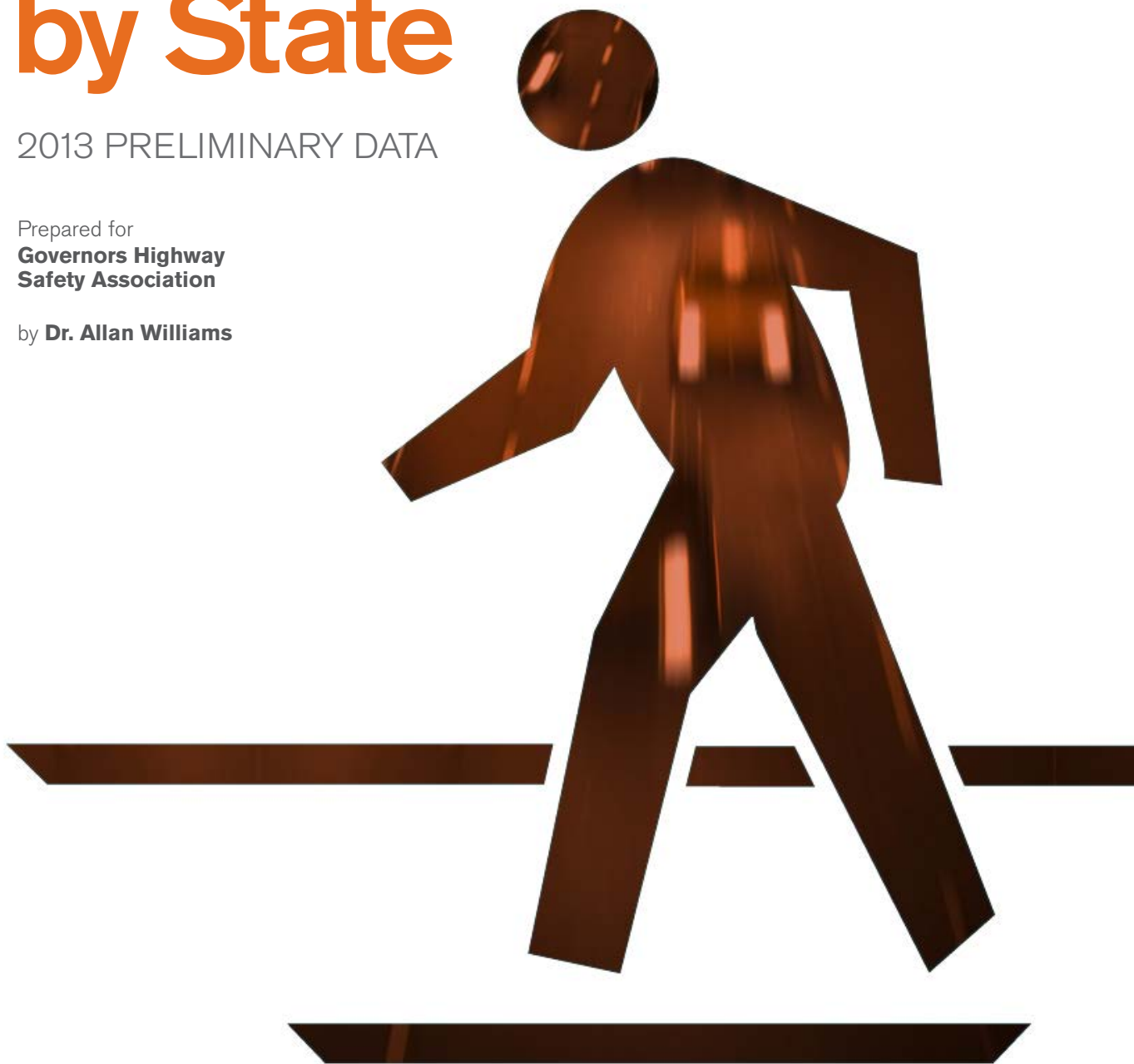# Pedestrian Traffic Fatalities by State

2013 PRELIMINARY DATA

Prepared for
**Governors Highway
Safety Association**

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Pedestrian Traffic Fatalities by State

