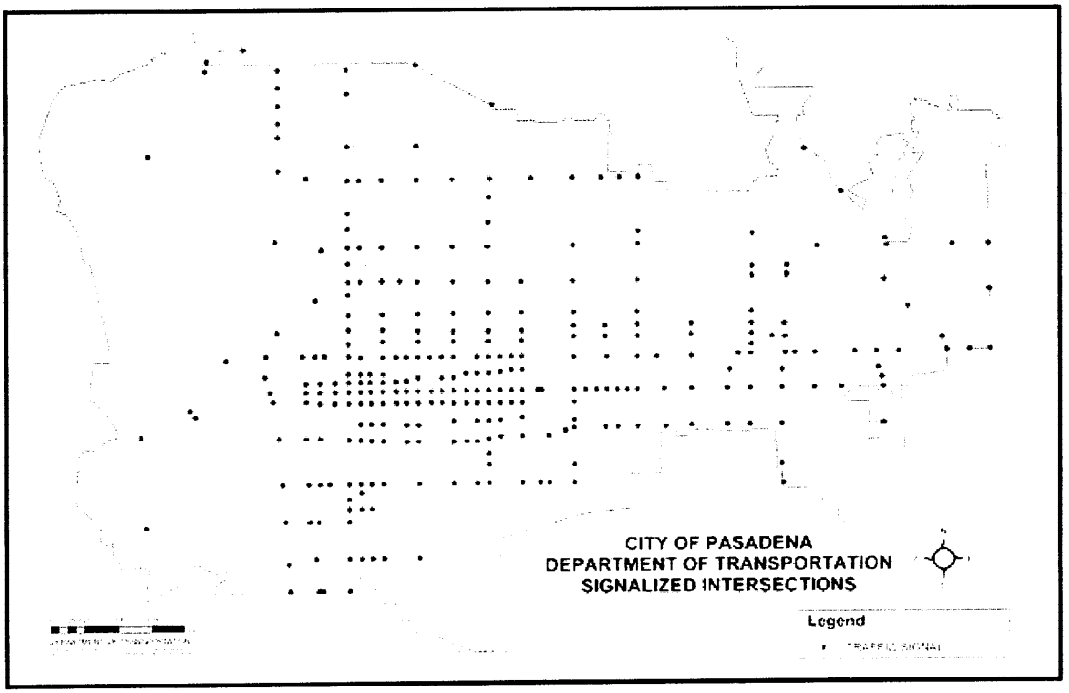
Figure 4-4: Signalized Intersections in Pasadena



4.4.2 Traffic Signal Timing Review

In Pasadena, 296 intersections are equipped with traffic signals and interconnected to the City's Traffic Management Center (TMC). Signal timing provisions at each location are evaluated periodically to ensure their effectiveness in meeting the needs of road users.

At a signalized intersection where pedestrian indication is provided, the timing is designed to provide sufficient walk time for pedestrians to safely cross streets. Pedestrian signals may be partially omitted at certain intersections due to safety reasons. Pedestrian should always obey traffic controls and be alert when crossing streets.

What do these indications mean?

Pedestrian signals may consist of symbols or words

When you see this indication, you may enter the roadway and *Start* to cross the street proceeding in the direction of the indication.

FLASHING

Continue across the street at a normal pace. If you haven't started crossing yet, *Don't Start!*

NON FLASHING

Stay Out! of the street! If you are still crossing, *Get Out* of the street immediately. A pedestrian cannot legally enter the roadway when this indication is displayed.

The green **WALK** interval is usually five seconds in length. At intersections where high pedestrian volume is observed, the **WALK** interval may be set to seven seconds for adequate opportunity to leave the curb or shoulder before the pedestrian clearance time begins. The pedestrian clearance time refers both to flashing and non flashing intervals of **DON'T WALK**. The pedestrian clearance provides sufficient time for a pedestrian crossing in the crosswalk, who left the curb or shoulder during the **WALK** interval, to at least the far side of the travel way or to a pedestrian median. In Pasadena, pedestrian clearance time at most intersections is sufficient for persons walking at a rate of four feet per second.

