

FEBRUARY 2012



Emerging Opportunities for
ATSSA Members
in **Pedestrian Safety**



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INTRODUCTION

The traveling public in the United States is beginning to reevaluate how they choose to reach their destinations as a result of many emerging trends. With gasoline prices rising 67% between 2001 and 2009, more Americans are consciously reducing the number of trips they take in their vehicles.¹ During the same period of time, annual walking trips increased from 33 billion to 41 billion.² Additionally, the nation has experienced an abundance of change on the transportation network, including roadway construction and driver distractions (e.g., cellular phones), making roadways more dangerous for vulnerable road users such as pedestrians.

This guidebook is designed to assist ATSSA members in identifying approaches to pedestrian safety issues that will allow them to make a contribution to their state or local government's efforts to reduce fatalities and Move Toward Zero Deaths. This guidebook also presents information on new or expanded business opportunities. It is organized into the following sections: (please see side bar to the right). Most

of the devices and treatments presented in this report are consistent with the requirements of the Manual on Uniform Traffic Control Devices (MUTCD). Some are experimental and a few are ideas that might warrant further demonstration.³ With walking rates on the rise and with dangerous pedestrian conditions throughout the United States, ATSSA members have the potential to have a positive impact on pedestrian safety by advocating for the implementation of emerging pedestrian safety devices and strategies.

This report does not seek to provide a "one size fits all solution" for the issues of pedestrian safety; however, it does provide valuable information that can help ATSSA members get involved and develop their own business plan(s) to market to their local and state jurisdictions.



Source: ATSSA Certified Pedestrian Safety Professional™ Training Course

Figure 1: Pedestrians are some of the most common vulnerable road users.

Pedestrian Safety Highlights in This Issue

Chapter 1 presents statistical information demonstrating the need to focus on pedestrian safety.

Chapter 2 contains suggestions on ways that ATSSA members can address pedestrian safety at vertical construction sites.

Chapter 3 addresses pedestrian safety in work zones, emphasizing ADA compliance.

Chapter 4 explains ways that pedestrian safety can be improved at non-traditional crossing scenarios, such as grade separated crossings, mid-block crossings, and un-signalized intersections.

Chapter 5 presents innovative ways to keep pedestrians safe at special events.

Chapter 6 focuses on strategies to improve pedestrian safety at school crossings.

Chapter 7 offers an overview of the Federal Highway Administration's (FHWA) Pedestrian Road Safety Audit (RSA) Program and ways that other agencies have transformed it to meet their needs.

Chapter 8 describes ATSSA's Certified Pedestrian Safety Specialist Training Course.

Chapter 9 summarizes helpful resources to use in developing a business case for pedestrian safety.

MARKET ASSESSMENT

This chapter presents historical data to establish potential approaches to defining the market for pedestrian safety improvements. Topics covered include:

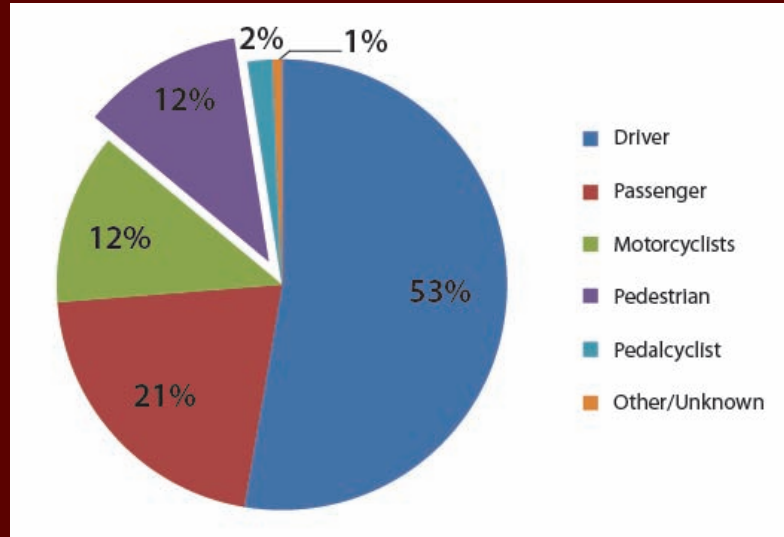
- Overall pedestrian fatality and injury trends;
- City-specific pedestrian fatality trends;
- Funding sources for pedestrian safety improvements; and
- Resources for state and local agencies.

In 2009, over 4,000 pedestrians were killed in traffic crashes and an estimated 59,000 were injured.⁴ Data shown in Figure 2 from the Fatality Analysis Reporting System (FARS) indicates that pedestrians accounted for approximately 12% of all traffic fatalities from 2005 to 2009.⁵ Recent upgrades to occupant protection standards and vehicle crashworthiness testing have greatly benefitted the driving public; however, knowledge of pedestrian safety countermeasures, installation of safety devices, and adoption of emerging pedestrian safety practices have not advanced as quickly.

Figure 3 demonstrates that over a five year period, from 2005 to 2009, the total number of roadway fatalities decreased. Closer inspection of the pedestrian fatality data shows that while the number of pedestrian fatalities decreased, it did so at a slower rate than the overall fatality rate. The dashed black line in Figure 3 represents the percent of pedestrian fatalities with respect to

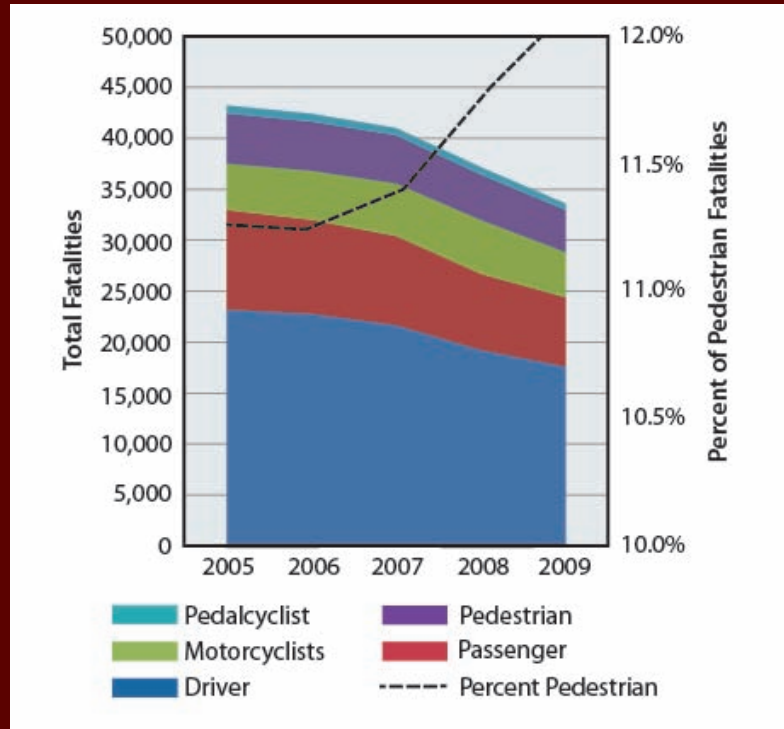
the total number of fatalities. This measurement metric, as seen on the right-side axis of the graph, indicates that the proportion of the overall fatality data attributable to pedestrian safety problems is increasing in

comparison to the rest of the road users. While there has been a decrease in in-vehicle fatalities compared to the total number of fatalities, pedestrian fatalities have not seen this trend.



Source: FARS Database, 2005-2009

Figure 2: Percent of Fatalities by Person Type.



Source: FARS Database, 2005-2009

Figure 3: Total Traffic Fatalities by Person Type.

As state and local governments and agencies move toward building more walkable communities, the number of residents who use walking as a form of transportation will invariably increase. It is important that advocates, planners, and practitioners who develop or retrofit walkable, livable or sustainable communities carefully consider infrastructure safety in the planning stages of their projects.

In order to demonstrate some different approaches to analyzing pedestrian fatality trends, this report examines pedestrian data for the 50 most populated cities in the United States. The data was collected from FARS, the US Census Bureau, and the US Geological Survey.⁶ Three analyses were performed:

1. Total fatalities from 2005-2009;
2. Total fatalities in each city per capita; and
3. Total fatalities per square mile of the city.

It is important to clarify that these lists do not include cities from every state, nor are they intended to encompass every factor that contributes to pedestrian safety.

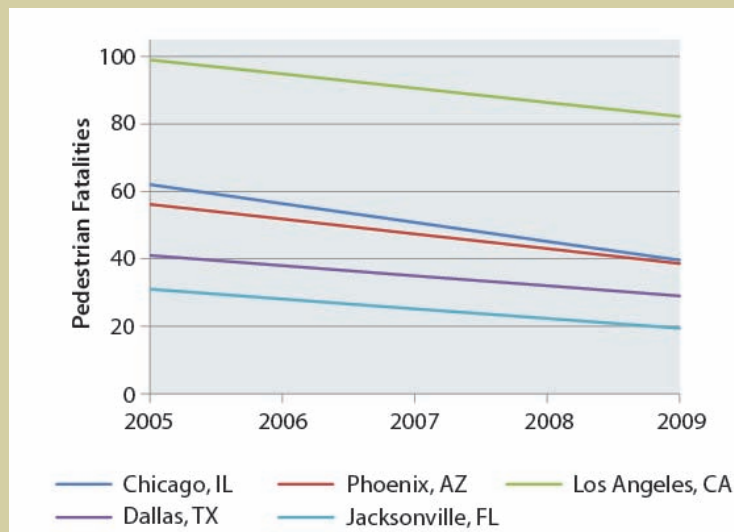
Total Pedestrian Fatalities from 2005-2009

An examination of the number of fatalities over a five year period reveals certain trends. Figure 5 shows the linear fatality trends for the five cities that have experienced the quickest reduction of pedestrian fatalities. It is accompanied by Table 1, which shows the actual data points used to develop Figure 5.



