pedestrian areas in the city, and ensure that they are focus areas in future specific plans.

- Develop pedestrian design guidelines for the TOD corridor and city-wide.

**(m) Pedestrian Master Plan**

This type of plan includes a large menu of policy, program, and practice suggestions, as well as site-specific (and prototypical) engineering treatment suggestions. A Pedestrian (or Pedestrian/Bicycle) Master Plan documents a jurisdiction'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 Complete Streets Policy
(described below) would address other suggestions in this report. Watsonville does not currently have a Pedestrian Master Plan.

Funding source for pedestrian and bicycle improvements are generally obtained through grant and development fees. The City always incorporate pedestrian and bicycle elements in grant applications. It has been awarded several grants such as one from the Bay Area Air Quality Management District. The City spends roughly $250,000 per year on pedestrian and bicycle improvements including about $75,000 for curb ramp upgrades. Up to ten percent of time is devoted to pedestrian related work.

The City of Watsonville Parks and Recreation Facilities Master Plan recognizes the important role parks and trails play in improved mobility for bicyclists and pedestrians. It incorporates pedestrian paths and links in its design guidelines. The General Plan also contains a dedicated section for pedestrian and bicycle facilities. The needs of pedestrians are not always integrated in school construction and renovation plans but public schools are outside the jurisdiction of the City.

**Suggestion for Potential Improvement**

- Develop a Pedestrian Master Plan and include policies and suggestions in the Pedestrian Master Plan to prioritize and implement capital and maintenance projects, which could address the following:
  - Development of a comprehensive, Citywide crosswalk policy and toolbox
  - Pedestrian connectivity
  - Prioritization of sidewalks and other pedestrian facility improvements
  - Opportunities and barriers to pedestrian travel
  - Public safety and "eyes on the street" design guidelines
  - Consistency of treatments
  - Interdepartmental coordination

Model Pedestrian Master Plans are available at:

(n) Adoption of Bicycle Parking Requirements

Bicyclists become pedestrians after parking their bicycles. Safe and convenient bicycle parking is essential for encouraging bicycle travel (especially in-lieu of vehicle travel). Bicycle Parking is required in Watsonville’s Zoning Code (Section 14017.113). It specifies the conditions when bicycle parking is required, the number of spaces required and the dimension of the parking spaces.

Suggestions for Potential Improvement

- Ensure implementation of the bicycle parking requirement in the development review process.
- Consider enhancing the Bicycle Parking Ordinance to require bicycle parking in the city that distinguishes between and includes provisions for both long-term and short-term bike parking such as the Oakland bicycle parking ordinance (http://www.oaklandpw.com/AssetFactory.aspx?did=3337). The Bicycle Parking Guidelines, published by the Association of Pedestrian and Bicycle Professionals (APBP), is a resource for best practices in bicycle parking design (see http://www.bfbc.org/issues/parking/apbp-bikeparking.pdf). Additional information on bicycle parking is summarized on www.bicyclinginfo.org and http://www.bicyclinginfo.org/engineering/parking.cfm.
- Consider implementation of “branded” racks for the City (with a unique design or City symbol) such as the branded rack program in San Diego and Davis.
- Consider adopting a Bicycle Master Plan to prioritize bicycle projects. Adoption of a Bicycle Master Plan also establishes eligibility for grant funding through the Bicycle Transportation Account for implementation of bike projects.

![Bicycle Racks](image source: http://www.cityofmadison.com/trafficEngineering/documents/MadisonBikeParking.pdf)

(o) Adoption of 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. Watsonville does not have a street tree ordinance. It was proposed about five years ago but was not approved. As a part of conditions of approval for new developments, trees of certain size are required to be planted.
**Suggestion for Potential Improvement**

- Reconsider the adoption of a Street Tree Ordinance to specify where and how often street trees could be planted/ replaced, and specify which types of trees are appropriate. The ordinance could also allow trees in the parking lane, like those on Castro Street in downtown Mountain View, where sidewalk widths do not support the additional street trees.

- Incorporate trees into broader thermal comfort considerations placing trees in areas and along paths of travel.

**(p) Adoption of Routine Accommodations for New Development**

Routine Accommodations or Complete Streets Policies accommodate all modes of travel and travelers of all ages and abilities. The City does not have a Routine Accommodations or Complete Streets policy but intends to include it in the next General Plan Update. The City assesses an impact fee for new developments that funds traffic improvements, which can be a key building block for such a policy. Through the development review process, the City also requires all new subdivisions or new developments to construct sidewalks and bike lanes (where feasible) to accommodate pedestrians and bicyclists. In industrial area, in lieu fee for sidewalks is collected.

All new developments are required to comply with Title 24 California Accessibility Regulations. Safe passageway connecting buildings and to/from parking areas are required.

**Suggestion for Potential Improvement**

- To support Complete Streets policies, the City may consider codifying their subdivision and development requirements by establishing a Complete Streets Policy and accommodating all modes in standard cross-sections for collectors and arterials. This policy could include a checklist for use during development application review.

- MTC’s Routine Accommodation Checklist, which documents how the needs of bicyclists and pedestrians are considered in the process of planning and designing for projects considered for regional transportation funds, may be a model:
  
  [http://www.mtc.ca.gov/planning/bicyclespedestrians/routine_accommodations.htm](http://www.mtc.ca.gov/planning/bicyclespedestrians/routine_accommodations.htm)

- Consider adopting a Multi-Modal Level of Service methodology for transportation analysis in the City. A resource is the Complete Street Level of Service Multimodal LOS Toolkit: [http://www.dowlinginc.com/CompleteStreetsLOS.php](http://www.dowlinginc.com/CompleteStreetsLOS.php).

The following jurisdictions have established practices for Complete Streets and Routine Accommodations, including implementation of these policies through multi-modal level of service thresholds, and may serve as models for Watsonville:


- San Francisco, California, Department of Public Health’s Pedestrian Quality Index: www.sfphes.org/HIA_Tools/PEQI.pdf

(a) Public Involvement and Feedback Process

Responding to public concerns through public feedback mechanisms represents a more proactive and inclusive approach to pedestrian safety compared to a conventional approach of reacting to pedestrian collisions. Watsonville residents may file a pedestrian/bicycle hazard report with any comments or complaints for safety improvements on city streets. The reports are processed through Santa Cruz County Transportation Commission, which then forward the information to the City. In addition, residents may also contact the City directly through telephone.