The 2003 Manual on Uniform Traffic Control Devices (MUTCD) provides provisions to calculate the pedestrian clearance time based on slower walking speed if a crosswalk is routinely used by seniors or persons with disabilities.[10] The Pasadena DOT is currently adjusting signal timing to accommodate a greater cross-section of its population where the needs can be substantiated. Use of a slower walking speed of 3.5 feet per second or three feet per second will increase pedestrian clearance time by 12 to 25 percent.

Additionally, many major travel corridors are being equipped with upgraded traffic signal technology, such as video detection, closed circuit

TV (CCTV), and count-down pedestrian signals. These upgrades are an integral part of the City's advanced traffic management system that provides more efficient and safe uses of streets by all users.

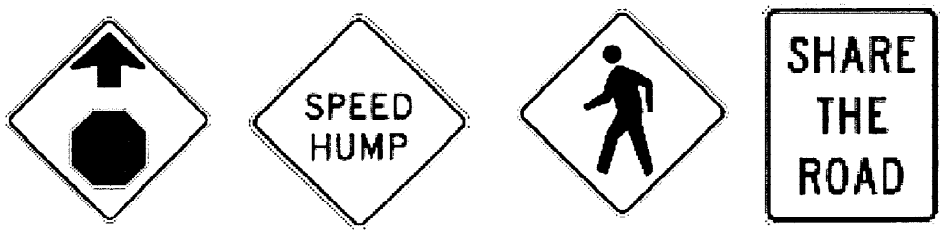
4.4.3 Accessible Pedestrian Signals

Many traffic signals located on major streets are equipped with devices to assist pedestrians with hearing and vision disabilities. These devices include audible tones, vibro-tactile pushbuttons, and ADA-compliant pushbuttons. The Pasadena DOT actively participates in the continuing advancement of traffic control devices that assist persons with disabilities. Accessible pedestrian devices will be incorporated for installation on new traffic signals.

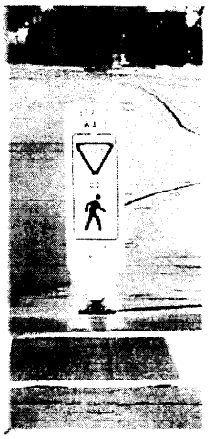
4.4.4 Traffic Safety Signs and Markings

Regulatory signs such as stop signs, speed limits, pedestrian crosswalk restrictions and turn restriction signs are used to guide movements and assign right-of-way.

Warning signs such as pedestrian presence and crossing signs are used to warn motorists and direct pedestrians to appropriate crossing locations and are used in conjunction with marked and unmarked crosswalks. Pavement markings such as Stop and Ped Xing messages are also used to further enhance or reinforce the field condition.



4.4.5 Crosswalks & In-Roadway Warning Lights (IRWL)



The need for crosswalks is assessed based on whether an intersection is controlled or uncontrolled, the number of travel lanes, the grade of street, the speed of vehicles, vehicular volume, the number of pedestrians, collision history, and site conditions such as street width, sight visibility, parking, and adjacent land uses.

The Pasadena DOT conducts ongoing reviews of the need for such improvements as part of its operational programs. Annually, Pasadena DOT responds to over 100 requests for signs. Each request is reviewed by an on-site assessment in order to determine appropriate action.

In-Roadway Warning Lights (IRWL) is one example of a number of crosswalk enhancements to be used in the City. IRWL's are special flashing lights installed on the roadway surface to enhance driver awareness at uncontrolled pedestrian crossings. This includes, but is not necessarily limited to, school crosswalks, mid-block cross-walks, and crosswalks at uncontrolled intersection approaches. As part of the City's ongoing efforts to improve pedestrian safety, six IRWL's will be installed as part of the Suggested Routes to School and Safe Rides and Strides Project. More locations are planned to be installed as funding becomes available in the future.

In December 2000, the use of LED In-Roadway Warning Lights at crosswalks became a new federal standard in the Manual on Uniform Traffic Control Devices (MUTCD).