Photo Credit: Steve Hayes

Figure 4: This dangerous crossing scenario is a common problem across the United States. In this photo, construction equipment is close to the poorly delineated walkway. Additionally, the walkway is narrow, close to moving traffic, and uses inappropriate traffic control devices (e.g., safety cones) instead of the appropriate barricades or barriers.



Source: FARS, US Census Bureau, US Geological Survey

Figure 5: Top Five Cities with the Greatest Downward Fatality Trend.

City	2005	2006	2007	2008	2009	Total	Annual Average	Slope of BFL
Chicago, IL	66	48	50	56	34	254	50.8	-5.6
Phoenix, AZ	52	58	47	42	38	237	47.4	-4.4
Los Angeles, CA	96	99	86	95	77	453	90.6	-4.2
Dallas, TX	46	30	35	36	28	175	35	-3.0
Jacksonville, FL	34	23	30	16	23	126	25.2	-2.9

Source: FARS, US Census Bureau, US Geological Survey

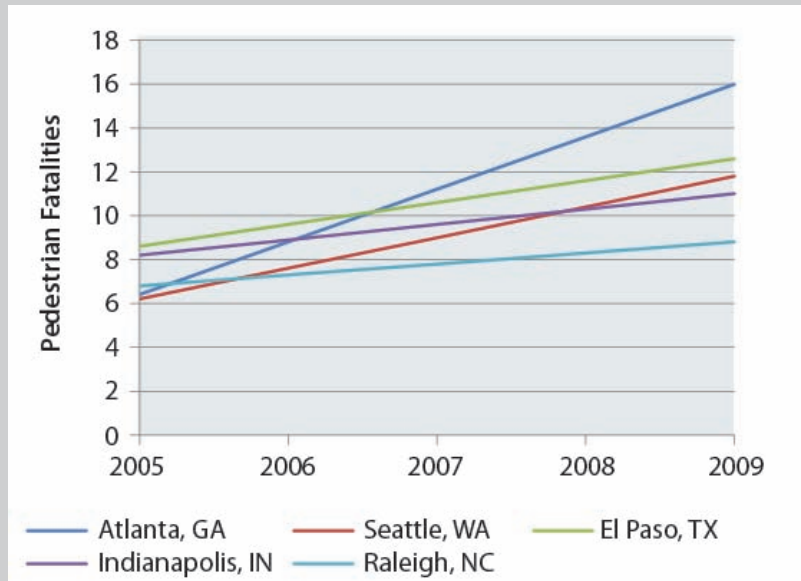
Table 1: Top Five Cities with the Greatest Improvement in Pedestrian Safety.

Historic crash data does not typically plot into straight lines, so in order to present a clear picture of the pedestrian fatality trends, the plots below are simplified by showing a trend line representing the sporadic data points. The line with the steepest downward slope represents the city with the quickest fatality reduction rate from 2005-2009.

The same type of analysis was performed on the data to determine the cities with the highest growth in pedestrian fatalities. Figure 6 and Table 2 show the top five cities with the greatest rate of increase in pedestrian fatalities between 2005 and 2009.

Pedestrian Fatalities Per Capita

Another approach to assessing pedestrian fatalities is to measure the number of fatalities per unit of population. Table 3 demonstrates the application of this technique to the five cities with the highest number of fatalities per 100,000 city residents. However, a number of unidentified variables may have an impact on this data sample. Sources for this data did not provide descriptions for what the data encompasses. For example, in highly populated cities with a high level of tourist activity, the number of tourists may have not been counted in the population estimate, resulting in a higher ratio of pedestrian fatalities per 100,000 capita.



Source: FARS, US Census Bureau, US Geological Survey
 Figure 6: Top Five Cities with the Steepest Upward Fatality Trend.

City	2005	2006	2007	2008	2009	Total	Annual Average	Slope of BFL
Atlanta, GA	6	6	14	18	12	56	11.2	2.4
Seattle, WA	7	8	7	10	13	45	9	1.4
El Paso, TX	12	4	12	12	13	53	10.6	1.0
Indianapolis, IN	7	10	9	13	9	48	9.6	0.7
Raleigh, NC	5	8	9	11	6	39	7.8	0.5

Source: FARS, US Census Bureau, US Geological Survey
 Table 2: Top Five Cities with the Most Needed Improvement in Pedestrian Safety.

City	Population (2009 est.)	2005	2006	2007	2008	2009	Total	Annual Average	Annual Average Per 100,000
Miami, FL	433,136	22	27	17	21	13	100	20	4.617
Detroit, MI	910,921	37	28	30	27	31	153	30.6	3.359
Jacksonville, FL	813,518	34	23	30	16	23	126	25.2	3.098
Phoenix, AZ	1,593,659	52	58	47	42	38	237	47.4	2.974
Albuquerque, NM	529,219	21	18	14	13	10	76	15.2	2.872

Source: US Census Bureau population data
 Table 3: Data for the Top Five Cities with the Highest Annual Pedestrian Fatality Rate per 100,000 Capita.

City	Square Miles	Year						Total	Annual Average	Annual Average Per Square Mile
		2005	2006	2007	2008	2009				
Miami, FL	35	22	27	17	21	13	100	20	0.571	
New York City	303	154	157	135	153	158	757	151.4	0.500	
San Francisco, CA	46	16	19	27	15	20	97	19.4	0.422	
Washington, DC	61	16	17	19	9	14	75	15	0.246	
Philadelphia, PA	135	30	36	34	31	31	162	32.4	0.240	

Source: US Census Bureau population data

Table 4: Data for the Top Five Cities with the Highest Annual Pedestrian Fatality Rate per Square Mile.



Photo Credit: www.pedbikeimages.org / Michael Frederick

Figure 7: An example of proper pedestrian crossing facilities showing curb ramps, visible crosswalk striping, and proper advisory signage warning drivers of the crosswalk.

Pedestrian Fatalities Per Square Mile

A third approach, shown in Table 4, is similar to the one above, but it assesses pedestrian fatalities per square mile instead of per capita. This approach does not take into account population density.

The data and analyses presented in this section can be utilized to present compelling cases to local and state agencies for spending on pedestrian safety improvements. Most state and local agencies have chosen to use the actual number of fatalities as the relevant data point for shaping their goals for Pedestrian Safety Plans or Strategic Highway Safety Plans. Agencies are also establishing targets to reduce those numbers either on an annual basis or on a rolling three or five year average in an effort to achieve the national goal to move Toward Zero Deaths.

Data Resources for State and Local Agencies

Active pedestrian safety advocates are necessary in order to reduce the number of pedestrian fatalities. If no current programs exist in your state, city, county or region, it is a perfect opportunity to make a positive impact on your community. The figures presented in this report can help you identify general fatality trends in order to make a business case for pedestrian safety in your area. However, in many cases, your state, city, county or region may already be focusing on the area of pedestrian safety through their Pedestrian Safety Plans (PSPs).

The following data resources can help you make an even better business case for pursuing a more rigorous pedestrian safety program in your jurisdiction:

- T4America provides an Interactive map showing the locations of more than 40,000 pedestrian fatalities across the United States between 2001 and 2009:

<http://t4america.org/resources/dangerousbydesign2011/map/>

- The Fatality Analysis Reporting System (FARS) Database provides a myriad of statistics regarding pedestrian fatality trends:

<http://www.fars.nhtsa.dot.gov/Main/index.aspx>

- FHWA offers a number of courses to assist with developing a Pedestrian Safety Action Plan:

http://safety.fhwa.dot.gov/ped_bike/pedforum/2011/spring2011.cfm

- ATSSA provides training to assist with work zone and ADA pedestrian safety compliance. More detailed information is in Chapter 8 of this report:

<http://www.atssa.com/TrainingCertification.aspx>

Funding Resources for Pedestrian Safety

Your state and local government agencies may already be aware of these sources of government funding for pedestrian safety improvements; however, many may not be taking advantage of these resources. Here are a few resources that are commonly used:

- The Surface Transportation Program (STP) provides funds to be used for the construction of bicycle paths and pedestrian walkways or for the publication of documents or public service announcements that aim to increase bicycle and pedestrian safety.
- The Hazard Elimination and Railway-Highway Crossing Program is comprised of 10 percent of each state's STP funding. This program allows funds to be used for identifying unsafe pedestrian locations and implementing safety-related traffic calming techniques.
- Funds from the Recreational Trails Program can be used to create new pedestrian routes away from dangerous roadways and intersections.
- FHWA and NHTSA administer the state and Community Highway Safety Grants program. In order to apply, states must have a Performance Plan that establishes goals and performance measures and a Highway Safety Plan that describes how to achieve those goals.
- Check with your local government to determine if they have a special tax program that benefits pedestrian safety.

Safety product manufacturers are unable to apply for the previously mentioned federal funding sources or grants. However, when creating a business plan, these resources can be cited as places where state and local governments can go to apply for additional funding to finance pedestrian safety enhancement projects.