Suggestion for Potential Improvement

- Consider adding a category or subcategory to the City’s website (dedicated to pedestrian topics. This category or subcategory may allow residents to file comments or complaints for traffic control devices or potential safety concerns.
- Consider holding public meetings with established forums in the community such as churches, senior centers, or schools.
- Consider a tracking number process for Active Citizen Request, so that community members can track their requests.

(r) Economic Vitality

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

An Enterprise Zone is established in the downtown area where businesses are given tax credit and other incentives for hiring local workers. However, no funding is provided for sidewalk or streetscape improvements. The Redevelopment Agency offers facade improvement program for local business primarily for signage improvements. However, such funding may also be used for improvement the whole facade.

Parking in downtown is free and unrestricted. The exceptions are the Civic Center garage, where the cost is $5 after the first two hours, and the West Beach garage, where there is a time restriction of three hours. Annual permit may be purchased for unlimited parking.
Suggestion for Potential Improvement

- Consider establishing business improvement districts in downtown and other commercial areas to generate funds specifically for pedestrian-related improvements.

- Consider adding overlay zones, such as transit-oriented zones, to the Zoning Code such as the City of Palo Alto’s Pedestrian and Transit Oriented Development Combining District Regulations in §18.34 of the Municipal Code (see: http://www.amlegal.com/nxt/gateway.dll/California/paloalto_ca/title18zoning/chapter1834pedestrianandtransitoriented).

(s) Use of Leading Pedestrian Intervals

Leading Pedestrian Intervals (LPIs) 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 that the LPI reduces conflicts between turning vehicles and pedestrians by enhancing the visibility of the pedestrian in the crosswalk. No LPIs are installed in Watsonville.

Suggestion for Potential Improvement

- Consider installing LPIs in areas of high pedestrian activity throughout the City

- Provide a right-turn-on-red restriction as necessary per recent research findings

(t) Use of Neighborhood-sized Schools

Neighborhood-sized schools, as opposed to mega schools on the periphery, are a key ingredient for encouraging walking and bicycling to school. In addition, pedestrian and ADA improvements could be prioritized near schools. The City does not have a formal policy to encourage neighborhood-sized schools. Schools tend to be older and were sized when they were built. Generally, these schools are overpopulated but limited funding prohibits construction of new schools. The City works with the School District to put in neighborhood sized schools with the development of new large development projects.

Suggestion for Potential Improvement

- Consider working with the local school districts to establish a policy on neighborhood-sized and oriented schools as part of a Safe-Routes-to-School policy.

(u) Formal Advisory Committee

Advisory committees serve as important sounding boards for new policies, programs, and practices. A citizens’ pedestrian advisory committee is also a key component of proactive public involvement for identifying pedestrian safety issues and opportunities.

---


Pedestrian issues in Watsonville are addressed through the South County Pedestrian and Bicycle Work Group. The Work Group is a subcommittee of the Community Traffic Safety Coalition, which is supported by funding from Santa Cruz County Regional Transportation Commission and in-kind match from member organizations such as Santa Cruz County Health Services Agency. The membership of the Group is made up of representatives from Santa Cruz County, Watsonville, community groups and a number of other public agencies and departments.

**Suggestion for Potential Improvement**

- Consider establishing a citywide citizen’s advisory committee to exclusively address Watsonville’s pedestrian and bicycle needs and to help steward the potential implementation of the Bicycle Master Plan and Pedestrian Master Plan. Consider a disability representative for the committee.

**(v) Coordination with Health Agencies**

Involving non-traditional partners such as Emergency Medical Service (EMS) personnel, public health agencies, pediatricians, etc., in the planning or design of pedestrian facilities may create opportunities to be more proactive with pedestrian safety, identify pedestrian safety challenges and education venues, and secure funding. Additionally, under-reporting of pedestrian-vehicle collisions could be a problem that may be partially mitigated by involving the medical community in pedestrian safety planning.\(^5\)

The Fire Department and other health agencies within the City are involved in planning of pedestrian facilities through project review process.

**Suggestion for Potential Improvement**

- Seek opportunities for technical collaboration and funding with public health and health care professionals.
- Consider coordinating with local hospitals as another source of collision data.

### 3.3 OPPORTUNITY AREAS

**(a) Collection of Pedestrian Volumes**

Pedestrian volume data is important for prioritizing projects, developing collision rates, and determining appropriate pedestrian infrastructure. The City does not routinely collect bicycle and pedestrian volume data but may collect them as part of a traffic impact study or for general plan update. It does not require that bicycle or pedestrian counts be collected with manual intersection counts. The Police Department works with a group in Santa Cruz County Health Department to perform pedestrian and bicycle observations but such observations do not necessarily include volume data.

---

Suggestions for Potential Improvement

- Consider routinely collecting pedestrian and bicycle volumes by requiring them to be conducted in conjunction with manual intersection turning movement counts.
- Geo-code pedestrian volume data with GIS software along with other data such as pedestrian control devices and collisions to analyze data for trends or hotspots related to pedestrian safety.

(b) Attention to 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.

The City does not have a formal policy for identifying and addressing barriers to walking. Currently, all railroad crossings are at-grade with traffic signal provided at Riverside Drive and Walker Street; while all other crossing locations are unsignalized. Bridges with sidewalks are provided over slough to facilitate pedestrian movements. The City has identified the existing bridge over Highway 1 at Harkins Slough Road to be inadequate for vehicle and pedestrian travel. It is working with Caltrans to improve the interchange by widening the bridge to provide bike lanes and sidewalks.

Suggestions for Potential Improvement

- Consider adoption of design standards for the accommodation of pedestrian and bicyclists at highway interchanges, railroad crossings and bridges.
- Identify and create a geocoded inventory of pedestrian barriers.
- Develop policies for reducing the barriers through prioritizing projects and requirements with future development.

(c) Transportation Demand Management Program

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. Watsonville does not have a TDM program for City employees and the City does not have a TDM Coordinator. Large new development projects are required to respond to comments from Santa Cruz Metropolitan Transit District (METRO) received as part of the development approval process. METRO's requirements are incorporated into conditions of approval.

The City works closely with the Pajaro Valley Transportation Management Association (PVTMA), an affiliate organization of the Pajaro Valley Chamber of Commerce. PVTMA develops and offers incentives and education-based programs and activities to area business and local communities to encourage alternative modes of transport. It also promotes traffic, pedestrian and bicycle safety.
Suggestions for Potential Improvement

Continue to work with PVTMA to support TDM policies and programs. As part of a comprehensive TDM program:

- Identify a part-time TDM Coordinator among City staff
- Develop a TDM policy which:
  - Incentivizes non-auto travel options (e.g., commuter checks, parking cash-out programs, transit passes, etc.)
  - Creates support for major employers to implement a TDM program (e.g., emergency ride home programs)
  - Involves METRO transit service in major decisions
- Create a TDM website with separate pages for employees, residents, and visitors.
- Establish a Transportation Management Association (TMA) for key commercial and business areas to coordinate parking, transit, and other TDM strategies and policies.