4.5 SUGGESTED ROUTES TO SCHOOL: REVIEW OF SUPPORTIVE INFRASTRUCTURE

In many communities, few children walk to school. Research estimates that while more than two-thirds of children walked or biked to school as little as thirty years ago, that number has now plummeted to less than ten percent.[11] Parents driving their children to school increasingly are part of the morning commute. The California Department of Health Services cited the fear of traffic as one of parents' top concerns in allowing their children to walk or bike to school. They noted the importance of stronger traffic education programs, better enforcement of traffic laws, and programs and projects to slow down the speed of residential traffic.

The **Suggested Routes to School Program** focuses on encouraging children to walk or bike to school. This program which is underway in communities throughout the nation is a collaborative effort of parents and neighborhood groups, school and local officials, traffic engineers, and planners.

Suggested Routes to School is a year-round program, beginning with the school year 2005-06. A joint letter from the Department of Transportation and the Pasadena Unified School District (PUSD) informed a cross section of parents of this important safety initiative program and requested feedback regarding their child's specific route. Parents were asked to review the route map and identify their individual routes as well as any safety issues along the route. Suggested Routes to School maps will be posted on the City's web page and at the local schools to assist parents in identifying their preferred routes to school. These maps are provided in Appendix B.

Various pedestrian safety and mobility enhancements will be constructed as a result of the Suggested Routes to School program. These improvements, generally funded competitively through the Caltrans Safe Routes to School Program, include in-pavement lighted crosswalks, new sidewalks, and new curb ramps.

4.6 REVIEW OF TRANSIT STOPS

The Pasadena Area Rapid Transit System (ARTS) has seven fixed bus routes operating within the City, serving more than 400 bus stops. A review is underway to determine suitable improvements including pedestrian-friendly amenities at each of the following types of ARTS stops:

- "Time-Points" are the most used stops on a bus route. The departing times at these locations are indicated on a bus schedule. There are 50 ARTS stops classified as "time points," for example, the intersection of Fair Oaks Avenue and Woodbury Road.
- "Heavy Use" and "Destination" bus stops are used consistently through the day or serve specific destinations where transit use is encouraged, but are not identified as "time-points." There are about 200 ARTS stops in these two categories, for example, the intersections of Colorado Boulevard-Los Robles Avenue and Colorado Boulevard-Arroyo Parkway.
- "Support" bus stops provide additional boarding and alighting opportunities along a bus route. There are about 160 support stops throughout the City.

Improvements taken into account during this review that are of benefit to pedestrians include:

- Location of bus stops to facilitate linkages and pedestrian safety
- Accessibility for people with disabilities, including curb cuts and ramps
- Waiting areas that are secure, comfortable, well lit, and easily accessible
- Crosswalks and traffic signal timing set to allow pedestrians time to comfortably cross streets in areas immediately adjacent to transit stops
- Appropriate street furnishings
- Signage for system coverage and connectivity
- Trash receptacles where appropriate
- Bus shelters where needed

4.7 NEIGHBORHOOD TRAFFIC MANAGEMENT PROGRAM (NTMP) REVIEW

The traffic conditions on a street affect not only pedestrians (both adults and children) but also people living within the residential structures along a street. The impacts of traffic include noise, dust, air pollution, vibration, traffic accidents, and decreased pedestrian safety. These impacts affect the quality of life for people who live nearby and may raise safety

concerns. Pasadena places an emphasis on the livable and walkable neighborhoods that are protected from the impacts of traffic, particularly cut-through traffic, speeding cars, on-street parking and, in some cases, noise.

The Neighborhood Traffic Management Program (NTMP) is a comprehensive process for addressing these issues on local streets. The program benefits pedestrians by improving the overall neighborhood environment. It also promotes the goals of Safe Routes to Schools which are discussed in this report. One initiative resulting from preparation of the Pedestrian Plan is adding a Pedestrian Survey to the NTMP review process (see Appendix E). Information collected through such surveys will be considered in developing neighborhood pedestrian improvements.

NTMP GOALS

1. Improve the safety and convenience for motorists, pedestrians, and bicyclists.
2. Protect neighbohroods from traffic intrusion through traffic control measures.
3. Increase the quality of life by creating safe and attractive streets.
4. Promote non-auto modes of travel.
5. Achieve transportation programs desired and supported by the community.