2013 PRELIMINARY DATA

SUMMARY

Pedestrian fatalities in the United States decreased in 2006, 2007, 2008, and 2009, but increased in 2010, 2011 and 2012. The 15% increase in pedestrian deaths from 2009 to 2012 compares with a 3% decrease in all other motor vehicle deaths during the same time period. Based on preliminary data for the first six months of 2013 supplied by all states and the District of Columbia, there were 1,985 pedestrian deaths. This compares with 2,175 recorded in the Fatality Analysis Reporting System (FARS) for the same time period in 2012—a decrease of 8.7 percent. If the second half of 2013 conforms to this pattern, the recent yearly increases in pedestrian deaths will have halted. Overall, in the first half of 2013, pedestrian fatalities decreased in 25 states, increased in 20 states and the District of Columbia, and stayed the same in five. Nine states reported decreases of ten or more deaths, compared with two that had increases of this magnitude.

There is an uneven distribution of pedestrian deaths among the states, with three (California, Texas and Florida) accounting for one-third of the 4,743 deaths in 2012. In nine states there were fewer than ten pedestrian deaths in 2012. Pedestrian deaths are largely an urban phenomenon, frequently occurring at night and often involving alcohol consumption by pedestrians. People age 70 and older have the highest per capita pedestrian death rate; very few children are involved, a change from earlier years.

Reasons for the increase in pedestrian deaths in 2010 through 2012 are not clearly understood. Possibilities include more people walking in the aftermath of the economic recession of 2008 through 2009 because of motor vehicle operating costs, and the encouragement of walking for health and environmental benefits. Other possible explanations include the growth in vulnerable populations (e.g., immigrants, seniors), milder weather patterns, and an increase in distracted driving and walking. If pedestrian deaths are now decreasing, explaining the change will be challenging since several of the reasons suggested for the increase in 2010 through 2012 still apply. It is, however, in line with the National Highway Traffic Safety Administration's (NHTSA) projection that total fatalities dropped by 4% in the first half of 2013.

States generally use a mix of education, enforcement and engineering countermeasures to address pedestrian safety. In August 2013 NHTSA announced the availability of $2 million in safety funds for countermeasure efforts in cities with high pedestrian death rates. Both NHTSA and the Federal Highway Adminstration (FHWA) provide extensive information to guide countermeasure choices.

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INTRODUCTION

Public roads are designed primarily to accommodate motor vehicle travel. People on foot also use these roads, crossing or traveling on or alongside them. Collisions involving pedestrians and motor vehicles can have serious consequences. Pedestrians, along with bicyclists and motorcyclists, are commonly referred to as "vulnerable road users": when they collide with motor vehicles the lack of a protective structure and differences in mass heighten their susceptibility to injury. Worldwide, pedestrians comprise 22% of the 1.24 million yearly traffic deaths, with especially high contributions in low- and middle-income countries that are becoming motorized (World Health Organization, 2013).

Pedestrians on the road network are thus at risk. At the same time, walking and bicycling are encouraged by many organizations for health and environmental reasons. Physical activity is a means to combat obesity and reduce greenhouse gas emissions.

The Fatality Analysis Reporting System (FARS) includes data on deaths involving pedestrians when the crash originates on a public roadway. Crashes that occur exclusively on private property, including driveways and parking lots, are not included. In 1975, the first year in which data from the Fatality Analysis Reporting System (FARS) were compiled, there were 7,516 pedestrian deaths. This number has dropped significantly since then.