VERTICAL CONSTRUCTION AND ALTERNATE PEDESTRIAN ROUTES

This section describes and illustrates current and emerging vertical construction and alternate pedestrian routing products and practices that are being used or evaluated.

Vertical construction projects often lead to unsafe pedestrian walking conditions. At vertical construction zones, the following issues are commonly encountered by pedestrians:

- Entire street sections and/or sidewalks have been removed from public use;
- Paths are discontinuous or inaccessible;
- Warning and rerouting signs are not adequate for pedestrians to avoid the area;
- Safe and accessible alternative routes around the construction to adjacent destinations are not provided; and
- Ineffective or unusable barriers (e.g., plastic tape) are often used instead of proper, safe methods.⁷

The types of vertical construction safety and alternative routing products and practices described here include:

- Covered Walkways/Sidewalk Sheds;
- Physical Separation/Solid Barriers; and
- Routing Signage.

These safety products and practices help protect pedestrians from falling debris and unsafe sidewalks by providing overhead cover or by guiding pedestrians to avoid hazardous sidewalks or crossing areas. The consistent application of signage, physical separations, and overhead

covering at a vertical construction zone can increase pedestrian safety. In almost every case, one product does not stand alone. Rather, all three types of these products and practices must be integrated to form the safest environment for pedestrians walking in vertical construction zones.



Photo Credit: Tim Cox

Figure 8: This covered walkway effectively provides a covered overhead and adequate lighting. The walkway's structure could catch long canes, provides little protection from the street and does not have the brightly-colored sheeting that provides the visual signal of the construction zone – all of which compromises pedestrian safety.



Photo Credit: Steve Hayes

Figure 9: This traditional sidewalk shed demonstrates a compliant design complete with complementary, brightly colored physical barriers blocking the walkway from street traffic and rerouting signage alerting pedestrians where to cross and where the construction starts and ends.

Covered Walkways/Sidewalk Sheds

Covered walkways (also known as sidewalk sheds) are a common and effective means to protect pedestrians from overhead construction in urban areas. When properly set up and maintained, they effectively prevent pedestrian injuries caused by falling objects during construction on tall buildings.

Covered walkways should be made of solid materials, have adequate lighting, and be coupled with solid barriers to both construction and street traffic. Bright colors also help alert drivers and pedestrians that they are entering a construction zone.

Traditional wooden and steel sidewalk sheds are the most commonly used type of covered walkway; however, common design violations in these structures, including lack of lighting and loose or missing cross braces and deck closures, can put pedestrians in danger.

Recently, the New York Buildings Department championed the development of a new form of sidewalk shed, the urban umbrella, which combines effective lighting; improved aesthetics; elimination of safety hazards associated with cross-bracing and exposed bolts; and reduced sidewalk obstruction that allows for more space for pedestrian traffic.⁸ This design is a recent innovation in covered walkway design that is not yet on the market, but the City of New York plans to utilize this new design on many of its vertical construction projects in the near future.

Physical Separations/Solid Barriers

Physical separations, barriers, and barricades all provide pedestrians with an added safety measure at vertical construction zones by providing protection from adjacent traffic. These barriers and separations also serve as guided walkways that protect pedestrians from walking dangerously close to traffic or crossing traffic inappropriately to avoid walking near work activity.

When used properly, barricades must line the walkway on both sides in straight lines, provide wide enough space for wheelchairs and walkers, and in space-constrained scenarios like this, be coupled with appropriate rerouting signage that safely guides pedestrians to cross the street and use the adjacent sidewalk.



Source: urbanSHED International Design Competition
http://www.urbanshed.org/images/slides/Homepage_winner_photo2.jpg

Figure 10: The urban umbrella design can accommodate vertical construction and pedestrian safety without sacrificing utility, aesthetics, or space. There may be a market for advocating similar innovative designs in your jurisdiction.



Photo Credit: Steve Hayes

Figure 11: Physical separations must shield pedestrians from construction and traffic. This walkway setup includes brightly-colored barricades with reflectors and brightly-colored metal fencing, providing a wide, set back walkway that is adequately guarded from both street traffic and construction activity. However, the fencing is not ADA-compliant due to a lack of a lower rail for walking canes and the tripping hazard caused by the supports protruding into the walking way.

Routing Signage

In many cases, the only signage communicated to a pedestrian is that the sidewalk they are using is closed, offering no pathway alternative or opportunity to cross safely. Improper positioning and types of signs can also

create confusion for the pedestrian. Proper signage that directs pedestrians where to walk and cross safely in or near a vertical construction area is a critical component of adequate pedestrian facilities in work zone environments.



Photo Credit: Tim Cox

Figure 12: The use of improper separations or barriers, such as these wooden posts, poses a threat to pedestrians that pass through this walkway. Wooden posts do not provide a solid, sturdy barrier to traffic.



Photo Credit: Tim Cox

Figure 13: In this walkway setup, the proper use of colored barricades is used in an unsafe and confusing manner, as they are sporadically placed and provide no clear indication of a safe walkway to utilize.



Photo Credit: Steve Hayes

Figure 14: Colored barricades are set back and set along a straight line to provide an adequate and navigable walkway adjacent to a vertical construction zone. This walkway places pedestrians at a safe distance from construction while also protecting them from on-coming traffic.

Business Resources

Many states and local jurisdictions are developing stricter guidance regarding vertical construction safety requirements. For example, the District of Columbia requires that within work zone traffic control plans, the plans for covered walkways/sidewalk sheds must meet a municipal standard. These plans are thoroughly reviewed and approved before a permit is granted.⁹ New York City and the State of New Jersey have similar strict policies regarding the use of vertical construction pedestrian safety mechanisms. However, due to the frequency of construction and the sometimes quick turn-around of construction projects, the use of vertical construction and alternative routing devices is not always enforced or properly maintained.

To help create a business case for enforcing the use of proper pedestrian safety equipment in and around vertical construction work zones, the following agencies can be contacted:

- Local or state Departments of Transportation – Traffic Control Division, Office of Safety, or Planning Office; and
- Local or state Building Code and/or Permitting Offices.

In addition, you can contact general contractors and construction management companies to inform them of proper pedestrian safety around vertical construction zones and to offer products that are available to help them become compliant with standards and reduce safety risks to pedestrians.



Photo Credit: Tim Cox

Figure 15: This vertical construction zone is missing proper signs to guide pedestrians to a safe crossing or diverted pathway. This sign is defaced and altered to be non-MUTCD-compliant. Additionally, it improperly directs the pedestrian to cross at an unsafe crossing area devoid of a crosswalk.



Photo Credit: Tim Cox

Figure 16: These signs provide adequate information to alert pedestrians that the sidewalk is closed and to use the alternative path defined by barricades and channelizers, and includes an ADA accessible ramp due to the steep grade change from sidewalk to street.

WORK ZONES AND ADA

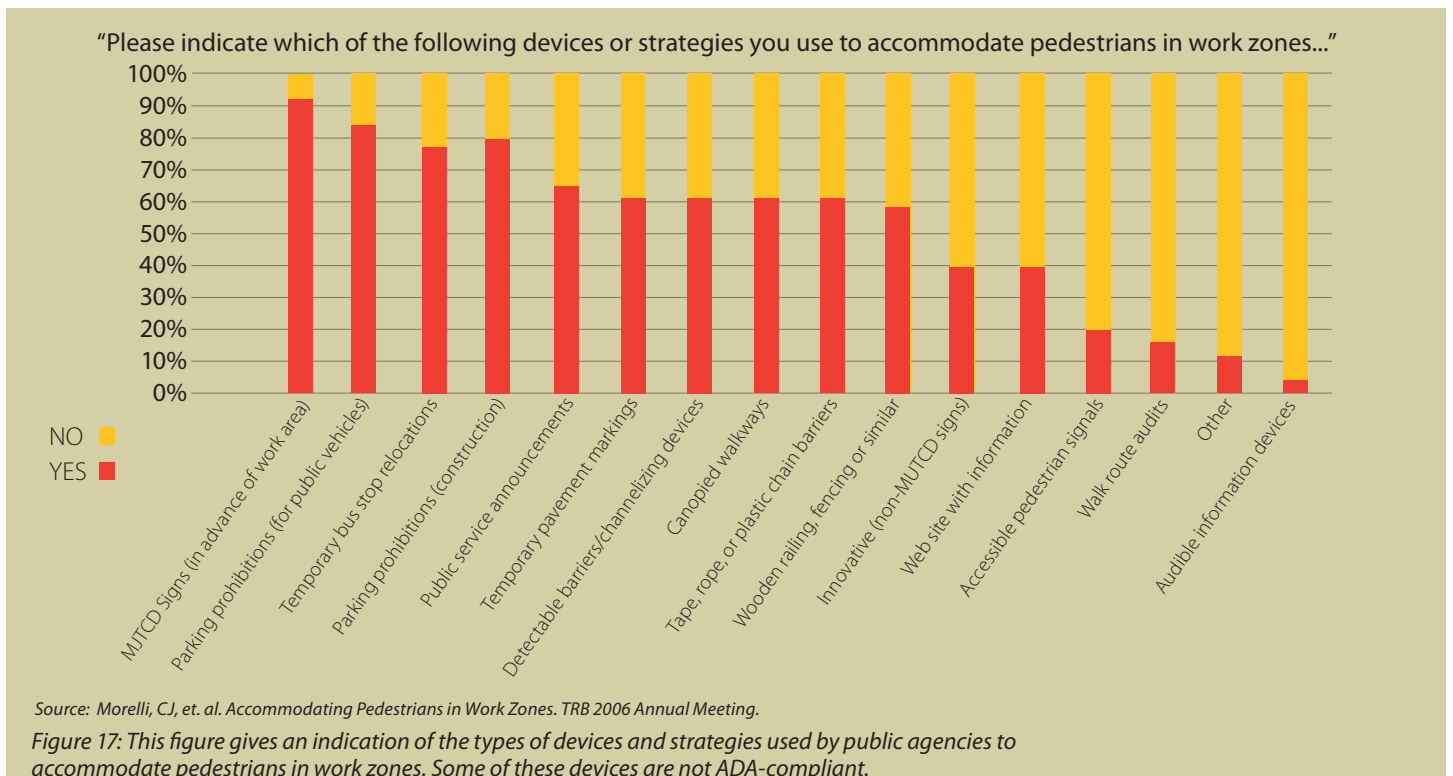
This section describes and illustrates products and practices that can improve ADA accessibility for pedestrians at work zones.