4.8 LANDSCAPING

The presence of landscaping and trees can greatly improve the pedestrian environment. Pasadena residents, workers, and visitors benefit from more than 57,000 trees lining City streets. Preserving this urban forest is a major objective of the City. The Department of Public Works is developing a tree maintenance and replacement program that will insure that trees are replaced in a staggered manner on each street to insure that there is always the presence of mature arching trees throughout the City.

More than 57,000 street trees in Pasadena provide enhanced pedestrian environment and quality of life.

4.9 OTHER PEDESTRIAN-RELATED REVIEWS

In addition to infrastructure reviews, the City conducts periodic surveys of pedestrians in major retail activity centers including South Lake Avenue, the Playhouse District, Old Pasadena, and Hastings Ranch. These studies assess where each district's pedestrians come from, and the perceptions of visitors to the areas using a list of key attributes. They also document pedestrian patterns and types of merchandise or restaurants that the pedestrians surveyed would most like to see in the districts.

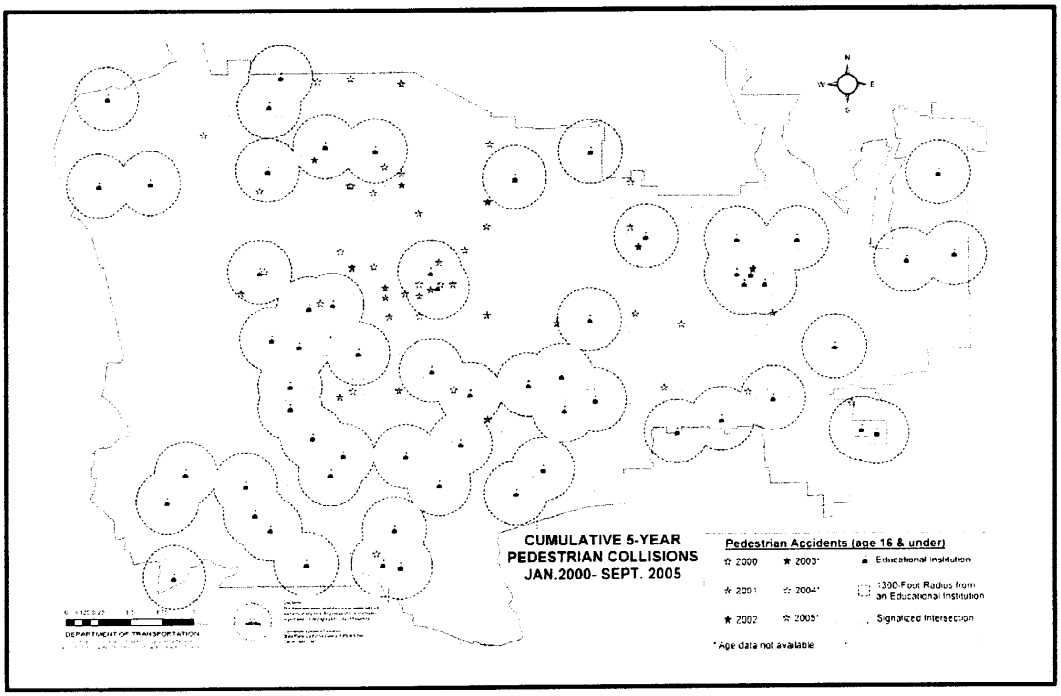
Generally the percentage of pedestrians in these areas who also live in the City has increased and more of these people travel to the areas by sharing rides. Off all districts, the Playhouse District has the lowest percentage of drivers since many of these people walk from residences to nearby shops. Old Pasadena has a regional draw and there too, more people are now sharing rides. While these studies are intended to provide information for the leasing and district management of these areas, they are also a source of information about pedestrians who visit these major places of activity.[12]

4.10 USE OF GIS DATA TO DEVELOP A BETTER PEDESTRIAN ENVIRONMENT

The data collected and mapped for the Pedestrian Plan provides a very valuable tool to address the ongoing design and development of improvements for pedestrians. Information has been formatted in a geographic information system format to facilitate ongoing analysis and project development.

For example, the formatted data allow pedestrian accident data to be overlaid with school locations to determine the incident rate in proximity to schools. Figure 4-5 illustrates this combined data set.