Trends in pedestrian deaths and in all other motor vehicle deaths from 2000 through 2012 and year-to-year fluctuations are displayed in Table 1. Between 2005 and 2009 pedestrian deaths declined from 4,892 to 4,109, but subsequently increased. The first indication that the downward trend had halted was detailed in a 2011 report by the Governors Highway Safety Association (GHSA). There were 4,302 pedestrian deaths in 2010, increasing to 4,457 in 2011 and 4,743 in 2012. The uptick in pedestrian deaths in 2010 and 2011 stood out because other motor vehicle deaths were declining in those years. Notably, pedestrian deaths in 2012 were still lower than in all but one of the years from 2000 through 2006.

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Concerns about the possibility of further increases prompted GHSA to conduct this new study of pedestrian deaths in the first six months of 2013, based on preliminary counts provided by State Highway Safety Offices (SHSO) in October/November 2013. This is the same methodology used in the prior study of 2010 pedestrian deaths, in which 1,891 fatalities were reported by the states for the first six months of the year. This compares with the 1,906 deaths subsequently reported by FARS for this same time period, making the preliminary counts quite accurate.

All 50 states and the District of Columbia provided preliminary data for the first six months of 2013. States also were asked to comment on any trends in their data, the extent to which distraction is a factor in pedestrian deaths, and programs that are in operation or being planned to address pedestrian safety.

Table 1 **Trends in Pedestrian and All Other Motor Vehicle Fatalities, 2000-2012**

Year	Pedestrian Fatalities	% change from previous year	Other MV fatalities	% change from previous year
2000	4,763	–	37,182	–
2001	4,901	+3	37,295	+<1
2002	4,851	-1	38,154	+2
2003	4,774	-2	38,110	-<1
2004	4,675	-2	38,161	+<1
2005	4,892	+5	38,618	+1
2006	4,795	-2	37,913	-2
2007	4,699	-2	36,560	-4
2008	4,414	-6	33,009	-10
2009	4,109	-7	29,774	-10
2010	4,302	+5	28,697	-4
2011	4,457	+4	28,022	-2
2012	4,743	+6	28,818	+3

Source: Fatality Analysis Reporting System

PEDESTRIAN FATALITIES IN 2012 AND 2013

Comparing the first six months of 2013 and 2012, pedestrian deaths decreased from 2,175 to 1,985, a drop of 8.7%. Table 2 summarizes the data.

Table 2 **Pedestrian Fatalities, January-June, 2012 vs. 2013**

	January – June
2012 (reported by FARS)	2,175
2013 (preliminary data from states)	1,985
Change from 2012	-190
States with Decrease	25
States with Increase	20 + D.C.
States Unchanged	5
States with Decrease of 10 or more	9
States with Increase of 10 or more	2

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There were substantial differences among states in changes in pedestrian deaths during this period, as indicated in Table 3. States that had decreases slightly outnumbered states with increases, but there were more states that had large decreases, especially Florida (-55) and California (-37).

Table 3
Pedestrian Fatalities by State for First Six Months of 2012 and 2013

Sources: 2012 data - FARS
2013 data - reported by states

If data for the second half of 2013 conform to the first six months, this will mean that the yearly upward trend in pedestrian deaths that occurred in 2010 through 2012 has ended, at least temporarily.