The United States Department of Transportation reports that nearly 14 percent of work zone fatalities are pedestrians. A study conducted in 2006 of 50 work zones in 8 cities concluded that a large number of sites had minimal or no pedestrian accommodation. Over 30 percent of the sites had minimal pedestrian accommodation (e.g., only MUTCD warning signs, no bypass or detour), while over 20 percent lacked any form of accommodation¹⁰. Moreover, most devices that were used in accommodating pedestrians at work zones were non-compliant with ADA standards.



Photo Credit: Steve Hayes

Figure 18: This temporary walkway is poorly designed and maintained. The drums are unstable and pose a threat to pedestrians walking along the path; debris and work zone equipment are spilling dangerously over the pathway; and the break between channelizing devices and drums in the path poses a threat to those pedestrians using canes or walkers.



All pedestrian work zone safety devices must at a minimum accommodate three critical considerations for pedestrian safety in work zones ¹¹:

1. Pedestrians must be separated from work site vehicles, equipment and operations.
2. Pedestrians must be separated from traffic moving through or around the work site.

3. Pedestrians must be provided with a safe, accessible and convenient travel path that duplicates normal characteristics of sidewalks or footpaths.

The types of standard work zone and ADA-compliant work zone products and practices described here are those that incorporate the aforementioned principles. These products address sidewalk and crosswalk closures,

diversions and detours, and pedestrian information.

These safety products and practices help protect pedestrians by providing guidance on navigating through work zones and providing safe access to pathways.

Sidewalk and Crosswalk Closures, Diversions, and Detours

When closing parts of a sidewalk, it is pertinent to provide the pedestrians with a safe and clearly defined walking alternative. The following are elements that work zones should consider as they pertain to sidewalk and crosswalk closures, diversions and detours ¹²:

- Ground surface must be stable, weather-proof, and prevent major vibrations that could throw pedestrians off-balance.
- Transition between two surfaces needs to be smooth, sturdy, made of non-slip material and must be free of ridges.
- Devices must delineate the sides of a walkway and should be sturdy, stand straight up, and not contain holes or openings at the bottom edge, in order to prevent tripping or disorienting pedestrians using a cane or walker. The walkway needs to be wide enough for wheelchair or motorized cart access.



Photo Credit: Tim Cox

Figure 19: This walkway is an example of non-ADA compliant work zone accommodations. It does not use stable or sturdy barriers to protect pedestrians from construction hazards, offers no signage or warning of a hazard, and does not guide pedestrians to safe, accessible crossing areas.



Photo Credit: Tim Cox

Figure 20: This detour employs multiple ADA-compliant practices including: the use of stable, weather-proof surfacing; a smooth, low-grade, and non-slip transition between surfaces; guide rails; and an ADA-compliant width.

- Channelizing devices with guide rails connected to them should be continuous, allowing a pedestrian to hold the rail for balance and security, safely running their hand along the top of the rail. The guide rail must be made of safe-to-the-touch materials and should not have couplings larger than the rail itself.
- Curb ramps need to be as wide as the detour route, meet ADA slope requirements, and be made of non-slip materials.
- Diversions and detours must protect the pedestrian from traffic and work zone area hazards.
- Detours should be well-lit.

Pedestrian Information

Proper information should be provided to the pedestrian entering a work zone. The most appropriate way to do this is through signage with large, clear and concise lettering, and high contrast coloration.

Key components of ADA-compliant signage include:

- Positioning placement should be well before the beginning of the work zone.
- Signs should be positioned to indicate the beginning and end of the detour, sidewalk closing, or diversion.



Photo Credit: Tim Cox

Figure 21: This temporary curb ramp is at a low grade, utilizes non-slip materials (e.g., non-slip coated wood), and is wide enough for ADA-compliant access. Temporary curb ramp solutions are still an area in need of further innovation.



Source: ATSSA Pedestrian Safety and Accessibility in Work Zones Module

Figure 22: This work zone detour provides a solid barrier to traffic through the use of longitudinal channelizers, is an ADA accessible width, and incorporates a low-grade curb ramp.



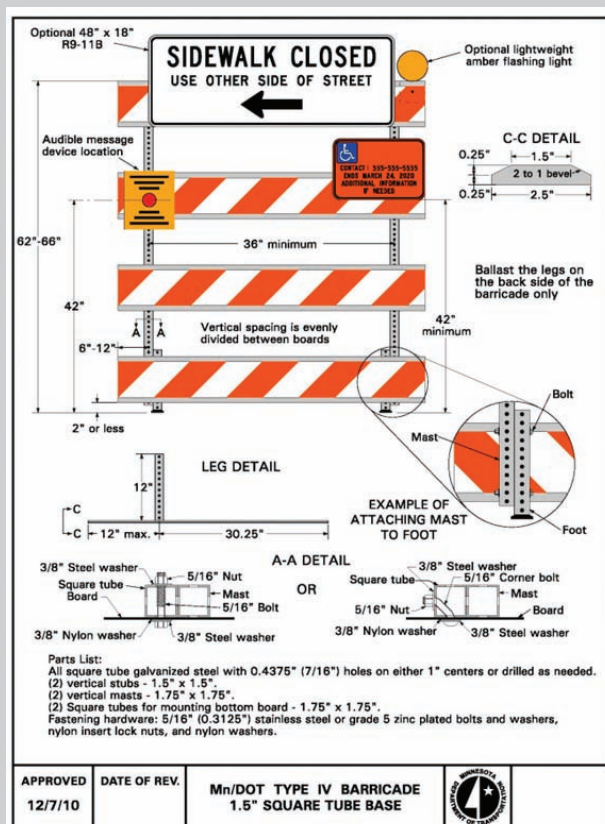
Source: ATSSA Pedestrian Safety and Accessibility in Work Zones Module

Figure 23: This detour is a common example of an ADA non-compliant work zone pathway. The drums do not provide sufficient protection from traffic, are not continuous, and the pathway is not wide enough to accommodate wheelchairs or carts, and the pathway is dark and unlit.



Source: FHWA Work Zone Intersection Safety Brief – Issue 16
http://safety.fhwa.dot.gov/intersection/resources/fhwas10005/docs/brief_16.pdf

Figure 24: The combinations of signs in this work zone set up provide clear information to pedestrians about sidewalk closures in advance of the work zone and offer directional guidance on the next safest path. These signs are also situated near a curb ramp for ADA access.



Source: TPAR.com <http://www.safetysigns-mn.com/tpar/the-solution>

Figure 25: Some state agencies, such as the Minnesota Department of Transportation, are developing ADA-compliant work zone signage that provides a flashing warning light, an audible message device with a loud recorded message that overcomes typical ambient sound levels, and a bright orange sign with contact information about the construction schedule. This signage is not MUTCD-compliant, but is an innovative solution for ADA-compliant signage.

- Signs should indicate the length of the sidewalk detour.

Another helpful feature that could be added to signage is a flashing warning light placed at the beginning and end of a detour. These provide a benefit to pedestrians with low or no vision and/or balance issues.¹³

Many ATSSA members also manufacture alternative ADA-compliant products and solutions. In June of 2011, ATSSA organized a Temporary Accessible Pedestrian Route Demonstration in Sacramento, California. The event was supported by an FHWA Grant and showcased an assortment of ADA compliant products manufactured by 12 ATSSA members. Twenty low or no-vision and mobility impaired citizens from the surrounding ADA community and sixteen various state DOT representatives and public officials served as the event's evaluators.

Many of the DOT representatives and public officials said that the event had completely changed their outlook on ADA compliance issues, and stated that they would be "going home and moving in an entirely new direction" regarding ADA issues in their respective states.

Business Resources

Many states and local jurisdictions around the country are working to develop ADA-compliant work zones and pedestrian infrastructure standards. For example, California's state transportation authority, Caltrans, announced that it plans to spend \$1.1 billion over the next 30 years on making existing

sidewalks accessible, adding new curb ramps/upgrading non-compliant ramps, using alternate pedestrian routes at work zones, and ensuring that the alternate routes are ADA-accessible.¹⁴ Other state agencies, such as Minnesota’s Department of Transportation, are working with industry professionals to develop state-approved, ADA-compliant “temporary pedestrian access route” (TPAR) devices.¹⁴

Yet another example of a defined need for ADA-compliant work zone practices and solutions involves utility work zones. The inherent nature of utility work is short-term, making most pedestrian accommodations an after-thought to utility workers. There may be opportunities to network with utility providers and contractors and provide them with solutions for proper ADA-compliant work zone accommodations.