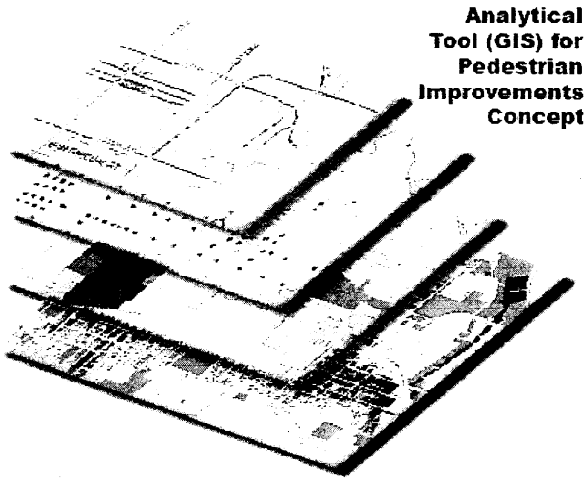
Figure 4-5: Cumulative Five-Year Pedestrian Collisions in Relations to Schools



It is then possible to draw designated walk time (in this case a ten-minute walk shed) to capture a visual illustration of the findings.

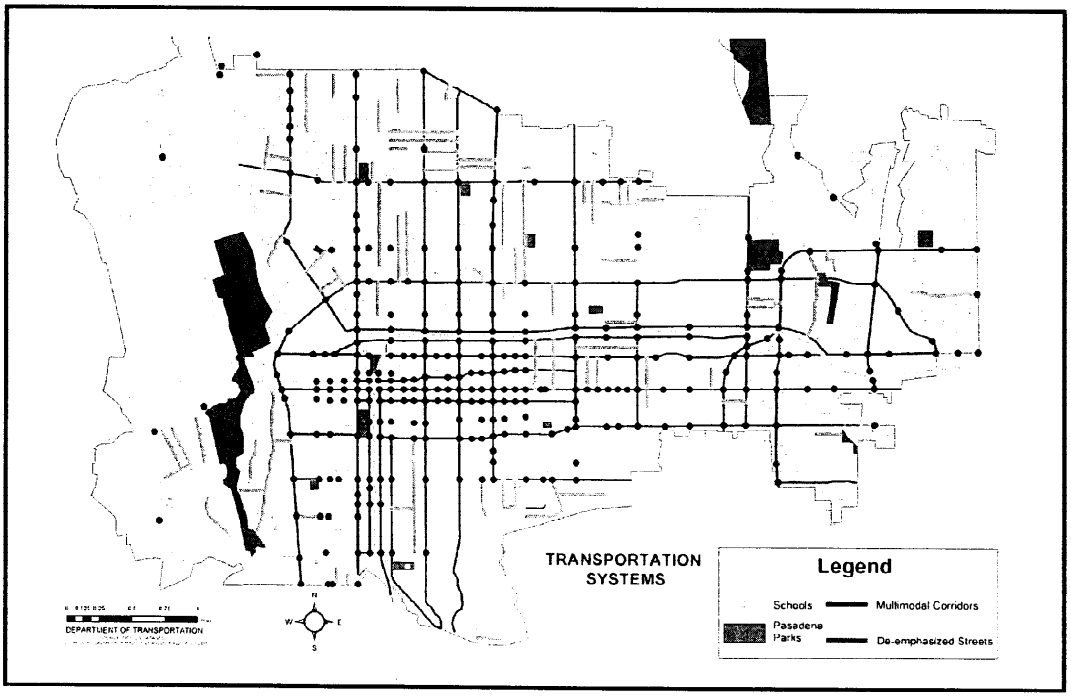
Figure 4-6 illustrates new layers of information that were used to develop the Pedestrian Plan. These layers can be combined to suite a variety of analyses. The walk shed can be expanded to any desired distance to capture related data from design and review functions.

Figure 4-6: Analytical Tool (GIS) for Pedestrian Improvements Concept



Use of GIS data has considerable applications including design of projects, review of proposed projects, fine-tuning operational programs, designing enforcement programs, and so forth. With this information the Pedestrian Plan is not only a policy document, but also an ongoing source of easily constructed data files tailored to meet the ongoing needs of Pasadena's pedestrians.