State	Jan-June 2012	Jan-June 2013	Change from 2012
Alabama	35	28	-7
Alaska	2	2	-
Arizona	66	70	+4
Arkansas	24	22	-2
California	281	244	-37
Colorado	30	33	+3
Connecticut	19	14	-5
Delaware	8	11	+3
DC	3	7	+4
Florida	234	179	-55
Georgia	71	73	+2
Hawaii	11	17	+6
Idaho	4	6	+2
Illinois	58	52	-6
Indiana	27	35	+8
Iowa	6	11	+5
Kansas	13	9	-4
Kentucky	26	24	-2
Louisiana	57	38	-19
Maine	2	2	-
Maryland	45	58	+13
Massachusetts	35	30	-5
Michigan	54	41	-13
Minnesota	12	7	-5
Mississippi	22	20	-2
Missouri	41	34	-7
Montana	4	9	+5
Nebraska	6	6	-
Nevada	30	31	+1
New Hampshire	4	4	-
New Jersey	62	68	+6
New Mexico	33	25	-8
New York	143	128	-15
North Carolina	74	79	+5
North Dakota	1	2	+1
Ohio	56	35	-21
Oklahoma	30	30	-
Oregon	28	20	-8
Pennsylvania	81	52	-29
Rhode Island	2	4	+2
South Carolina	52	40	-12
South Dakota	1	2	+1
Tennessee	33	40	+7
Texas	223	245	+22
Utah	10	11	+1
Vermont	5	2	-3
Virginia	41	37	-4
Washington	34	21	-13
West Virginia	16	9	-7
Wisconsin	17	18	+1
Wyoming	3	0	-3
TOTAL	**2175**	**1985**	**-190**

PEDESTRIAN FATALITY PATTERNS

Pedestrian deaths are largely an urban phenomenon. In 1975, 59% of the deaths occurred in urban areas, whereas in recent years, more than 70% have occurred in urban settings. Table 4 shows the number of pedestrian deaths by state in 2012, ordered from highest to lowest, and the percentage of all motor vehicle deaths that involved pedestrians. Nationally, 14% of all motor vehicle deaths reported in FARS in 2012 were pedestrians.

There is a large variation in the number of fatalities, ranging from 612 in California to two in South Dakota. California accounted for 13% of all pedestrian deaths in the U.S. in 2012, with one-third taking place in California, Texas and Florida. The states with the most fatalities are primarily large-population states with many urban centers. In nine states there were fewer than ten pedestrian deaths in 2012 (See Table 4). There was also a great variation in the contribution of pedestrian deaths to total motor vehicle deaths, ranging from 2% in South Dakota to 47% in the District of Columbia (but based on only 15 total deaths). The District of Columbia is 100% urban. Other high-ranking states are New Jersey (26%), New York (25%) and Delaware (24%).

The key finding from Table 4 is that in some states pedestrian deaths are a relatively minor problem, whereas in other states they contribute more substantially in terms of numbers and percentage of the total.

Notable patterns in pedestrian deaths involve age, time of day and alcohol involvement. Pedestrians age 70 and older have always had the highest per capita death rate and are identified as a special target group for countermeasures (Zegeer et al., 2010; National Highway Traffic Safety Administration, 2013a). There has been a substantial reduction in pedestrian deaths involving children ages 0 to 12. In 1975, children represented 22% of all pedestrian deaths. That has now dropped to less than 5%, totaling only 206 in 2012. This change is attributed largely to a decrease in exposure (Jacobsen, Racioppi, & Rutter, 2009; Roberts, 1993).

Another distinguishing feature of pedestrian deaths is their common occurrence during evening and late-night hours. In 2012, 44% happened between 9 p.m. and 6 a.m., and 25% took place between 6 p.m. and 9 p.m. (Insurance Institute for Highway Safety, 2013). Griswold et al. (2011) reported that the highest frequency of pedestrian deaths was during twilight and the first hour of darkness. Alcohol is a frequent factor, particularly in nighttime crashes. In 2012, 51% of pedestrians age 16 and older killed between 9 p.m. and 6 a.m. had blood alcohol concentrations (BACs) of 0.08% or higher, compared with 23% of those killed at other times of the day (Insurance Institute for Highway Safety, 2013).

