

DANGEROUS BY DESIGN 2011



MASSACHUSETTS

Solving the Epidemic of Preventable Pedestrian Deaths
(And Making Great Neighborhoods)

Massachusetts 2000-2009 Overview

724 pedestrians were killed in Massachusetts between 2000 and 2009.

Nationally, **67 percent** of all pedestrian fatalities occurred on roads that are eligible to receive federal funding for construction or improvement, with federal guidelines or oversight for their design.

Especially when combined with unsafe street and road design, vehicle speed presents a deadly threat to pedestrians. Nearly **60 percent** of pedestrian fatalities from 2000 to 2009 occurred on roads with speed limits of 40 mph or greater. Pedestrians have only a **15 percent** chance of surviving a collision with a car traveling 40 mph.

Too many arterial roads, even in urban areas, are simply not designed to accommodate pedestrians and sometimes lack sidewalks altogether. Of the 47,452 pedestrian fatalities for which the location of the collision is known, more than **40 percent** occurred where no crosswalk was available. And just **ten percent** of pedestrian fatalities occurred inside a crosswalk.

African-Americans and Hispanics are killed in disproportionate numbers. In Massachusetts between 2000 and 2007, the average pedestrian death rate for Hispanics was **1.9** per 100,000 people, a rate 81 percent higher than the **1.1** rate for non-Hispanic whites. The average pedestrian death rate for African-Americans was **1.7** per 100,000 persons, a rate almost 59 percent higher than for non-Hispanic whites.

Nationwide, older Americans are nearly twice as likely to be killed while walking than those under 65 years of age. A total of 8,458 pedestrians 65 and over were killed between 2000 and 2007. **231** of those were killed in Massachusetts. Older pedestrians died at a rate of **3.4** per 100,000 residents in Massachusetts, compared to **0.9** per 100,000 for residents under age 65, ranking **10th** nationally for fatality rate for pedestrians over the age of 65.

Pedestrian injury is the third leading cause of death by unintentional injury for children 15 and younger, according to Centers for Disease Control and Prevention mortality data. Nationwide, 3,880 pedestrians 15 years and younger were killed between 2000 and 2007. **39** of those killed were in Massachusetts.

Massachusetts's overall Pedestrian Danger Index (PDI) of **24.9** ranks **42nd** nationally, though assessing risk locally at the metro or county level with the data that follows in this report can provide a much fuller picture of the danger to pedestrians.

Dangerous by Design 2011: Massachusetts

Solving the Epidemic of Preventable Pedestrian Deaths (and Making Great Neighborhoods)

Between 2000 and 2009 **724** people were killed while walking in Massachusetts. This is a share of the more than **47,700** Americans who died on our streets and roads, whether walking to school, approaching a bus stop, or strolling to the grocery store. Children, older Americans, and racial and ethnic minorities were killed in disproportionate numbers. An overwhelming proportion of these deaths share a common thread: they occurred along “arterial” roadways that were **dangerous by design**, streets engineered for speeding cars with little or no provision for people on foot, in wheelchairs or on bicycles.

Nationwide, pedestrians account for nearly **12 percent** of total traffic deaths. But state departments of transportation have largely ignored pedestrian safety from a budgetary perspective, allocating only **1.5 percent** of available federal funds to projects that retrofit dangerous roads or create safe alternatives.¹

The good news is that communities choosing to prioritize pedestrian safety and invest in safer designs see fewer deaths and injuries, while improving quality of life.

In recent years, scores of communities began retrofitting poorly designed roads to become “complete streets” by adding sidewalks and bicycle lanes, reducing crossing distances and installing crosswalks to make walking and biking safer and more inviting for users of all ages and abilities. Though growing in number, communities that have completed their streets remain the exception rather than the rule, placing Massachusetts’s pedestrians in continued danger.

Since the 1950s, states have used federal dollars on the vast network of federal-aid roadways that are some of the most dangerous places for walking today. As Congress debates legislation that will set transportation investment priorities for the next six years, policymakers have an opportunity to ensure that federal dollars are allocated to make roads safer for everyone who uses them. As this report demonstrates, many pedestrian injuries and deaths — as well as those of motorists — are preventable with low-cost design features and retrofits.