To get involved in developing new ADA-compliant work zone safety devices or to become an advocate of proper ADA-compliant work zone set-ups, get involved in state-run initiatives to develop mandatory ADA-compliant work zone devices, requirements and procedures. The following government agencies may be involved in this effort:

- State Highway Safety Office,
- State/Local Departments of Transportation,
- Local Permit Offices (Utility, Building Permits), and
- Regional/Local Utility Providers and Contractors.



Photo Credit: Donna Clark

Figure 26: ATSSA member products were arranged in a maze that loosely represented a work zone environment. Each product was thoroughly inspected and tested by each product evaluator.



Photo Credit: Tim Cox

Figure 27: Temporary, short-term utility work frequently violates ADA guidelines and provides a key market for advocating ADA-compliant work zone devices and practices.

The following websites provide a good start to better understanding ADA Compliance and offer a good opportunity to learn how to get involved in this business development process:

- Pedestrian Safety and Accessibility in Work Zones:

http://www.workzonesafety.org/files/documents/training/fhwa_wz_grant/atssa_pedestrian_work_zones.pdf

- Guidance Sheet – Temporary Traffic Control Zone Pedestrian Access Considerations:

<http://www.atssa.com/galleries/default-file/WZ%20Guidance%20Sheet%20FINAL%20LAYOUT%20TO%20FHWA.pdf>

- FHWA's A Resident's Guide for Creating Safe and Walkable Communities:

http://safety.fhwa.dot.gov/ped_bike/ped_cmunity/ped_walkguide/resource7.cfm

- United States Access Board's Public Right of Way Access Advisory Committee's Special Report on Accessible Public Rights-of-Way Planning and Designing for Alterations:

<http://www.access-board.gov/prowac/alterations/guide.pdf>

- TPAR.com's TPAR Compliant Pedestrian Access Routes website:

<http://www.safetysigns-mn.com/tpar/>

NON-TRADITIONAL CROSSING SCENARIOS

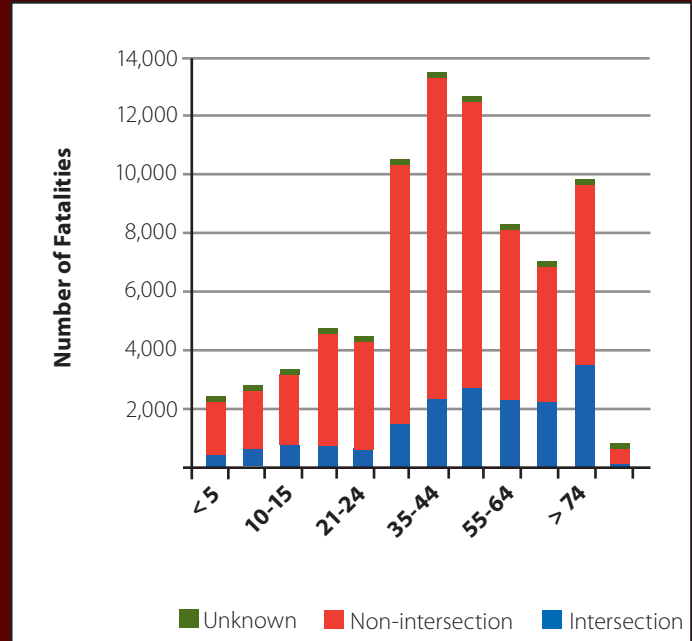
This section describes and illustrates non-traditional crossing products and practices that can improve safety at unsignalized intersections, grade-separated interchanges, and mid-block crossings.

Non-traditional crossing scenarios pose a high level of danger for pedestrians. One study conducted in 2002 found that pedestrians are more likely to cross at intersections that are equipped with a traffic signal, a pedestrian signal (Walk/Don't Walk signs) and/or a marked crosswalk.¹⁶ However, the presence of a marked crosswalk is not enough to aid pedestrians in crossing at a midblock location; according to one study, pedestrians prefer additional facilities in order to feel safe crossing midblock¹⁷.

The types of non-traditional crossing scenario products and practices described here include:

- Pedestrian Crossing Treatments and
- Midblock Signals and Red Beacon Displays.

These safety products and practices help protect pedestrians by warning drivers of the presence of pedestrians attempting to cross and providing pedestrians with guidance on when and where to cross safely.



Source: FARS Data, 1994-2009

Figure 28: Pedestrian fatalities by location of crash.



Photo Credit: Scott Crawford

Figure 29: Pedestrian in a wheelchair crossing mid-block with no crosswalk.

Pedestrian Crossing Treatments

The most desirable characteristics for a pedestrian crossing include the following:

- Simplicity and convenience,
- Excellent visibility,
- Slowed or controlled vehicle speeds, and
- Driver awareness of the crosswalk.¹⁸

However, in more complex crossing scenarios (e.g., multi-lane, high-speed, high-volume), several different treatments must also be considered, such as:

- Median refuge islands,
- Advanced yield lines,
- Curb extensions,
- Pedestrian flags,
- Pedestrian-activated flashing beacons,
- Motorist signage,
- Centerline and standard pedestrian signage, and
- In-pavement warning lights.¹⁹



Photo Credit: Don Lewis

Figure 30: Median refuge areas allow pedestrians to walk at appropriate locations across wide roadways and provide drivers with a clear visual of where pedestrians may cross.



Source: Kingsport Tennessee Neighborhood Traffic Management Plan, June 2007

<http://publicworks.kingsporttn.gov/traffic/traffic-calming>

Figure 31: This raised crosswalk (a traffic calming/pedestrian safety solution) can decrease pedestrian accidents by an average of 45%.



Photo Credit: Sue Reiss

Figure 32: This example of centerline pedestrian signage is brightly colored and, by being placed in the roadway, alerts motorists of pedestrian right-of-way.



Photo Credit: www.pedbikeimages.org / Jan Moser

Figure 33: Although not mentioned in the MUTCD, pedestrian flags are an out-of-the-box solution to accomplish pedestrian safety. They are a simple way of alerting drivers that a pedestrian is in a crosswalk. Normally colored bright orange or yellow, these flags are carried by pedestrians crossing at unsignaled intersections or midblock crossings.

Midblock Signals and Red Beacon Displays

Traffic signals and red beacon displays are effective means to encourage motorists to yield to pedestrians along high-volume and/or high-speed roadways. Several studies have documented drivers yielding in the 90 to 100 percent range upon encountering these signals and displays.²⁰

In addition, the same studies showed a clear relationship between the addition of signs, flashing lights, and/or signals, and the pedestrians' perception of safety. Pedestrians felt safer with the addition of some form of signal.²¹



Photo Credit: Don Lewis

Figure 34: This pedestrian-activated flashing beacon provides drivers with an advanced warning that a pedestrian is in the crosswalk.



Photo Credit: www.pedbikeimages.org / Dan Burden

Figure 36: This advanced yield horizontal marking alerts drivers to the colored crosswalk ahead, urging drivers to slow down and to stay alert for pedestrians crossing where there is no intersection.



Photo Credit: www.pedbikeimages.org / Dan Burden

Figure 35: In-pavement warning lights provide an enhanced visual awareness of pedestrian crosswalks at night to warn drivers to slow down and stay alert when approaching a crosswalk.



Photo Credit: www.pedbikeimages.org / Dan Burden

Figure 37: Curb extensions play multiple roles in pedestrian safety. They act as traffic calming devices, provide a pedestrian refuge area, reduce the crossing distance, and allow pedestrians and approaching vehicle drivers to see each other when vehicles parked in a parking lane could otherwise block visibility.

Business Resources

States and local jurisdictions around the country are beginning to initiate pedestrian safety campaigns, including the State of Delaware's "Cross This Way" campaign²² and the District of Columbia's "Street Smart" program²³. In addition, some cities, like Redmond, Washington, are adopting new criteria to better address jurisdiction-specific pedestrian accommodation issues that differ from existing MUTCD guidelines. These types of pedestrian safety campaigns are being run by state and local government agencies, including the following:

- State Highway Safety Office,
- Local/State Law Enforcement,
- Local/State Departments of Transportation,
- Local/State Planning Office,
- Local Bicycle & Pedestrian Program Office,
- Regional/Local Transit Agencies, and
- Neighborhood Advisory Councils or Homeowners Associations (HOA).

To help support a business case for enforcing the use of proper pedestrian safety equipment in and around non-traditional crossing scenarios, follow these sample steps:

- Research pedestrian safety campaigns in your area via the internet or by visiting your local Department of Transportation.
- Ask the Chief Safety Officer or government representative in a similar role about who is in charge of implementing pedestrian safety solutions around non-traditional crossing scenarios.
- Attend neighborhood council meetings, town halls, or HOA meetings with agendas regarding traffic calming or pedestrian safety. Come prepared with plausible solutions for pre-identified problem areas to market your products and solutions at the meeting.



Source: FHWA - Safety Effectiveness of the HAWK Pedestrian Crossing Treatment
<http://www.fhwa.dot.gov/publications/research/safety/10042/10042.pdf>

Figure 38: This HAWK signal provides a solid red signal, presenting a clear regulatory message to drivers, resulting in a uniform stop response in lieu of drivers yielding or speeding through the signal to avoid slowing for pedestrians.