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Table 4
Number and Percentage of Pedestrian Fatalities by State, 2012

Source: FARS

State	Pedestrian Fatalities	% Pedestrians/All Fatalities
California	612	21
Texas	478	14
Florida	476	20
New York	297	25
North Carolina	197	15
Georgia	167	14
Pennsylvania	163	12
New Jersey	156	26
Illinois	138	14
Michigan	129	14
South Carolina	123	14
Arizona	122	15
Louisiana	118	16
Ohio	115	10
Virginia	98	13
Maryland	96	19
Missouri	84	10
Alabama	77	9
Colorado	76	16
Massachusetts	72	21
Washington	72	16
Tennessee	67	7
Oklahoma	65	9
New Mexico	61	17
Indiana	59	8
Oregon	55	16
Nevada	54	21
Kentucky	49	7
Mississippi	48	8
Wisconsin	45	7
Arkansas	44	8
Minnesota	38	10
Connecticut	36	15
West Virginia	31	9
Utah	28	13
Delaware	27	24
Hawaii	26	21
Kansas	26	6
Iowa	20	5
Nebraska	15	7
Idaho	13	7
Vermont	10	13
Maine	9	5
Alaska	8	14
Montana	8	4
New Hampshire	8	7
District of Columbia	7	47
North Dakota	7	4
Wyoming	6	5
Rhode Island	5	8
South Dakota	2	2

REASONS FOR RECENT FLUCTUATIONS IN PEDESTRIAN DEATHS

The data analysis prompts two questions: why were pedestrian fatalities increasing in 2010, 2011 and 2012, and particularly in 2010 and 2011 when motor vehicle fatalities in general were decreasing; and why do pedestrian fatalities appear to be decreasing in 2013? These are not questions that can be answered with any certainty.

Changes in highway deaths over time presumably reflect some combination of broad social trends that can affect the amount and type of exposure, and targeted countermeasures for which there is empirical evidence of effectiveness. The dominant societal trend from 2007 through 2012 was the severe economic recession of 2008/2009 and the partial subsequent recovery. The economic downturn and high gasoline prices are thought to have depressed driving, especially among teenagers, and may have increased walking. The recent trend to encourage walking and bicycling for health and environmental benefits may also have played a role. Unfortunately, pedestrian exposure data are not adequately available to address these potential explanations.

California, the state with the highest number of pedestrian deaths in 2012, noted the following:

> *Based on a study conducted by the Safe Transportation Research and Education Center, age, geography and ethnicity contribute to higher trends in pedestrian injuries and fatalities. The most recent census showed a dramatic change in demographics in the last ten years resulting in an increase in pedestrian populations unfamiliar with the rules of the road, signage and traffic management systems.*

The FHWA 15-year strategic plan for pedestrian safety, issued in 2010, discusses the importance of focusing on immigrants and seniors, both growing populations (Zegeer et al., 2010). The report describes the tendency of immigrants to live in suburbs and be largely dependent on walking and public transit for travel, and the high senior pedestrian death rate.

Other speculations involve weather patterns. Nebraska noted:

> *Fluctuations tend to follow annual weather conditions. When the winter and spring weather is mild and dry, we tend to have higher pedestrian deaths…2012 was one the warmest and mildest ever.*

The most popular hypothesis for attempting to explain the recent increase in pedestrian deaths is the contribution of driver and pedestrian distraction. Many states agree this is an important issue, although supportive data other than occasional anecdotes are sparse. However, two recent studies suggest an increasing role for motorist and pedestrian distractions. In one study, based on FARS data, pedestrian fatalities associated with driver distraction increased from 2005 through 2009 (Stimpson, Wilson,

& Muelleman, 2013). In the other study, based on hospital emergency room data from the US Consumer Product Safety Commission, injuries to pedestrians using mobile phones when struck increased relative to total pedestrian injuries from 2004 through 2010. However, the percentage of injured pedestrians using phones was small (3.7% in 2010) (Nasar & Troyer, 2013).