¹ Federal funds categorized as a bicycle or pedestrian improvement type. Includes funds for sidewalks, bicycle paths and lanes, crosswalks, and other projects or programs that improve existing, or provide new infrastructure, or promote safe walking and bicycling. Data is derived from the Federal Highway Administration's Fiscal Management Information System for the fiscal years 2005 through 2008.

Why pedestrian safety is in the federal interest

For decades, federal dollars have been invested in thousands of miles of state and local highways. There has been a debate brewing in the 112th Congress about what constitutes the “federal interest” in transportation. Pedestrian safety is often perceived as a strictly local issue, but **67 percent of all 47,000+ pedestrian fatalities from 2000-2009 occurred on federal-aid roadways** — roads eligible to receive federal funding for construction and improvements with federal guidelines or oversight for design. Taxpayer money that goes to the federal government and is distributed to states for transportation should be used to build streets, roads and highways that are safe for all users. With millions of Americans walking along and crossing these federally funded roads each day, the millions in federal dollars spent on them each year must result in safer conditions for pedestrians.

Measuring the danger to Massachusetts’s pedestrians

In Massachusetts from 2000 to 2009, **724** pedestrians were killed, resulting in a fatality rate of **1.1** deaths per 100,000 residents. But the fatality rate for pedestrians within the state population as a whole provides a limited picture about the relative danger for pedestrians in one location compared to another. For a more complete picture, the number of fatalities should be compared with how frequently residents walk in a given area.

A city where many people walk may see a higher absolute number of pedestrians killed than a place where road conditions dissuade people from walking, simply because there are more people walking in that city’s population. But the *fatalities per trip taken on foot* in these places are typically lower than in places where road conditions are hostile to those who do walk.

In analyzing the relative danger to pedestrians, the share of people who walk to work in a given place can serve as a proxy for the total number of walkers in the population.² Many of the areas with the most dangerous roads have both a high proportion of pedestrian traffic deaths *and* a low percentage of residents walking to work. These are places where pedestrians have a high chance of being killed while walking, a risk captured by the Pedestrian Danger Index for the metro areas in Massachusetts.

Researchers at the Surface Transportation Policy Partnership in the 1990s developed the **Pedestrian Danger Index (PDI)** in an effort to establish a level playing field for comparing metropolitan areas based on the danger to pedestrians. Correcting for the fact that the cities where more people walk on a daily basis are likely to have a greater number of pedestrian fatalities, the PDI computes the rate of pedestrian deaths relative to the amount of walking in that area. The PDI demonstrates that the most

² In order to address concerns that Journey-to-Work data captures only a small share of total trips made, Transportation for America calculated a regression analysis of the American Community Survey’s Journey-to-Work data and the National Household Travel Survey (NHTS) data on all trips by all people. We determined the two measures show a good correlation, with an R-squared of 0.67. This means that about two-thirds of the variation in the ACS data can be explained by the NHTS.

dangerous places to walk are the communities failing to make smart infrastructure investments that make roads safer for everyone.

Massachusetts has an overall PDI of 24.9, ranking 42nd nationally for relative risk to pedestrians, though assessing risk locally at the metro or county level with the following data can help provide a much fuller picture of the danger to pedestrians.

The first table lists Massachusetts's large metro areas, ranked by their average PDI from 2000 to 2009, including where each metro ranks nationally. The safer places for walking are those with a lower PDI. Using the PDI, we can identify the most dangerous places – those with a high number of pedestrian fatalities despite low walking rates. Put another way, people who walk in these areas have the highest chance of being killed while walking. These areas are dominated by lower density and automobile-oriented development patterns that rarely account for the safety of pedestrians.

Massachusetts metros over 1 million, ranked by PDI (most to least dangerous)

National PDI Rank	Metro Area	Average % of Workers Walking to Work	Total Pedestrian Fatalities (2000-2009)	Pedestrian Danger Index
40	Providence-New Bedford-Fall River, RI-MA	2.8%	186	41.6
52	Boston-Cambridge-Quincy, MA-NH	5.0%	483	21.6

The following table lists all the metros within the region, showing how Massachusetts's metro areas compare to other nearby metros in neighboring states.