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

A GIS-based sidewalk inventory enables project identification and prioritization, as well as project coordination with new development, roadway resurfacing, etc. Best practices for sidewalk inventories include the delineation between development driven and City funded gap filling projects and policies that make it possible for the City to be reimbursed for filling a development driven sidewalk gap.

The City does not maintain an inventory of existing or missing sidewalks. As the city is primarily build-out, there are not many areas with missing sidewalks. The City uses aerial pictures to identify locations with missing sidewalks, which are filled when grant funding becomes available. There is no existing program or on-going funding source to replace sidewalks or to fill existing gaps.

Property owners are responsible for sidewalk maintenance. However, the City can assist property owners in locating and coordinating with contractors. In annex areas where assessment districts are formed, the City is responsible for fifty percent of the costs of sidewalk and gutter installation. Generally, the City would perform the actual installation.

The City does not have a list of informal pathways and pedestrian opportunity areas, such as cul-de-sac cut-through paths. However, pedestrian and bicycle pathways that allow short cut between long blocks are seen during the walking audits in the downtown area.

Suggestions for Potential Improvement

- Inventory and geocode sidewalks in the City and add informal pathways and key pedestrian opportunity areas.
- Consider additional sidewalk funding mechanisms, such as requirement to provide or repair sidewalks with each property sale.
4. WALKING AUDIT RESULTS AND SUGGESTIONS

Walking audits are typically conducted as an initial step to improve the pedestrian environment within the selected area. Many individuals can participate in a walking audit: 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). For each opportunity area, the group discusses possible suggestions to address pedestrian safety concerns. Walking audits are highly interactive, with many observations 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 suggestions made during the walking audits conducted in the city of Watsonville on January 18, 2011. The suggestions are based on best practices and discussions with the participant group regarding local needs and feasibility. A glossary of the pedestrian improvement measures is presented in Appendix A.

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

- Demonstrated pedestrian safety concerns
- Presence of children/school-related pedestrians
- Proximity to key generators, such as transit, retail, parks, and schools

The walking and windshield audits covered six focus areas in Watsonville:

1. Downtown including Main Street and Transit Center
2. Freedom Boulevard
3. E. Lake Avenue (SR-152) at Palm Avenue/Manor Avenue
4. Airport Boulevard at Freedom Center
5. Pejaro Valley High School
6. Watsonville High School

An overview of the focus areas are shown in Figure 4-1. The following sections present the key issues identified during the audits. Suggestions are presented to respond to the issues at each site. Focus area summary graphics, with a compilation of all suggestions, are provided in the discussion.
Figure 4-1: Walking Audit Locations
4.1 GENERAL CITYWIDE SUGGESTIONS

The following general suggestions have been noted as appropriate for citywide implementation:

- Implement a citywide pedestrian education campaign to teach basic pedestrian responsibilities and reinforce desirable behaviors.

- Initiate a systematic assessment program for all uncontrolled marked crosswalks in Watsonville to determine whether the marked crosswalk is needed; and if so, whether additional crosswalk enhancements would be necessary. The demand of the marked crosswalk may be established by collecting pedestrian volume counts. If a crosswalk is deemed unnecessary due to under-utilization, the City may consider removal of the marked crosswalk in order to minimize visual clutter and to help focus motorists on crosswalks that are in demand. Additional enhancements may be made to those crosswalks that are in demand. In addition to standard pedestrian crossing signs and high visibility crosswalk striping patterns, enhancements, which would be tailored for the needs of each location, may also include: in-pavement warning lights, advance warning signs with flashing beacons such as rectangular rapid flashing beacons (RRFB), high intensity activated crosswalks (HAWK) beacon signals, median pedestrian island, in-street pedestrian crossing signs, curb extensions, raised intersections, or other treatments.

- Use a high-visibility crosswalk striping pattern for uncontrolled marked crosswalks (the “triple-four” is suggested).

- Add advanced stop lines for stop-sign or signal controlled crossings.

- Add advanced yield lines and appropriate signing for multi-lane uncontrolled crossings.

- Install new fluorescent yellow green (FYG) signage at all uncontrolled marked crosswalks.
- Install pedestrian countdown signal heads at all signalized intersections based upon prioritization process
- Ensure signal timings are adequate for pedestrians
- Where possible, provide a buffer between vehicles and pedestrians by separating sidewalks from the curb
- Provide directional curb ramps, rather than diagonal ramps, where appropriate
- Maintain ADA-compliant crossings (truncated domes, cross slopes, audible signals, separated pedestrian push buttons, etc.)

4.2 FOCUS AREA 1: DOWNTOWN AREA

Observations

A walking audit was conducted along Main Street between the Freedom Boulevard intersection and Beach Street and along Rodriguez Street between W. Lake Avenue and W. Beach Street along the frontage of Watsonville Transit Center in the downtown area.

The focused segment of Main Street is designated as State Route 152 and is under Caltrans' jurisdiction. Despite its state highway designation and relatively long block lengths, the City of Watsonville, along with Caltrans, has developed some positive elements of a walkable environment along Main Street. The following positive characteristics were observed:

- Wide, continuous sidewalks
- On-street parking buffering pedestrians from traffic
- Street trees and pedestrian-scaled lighting
- Mid-block crosswalks with curb extensions to increase pedestrian visibility to motorists and shorten crossing distance for pedestrians
- Curb ramps with truncated domes at intersections
- Pedestrian signals are provided with pushbuttons at traffic signals
- Primarily one- to two-story buildings and ground level retail storefront abutting the street
- Public and private open space, such as Watsonville Plaza, provides opportunities for gatherings and rest
- Pedestrian alleys provide access through the long blocks
- Transit service availability
- Way finder and other informational signs

The signalized intersection of Main Street and Freedom Boulevard is a major junction for vehicles traveling in/out of downtown. The City has proposed installation of a multi-lane roundabout to better facilitate traffic at this skewed intersection. Currently there are no marked crosswalks across the west and south legs of the intersections as shown in Figure 4-2.