In a few cases, states counseled against overemphasis on distraction as a contributing factor. Georgia offered the following:

> *Compared to speeding, red light running, illegal turns, and distance between safe crossing facilities, distracted walking is just a minor contributor to risk of pedestrian deaths.*

If FARS data for all of 2013 (not expected to be available until late 2014) confirm the preliminary data that pedestrian deaths are now on the decline, what would explain that? Again, the answer is not apparent, and many of the possible reasons for the 2010 through 2012 increases discussed above, including distracted walking/driving, are presumably still in play. However, it is notable that a decrease in pedestrian deaths is consistent with an early estimate of total motor vehicle deaths for the first half of 2013 dropping by 4% (National Highway Traffic Safety Administration, 2013b).

In this context, it is of interest to discuss countermeasure approaches in general and what states are currently doing to increase pedestrian safety. Some states with small numbers of pedestrian deaths do not focus on pedestrians, but many states have active programs.

APPROACHES TO REDUCING PEDESTRIAN INJURIES

There are many approaches to preventing harmful encounters between pedestrians and motor vehicles. These include laws and their enforcement, education and training of pedestrians and motorists, engineering/environmental fixes, and vehicle design changes. Vehicle design changes are a separate issue, but it should be noted that rear cameras now becoming available in new cars may prevent back-over collisions with pedestrians. Some forward collision warning systems are designed to detect pedestrians and alert the driver, or to autonomously brake or steer the vehicle, and are thought to have great potential for preventing pedestrian injuries (Jermakian & Zuby, 2011).

NHTSA and FHWA provide extensive information to guide countermeasure choice, have developed how-to guides, and summarize the evidence base for the various approaches that are available. These include:

- NHTSA's *Countermeasures that Work* (NHTSA, 2013c), which provides information on behavioral countermeasures;
- FHWA's "Toolbox of countermeasures" (2013);
- FHWA's "How to develop a safety action plan" (Zegeer, Sandt, and Scully, 2009); and
- a detailed literature review conducted for FHWA on pedestrian safety roadway and engineering treatments (Mead, Zegeer, & Bushell, 2013).

In August of 2013, in response to increases in pedestrian deaths, NHTSA announced the availability of $2 million in grant funding for pedestrian education and enforcement programs in cities with high rates of pedestrian deaths. In addition, a new website (www.nhtsa.gov/everyoneisapedestrian) was launched in partnership with FHWA, providing safety tips and resources for protecting pedestrians.

EDUCATION:

Education has always been a staple of pedestrian programs. Many states have developed and implemented educational campaigns urging vigilance and protective and law-abiding behavior on the part of pedestrians and motorists. Education is a necessary countermeasure, as studies have indicated that many pedestrians and motorists have limited understanding of the rules they are legally obligated to follow in crosswalks and other locations (Hatfield, et al., 2007; Mitman & Ragland, 2007). Law changes must be accompanied by public outreach and education initiatives. For example, New Jersey noted that a 2010 law that changed the requirement for motorists to stop rather than yield for pedestrians in marked crosswalks had created confusion among motorists and pedestrians, with possible safety consequences.

New automotive technology may call for education as well. For example, the finding that hybrid vehicles are over-involved in collisions with pedestrians (Wu, Austin, & Chen, 2011) points to the need for extra vigilance both by pedestrians and hybrid car owners.

ENFORCEMENT:

Enforcement is also a component of many state programs. Some states use pedestrian "decoys"—plainclothes police officers who are placed in marked crosswalks to identify and warn or cite motorists who do not yield the right of way. Others are implementing anti-jaywalking campaigns. In some cases education and enforcement are combined. For example, South Carolina's "Stop, Educate and Enforce" program involves law enforcement officers making contact with pedestrians walking in the roadway to educate them about pedestrian laws and fatality trends. Enforcement activity is initiated if appropriate.

It is not clear what enforcement programs can accomplish when it comes to pedestrian safety. They may raise awareness of laws and the risk of being cited for noncompliance and change behavior in the short-term. Highly publicized enforcement programs such as "Click It or Ticket" are successful in increasing seat belt use, but limitations in police manpower may limit the extent to which enforcement efforts involving pedestrians and motorists can be sustained, particularly if they involve targeting violations by pedestrians.