Photo Credit: www.pedbikeimages.org / Dan Burden

Figure 39: Although not mentioned in the MUTCD, pedestrian activated flashing crosswalks perform similarly to the HAWK signal, but do not require the driver to come to a complete stop. Instead, this form of signal prompts drivers to yield until pedestrians have cleared the crosswalk.

SPECIAL EVENTS

Many communities hold special events throughout their calendar year. These events could range from bicycle races to carnivals and parades. Some cities may consistently host large events such as sports games or national conventions, which necessitate a detailed pedestrian plan. Special events require additional consideration of pedestrians in order to ensure the safest environment for the most vulnerable of road users. This section presents emerging techniques and technologies that can be employed during special events to increase driver awareness and protect pedestrians.

The types of special events products and practices described here include:

- Vehicle-Pedestrian Mitigation and
- Pedestrian Guidance.

Locations that have high pedestrian volumes due to recurring special events, such as sports events and theater shows, may find further information on traffic calming and pedestrian plans in the section on non-traditional crossing scenarios (Chapter 4).

Vehicle-Pedestrian Mitigation

If a device is to be used to provide a barrier between pedestrians and vehicles, it must pass the Manual for Assessing Safety Hardware (MASH) test. MASH testing has replaced NCHRP 350 testing for new devices tested after January 1, 2011. The new test procedure includes more

stringent requirements, which lead to better protection of all road users, including pedestrians.

The District of Columbia requires that traffic control devices used to delineate a pedestrian walkway in a temporary traffic control zone must be crashworthy and reduce the threat of serious injuries to pedestrians and vehicle occupants.

Another way to limit the danger to pedestrians traveling in or near vehicles is to invoke traffic calming devices. Speed bumps are considered

a roadway design element, so they will not be found in the MUTCD even though they are an effective way to reduce speeds and increase driver awareness.²⁴

Pedestrian Guidance

Special events often require additional guidance to keep pedestrians off of the special event route. Light barriers provide easy setup and take down at events where barriers are needed to direct pedestrians. The channelizers in this section are intended to guide pedestrians, not to protect



Source: FHWA Research & Technology Transporter
<http://www.fhwa.dot.gov/publications/transporter/02feb/index.cfm>

Figure 40: An example of a portable speed bump that acts as a temporary rumble strip to slow vehicles through a populated area.

them from errant vehicles during races or parades. They should not be used as barriers or barricades between pedestrians and vehicles.

Pedestrian wayfinding signs are an allowable way to direct pedestrians toward special events or locations. These signs shall not be retroreflective and they shall be placed so they are visible to the pedestrians but out of the sight of the drivers.



Photo Credit: Tom Hickmore

Figure 41: An example of a longitudinal pedestrian channelizing device that was used during a bicycle race.



Photo Credit: www.pedbikeimages.org / Dan Burden

Figure 43: Pedestrian wayfinding sign in Charlotte, North Carolina displaying a map to locations frequented by pedestrians during special events, such as stadiums and convention centers.



Photo Credit: Jason Hancock

Figure 42: Pedestrian wayfinding signs in Des Moines, Iowa. These signs direct pedestrians to areas with frequent special events and/or safe crossing routes, such as skywalks.



Photo Credit: www.pedbikeimages.org / Dan Burden

Figure 44: For areas where special events frequently attract pedestrians, advisory signs can be used to remind pedestrians to practice safe crossing behavior.

ADA Accessibility

All pedestrian facilities, whether temporary or permanent, should provide for the needs of all pedestrians by complying with the requirements of the Americans with Disabilities Act (ADA). For example, sturdy barriers, such as longitudinal channelizing devices and barricades with a uniform and continuous bottom edge, help guide pedestrians with disabilities by providing solid boundaries against the bottom of the sidewalk or pavement.

Business Resources

Only a few states have established guidelines for pedestrian control during special events. The District of Columbia, for example, combines special event management with incident management in their policy on Pedestrian Safety and Work Zone Standards. It is important to develop guidelines in other states to encourage practitioners to consider pedestrian safety a priority in design.

To help support a business case for enforcing the use of proper pedestrian safety equipment at special events, the following agencies can be contacted:

- Local or State Department of Transportation – Traffic Control Division, Office of Safety, or Planning Office;
- Local or State Permitting Office; and
- Local or State Special Event Planning Committees or Public Space Administrations.

SCHOOL CROSSINGS

Unsafe pedestrian conditions frequently lead to imminent danger for children. Parents cite traffic danger as the most common reason why their child does not walk to school.²⁶ Improving pedestrian facilities around schools has the potential both to improve safety and to increase the number of students who walk or bike to school.

This section presents emerging techniques and technologies that can be employed at school crossings to increase driver awareness and protect children while crossing the roadway.

The types of school crossing products and practices described here include:

- Pavement Marking;
- Rectangular Rapid-Flashing Beacons;
- Crosswalk Signals, Centerline, and Traditional Signing;
- High Intensity Activated Crosswalk (HAWK) Beacons;
- Crossing Guard Innovations;
- Pedestrian Detection Systems; and
- Other Innovations.

Pavement Marking

In an FHWA study, two types of crosswalks were selected as the most visible and effective crosswalk designs: the Continental Crosswalk and the Bar Pairs Crosswalk.²⁷ The results of the study indicate that these two crosswalk patterns were more visible at farther distances compared to a Transverse Crosswalk pattern.



Photo Credit: www.pedbikeimages.org / Dan Burden

Figure 45: This Continental Crosswalk includes brightly painted striping and is also accompanied by ADA compliant curbs and concrete barriers to warn pedestrians to cross within the crosswalk.



Photo Credit: www.pedbikeimages.org / Dan Burden

Figure 46: This Bar Pairs Crosswalk is highly visible due to the breaks between striping, alerting drivers that they are approaching a crosswalk.



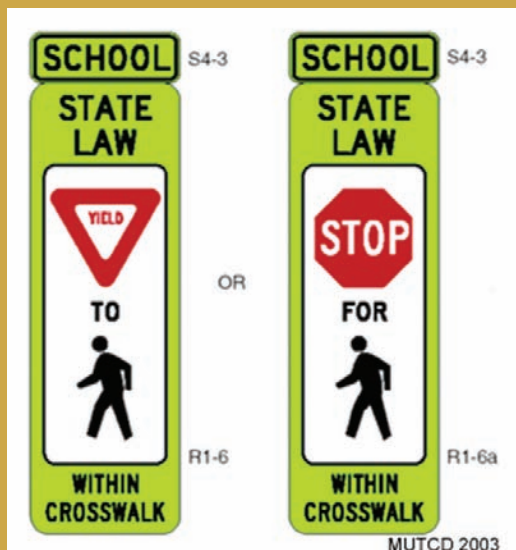
Photo Credit: www.pedbikeimages.org / Dan Burden

Figure 47: While non-MUTCD compliant, this “LOOK” sign does help to remind pedestrians to look both ways before crossing a bike path.



Source: Pedestrian Safety Countermeasures Deployment and Evaluation: Las Vegas Case Study, http://safety.fhwa.dot.gov/ped_bike/tools_solve/ped_scdproj/webinar052809/las_vegas/

Figure 48: Electronic signs with “animated eyes” in Las Vegas, Nevada remind pedestrians to look for turning vehicles.



Source: Safe Routes to School Guide

http://guide.saferoutesinfo.org/engineering/in-street_signing.cfm

Figure 49: In-street pedestrian crossing sign for school crosswalks.

The sign in Figure 47 reminds pedestrians that they are crossing an unsignalized intersection. Similar signs can be installed within neighborhoods and along school routes to help protect children. The large, bold lettering and the use of simplified vocabulary make it easy for children to read and comprehend the sign.

Crosswalk Signals and Signing

Recent revisions to the MUTCD have permitted the use of additional information on crosswalk Walk/Don't Walk signs. For example, signs can count down the number of seconds remaining in the walk indication and show animated eyes on the crosswalk signs. The eyes remind the pedestrian to look for turning vehicles while utilizing the crosswalk. Many pedestrian crossing signals also have an auditory or vibrotactile element to inform visually disabled pedestrians when it is safe to cross the streets.

In-street pedestrian crossing signs may be adjusted to include a “SCHOOL” plaque (S4-3P in the MUTCD) at the top of the sign and the “STATE LAW” legend may be kept or removed.

Rectangular Rapid-Flashing Beacons

The Rectangular Rapid-Flashing Beacons (RRFB) activate a quick-flashing light that is mounted on a street-side sign (Figure 50), installed above a crosswalk, or both. This device captures the driver's attention and notifies them that there is a pedestrian either actively crossing or waiting to cross the street.

High Intensity Activated Crosswalk Beacons

This safety device, commonly referred to as the HAWK, is similar to the RRFB, but it more forcefully captures the driver's attention.

The HAWK crossing beacons are typically installed on unsignalized major roads and stop-sign controlled minor roads, as well as at midblock crossings. The system usually includes an overhead red-yellow-red beacon for each direction of traffic. Signs are placed next to the beacons that say "CROSSWALK STOP ON RED" and "PEDESTRIAN CROSSING" (Figure 51).

Pedestrian Detection Systems

Systems like the RRFB and the HAWK crossing beacons require some way of identifying when a pedestrian is present. The current state of practice is to install a button that the pedestrians press to request their turn to walk, but new sensing technologies provide another option. These devices have sensors that are directed towards a certain place on the ground. When they "see" a pedestrian in that space, they activate the crosswalk signal and allow the pedestrian to cross. Some crosswalks are even equipped with sensors that can detect whether a pedestrian is still in the crosswalk or not.