The focused segment of Rodriguez Street is a curvilinear roadway with four travel lanes and a two-way-left-turn lane. It carries approximately 9,000 to 10,000 average daily vehicles. A large parking lot for CVS Pharmacy and other businesses along W. Lake Avenue and W. Beach Street lies directly across Rodriguez Street from the Transit Center. Pedestrians can walk across the parking lot to reach Main Street through an infill park. Both the Rodriguez Street intersections at W. Lake Avenue and W. Beach Street offer marked crosswalks for pedestrians; however, many pedestrians were observed jaywalking midblock across Rodriguez Street on the most direct, but also one of the widest crossing points between the Transit Center and the CVS parking lot (Figure 4-3) despite the posted "no pedestrian crossing" sign.
Figure 4-2: Main Street and Freedom Boulevard Intersection
Figure 4-3: Pedestrian Desire Line
Suggestions for Potential Improvement

The City may perform the assessment for uncontrolled crosswalks along Main Street and install necessary improvements as suggested under General Citywide suggestions. Figure 4-4 shows an example of treatments at unsignalized midblock crosswalks from the California Manual on Uniformed Traffic Control Devices for Streets and Highways (Ca MUTCD) that may be considered for midblock crossings along Main Street. An application of potential improvements is provided in the Freedom Boulevard section below.

Figure 4-4: Example of Midblock Crosswalk Treatment

The following are treatments generally suggested for the Main Street and Freedom Boulevard intersection in addition to those suggested city-wide:

- Consider installing a modern roundabout design concept at the Main Street and Freedom Boulevard intersection
- Include pedestrian crossings with pedestrian refuge areas in the splitter islands of the modern roundabout for all legs of the intersection to the extent possible
- Provide pedestrian refuge between bypass lanes and the roundabout circular roadway to the extent possible

Two alternatives were developed for improving pedestrian service along Rodriguez Avenue near the Transit Center. Both alternatives include upgrading the Rodriguez Avenue and W. Lake Avenue intersection with marked school crosswalks, directional curb ramps and advanced stop bars on all four legs of the intersection.
Option 1 (Figure 4-5): This option would install a midblock pedestrian refuge island along pedestrian desire line between the Transit Center and CVS Pharmacy to better serve pedestrian needs. It would also reduce the number of travel lanes on Rodriguez Avenue between W. Lake Avenue and W. Beach Street from two lanes to one lane on each direction, in line with the Rodriguez Avenue segments to the north and to the south. The existing center two-way-left-turn lane would remain to provide storage for turning traffic into the Transit Center and the parking areas of CVS Pharmacy and Kragen/O’Reilly Auto Parts. The single lane configuration would reduce pedestrians’ exposure to motorized vehicles and would minimize multiple lane threat collisions at the proposed uncontrolled crosswalks.

The following are treatments generally suggested for Option 1 in addition to those suggested citywide:

- Install a pedestrian refuge island on Rodriguez Avenue
- Install high visibility, off-set marked crosswalks
- Install advanced yield markings and appropriate warning signs
- Restripe the lane markings on Rodriguez Avenue to provide one travel lane and one bicycle lane on each direction, one center two-way left-turn lane, and one parking lane along the west side of Rodriguez Avenue. The existing loading zone for taxi would remain
- Install a curb extension at the southwest corner of the Rodriguez Avenue and W. Lake Avenue intersection
- Consider installing a curb extension at the west terminus of the proposed offset crosswalk by reducing the length of the taxi loading zone. If additional loading space is needed, elimination of the existing curb extension/planting area at the vehicular entry to the Transit Center may be considered.

Conceptual Option 2 (Figure 4-6): The second alternative would also include the installation of the midblock pedestrian refuge island and related treatments. However, the existing lane configuration would be preserved to provide two travel lanes per direction. The sidewalk on the west side of Rodriguez Avenue would be extended southward into the taxi loading zone to accommodate the western terminus of the proposed crosswalk. If additional loading space is needed, elimination of the existing curb extension/planting area at the vehicular entry to the Transit Center may be considered.
Figure 4-6: Watsonville Transit Center - Option 2

- Consider installing marked school crosswalks, directional curb ramps, and advanced stop bars.
- Install pedestrian refuge island with offset crosswalk, curb ramps, yield lines, and appropriate advance warning signs.
- Extend sidewalk.
4.3 FOCUS AREA 2: FREEDOM BOULEVARD

Observations

A windshield audit was conducted along Freedom Boulevard between Airport Boulevard and Brennan Street. Stops were made at two focus area locations, Sydney Avenue and Lincoln Street, to allow for closer examination of the corridor and the areas of concerns. An overview of the corridor and the two focus areas are shown in Figure 4-7.

Freedom Boulevard is an arterial and a key transit route. Sidewalks are generally provided along the corridor with the exception of several gaps on the northern end of the observation segment near Roache Road. The corridor can be divided into two distinct segments. The segment north of Lincoln Street has two travel lanes on each direction and is lined with primarily retail commercial and institutional land uses. On the 1.36-mile long segment between Airport Boulevard and Lincoln Street, there are five signalized intersections offering protected crossing opportunities for pedestrians. In addition, there are four uncontrolled marked crosswalks at the following locations:

- Roache Road (south leg)
- Sydney Avenue (north leg)
- Mariposa Avenue (north leg)
- Marin Street (north leg)

The southern segment is characterized by one travel lane on each direction and a mix of commercial and residential uses are observed along the road. With the exception of Brennan Avenue at the southern end, no traffic signal is provided along this 3/4-mile segment. Three uncontrolled marked crosswalks are provided at the following locations:

- Prospect Street (south leg)
- Stanford Street (north and south legs)
- High Street (north and south legs)

Sydney Avenue is considered a typical uncontrolled marked crosswalk along the Freedom Boulevard corridor and was observed at a travel stop during the walking audit. The crosswalk is located approximately 400 feet south of Davis Avenue, a signalized intersection. Pedestrian warning signs are posted at the crosswalk on both directions at Sydney Avenue but such signage is not typical at other uncontrolled marked crosswalk on Freedom Boulevard and the signs are no longer consistent with the current Ca MUTCD standards. No other pedestrian treatment is provided.
Figure 4-7: Freedom Boulevard Corridor
During the brief observation period, the uncontrolled marked crosswalk was used by several pedestrians. Vehicles generally yielded to the pedestrians when they saw them. However, because of the many sensory distractions along this heavily commercialized segment, motorists did not appear to see the pedestrians until just before the vehicles reached the marked crosswalk. Such short reaction time sometimes necessitated braking hard in order to stop, which may increase the potential for rear end collisions. Some motorists chose not to yield for pedestrians. Vehicles stopping right at the crosswalk limit the line of sight of approaching vehicles in the adjacent lane; increasing the potential for collisions with pedestrians.