Northeastern metros over 1 million, ranked by PDI (most to least dangerous)

Regional PDI Rank	Metro Area	Average % of Workers Walking to Work	Total Pedestrian Fatalities (2000-2009)	Pedestrian Danger Index
1	Buffalo-Niagara Falls, NY	2.9%	163	49.0
2	Hartford-West Hartford-East Hartford, CT	2.4%	135	47.9
3	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	3.8%	965	43.6
4	Providence-New Bedford-Fall River, RI-MA	2.8%	186	41.6
5	Rochester, NY	3.4%	122	35.1
6	Pittsburgh, PA	3.7%	269	30.4

7	New York-Northern New Jersey-Long Island, NY-NJ-PA	6.1%	3,485	30.4
8	Boston-Cambridge-Quincy, MA-NH	5.0%	483	21.6

Metro areas often include a large number of counties. Within Massachusetts, the rate of pedestrian deaths varies widely from county to county (even within metro areas), depending to at least some degree on the condition and design of the local road network as well as the number of trips that are made on foot. This next table ranks counties in Massachusetts by pedestrian fatality rate per 100,000 residents, unadjusted for the amount of walking in that area. (Appendix B provides detailed statistics for all counties.) *Data comes from the National Highway Traffic Safety Administration's (NHTSA) Fatality Analysis Reporting System (FARS).*

Counties with highest fatality rate (unadjusted for amount of walking)

	County	Total number of pedestrian fatalities (2000-2009)	Percent of traffic deaths that were pedestrians (average 2000-2009)	Average Pedestrian Fatality Rate (per 100,000)
1	Suffolk County	118	37.5%	1.69
2	Hampden County	65	18.1%	1.41
3	Berkshire County	18	11.1%	1.37
4	Bristol County	69	13.9%	1.27
5	Franklin County	8	10.4%	1.11
6	Worcester County	82	13.0%	1.06
7	Norfolk County	69	17.6%	1.05
8	Middlesex County	148	22.3%	1.00
9	Essex County	70	16.7%	0.95
10	Plymouth County	44	9.7%	0.90

**Counties with fewer than five fatalities are omitted from this table due to an unreliable impact on rate.*

***Fatality rate is a measure of the number of pedestrian deaths relative to population. Pedestrian fatality rate is expressed in deaths per 100,000 individuals per year; thus, a pedestrian fatality rate of 5.0 in a county with a population of 100,000 would mean 5 deaths on average per year in the county each year from 2000-2009.*

More than half of pedestrian deaths are on poorly designed arterials

Over the past 50 years, traffic engineers have taken it as their mandate to move the most cars as rapidly as possible, often at the expense of safety and community livability. Research and experience, however, shows that making streets safer for pedestrians can help bring other benefits. A recent study in San Antonio showed that the streets safest for pedestrians were also safest for drivers.³

This emphasis on traffic movement at the expense of pedestrians and other travel modes has shifted daily activities away from Main Streets toward higher speed arterials. These arterial roads and highways have drawn shopping centers, drive-through eateries, apartment complexes and office parks, increasing automobile traffic and further straining existing capacity. However, the pressure to move as many cars through these areas as quickly as possible has led state departments of transportation to squeeze in as many lanes of traffic as possible, while designing out sidewalks, crosswalks and crossing signals, on-street parking and even street trees. As a result, more than half of fatal pedestrian crashes occur on these wide, high capacity and high-speed thoroughfares.

Engineering Wide Roads: Most pedestrians are killed on the wider, higher capacity and high-speed arterials. Arterial roads connect major destinations within an urban or rural area. Nationwide from 2000 to 2009, more than **52 percent** of the 47,067 pedestrians killed (for whom roadway classification data were recorded) died on principal or minor arterials.

Designing for Fast Travel Speed: Especially when combined with poor design, vehicle speed presents the greatest threat to pedestrians. A recent NHTSA report on pedestrian safety finds that a pedestrian is 16 times more likely to be killed in a crash occurring on a road with a posted speed limit of 50 mph or higher, than on a road with a speed limit of under 30 mph.⁴ At higher vehicle speeds, a collision is not only more deadly, but far more likely. Even without the distractions of cell phones and PDAs, a driver needs 164 feet to stop a vehicle moving at just 40 mph.⁵

Insufficient Pedestrian Infrastructure: Too many arterial roads, even in urban areas, are simply not designed to accommodate pedestrians and sometimes lack sidewalks altogether. Even places with sidewalks often lack crosswalks or have crosswalks spaced too far apart to be convenient for pedestrians. Of the 47,452 pedestrian fatalities for which the location of the collision is known, more than 40 percent occurred where no crosswalk was available. Just ten percent of pedestrian fatalities occurred inside a crosswalk.

