Smart Growth America
Making Neighborhoods Great Together

National Complete Streets Coalition

Dangerous by Design 2014
Missouri

May 2014

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The **National Complete Streets Coalition**, a program of Smart Growth America, seeks to fundamentally transform the look, feel and function of the roads and streets in our community, by changing the way most roads are planned, designed and constructed. Complete Streets policies direct transportation planners and engineers to consistently plan and design streets with all users in mind.

Smart Growth America is the only national organization dedicated to researching, advocating for and leading coalitions to bring better development to more communities nationwide. From providing more sidewalks to ensuring more homes are built near public transportation or that productive farms remain a part of our communities, smart growth helps make sure people across the nation can live in great neighborhoods.

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Project Team

Geoff Anderson, Smart Growth America
Craig Chester, Smart Growth America
Kara Davis, Loop Strategies
Steve Davis, Transportation for America
Alex Dodds, Smart Growth America
Derek Eder, DataMade
Michelle Ernst, Ernst Transportation Analytics
David Goldberg, Transportation for America
Jeri Mintzer, Smart Growth America
Colin Murphy, Smart Growth America
Ilana Preuss, Smart Growth America
Laura Searfoss, Smart Growth America
Stefanie Seskin, Smart Growth America
Sam Warlick, Smart Growth America

This report, including data for each state and an interactive map of 47,000+ pedestrian fatalities from 2003 to 2012, can be found online at www.smartgrowthamerica.org/dangerous-by-design

Cover photo: Oran Viriyincy

Overview

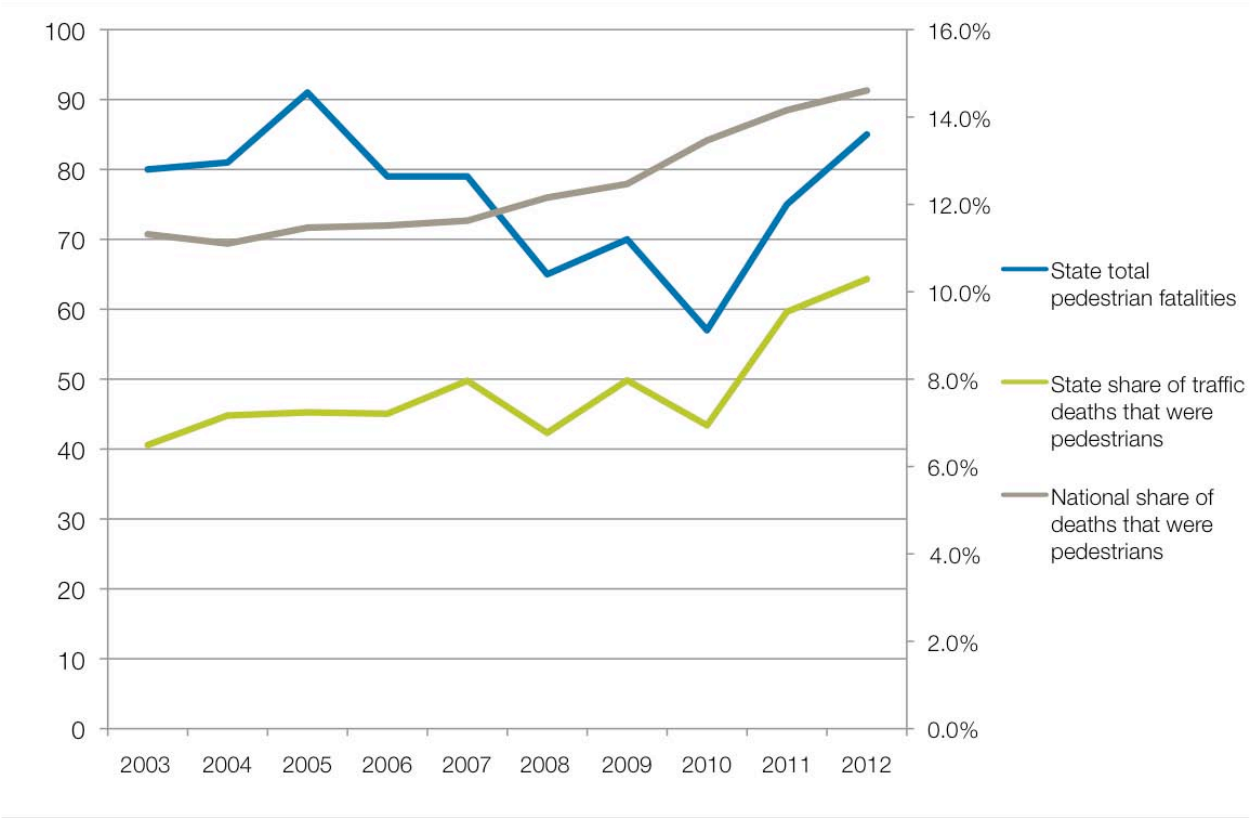
American communities are poised for a renaissance in walking. We're walking more often, for fun and to get to places in our neighborhood. We turn to WalkScore.com when figuring out where to live and our most walkable places often are among the most economically vibrant in the country. Hundreds of cities have adopted Complete Streets policies to ensure walking is in the forefront of our decisions regarding street design. Public health organizations from the U.S. Centers for Disease Control and the Office of the Surgeon General to the local doctor's office are encouraging us to get out for a walk for physical activity and to combat chronic disease. And indeed, we are walking: 6 of 10 people walk for physical activity, and the share of adults who said they walk for transportation grew 6 percent from 2005 to 2010, according to the most recent data available.[1]