Lincoln Street merges onto Freedom Boulevard where the roadway widens to two travel lanes per direction; therefore, Lincoln Street traffic has its own lane to merge onto without the need to slow down to yield to northbound Freedom Boulevard traffic. Northwest-bound through traffic on Lincoln Street is separated from Freedom Boulevard traffic by an at-grade island with perimeter barrier as shown in Figure 4-8. There is no clear pathway for pedestrians crossing Lincoln Street, who has to contend with not only northwest-bound traffic from Lincoln Street but also left-turning traffic from Freedom Boulevard onto Lincoln Street.

**Suggestions for Potential Improvement**

It is suggested that all the uncontrolled marked crosswalks on Freedom Boulevard be included as a part of the suggested citywide assessment of uncontrolled marked crosswalks as discussed under General Citywide Suggestions. Treatments are to be tailored to meet the needs of individual locations. The following treatments are suggested for the Sydney Avenue intersection (Figure 4-9) and may be considered a guide for other uncontrolled midblock crosswalk:

- Consider restriping the marked crosswalk on the north leg of the intersection with high visibility markings
- Install advanced yield lines and "Yield Here to Pedestrians" signs on both the northbound and southbound directions in accordance to California MUTCD guidance (Section 3B.16)
- Consider installing other warning devices such as pedestrian-actuated rectangular rapid flashing beacons (RRFB) to increase motorists awareness of the presence of pedestrians
- Install an advanced stop bar on the west leg on Sydney Avenue

Two alternatives were developed for improving pedestrian service at the Freedom Boulevard and Lincoln Street intersection.
Figure 4-8: Freedom Boulevard and Lincoln Street – Existing Conditions

- Existing at-grade island
- No clear pedestrian path to cross Lincoln Street
Figure 4-9: Freedom Boulevard at Sydney Avenue
Suggested Example for Uncontrolled Marked Crosswalks

Consider installing high-visibility crosswalk
with field lines and appropriate advance
warning signs with flashing beacons, RRFB,
HAWK, or in-pavement lighting.

Consider installing advanced
stop bar at stop-controlled
intersection.
At the Lincoln Street intersection, two options were developed for consideration.

**Conceptual Option 1 (Figure 4-10):** This option would provide a pedestrian pathway across Lincoln Street by reconfiguring the intersection to provide curb extensions on the east side of Freedom Boulevard and a median island. The northbound right-turn movement from Freedom Boulevard onto Lincoln Street would be prohibited. As this movement is infrequently used because access to Lincoln Street is provided at Prospect Street approximately 300 feet to the south, this restriction would have little effect on motorized traffic but would be beneficial to pedestrians. This option would not provide marked crosswalks across Freedom Boulevard.

The following are treatments suggested for Conceptual Option 1 in addition to those suggested citywide:

- Install a curb extension south of Broadis Street and a median island to channelize traffic between Lincoln Street and Freedom Boulevard
- Extend the curb at the southeast corner of the intersection across from Miles Lane to prohibit northbound right-turn movement onto Lincoln Street
- Install high visibility, marked, off-set crosswalks and curb ramps. The off-set would position the pedestrians towards incoming traffic; thereby, increase their visibility of oncoming traffic
- Stripe the pavement marking to extend the exclusive northwest-bound lane to Broadis Street
- Install an advanced stop bar on the west leg on Miles Lane
- Restripe the crosswalk at Broadis Street and include an advanced stop bar

**Conceptual Option 2 (Figure 4-11):** This option would provide a roundabout at the Freedom Boulevard/Lincoln Street/Miles Lane intersection and provide full movement access to/from all approaches. The intersection would be reconfigured to provide two approach lanes for the southbound movement and one approach lane for each of the remaining movements. Appropriate signage, such as Yield signs, would be provided on all approaches. Depending on the roundabout design, this alternative would likely entail expansion into the southeast corner of the intersection across from Miles Lane but narrowing of the remaining legs. Right-of-way acquisition would be likely be required on the south side of the intersection. In contrast to Option 1, this option would provide marked crosswalks across Freedom Boulevard. Option 2 would require pedestrians traveling along the east side of Freedom Boulevard to travel somewhat out of direction to cross Lincoln Street at the splitter island that would be part of the roundabout design.
Figure 4-10: Freedom Boulevard at Lincoln Street – Option 1

Reconfigure the intersection by installing curb extensions, a median, high visibility marked crosswalks, and prohibiting northbound right-turn from Freedom Boulevard onto Lincoln Street.

Consider providing advanced stop bars.
4.4 FOCUS AREA 3: E. LAKE AVENUE (ROUTE 152) AT MANOR AVENUE/PALM AVENUE

**Observations**

Observations were made at the E. Lake Avenue (Route 152) and Palm Avenue/Manor Avenue intersection, where a fatal pedestrian collision has been recorded. An uncontrolled marked crosswalk is provided on E. Lake Avenue just north of Palm Avenue. On the east side of the roadway, the crosswalk terminates at a driveway to a gas station. North of Manor Avenue, the road widens, and the curbs on the north side and south side of Manor Avenue do not align as shown in the aerial picture.

**Suggestions for Potential Improvement**

Two alternatives were developed for improving pedestrian service at the E. Lake Avenue and Palm Avenue/Manor Avenue intersection. Implementation of either alternative would be support the objective of integrating the transportation system to provide for the needs of all travelers including pedestrians, bicycles and transit riders (Caltrans Deputy Directive DD-64-R1 Complete Streets). Both alternatives would relocate the marked crosswalk from north of Palm Avenue to north of Manor Avenue.

**Conceptual Option 1 (Figure 4-12):** This option would provide a curb extension on the northeast corner of the Manor Avenue intersection. The curb extension would provide two benefits for pedestrians. It would shorten the crossing distance on E. Lake Avenue and would align the east side of the road so to provide a direct walking path.