Dangers to Pedestrians with Few Options

Walking is the first and most basic method of transportation. Nearly everyone is a pedestrian at some point each day, even if it is simply walking from the car to the office. Americans make about 10.5

³ Eric Dumbaugh and Wenhao Li. Design for the Safety of Pedestrians, Cyclists, and Motorists in Urban Environments. Journal of American Planning Association. Vol.7, No.1, Winter 2011.

⁴ NHTSA. National Pedestrian Crash Report, 2008. <<http://www-nrd.nhtsa.dot.gov/Pubs/810968.pdf>>

⁵ <http://www.jmu.edu/safetyplan/vehicle/generaldriver/stoppingdistance.shtml>

percent of all trips on foot,⁶ and 107 million American adults walk regularly to get to work, school, run errands or visit friends.⁷

Walking is even more critical for a large number of Americans. At least one-third of Americans cannot or choose not to drive and, and for most of them, being a pedestrian is an integral part of their daily life.⁸ This group includes children and young adolescents, older Americans who no longer drive, people with disabilities, low-income Americans and a growing number who seek to avoid the high cost of owning and maintaining a car.

Low-income: Over 19 percent of households make less than \$25,000 per year and do not own a vehicle.⁹ In the 234 counties nationally where more than 1 in 5 families has a household income lower than the poverty level (with more than five pedestrian fatalities over the decade), the pedestrian fatality rate averages **2.91** per 100,000 persons, significantly higher than the national rate of 1.6.¹⁰

Minorities: Ethnic and racial minorities are disproportionate victims of pedestrian fatalities. Nationwide from 2000 to 2007¹¹, the average pedestrian fatality rate for non-Hispanic whites was 1.38 (per 100,000 people.) The rates were higher for nearly all minority groups, with 1.45 for Asian Americans, 2.23 for Hispanics and 2.39 for African Americans, per 100,000 people.

In Massachusetts from 2000 to 2007, the average pedestrian death rate for Hispanics was **1.9** per 100,000 people, a rate 81 percent higher than the 1.1 rate for non-Hispanic whites and the average pedestrian death rate for African-Americans was **1.7** per 100,000 persons, a rate almost 59 percent higher than for non-Hispanic whites.¹² In absolute terms, **53** Hispanics, **45** African-Americans, **24** Asian Americans and **493** non-Hispanic white persons were killed in this period.

⁶ NHTS 2001. A trip is defined as travel from one address to another, with switches to different modes and each stop along the way counted as separate trips.

⁷ FHWA. Travelers Opinion Survey 2005.

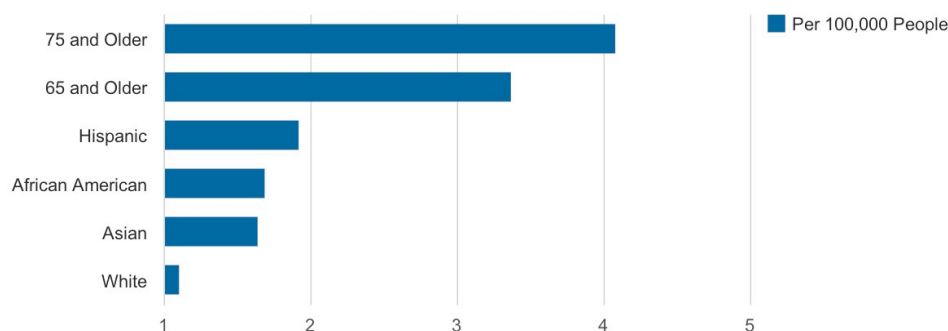
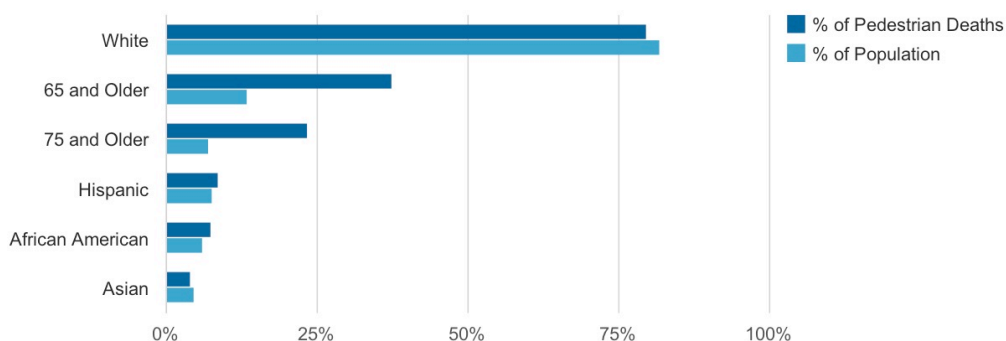
⁸ According to the most recent (2009) FHWA Highway Statistics Series (Table DV-1C), only 68 percent of Americans currently hold a driver's license. One-third is probably an underestimate, because we can assume that a number of the 68 percent of Americans who have a license do not drive.