But we are still dealing with a legacy of roadways that fail to account for the safety of people on foot.

In the decade from 2003 through 2012, **762 people died while walking in Missouri**.

FIGURE 1

Pedestrian fatalities in Missouri, 2003–2012



1 U.S. Centers for Disease Control and Prevention. (August 2012). More People Walk to Better Health. CDC Vital Signs. Retrieved from http://www.cdc.gov/vitalsigns/pdf/2012-08-vitalsigns.pdf

Nationally, 47,025 pedestrians died while walking on our streets, representing 12.3 percent of total traffic deaths over that decade. But the national fatality numbers have increased recently. A total of 4,280 people walking died in traffic crashes in 2010. That number increased to 4,432 in 2011, and went up *again* in 2012 to 4,743. In 2012, people on foot represented nearly 15 percent of all traffic fatalities.

We have seen for people in cars that a focus on safety and protective design can pay off. The number of drivers and passengers of vehicles who died in traffic crashes dropped by a third from 2003 to 2012. We realized this significant drop by focusing on vehicle design, encouraging and enforcing seat belt use, cracking down on drunk driving, and curbing distracted driving—saving thousands of loved ones.

While pedestrian deaths are labeled "accidents," the data reviewed here indicate we can prevent the majority of them by taking deliberate steps to do so, through better policy, design, practice and regulation—just as we have done with vehicle deaths. The majority of pedestrian deaths occur on arterial roadways, planned and engineered for speeding automobiles with little consideration for the diversity of people—young, old, with and without disabilities, walking, and bicycling—who rely on these streets to get them from point A to point B. The lion's share of these roadways were built with federal money and designed to federal specifications, so fixing the legacy of dangerous conditions undoubtedly will need to be a national project with federal support.

A national response is needed

The fundamental function of government is the protection of its people. National transportation policy has long been based in the agreed-upon belief that our roadways should be safe. For decades, "safe" has been defined to include people walking, bicycling and driving. Yet taxpayer money distributed to the states through the federal government often has not been applied to projects that would in fact improve safety for all. Of the 45,284 pedestrian deaths from 2003–2012 for which roadway classification information was collected, almost 68 percent occurred on federal-aid roadways—roads that follow federal guidelines or oversight that are eligible to receive federal funds. Nationally, from 2009 to 2013, less than one-half of one percent of available federal safety-related funds was obligated to projects that improve safety for people walking.

Cities and towns, counties, regions, and states across the country recognize the importance of safe streets. More than 600 of them have adopted policies that establish a clear vision for streets that are safe, comfortable and convenient for people walking. Such policies direct city and transportation leaders to include the needs of all users in the planning and design of local streets. But when these communities attempt to fulfill that vision by implementing those policies, they find state and national laws and practices block their efforts. They often face obstacles in gaining access to federal funding or making design changes, and their residents suffer.