The following are treatments suggested for Conceptual Option 1 in addition to those suggested citywide:

- Install a curb extension on the northeast corner of the E. Lake Avenue and Manor Avenue intersection
- Relocate the marked crosswalk from Palm Avenue to north of Manor Avenue
Figure 4-12: Lake Avenue at Palm Avenue/Manor Avenue – Option 1

- Consider installing street lighting.
- Consider repositioning crosswalk from the north leg of Palm Avenue intersection to the north leg of Manor Avenue.
- Install a curb extension on the east side of E. Lake Avenue with high visibility markings, crosswalk, appropriate warning signs, curb ramp, and yield lines.
- Install high visibility crosswalk marking for the relocated crosswalk
- Provide advanced yield lines and appropriate warning signs, as well as curb ramps
- Install street lighting to help improve pedestrian visibility

**Conceptual Option 2 (Figure 4-13):** This alternative would provide a pedestrian median island on the north leg of the Manor Avenue intersection in addition to treatments discussed under Conceptual Option 1. The island would allow a two-stage crossing for pedestrians, where they would only have to contend with one direction of traffic at a time. However, this configuration may require the consolidation of the southbound lanes from one left-turn lane and one through lane to one combination left-through lane. Manor Avenue mainly provides for local access.
Figure 4-13: Lake Avenue at Palm Avenue/Manor Avenue – Option 2

- Consider installing street lighting.
- Consider relocating crosswalks from the northwest to Manor Avenue.
- Install a curb extension on the east side of E. Lake Avenue with median refuges, high-visibility, marked crosswalks, and appropriate warning signs, curbs, and yield lines.
4.4 FOCUS AREA 4: AIRPORT BOULEVARD AT FREEDOM CENTER

Observations

This location was selected for study by request of the City's traffic enforcement officer because a number of pedestrian-involved collisions have occurred over the past few years. It is located near Watsonville's city limit with Santa Cruz County and in a transition area from a more rural agricultural area to an urban commercial environment. Airport Boulevard is a curvilinear road with one travel lane and a bike lane on each direction and a center turn lane. A westbound bus stop is located on the north side of road directly across from the access driveway to Freedom Center and a marked crosswalk is provided to the west in front of the bus stop.

Several factors contribute to a challenging environment for pedestrians:

- Westbound vehicle speeds tend to be faster as motorists approach from the rural environ
- The stopped bus may block the line of sight of both pedestrians at the crosswalk and motorists trying to drive around the bus
- Passing vehicles would also have to contend with vehicles exiting the Freedom Center driveway in addition to the bus and pedestrians
- Pedestrians crossing behind the bus in order to avail themselves more visible to motorists would land on the southeast side of the road, where there is no pedestrian path into the Freedom Center

Suggestions for Potential Improvement

The following are treatments suggested for the Airport Boulevard at Freedom Center location in addition to those suggested citywide (Figure 4-14):

- Coordinate with Santa Cruz Metro to relocate the existing bus stop westward about 150 feet and provide appropriate transit amenities
- Relocate the existing crosswalk slightly westward to align with pedestrian path down into Freedom Center
- Provide high visibility markings at crosswalk, yield lines and appropriate signage
- Consider installing pedestrian-activated or passive rectangular rapid flashing beacon
- Provide street lighting at the relocated bus stop to increase pedestrian visibility and safety
- Coordinate with Freedom Center to relocate the stop bar southward to provide a clear pedestrian path across the driveway
Figure 4-14: Airport Boulevard at Freedom Center – Suggestions

- Relocate bus stop southward
- Consider relocating crosswalk further west and installing high-visibility crosswalk, with yield lines and appropriate warning signs with flashing beacons, RRFB, or pavement lighting
- Relocate bus stop and install street light
- Existing bus stop
4.5 FOCUS AREA 5: PAJARO VALLEY HIGH SCHOOL

Observations

Observations were made near the Green Valley Road/Harkins Slough Road and Highway 1 junction during the end of school day for Pajaro Valley High School. During a 15-minute period, massive number of students was seen streaming across the Highway 1 overpass bridge towards Watsonville. Overall, students obeyed traffic controls and generally behaved in an orderly manner. However, with Harkins Slough Road being the sole route to/from the school, the sheer volume of students exceeds the capacity of the overpass, causing some to spill over to walk in the travel lane and bike lane. Sidewalk is only provided on the north side of the road between the school driveway and Silver Leaf Drive.

Improvement at the Harkins Slough Road interchange is included in the 2010 Regional Transportation Plan as a funding constrained project. The current half interchange would be reconstructed to a full interchange. Further, the bridge would be widened to provide better service to motorists, bicyclists and pedestrians.

Suggestions for Potential Improvement

The following are suggestions for the Pajaro Valley High School location in addition to those suggested citywide:

- Continue to work with Caltrans during the design phase of the interchange improvement project. Specifically, the full interchange would increase pedestrian exposures to motorized vehicles by adding two conflict points on the north side of the roadway. The design, such as curb radius, lane geometries, sidewalk landing, and traffic signals, should consider the needs of pedestrians and bicyclists.

- Continue to explore the potential for a pedestrian/bicycle access path between the north end of the school and Airport Boulevard as an alternative to Harkins Slough Road access
4.6 FOCUS AREA 6: WATSONVILLE HIGH SCHOOL

Observations

Observations at Watsonville High School were performed along E. Beach Street during the lunch recess period. Because there is no cafeteria service at the school, many students leave campus to purchase food off-site. A large number of students were seen dispersing from the school on all directions. Students generally followed traffic rules and crossed at the crosswalks; however, not surprisingly, a few students were observed to jaywalk across the one-way E. Beach Street. Because the T-intersection of E. Beach Street and Marchant Street is controlled by stop signs, vehicles had to stop for a relatively long duration to yield to long platoons of students. However, this situation lasted for only a few minutes. Protected crossing is provided at the signal-controlled Lincoln Street and E. Beach Street intersection. Further, Lincoln Street south of E. Beach Street is blocked for vehicular traffic during school hours; thereby providing safe pedestrian movements on the street.