Innovations for Crossing Guards

Another way to keep children safe on their routes to school is to enhance the visibility of the crossing guards. Many companies are manufacturing new vests (Figure 53) and stop signs (Figure 54) that are enhanced by illuminated outlines or LED lights in addition to the traditional reflective materials.

These illuminated items can be especially beneficial to cities and states that get dark before school lets out.



Photo credit: Kelly Donougue

Figure 50: RRFB with LED flashing beacons at a college campus.



Photo Credit: www.pedbikeimages.org / Mike Cynecki

Figure 51: Typical HAWK system with an additional strong yellow-green sign to indicate that this is a high school crosswalk.



Photo Credit: www.pedbikeimages.org / Dan Burden

Figure 52: Pedestrian detection devices, such as this, have sensors that detect when a pedestrian is approaching a crosswalk and set off in-pavement lights to flash until the pedestrian has crossed to the other side of the roadway.



Photo Credit: Jim Marshall



Photo Credit: Jim Marshall

Figure 53: Crossing guard wearing an ANSI Class 2 vest and ANSI Compliant headwear while holding an MUTCD compliant stop/stop paddle.



Source: Officer.com

<http://www.officer.com/product/10049637/stop-slow-or-stop-stop-paddle>

Figure 54: MUTCD acceptable LED enhanced stop paddles enhance the visibility of the crossing guard in a crosswalk.



Photo Credit: www.pedbikeimages.org / Dan Burden

Figure 55: Permanent application of a radar enhanced speed limit sign in a school zone.

Other Innovations

Changeable message signs, either permanent or portable, that display the speed of the approaching vehicle are permitted by the MUTCD when placed in conjunction with a speed limit sign. These changeable message signs must indicate "YOUR SPEED XX MPH" or contain similar text to inform the driver of the speed they are travelling. All changeable message signs must meet the standards set forth by the MUTCD in Section 2L.

Public Involvement

One way to become involved is through pedestrian advocacy programs like the Safe Routes to School Program. This is a federally sponsored program dedicated to improving pedestrian safety near schools and educating parents about ways they can advocate for better walking conditions.

Business Resources

Pedestrian safety near schools concerns parents, teachers, and transportation professionals alike. The following resources can be helpful to promote and improve school zone safety awareness in your community.

- Safe Routes to School Program:

<http://safety.fhwa.dot.gov/saferoutes/>

- Safe Routes to School Case Studies from Around the Country:

http://www.sacog.org/complete-streets/toolkit/files/docs/NCSTRS_SRTS%20Case%20Studies%20from%20around%20the%20country.pdf

- Walkability Checklist

<http://www.saferoutesinfo.org/sites/default/files/walkabilitychecklist.pdf>

- National Course offered by the Safe Routes to School Program:

<http://www.saferoutesinfo.org/events-and-training/national-course>

- Safe Routes to School National Conference (typically in August):

<http://www.saferoutesconference.org/>

To help support a business case for enforcing the use of proper pedestrian safety equipment in and around school zones, the following agencies can be contacted:

- Local Agencies – City Program Managers, Transportation Engineers/Planners;
- School Contacts – County School Boards, School Principals or Superintendents;
- Neighborhood Advisory Councils or Homeowners Associations (HOA).

In addition, circulating documents to parents and students can aid in improving the pedestrian safety atmosphere by educating parents about safer routes that their children can take to school. Children could also benefit from reviewing materials on how to obey crosswalk signals and how to cross streets safely. By targeting many audiences, there is a greater chance of success.

PEDESTRIAN SAFETY AUDITS

Road safety audits (RSA) are roadway inspections completed by a multidisciplinary team of transportation-related professionals. These teams could include civil engineers, planners, police officers, and/or state or city officials. Since the traditional focus of safety audits has been to address dangerous situations that occur on the road, pedestrian safety was often overlooked during site inspections. In response, FHWA implemented a pedestrian safety audit program that complements the traditional road safety audit program. Safety auditing provides a means to:

- Create a safer environment for both drivers and pedestrians.
- Consider all pedestrian types: walkers, runners, children, elders, and disabled pedestrians.
- Suggest changes to the road or roadside to ensure that the pedestrians are safely and adequately provided for during the construction phase.

Pedestrian Safety Audit Best Practices

- Assemble a knowledgeable audit team.
- Use 3-10 years of crash data to support pedestrian safety claims.
- Use prompted questions to ensure that major issues are evaluated.
- Critique the conditions from the perspective of the pedestrian and the driver during daylight and nightfall.



Source: Transportation for America, *Dangerous by Design* 2011 Report

Figure 56: Before (left) and after (right) photos of downtown Pottstown, Pennsylvania.



Source: FHWA Las Vegas Pedestrian Safety Project: Phase 2 Final Technical Report Final Implementation Report and Executive Summary
http://safety.fhwa.dot.gov/ped_bike/tools_solve/ped_scdproj/lasvegas/chap5d.cfm#Toc204403033

Figure 57: Completed treatment plan at a Las Vegas intersection (see Table 5).

Treatments	Stage 1	Stage 2	Stage 3
Median Refuge	●	●	●
High Visibility Crosswalk	●	●	●
Advance yield markings + warning sign for motorists		●	●
In-roadway knockdown sign			●
Install RPM standard line 100 feet long at the upstream crosswalk			●

Source: FHWA Las Vegas Pedestrian Safety Project: Phase 2 Final Technical Report Final Implementation Report and Executive Summary
http://safety.fhwa.dot.gov/ped_bike/tools_solve/ped_scdproj/lasvegas/chap5d.cfm#Toc204403031

Table 5: Example Treatment Plan for Las Vegas Pedestrian Safety Countermeasure Deployment Project

Pedestrian Safety Audit Resources

There are several online resources available for practitioners who are interested in performing pedestrian safety audits.

- FHWA's Pedestrian and Bicycle Safety website includes guidelines, prompt lists, and examples of completed pedestrian safety audits.

http://safety.fhwa.dot.gov/ped_bike/tools_solve/ped_rsa/

- FHWA's Pedestrian and Bicycle Crash Analysis Tool is a software database program available for download that contains detailed information on pedestrian and bicycle crashes.

<http://www.bicyclinginfo.org/facts/pbcats/index.cfm>

- FHWA's Pedestrian Safety Countermeasure Deployment Project tracks three cities as they identified pedestrian safety problems, developed solutions, and evaluated countermeasures.

http://safety.fhwa.dot.gov/ped_bike/tools_solve/ped_scdproj/

- FHWA-sponsored Pedestrian Safety Audit Guidelines and Prompt Lists contains sections on basic concepts that the RSA team should know in advance, auditing guidelines, and multiple prompt lists to aid in a productive audit.

<http://katana.hsrb.unc.edu/cms/downloads/PedRSA.reduced.pdf>

- Pedsafe's FHWA-sponsored Pedestrian Safety Guide and Countermeasure Selection System contains lists of countermeasures, including pedestrian facility design, roadway design, intersection design, traffic calming, traffic management, signals and signs.

<http://www.walkinginfo.org/pedsafe/>

ATSSA TRAINING/CERTIFICATION

The Certified Pedestrian Safety Specialist (CPSS) Training Course provided by ATSSA is a great way to get acquainted with pedestrian safety issues and solutions. The course targets Pedestrian Safety Specialists; however, it requires no previous experience in the field.

This course is intended to educate temporary traffic control personnel about standards and guidelines as stated in the Manual on Uniform Traffic Control Devices (MUTCD) to ensure the continuity and consistency of pedestrian and traffic management services and to provide for the safe and efficient movement of pedestrians and make provisions for their safety. Specific topics and guidelines that are addressed in the training include:

- MUTCD Chapter 6E, Flagger Control;
- MUTCD Chapter 6D, Pedestrian and Worker Safety;
- MUTCD Chapter 6H, Typical Applications (those applicable);
- American with Disabilities Act (ADA) considerations;
- Pedestrian and traffic management strategies; and
- Enforcement issues.

The agenda is organized to include:

1. Introduction to CPSSs;
2. Standards and guidelines (including ADA compliance);
3. Apparel, equipment and tools;
4. Policies and procedures;
5. Special situations;
6. Traffic signals; and
7. Special events.

The course is administered in 8 hours and is taught by skilled ATSSA training personnel.

Instructors use non-textual visual information through presentations, hands-on practices, and workshops. The training course ends with a 30-minute open-book examination comprised of 25 true/false questions that evaluate the students' understanding of the concepts and standards learned.

Interested parties should contact ATSSA's Training and Business Development Department at training@atssa.com or 877-642-4637.



Source: ATSSA

Figure 58: ATSSA CPSS Training Certificate awarded at the completion of the training course.



Source: ATSSA

Figure 59: ATSSA CPSS Training Materials.