The District of Columbia is taking another approach to curbing motorist violations that put pedestrians at risk. A pilot program is underway involving 20 stop sign running cameras and 20 uncontrolled crosswalk cameras that will issue traffic citations to drivers who run stop signs or fail to stop for a pedestrian in the crosswalk.

ENGINEERING:

Engineering/environmental changes have great potential for reducing pedestrian/motor vehicle collisions and pedestrian deaths, a fact acknowledged by some states. For example, North Carolina provided this perspective:

> *Increased driver awareness through activities such as safety campaign messaging and enforcement activities may contribute to fewer crashes, but improved infrastructure and crossings are the best countermeasure to reduce crashes. NCDOT adopted a Complete Streets policy in 2009 and has subsequently focused on training engineers and planners how to implement policies through new guidelines.*

"Complete Streets," sometimes referred to as "Livable Streets," are meant to be designed and operated to enable safe access for all roadway users.

Many states have gone in this direction. Ideally, engineering/environmental changes can achieve total physical separation between pedestrians and motor vehicles. For example, Mississippi indicated that *the state and several of the cities have built walkways for pedestrians and bicyclists to get exercise and stay out of roadway areas.*

In this context it is of interest that Connecticut has targeted 45 schools to participate in the Safe Routes to School (SRTS) program during the next three years. SRTS was created by Congress in 2005 to encourage safe walking and bicycling to school and has been widely adopted. It provides funding for roadway and engineering changes to enhance safety (e.g., sidewalk improvements, traffic calming, special signing, exclusive pedestrian crossing times) and for educational initiatives. Little has been known about the program's effect on safety outcomes, but a recent study in New York City provides evidence that it can result in a substantial reduction in school-aged pedestrian injury rates (DiMaggio & Li, 2013).

There are cases in which total physical separation cannot be achieved, and the goal then is to reduce the distance or time during which pedestrians are exposed to risk from motor vehicles. This can be accomplished through such measures as curb extensions, refuge medians or islands, traffic signals, leading pedestrian intervals (traffic signals that give pedestrians a head start in crossing the street), and extending the pedestrian walking phase. Supplementing these measures are methods to increase motorist awareness of pedestrians (e.g., through special signs and signals) to slow down vehicles.

Reducing vehicle speeds is key, given that with increasing speeds, the potential for serious injury and death increases exponentially. Tefft (2013) calculated that the average risk of serious pedestrian injury was 10% at an impact speed of 17 mph, 25% at 25 mph, 50% at 33 mph, 75% at 41 mph, and 90% at 48 mph. There are many known ways to reduce vehicle speeds such as lowering speed limits, narrowing roadways and installing speed cameras near school zones or in other areas frequented by pedestrians. As noted by the District of Columbia: *DC has significant numbers of red light and speed cameras and their presence has produced a measurable decline in vehicle speeds on major corridors.*

Many states have made other engineering changes that are likely to increase pedestrian safety. These include adding midblock crossings at transit stops, relocating bus stops that lack adequate pedestrian sight distance, improving crosswalk lighting, implementing leading pedestrian interval treatments at intersections, installing pedestrian hybrid beacons (a pedestrian-activated warning device), and other FHWA-recommended countermeasures.

DISCUSSION

Whatever the fluctuations in yearly pedestrian deaths, reducing them is a priority, especially since there are proven countermeasures available to states and municipalities. In the promotion of walking (and biking) for health and societal benefits, there has been negative reaction to the term "vulnerable road users" (Cynecki, 2012). However, the asymmetric injury risk in collisions that led to this term cannot be ignored. It is clear that there will be limitations on any increases in these activities if people do not feel safe on the roads (Jacobsen, Racioppi, & Rutter, 2009). Thus, encouraging walking and biking must be accompanied by vigorous efforts to protect people when they do so.

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