A small kiosk selling hamburgers and other food items is located on the north side of E. Beach Street near Lincoln Street. During the lunch period, students surround the building to purchase and consume the items and take over the sidewalk entirely blocking pedestrian passage. A short fence is erected from the intersection through the length of the kiosk so that customers/students would not spill over onto the street and into incoming traffic.
Suggestions for Potential Improvement

The following are suggestions for the Watsonville High School area in addition to those suggested citywide:

- Work with the hamburger vendor to manage the purchase queue possibly by directing the queue along and around the kiosk, taking advantage of the driveway to the west of the building; thereby leaving a clear path for pedestrians. The vendor could also encourage the students to congregate on the east side of the building, where there is ample room, rather than on the sidewalk.
APPENDIX A: GLOSSARY OF PEDESTRIAN IMPROVEMENT MEASURES
<table>
<thead>
<tr>
<th>Measure</th>
<th>Description</th>
<th>Benefits</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic Signal or All-Way Stop</td>
<td>Conventional traffic control devices with warrants for use based on the Manual on Uniform Control Devices (MUTCD).</td>
<td>Reduces pedestrian-vehicle conflicts and slows traffic speeds.</td>
<td>Must meet warrants based on traffic and pedestrian volumes; however, exceptions are possible based on demonstrated pedestrian safety concerns (collision history).</td>
</tr>
<tr>
<td>HAWK Beacon Signal</td>
<td>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 &quot;wig-wag&quot; pattern until the clearance interval has ended and the signal goes dark.</td>
<td>Reduces pedestrian-vehicle conflicts and slows traffic speeds.</td>
<td>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.</td>
</tr>
<tr>
<td>Overhead Flashing Beacons</td>
<td>Flashing amber lights are installed on overhead signs, in advance of the crosswalk or at the entrance to the crosswalk.</td>
<td>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.</td>
<td>Best used in places where motorists cannot see a traditional sign due to topography or other barriers.</td>
</tr>
<tr>
<td>Stutter Flash</td>
<td>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.</td>
<td>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.</td>
<td>Appropriate for multi-lane roadways.</td>
</tr>
</tbody>
</table>
## PEDESTRIAN IMPROVEMENT MEASURES

<table>
<thead>
<tr>
<th>Measure</th>
<th>Description</th>
<th>Benefits</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-Roadway Warning Lights</td>
<td>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.</td>
<td>This measure provides a dynamic visual cue, and is increasingly effective in bad weather.</td>
<td>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 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.</td>
</tr>
<tr>
<td>High-Visibility Signs and Markings</td>
<td>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.</td>
<td>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.</td>
<td>Beneficial in areas with high pedestrian activity, as near schools, and in areas where travel speeds are high and/or motorist visibility is low.</td>
</tr>
<tr>
<td>In-Street Pedestrian Crossing Signs</td>
<td>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.</td>
<td>This measure is highly visible to motorists and has a positive impact on pedestrian safety at crosswalks.</td>
<td>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.</td>
</tr>
<tr>
<td>Measure</td>
<td>Description</td>
<td>Benefits</td>
<td>Application</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Pedestrian Crossing Flags</td>
<td>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.</td>
<td>This measure makes pedestrians more visible to motorists.</td>
<td>Appropriate for mid-block and uncontrolled crosswalks with low visibility or poor sight distance.</td>
</tr>
<tr>
<td>Advanced Yield Lines</td>
<td>Standard white stop or yield limit lines are placed in advance of marked, uncontrolled crosswalks.</td>
<td>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 roadways. It is also an affordable option.</td>
<td>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 roads.</td>
</tr>
<tr>
<td>Geometric Treatments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pedestrian Overpass/Underpass</td>
<td>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.</td>
<td>Pedestrian overpasses and underpasses allow for the uninterrupted flow of pedestrian movement separate from the vehicle traffic.</td>
<td>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.</td>
</tr>
<tr>
<td>Road Diet (aka Lane Reduction)</td>
<td>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.</td>
<td>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.</td>
<td>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.</td>
</tr>
<tr>
<td>Measure</td>
<td>Description</td>
<td>Benefits</td>
<td>Application</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Median Refuge Island</td>
<td>Raised islands are placed in the center of a roadway, separating opposing lanes of traffic with cutouts for accessibility along the pedestrian path.</td>
<td>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.</td>
<td>Suggested for multi-lane roads wide enough to accommodate an ADA-accessible median.</td>
</tr>
<tr>
<td>Staggered Median Refuge Island</td>
<td>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 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.</td>
<td>Benefits of this tool include an increase in the concentration of pedestrians at a crossing and the provision of better traffic views for pedestrians. Additionally, motorists are better able to see pedestrians as they walk through the staggered refuge.</td>
<td>Best used on multi-lane roads with obstructed pedestrian visibility or with off-set intersections.</td>
</tr>
<tr>
<td>Curb Extension</td>
<td>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.</td>
<td>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.</td>
<td>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.</td>
</tr>
<tr>
<td>Measure</td>
<td>Description</td>
<td>Benefits</td>
<td>Application</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Reduced Curb Radii</td>
<td>The radius of a curb can be reduced to require motorists to make a tighter turn.</td>
<td>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.</td>
<td>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.</td>
</tr>
<tr>
<td>Curb Ramps</td>
<td>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.</td>
<td>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.</td>
<td>Curb ramps must be installed at all intersections and mid-block locations where pedestrian crossings exist, as mandated by federal legislation (1973 Rehabilitation Act and 1991 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.</td>
</tr>
<tr>
<td>Raised Crosswalk</td>
<td>A crosswalk whose surface is elevated above the travel lanes.</td>
<td>Attracts drivers' attention; encourages lower travel speeds by providing visual and tactile feedback when approaching the crosswalk.</td>
<td>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.</td>
</tr>
</tbody>
</table>
### PEDESTRIAN IMPROVEMENT MEASURES