⁹ Brookings Institution and UC-Berkeley, "Socioeconomic Differences in Household Automobile Ownership Rates"

¹⁰ U.S. Census Bureau, 2005-2009 American Community Survey

¹¹ Because data on race and ethnicity for pedestrian deaths from the federal FARS database is incomplete at the state level, we turned to the Centers for Disease Control and Prevention Web-based Injury Statistics Query and Reporting System (WISQARS) which documents pedestrian fatalities from 2000 to 2007 (in contrast to FARS, which covers through 2009).

¹² Knoblauch, R. L., Seifert, R. F., Murphy, N. B. "The Pedestrian and Bicyclist Highway Safety Problem As It Relates to the Hispanic Population in the United States." FHWA: December, 2004.

Pedestrian Fatalities by Ethnicity and Age

Pedestrian Fatalities as Percent of Population


Older Americans: Nationwide, older Americans are nearly twice as likely (96 percent) to be killed while walking than those under 65 years of age. A total of 8,458 pedestrians 65 and over were killed from 2000 to 2007. Older pedestrians represent 21.7 percent of total pedestrian fatalities during that period, despite comprising only 12.4 percent of the population.¹³ From 2000 to 2007, **231** pedestrians in Massachusetts aged 65 years or older were killed. Older pedestrians died at a rate of **3.4** per 100,000 residents in Massachusetts, compared to **0.9** per 100,000 for residents under age 65. Massachusetts ranks **10th** nationally for the highest fatality rate for pedestrians over the age of 65.

Older Americans have much to gain when walking is safe. Many older Americans who cannot or choose not to drive rely on others for transportation. Absent sufficient alternatives, they often become stranded in their home. The percentage of Americans aged 65 and over is expected to rise from 12 percent in 2005 to 18 percent in 2025, requiring new approaches to reflect the mobility challenges that increase with age.

Young Children: Pedestrian injury is the third leading cause of death by unintentional injury for children 15 and younger, according to CDC mortality data. Nationally, **3,880** children 15 years and younger were killed as pedestrians from 2000 to 2007. More than **39** of those deaths were in Massachusetts. Designing communities with convenient and fun opportunities for children to bicycle

¹³ NHTSA Traffic Safety Facts. 2008 Data for the Older Population.

and walk keep children safe and healthy. Safe Routes to School is a small federally funded program aimed at making it more convenient for children to walk and bicycle to school by financing the construction of safer streets, bicycle and pedestrian pathways and sidewalks.

Cost-Effectiveness Benefits of Safe Streets

Transportation is the second largest expense for American households, costing more than food, clothing, health care and even housing in some metro areas.¹⁴ Even prior to the recent increase in gasoline prices, Americans spent an average of 16 cents of every dollar on transportation, with the poorest fifth of families spending more than double that figure.¹⁵ These transportation expenses can be reduced if local infrastructure decisions encourage active transportation and improve safety.

Controlling Health Care Costs: The money saved by preventing pedestrian injuries and fatalities more than offsets the costs of improving our streets and roads. The National Safety Council estimates the comprehensive cost — including both economic costs and diminished quality of life — for each traffic death at \$4.3 million.¹⁶ Multiplying that figure by the 47,740 pedestrians killed nationwide from 2000 to 2009 equates to a cost of \$180 billion. Multiplying that figure by the 724 pedestrians killed in Massachusetts from 2000 to 2009 equates to a cost of \$3.11 billion over that period. Reducing fatalities by just 10 percent would save the state \$311.32 million.