Figure 4-7: Pasadena Transportation Systems Map in GIS Format



[1] Washington State Bicycle Transportation and Pedestrian Walkways Plan: Best Foot Forward Pedestrian News. 2003

[1] Ibid.

[1] Pedestrian and Streetscape Guide, sponsored by the Georgia Department of Transportation, prepared by OTAK, 2003.

[1] State of Georgia Guidebook for Pedestrian Safety

[1] Pedestrian and Streetscape Guide, sponsored by the Georgia Department of Transportation, prepared by OTAK, 2003.

[1] Institute of Traffic Engineers Issue Briefs. Number 9, April 2004.

[1] City of Pasadena Police Department Crossroad Database

[1] http://www.ci.pasadena.ca.us/police/traffic/Top_Ten_Most_Dangerous_Intersections.asp

[1] The City of Pasadena conducts traffic signal analyses based on the Federal Highway Administration's (FHWA) Manual on Uniform Traffic Control Devices (MUTCD) 2003 and the MUTCD 2003 California Supplement.

[1] Section 4E-10, MUTCD 2003, http://mutcd.fhwa.dot.gov/pdfs/2003/Ch4.pdf

[1] US Center for Disease Control Prevention

[1] Pedestrian Study Conducted for South Lake Avenue, the Playhouse District, Old Pasadena, and Hastings Ranch. Prepared by Gentleman Associates, 2003.

5. PEDESTRIAN PLAN IMPLEMENTATION

A successful pedestrian program necessitates not only attention to public improvements in the built environment but also a reversal of trends in the community's level of walking. Public education is important in achieving behavioral change and leadership, advocacy, and volunteerism throughout the community important ingredients. Many are needed to lead by example.

In the United States, the average share of walking has declined 50% over the past ten years from a low rate of 5.9% to a very low rate of 2.8%. Cities that rely extensively on non-auto travel are often found in other countries. Table 5.1 shows mode share characteristics for eight European cities that are of a similar scale of development as Pasadena although auto ownership is significantly lower.[1]

Table 5-1: Ridership Characteristics in Eight European Cities

City	Ped/Bike	Transit	Car	Inhabitants
Delft (NL)	49%	7%	40%	93,000
Groningen (NL)	58%	6%	36%	170,000
Arhus (DK)	32%	15%	51%	280,000
L'Hospitalet (ES)	35%	36%	28%	273,000
Mataro (ES)	48%	8%	43%	102,000
Vitoria (ES)	66%	16%	17%	215,000
Ghent (BE)	17%	17%	56%	226,000
Brugge (BE)	27%	11%	53%	116,000

These communities share similar features. Many are the site of colleges and universities, most are served by a regional light rail system, and some have undertaken public fitness initiatives as part of a European Union initiative referred to as **Shape Up.**

The Implementation section provides a description of the responsible agency and/or department for improving and/or maintaining Pasadena's pedestrian public realm as well as regional agencies whose programs, services and/or initiatives contribute to improving pedestrian facilities. Major initiatives are highlighted along with programming of near-term improvements.

5.1 IMPLEMENTATION INITIATIVES

Current and planned initiatives for improving pedestrian uses include overarching initiatives that constitute a comprehensive program and projects that collectively add to an enhanced pedestrian environment throughout the City. Sections 5.1 and 5.2 provide information on both these activities.

Element 1: Coordinate outreach efforts of ongoing pedestrian-related programs to increase public awareness of the role of the pedestrian in civic life and the importance of pedestrian safety and activity in achieving a healthy community.

Pasadena has effective public information resources focused on pedestrians. They include:

- Ongoing safety programs including **Safe Routes to School** and **Safe Rides and Strides** which are designed to improve safety for school-age children
- Driver education programs conducted by the Police Department for high-school students
- Messages to increase awareness of public safety and health such as **Watch the Road** and **Up and Moving Pasadena**
- Press releases to the media
- Ongoing community meetings on issues involving planning, public health, and neighborhood traffic management
- Advocacy groups that promote walking and biking such as **Pasadena Walks**
- Marketing studies that survey pedestrians to determine views of major retail districts

- ❑ Private organizations that organize and promote walking in historic areas of the City and along recreational paths and nearby nature trails
- ❑ Youth organizations such as sports teams