<table>
<thead>
<tr>
<th>Measure</th>
<th>Description</th>
<th>Benefits</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved Right-Turn Slip-Lane Design</td>
<td>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.</td>
<td>This measure reduces the pedestrian's crossing distance and turning vehicle speeds.</td>
<td>Appropriate for intersections with high volumes of right-turning vehicles.</td>
</tr>
<tr>
<td>Chicanes</td>
<td>A chicane is a sequence of tight serpentine curves (usually an S-shape curve) in a roadway, used on city streets to slow cars.</td>
<td>This is a traffic-calming measure that can improve the pedestrian environment and pedestrian safety.</td>
<td>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.</td>
</tr>
<tr>
<td>Pedestrian Access and Amenities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marked Crosswalk</td>
<td>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.</td>
<td>Marked crosswalks provide a designated crossing, which may improve walkability and reduce jaywalking.</td>
<td>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.</td>
</tr>
<tr>
<td>Measure</td>
<td>Description</td>
<td>Benefits</td>
<td>Application</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Textured Pavers</td>
<td>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.</td>
<td>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.</td>
<td>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.</td>
</tr>
<tr>
<td>Anti-Skid Surfacing</td>
<td>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.</td>
<td>Improves driver and pedestrian safety.</td>
<td>Appropriate for multi-lane roadways and roadways with higher posted speed limit and/or high vehicle volumes or collision rates.</td>
</tr>
<tr>
<td>Accessibility Upgrades</td>
<td>Treatments such as audible pedestrian signals, accessible push buttons, and truncated domes should be installed at crossings to accommodate disabled pedestrians.</td>
<td>Improves accessibility of pedestrian facilities for all users.</td>
<td>Accessibility upgrades should be provided for all pedestrian facilities following a citywide ADA Transition Plan.</td>
</tr>
<tr>
<td>Pedestrian Countdown Signal</td>
<td>Displays a &quot;countdown&quot; 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.</td>
<td>Increases pedestrian awareness and allows them the flexibility to know when to speed up if the pedestrian phase is about to expire.</td>
<td>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).</td>
</tr>
<tr>
<td>Measure</td>
<td>Description</td>
<td>Benefits</td>
<td>Application</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>Transit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-Visibility Bus Stop Locations</td>
<td>This measure should include siting bus stops on the far side of intersections, with paved connections to sidewalks where landscape buffers exist.</td>
<td>Provides safe, convenient, and inviting access for transit users; can improve roadway efficiency and driver sight distance.</td>
<td>Appropriate for all bus stops subject to sight distance and right-of-way constraints.</td>
</tr>
<tr>
<td>Transit Bulb</td>
<td>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.</td>
<td>Creates additional space at a bus stop for shelters, benches, and other passenger amenities.</td>
<td>Appropriate at sites with high patron volumes, crowded city sidewalks, and curbside parking.</td>
</tr>
<tr>
<td>Enhanced Bus Stop Amenities</td>
<td>Adequate bus stop signing, lighting, a bus shelter with seating, trash receptacles, and bicycle parking are desirable features at bus stops.</td>
<td>Increase pedestrian visibility at bus stops and encourage transit ridership.</td>
<td>Appropriate at sites with high patron volumes.</td>
</tr>
</tbody>
</table>
APPENDIX B: RESOURCE LIST
<table>
<thead>
<tr>
<th>RESOURCE LIST</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Guide for Reducing Collisions Involving Pedestrians (NCHRP Report 500)</td>
</tr>
<tr>
<td>Pedestrian and Bicycle Information Center</td>
</tr>
<tr>
<td><a href="http://www.walkinginfo.org/">http://www.walkinginfo.org/</a></td>
</tr>
<tr>
<td>National Center for Safe Routes to School</td>
</tr>
<tr>
<td><a href="http://www.saferoutesinfo.org/">http://www.saferoutesinfo.org/</a></td>
</tr>
<tr>
<td>Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations (HRT-04-100)</td>
</tr>
<tr>
<td>How to Develop a Pedestrian Safety Action Plan (FHWA-SA-05-12)</td>
</tr>
<tr>
<td>Improving Pedestrian Safety at Unsignalized Crossings (NCHRP Report 562)</td>
</tr>
<tr>
<td>Road Safety Audits: Case Studies (FHWA-SA-06-17)</td>
</tr>
<tr>
<td><a href="http://safety.fhwa.dot.gov/rsa/rsa_cstudies.htm">http://safety.fhwa.dot.gov/rsa/rsa_cstudies.htm</a></td>
</tr>
<tr>
<td>Pedestrian Road Safety Audit Guidelines and Prompt Lists</td>
</tr>
<tr>
<td><a href="http://drusilla.hsrc.unc.edu/cms/downloads/PedRSA.reduced.pdf">http://drusilla.hsrc.unc.edu/cms/downloads/PedRSA.reduced.pdf</a></td>
</tr>
<tr>
<td>PEDSAFE: The Pedestrian Safety Guide and Countermeasure Selection System (FHWA-SA-04-003)</td>
</tr>
<tr>
<td><a href="http://www.walkinginfo.org/pedsafe/">http://www.walkinginfo.org/pedsafe/</a></td>
</tr>
<tr>
<td>Pedestrian and Bicycle Crash Analysis Tool (PBCAT)</td>
</tr>
<tr>
<td><a href="http://www.bicyclinginfo.org/bc/pbcat.cfm">http://www.bicyclinginfo.org/bc/pbcat.cfm</a></td>
</tr>
<tr>
<td>FHWA, A Resident's Guide for Creating Safe and Walkable Communities</td>
</tr>
<tr>
<td>FHWA, Pedestrian Safety Guide for Transit Agencies (FHWA-SA-07-017)</td>
</tr>
<tr>
<td><a href="http://safety.fhwa.dot.gov/ped_bicycle/ped/ped_transguide/">http://safety.fhwa.dot.gov/ped_bicycle/ped/ped_transguide/</a></td>
</tr>
<tr>
<td>FHWA Pedestrian Safety Training Courses:</td>
</tr>
<tr>
<td><strong>Developing a pedestrian safety action plan (two-day course)</strong></td>
</tr>
</tbody>
</table>
| *next California course:*
| http://www.google.com/calendar/embed?src=lsstandt@email.unc.edu |
| **Designing for pedestrian safety (two-day course)** |
| *next California course:*
| http://www.google.com/calendar/embed?src=lsstandt@email.unc.edu |
| **Planning and designing for pedestrian safety (three-day course)** |
| *next California course:*
| http://www.google.com/calendar/embed?src=lsstandt@email.unc.edu |

Adapted from FHWA *Pedestrian Road Safety Audit Guidelines and Prompt Lists*
ABOUT THE TECHNOLOGY TRANSFER PROGRAM

The Technology Transfer Program, a division of the Institute of Transportation Studies at the University of California, Berkeley, is the California transportation community's source for professional training, expert assistance, and free resources for public agencies.

The Technology Transfer Program provides training, workshops, conferences, technical assistance and information resources in the transportation-related areas of planning and policy, traffic engineering, project development, infrastructure design and maintenance, safety, environmental issues, railroad and aviation.

Our training programs and services are affordable—often free—and are offered statewide. Most of our classes are subsidized for California-based public employees, but our service area is national and international.

As California's LTAP Center, we serve the more than 25,000 public and private transportation agency personnel working for our state's 476 cities, 58 counties, over 50 regional transportation planning agencies (MPOs, RTPAs, CTCs and CMAs) and the California Department of Transportation.

ITS Berkeley ➔ TECH TRANSFER

TECHNOLOGY TRANSFER PROGRAM
INSTITUTE OF TRANSPORTATION STUDIES
UNIVERSITY OF CALIFORNIA, BERKELEY

1301 South 46th Street, Building 155
Richmond, CA 94804
Phone: 510-665-3410
Fax: 510-665-3454

techtransfer@berkeley.edu
www.techtransfer.berkeley.edu