FOOTNOTES

- ¹ (Energy Information Administration (Department of Energy), 2011)
- ² (Federal Highway Administration, 2009)
- ³ The authors have made an effort to properly reference the compliance status in the latter instances.
- ⁴ National Highway Traffic Safety Administration: <http://www-nrd.nhtsa.dot.gov/Pubs/811394.pdf>
- ⁵ FARS Database: <http://www-fars.nhtsa.dot.gov/Main/index.aspx>
- ⁶ Population data from:
<http://www.census.gov/popest/cities/City area data from: http://quickfacts.census.gov/qfd/index.html>
- ⁷ FHWA, Designing Sidewalks and Trails for Access, Part II of II: Best Practices Design Guide - Sidewalk Maintenance and Construction Site Safety. <http://www.fhwa.dot.gov/environment/sidewalk2/sidewalks210.htm>
- ⁸ New York Department of Buildings.
http://www.nyc.gov/html/dob/html/community_partnerships/urbanSHED_main.shtml
- ⁹ District Department of Transportation (DDOT). Pedestrian Safety and Work Zone Standards: Covered and Open Walkways. Departmental Order No. 2008-OD-02, December 14, 2007.
- ¹⁰ Morelli, CJ, et. al. Accommodating Pedestrians in Work Zones. TRB 2006 Annual Meeting.
- ¹¹ University of North Carolina Highway Safety Research Center. Florida Pedestrian Planning and Design Handbook. April 1999.
- ¹² <http://www.safetysigns-mn.com/tpar/the-solution/>
- ¹³ TPAR.com (<http://www.safetysigns-mn.com/tpar/the-solution>)
- ¹⁴ Caltrans News Release, December 22, 2009, <http://www.dot.ca.gov/hq/paffairs/news/pressrel/09pr28.htm>
- ¹⁵ TPAR.com (<http://www.safetysigns-mn.com/tpar/the-solution>)
- ¹⁶ Chu, X., M. Guttenplan, and M. Baltes. "Why People Cross Where They Do." TRB Paper No. 03-3078, TRB, Washington, DC, September 2002.
- ¹⁷ Ibid.
- ¹⁸ Fitzpatrick, K., et al. "Improving Pedestrian Safety at Unsignalized Crossings." TCRP Report 112/NCHRP Report 562, Washington, DC, 2006.
- ¹⁹ Ibid.
- ²⁰ Fitzpatrick, K., et al. "Improving Pedestrian Safety at Unsignalized Crossings." TCRP Report 112/NCHRP Report 562, Washington, DC, 2006.
- ²¹ Ibid.
- ²² <http://ohs.delaware.gov/PedestrianSafety>
- ²³ <http://www.beststreetsmart.net/>
- ²⁴ Liu, B., Zhu, S., Wang, H., Xia, J. Literature review and prospect on the study of perceptual speed reduction. IEEE International Conference on Service Operations and Logistics. 2008.
- ²⁵ District Department of Transportation (DDOT). Pedestrian Safety and Work Zone Standards: Covered and Open Walkways. Departmental Order No. 2008-OD-02, December 14, 2007.
- ²⁶ Safe Routes to School Program <http://www.saferoutesinfo.org/>
- ²⁷ Crosswalk Marking Field Visibility Study <http://www.fhwa.dot.gov/publications/research/safety/pedbike/10068/index.cfm#toc>

CONTACTS, RESOURCES, AND GETTING INVOLVED

This section summarizes the resources listed throughout this report as well as describes how ATSSA members can find more information and get involved in developing, refining, and marketing pedestrian safety products and practices.

Government Agencies

As with most businesses, it pays to know the right people. When it comes to pedestrian safety, there are government agencies that are involved in the topic. These various government resources provide information on safety programs being funded at various levels throughout the country, as well as general resource information to help you develop or market innovative solutions to the nation's pressing pedestrian safety problems:

Federal Government Resources

- **FHWA Bicycle & Pedestrian Program**
<http://www.fhwa.dot.gov/environment/bikeped/>
- **FHWA Pedestrian Safety Action Plan Resources:**
http://safety.fhwa.dot.gov/ped_bike/pedforum/2011/spring2011.cfm
- **FHWA Safe Routes to School Program**
<http://safety.fhwa.dot.gov/saferoutes/>
Also check out the Walkability Checklist available at:
<http://www.saferoutesinfo.org/sites/default/files/walkabilitychecklist.pdf>
- **FHWA Office of Safety**
http://safety.fhwa.dot.gov/ped_bike/
- **FHWA Turner-Fairbank Highway Research Center**
<http://www.tfhrc.gov/safety/pedbike/>
- **National Highway Traffic Safety Administration**
<http://www.nhtsa.gov/Pedestrians>
NHTSA also maintains the Fatality Analysis Reporting System (FARS) which gives industry access to important fatality trends by year, jurisdiction, etc. at:
<http://www-fars.nhtsa.dot.gov/Main/index.aspx>
- **FHWA Pedestrian Research Opportunities**
http://safety.fhwa.dot.gov/ped_bike/pssp/fhwasa10035/appendixbcd.cfm
- **Federal Funding Resource Information for States and Local Governments**
<http://www.fhwa.dot.gov/environment/bikeped/bp-broch.htm>
- **United States Access Board**
The USAB offers an ADA compliance guidebook entitled: Public Right of Way Access Advisory Committee's Special Report on Accessible Public Rights-of-Way Planning and Designing for Alterations at:
<http://www.access-board.gov/prowac/alterations/guide.pdf>
- **FHWA-sponsored Pedestrian Safety Audit Guidelines and Prompt Lists**
<http://katana.hsrc.unc.edu/cms/downloads/PedRSA.reduced.pdf>
- **Pedsafe**
<http://www.walkinginfo.org/pedsafe/>

State Government Resources

- **State DOT Bicycle and Pedestrian Coordinator Contact Information**
<http://www.walkinginfo.org/assistance/contacts.cfm#IL>
- **State Highway Safety Plan (SHSP)**
<http://safety.fhwa.dot.gov/safetealu/shspquick.cfm>
Also type in these keywords to view your specific state's SHSP:
Keyword search: "{state name} state highway safety plan"
- **State Safe Route To School Contacts**
<http://www.saferoutesinfo.org/contacts/>
- **Statewide Bicycle and Pedestrian Plans**
Keyword search: "{state name} state pedestrian plan"

Regional Government Resources

- **Metropolitan Planning Organization (MPO) Database**
<http://www.planning.dot.gov/mpo.asp>

Local Government and Citizen Participation Resources

- **Departments of Transportation**
Search specifically for contacts in the Traffic Control Division, Office of Safety, or Planning Office
- **Building Code and/or Permitting Offices**
- **Law Enforcement Offices**
- **Bicycle & Pedestrian Program Office**
- **Transit Agencies**
- **Neighborhood Advisory Councils**
- **Homeowners Associations (HOA)**

Professional Organizations

There are several professional organizations that provide opportunities for networking, information sharing, and in some cases, guidance and manual development. The first four organizations (i.e., AASHTO, NCUTCD, NACTO, TRB) have designated membership, but interested observers are usually welcome at technical meetings. The last two listings (i.e., APBP, ITE) are dues-based professional organizations.

- **American Association of State Highway Transportation Officials (AASHTO) Joint Technical Committee on Nonmotorized Transportation**
<http://design.transportation.org/Pages/NonmotorizedTransportation.aspx>
- **National Committee on Uniform Traffic Control Devices (NCUTCD)**
<http://www.ncutcd.org/>
- **Transportation Research Board (TRB) Pedestrian Committee**
<http://www.walkinginfo.org/trbped/>
- **Association of Pedestrian and Bicycle Professionals (APBP)**
<http://www.apbp.org>
- **Institute of Transportation Engineers (ITE), Pedestrian and Bike Council**
http://www.ite.org/councils/Ped_Bike

Online Resources and Advocacy Organizations

There are several online resources that provide technical information about pedestrian safety:

- **Pedestrian and Bicycle Information Center (PBIC)**
<http://www.pedbikeinfo.org>
- **Trainings offered by the Pedestrian and Bicycle Information Center**
<http://www.walkinginfo.org/training/pbic/>
- **Perils for Pedestrians**
Contains links to several national, state, and local advocacy groups at:
<http://www.pedestrians.org/links/links1a.htm>
- **T4America**
<http://t4america.org/resources/>
- **National Center for Bicycling and Walking**
<http://www.bikewalk.org/>
- **National Center for Safe Routes to School**
<http://www.saferoutesinfo.org/>
- **Alliance for Biking and Walking (formerly Thunderhead Alliance)**
<http://www.peoplepoweredmovement.org>
- **National Complete Streets Coalition**
<http://www.completestreets.org>
- **Rails to Trails Conservancy**
<http://www.railtrails.org>
- **Index of State and Local Advocacy Organizations**
<http://www.peoplepoweredmovement.org/site/index.php/site/memberservices/C530>

Getting Started

It is clear that the expansion of the pedestrian market in general and the number of both recreational and work-related users in particular, will result in increased opportunities for the development of safety products. ATSSA member companies will need to make their own assessments if this potential opportunity in their geographic business area is sufficient to warrant their time and attention and the dedication of company resources. As cited early in this section, a good place to start is by educating yourself on Federal, state, and local programs, followed by the numerous other sources of information for which URLs have been included. By developing a business plan that is well-researched and caters to the jurisdiction within which you are seeking to improve pedestrian safety, you can enhance your chances of marketing your product to various agencies.



SAFER ROADS SAVE LIVES

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AFTERWORD

We hope that you find value in the ideas provided in this publication. If there are other potential areas of business that you would like ATSSA to investigate, please call our President and CEO,

Roger Wentz, at 540-368-1701

and discuss those with him, or send him an email at roger.wentz@atssa.com. Your thoughts and input are always appreciated.