Additional resources include:

- ❑ Schools and educational institutions
- ❑ Community centers
- ❑ Signage in the public pedestrian realm
- ❑ Transit marketing initiatives
- ❑ Employers and business organizations
- ❑ Planning programs including Specific Plan updates and community meetings
- ❑ Neighborhood Traffic Management Program
- ❑ City's public information processes
- ❑ Traffic safety awareness and enforcement programs
- ❑ Federal, state, and regional public agencies with responsibility for and/or interest in promoting pedestrian activity
- ❑ The media
- ❑ Health institutions
- ❑ Non-profit groups such as those providing walking tours, pedestrian safety advocacy, and public health advocacy

Element 2: Use Pedestrian Plan policies, data and analytical tools to refine pedestrian improvements in updates of City plans, policy documents, and improvement projects.

Preparation of the Pedestrian Plan has been coordinated with the concurrent preparation of the Open Space and Recreation Element. The information collected for the Pedestrian Plan, the application of GIS tools prepared for the Pedestrian Plan, and the Public and Private Realm Design Guidelines developed as part of the Central District Specific Plan and the Mobility Element will facilitate a more detailed review of pedestrian enhancements in that program and other planning initiatives. Volume 2 of

the Pedestrian Plan contains design guidelines that are used to achieve quality built form that enhances the pedestrian environment.

Element 3: Seek grant funding for projects that implement Pedestrian Plan policies.

Adoption of a Pedestrian Plan strengthens initiatives to secure competitive grant funding. Such documents demonstrate the City's commitment to coordinating pedestrian policies with related plans and addressing pedestrian improvements in a comprehensive fashion. Additionally, the data provided in the Pedestrian Plan can be used to support and target needed grant-funded improvements.

Element 4: Tailor annual operating programs to better meet the needs of pedestrians.

The information collected for the Pedestrian Plan will facilitate refinement of ongoing improvement programs for sidewalks, curb ramps, safety measures, street lighting, pedestrian amenities, and so forth.

Plans are underway in the Transportation Department to undertake a marketing program for the ARTS service. The information collected for the Pedestrian Plan will support a thorough review of the City's 400 transit stops and will assist in developing an assessment of transit/pedestrian enhancements that will encourage ridership. Pedestrian information will also support Transportation Department efforts to provide signal timing settings that meet pedestrian needs at various locations.

Additionally, the information will assist City Departments in future updates of plans and in design and development of provisions for transit oriented districts as outlined in adopted City policy plans.

Element 5: Evaluate the Effectiveness of Improvement Programs.

Pasadena has a number of ongoing evaluative programs to monitor the effectiveness of pedestrian improvements. These include:

Accident safety statistics. This information is collected annually and the Top Ten Most Dangerous Intersections are reported on the City's web page and are updated regularly.

Periodic surveys of pedestrians. Pasadena regularly conducts surveys of pedestrians in major shopping districts. These surveys

help assess the geographic area from which they come including which percentage are out-of-town visitors, how pedestrians view shopping areas on a list of key attributes, their choice of mode in accessing surveyed shopping areas and the amount of time and money they spend.

Citywide Quality of Life Index. This unique program supports decision-making, planning, and policy development that ultimately determine the quality of life and sustainability of the community. Its indicators relate to quality of life issues including transportation; they are reliable enough to track, monitor changes, and ensure that the City is moving in the right direction. The last assessment was conducted in 2002.[2]

Neighborhood Traffic Management Program Follow-up Assessments. A Pedestrian Survey will be included in the future NTMP program areas to identify needs and improvement priorities.

Operational Reviews and Reporting of Problem Areas. The Pedestrian Plan benefits from recent surveys of sidewalk conditions and the ongoing curb ramp implementation program. City residents are another strong asset in monitoring problem areas. Pasadena's web page provides ample opportunity for the public to report problem areas; for example needed curb ramps, broken street lights, sidewalks needing repair, street sweeping, broken bus benches, storm drain problems and so forth. This information enables the City to monitor operational conditions and provide timely maintenance services.