Sparking Neighborhood Reinvestment: The economic downturn taught us that the most resilient local economies are those with lively downtowns and village centers — walkable places with a variety of shops, services and restaurants. A recent survey by the National Association of Realtors found that most Americans would like to live in walkable communities where shops, restaurants and local business are within an easy walk from their homes, regardless of what type of neighborhood or house they live in.¹⁷

A movement has emerged to convert deadly arterials and lifeless strip malls into more walkable urban centers. Developers recognize these new walkable places can command a higher purchase price. A recent CEOs for Cities report found that “homes located in more walkable neighborhoods — those with a mix of common daily shopping and social destinations within a short distance — command a price premium over otherwise similar homes in less walkable areas. Houses with above average walkability command a premium of about \$4,000 to \$34,000 over houses with just average levels of walkability in the typical metropolitan areas studied.”¹⁸ Similarly, an analysis of office, retail, apartment and industrial properties found higher values for properties in more walkable areas.¹⁹

¹⁴ Center for Neighborhood Technology. Housing and Transportation Affordability Index. <http://htaindex.cnt.org/>

¹⁵ Bureau of Labor Statistics. Consumer Expenditure Survey, 2009. Expenditures by Income Group.

¹⁶ National Safety Council. Estimating the Costs of Unintentional Injuries, 2000-2009

¹⁷ National Association of Realtors. 2011 Community Preference Survey. http://www.realtor.org/government_affairs/smart_growth/survey

¹⁸ J. Cortright. “Walking the Walk: How Walkability Raises Housing Values in U.S. Cities.” CEOs for Cities. August 2009.

¹⁹ Pivo, G. and Fisher, J. “Effects of Walkability on Property Values and Investment Returns” Working paper. August 2009.

Making places more walkable not only improves their safety and encourages physical activity, but it also helps restore local tax bases and boosts local economies.

Smart Investment and Smart Design

Many communities have succeeded at increasing safety and preventing pedestrian deaths through targeted investments in pedestrian infrastructure, often using federal dollars. These tools for change include safer street design — most fatalities occur on federal-aid roads and arterials — creating walkable communities, traffic calming, road diets, complete streets policies and Safe Routes to School programs.

Traffic calming and street design. Traffic calming includes a host of engineering techniques used to physically alter road design for the purpose of slowing traffic and improving safety for bicyclists and pedestrians. Beyond simply installing sidewalks, these improvements enhance safety through a focus on intersections, with features such as pedestrian refuge medians, better road geometry and signals giving pedestrians a “head start” when crossing roads. Depending on the type of measure implemented and speed reductions achieved, traffic calming reduces collisions by 20 to 70 percent.

Complete streets. Where traffic calming seeks to improve safety by reducing traffic speeds, complete streets policies ensure that future road projects consistently take into account the needs of users of all ages and abilities, particularly pedestrians and bicyclists. Complete street designs are not a one-size-fits-all strategy and vary by location. A complete street might feature sidewalks, bicycle paths, comfortable bus stops, median islands, frequent crosswalks and pedestrian signals. Both the American Academy of Pediatrics and the Centers for Disease Control and Prevention recently endorsed the adoption of local and statewide complete streets policies as a strategy for improving safety and increasing physical activity among children and adults. By ensuring new and reconstructed roads take the needs of all users into account, money can be saved over expensive retrofits later on to improve pedestrian safety. To date, more than 100 jurisdictions across the country have implemented complete streets policies.

Safe Routes to School programs. Safe Routes to School programs take a comprehensive approach to improving safety around schools for children walking and bicycling. The program funds engineering upgrades like sidewalks and crosswalks, improved traffic enforcement and bicycle and pedestrian safety education. The intent is to address parental concerns about traffic dangers and get more children walking and bicycling to school, improving their physical fitness and health. Starting as a handful of pilot efforts across the country, Safe Routes to School has grown into a federally-funded program providing more than \$600 million over five years for thousands of projects nationwide.