5.2 SUMMARY OF IMPLEMENTATION PROJECTS & SCHEDULE

The project described in the Pedestrian Plan does not include physical implementation of any new physical improvements. Instead the Pedestrian Plan incorporates pedestrian improvements adopted as part of Specific Plans and are subsequently implemented through the Capital Improvement Program. It also provides information to facilitate consideration of pedestrian enhancements such as those described in this section at the time of any development project is proposed within the City. The particular pedestrian improvements that may become part of a future

development project will be selected during analysis of that future development project.

Projects in the City's Capital Improvement Program are funded with City resources and/or grant funding. Other programs involve application of extensive project design review measures to ensure that new projects and reuse of existing development take into account the needs of pedestrians. Table 5.2 summarizes Pasadena's ongoing pedestrian-related implementation programs and a schedule of near-term implementation projects. Funding and priority of these projects included in the Capital Improvement Program are reviewed and adjusted annually. New projects are solicited each year through an open Call for Projects process and evaluated competitively. The information provides a brief project description, funding sources, project schedule. Both citywide and specific plan projects are documented below.

Additional information on the background, justification, and source of funding for each project is provided in Volume 2, Section 1.

Table 5-2: Summary of Pedestrian-Related Improvements

Project Name: Wheelchair Ramps – Citywide (73736)

Description: This is a fifteen-year project to install wheelchair ramps along arterial and collector streets throughout the City. The arterial and collector street system was targeted because of higher pedestrian volumes and its proximity to commercial and business districts. The Accessibility and Disability Issues Committee annually works with staff to identify specific corridors to address the needs for wheelchair ramp installation. Also, the program installs ramps in residential districts in response to specific requests from citizens.

Schedule: This project began in FY 1994. To date, 800 ramps have been constructed as part of this program. Approximately 75 ramps were installed in FY 2005 and another 70 will be installed in FY 2006.

Total Estimated Cost	Appropriated Thru FY2004	Adopted FY2005	Adopted FY2006	FY2007-2010 Estimated Cost
$2,696,000	$1,421,100	$122,500	$122,500	$1,029,900

Project Name: Neighborhood Traffic Management – Citywide (75210)

Description: The Neighborhood Traffic Management Program (NTMP) is a comprehensive process for managing traffic volume, travel speeds, and traffic-related noise in the City's residential neighborhoods. The NTMP relies heavily on community input to determine the best-suited traffic management measures for a particular neighborhood. Specific measures include reconfiguration or installation of roadway striping, alteration of signal timing, installation of regulatory or warning signs, installation of traffic-calming devices, and pedestrian safety measures.

Schedule: In FY 2006, the following neighborhoods are scheduled for comprehensive traffic review, in addition to the current study areas:

1. Daisy Avenue/Villa Street Neighborhood bounded by Maple Avenue to the south, Orange Grove Avenue to the north, Sierra Madre Boulevard to the west, and Eaton Drive to the east;

2. Los Robles/Mountain Street Neighborhood bounded by Washington Boulevard to the north, Marengo Avenue to the west, Orange Grove Avenue to the south, and El Molino Street to the east;

3. Craig Avenue/Casa Grande Neighborhood bounded by north city limits, Allen Avenue to the west, Loma Vista to the south, and Altadena Street to the east;

4. WCIU Neighborhood bounded by north city limits, Hill Avenue to the west, Washington Boulevard to the south, and Sierra Bonita to the east. In addition, the program will continue to conduct speed hump reviews and installations; distribute NTMP handbooks; conduct preferential permit parking program studies as needed; perform traffic counts and speed surveys as needed; and install traffic equipment such as electronic speed signs, portable data collection devices, etc.

Total Estimated Cost	Appropriated Thru FY2004	Adopted FY2005	Adopted FY2006	FY2007-2010 Estimated Cost
$2,488,400	$1,593,400	$195,000	$175,000	$525,000

Project Name: South Access Pedestrian Bridge to the Sierra Madre Villa Light Rail Station – Citywide (75068)

Description: This project will provide a southern pedestrian bridge over the eastbound lanes of the Route 210 Freeway at the Sierra Madre Villa Light Rail Station. This bridge will provide a direct and safe approach for pedestrians and bus riders approaching from the south. It will supplement the north pedestrian bridge which provides access to a 1,000-car parking garage as well as facilitate pedestrians and bus riders approaching from the north.