Walkable neighborhoods. Walkable communities are safe and inviting for walking and bicycling and feature a variety of destinations, such as parks and public space and nearby schools, workplaces and other amenities like restaurants and retail facilities, in closer proximity.

Now is the time for Congress to act

Congress is currently drafting a multi-year federal transportation bill that will guide funding priorities for states and cities. Now more than ever, there is a clear need for strong leadership, greater resources for pedestrian safety and more accountability from states on how those funds are spent.

With 67 percent of pedestrian deaths occurring on federal-aid roads and highways, there's a clear need for ensuring our federal transportation dollars are used to make these thoroughfares safe for pedestrians and all other users. Greater resources must be dedicated toward projects and programs that improve pedestrian safety. Streets designed for speed rather than people continue to fuel these preventable pedestrian deaths. Now, we must call on Congress to change transportation funding and policy to ensure our roads are safe for everyone.

We recommend that the next federal transportation spending bill include the following provisions:

- **Retain dedicated federal funding for pedestrians and bicyclists.** Congress is currently contemplating elimination of dedicated funding for Transportation Enhancements and the Safe Routes to School program, the two largest funding sources for bike and pedestrian facilities. Without these committed funding streams, states will likely reduce spending for safety features like sidewalks, crosswalks and trails.
- **Adopt a national complete streets policy.** Ensure that all federally funded road projects take into account the needs of all users of the transportation system, including pedestrians, bicyclists, and transit users, as well as children, older adults, and individuals with disabilities.
- **Fill in the gaps.** Beyond making new and refurbished roads safer for pedestrians, we need to create complete networks of sidewalks, bicycle paths, and multi-use trails so that residents can travel safely throughout an area.
- **Commit a fair share for safety.** In 2008, only two states spent any of their Highway Safety funding to improve infrastructure for bicycling and walking. Yet, pedestrians and bicyclists make up 14 percent of all traffic-related fatalities. Federal, state, and local governments should set safety goals that not only reduce fatalities overall, but reduce fatalities for individual modes, with safety goals for pedestrians, bicyclists, motorcyclists, and motorists.
- **Hold states accountable for creating communities that are safe for walking.** Congress must hold states accountable to ensure that transportation funds are spent wisely, by ensuring that:
 - New streets are built to be safe for pedestrians, bicyclists, public transportation users, and motorists alike;
 - The most dangerous roads are retrofitted for safety; and,
 - Federal safety dollars result in lives saved and a more active population.

Appendix A: All Massachusetts metro areas with pedestrian fatality data, listed alphabetically

Metro Area	Total pedestrian fatalities (2000-2009)	Percent of traffic fatalities that were pedestrians	Fatality rate (per 100,000 people)	2009 population
Barnstable Town	20	8.9%	0.9	221,151
Boston-Cambridge-Quincy	483	18.4%	1.1	4,588,680
Pittsfield	18	11.1%	1.4	129,288
Springfield	83	15.5%	1.2	698,903
Worcester	82	13.0%	1.1	803,701

Appendix B: All Massachusetts counties with pedestrian fatality data, listed alphabetically

County	Total pedestrian fatalities (2000-2009)	Percent of traffic fatalities that were pedestrians	Fatality rate (per 100,000 people)	2009 population	Percent of population below poverty line
Barnstable County	20	8.9%	0.9	221,151	6.5%
Berkshire County	18	11.1%	1.4	129,288	11.4%
Bristol County	69	13.9%	1.3	547,433	10.7%
Dukes County	2	13.3%	1.3	15,974	8.0%
Essex County	70	16.7%	1.0	742,582	10.0%
Franklin County	8	10.4%	1.1	71,778	12.1%
Hampden County	65	18.1%	1.4	471,081	16.6%
Hampshire County	10	10.0%	0.6	156,044	11.5%
Middlesex County	148	22.3%	1.0	1,505,006	7.4%
Nantucket County	0	0.0%	0.0	11,322	7.3%
Norfolk County	69	17.6%	1.1	666,303	6.0%
Plymouth County	44	9.7%	0.9	498,344	6.6%
Suffolk County	118	37.5%	1.7	753,580	18.5%
Worcester County	82	13.0%	1.1	803,701	9.3%

**Counties with fewer than 5 pedestrian deaths from 2000-2009 (second column) have a high margin of error due to small sample size and should be referenced with caution.*