Pedestrian danger in Missouri

In Missouri from 2003–2012, 762 people were killed while walking, resulting in a fatality rate of 1.29 deaths per 100,000 residents. Nationally, the pedestrian fatality rate was 1.56. Of all traffic deaths, pedestrians represent 7.6 percent in Missouri.

Within Missouri, the fatality rate varies from region to region—and even between counties within the same region—depending in part on the design of the transportation system and how comfortable and convenient it is for walking. Appendix B provides detailed statistics for all metro regions and Appendix C offers information for all counties in this state.

Fatality rates offer a limited picture: to better understand the relative danger for pedestrians, this report uses a pedestrian danger index (PDI) based on the share of local commuters who walk to work—the best available measure of how many people are likely to be out walking each day—and the most recent five years of data on pedestrian fatalities. The more dangerous places are those with a higher PDI—where a high number of pedestrians are killed despite low walking rates. The most dangerous regions tend to be those that grew in the post-war period, mostly through rapid spread of low-density neighborhoods that rely on wider streets with higher speeds to connect homes, shops and schools—roads that tend to be more dangerous for people walking.

From 2003–2012, the statewide PDI for Missouri was 59.55, compared to the national PDI of 52.2 and ranked 18th nationally.

The PDI can be applied to large metropolitan areas as well. Table 1 lists these areas, ranked by their PDI scores.

TABLE 1

Large metro areas in Missouri, ranked by PDI

National Rank	Metropolitan area	Total pedestrian fatalities (2003-2012)	Annual pedestrian deaths per 100,000 (2008-2012)	Percent of people commuting by foot (2008-2012)	Pedestrian Danger Index (2008-2012)
21	Kansas City, MO-KS	228	1.13	1.3%	85.74
26	St. Louis, MO-IL	364	1.22	1.7%	69.69

The characteristics of dangerous roads

The examination of data in the federal Fatality Analysis Reporting System (FARS) reveals that people on foot were most often killed on higher capacity and higher speed roads classified as "arterial." In transportation planning and engineering, arterial roads are expected to move the most automobile traffic possible with minimal delay over longer distances, meaning they often are made wide, fast, and flat to serve the purpose of quick automobile travel. At the same time, however, these arterials have become the "main streets" of our communities, and typically are flanked by apartment complexes, shopping centers and office parks. Design guidelines do provide some flexibility, but too often, the needs of people and communities have been secondary concerns or simply left out of the process entirely.

Indeed, the majority—52.3 percent—of the 45,284 pedestrian deaths nationally (for which roadway classification data were recorded) over the last decade occurred on arterial roadways. **In Missouri, 34.1 percent of pedestrian deaths were on arterials.**

As of 2008, the overwhelming majority (83.3 percent) of arterials in rural areas and over a third of urban arterials are part of the National Highway System (NHS),[2] and thus eligible for federal transportation funding. Under the 2012 federal transportation law, known as MAP-21, another 230,000 lane miles—including a large share of urban arterials—are expected to be included in NHS.[3]

In the decade from 2003 through 2012, almost 68 percent of all pedestrian fatalities nationwide were on roadways funded in some part by federal money and designed in accordance with federal guidelines.

> "The establishment of well-connected walking and bicycling networks is an important component for livable communities, and their design should be a part of Federal-aid project developments."
>
> *– U.S. DOT Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations, March 2010*

Vehicle speed is a major factor in all types of crashes, and has especially serious consequences for people on foot. Where the posted speed limit was recorded, **62.6 percent of pedestrian fatalities in Missouri were on roads with a speed limit of 40 mph or higher**, compared to 8.7 percent on streets with a speed limit of 30 mph or under. Nationally, 61.3 percent of pedestrian fatalities were on roads with a speed limit of 40 mph or higher and 9.0 percent were on streets with a 30 mph or under speed limit.

2 Federal Highway Administration, 2010 Status of the Nation's Highways, Bridges, and Transit: Conditions & Performance.

3 Federal Highway Administration, National Highway System Questions & Answers. Retrieved from http://www.fhwa.dot.gov/map21/qandas/qanhs.cfm

The most threatened populations

Overwhelmingly, children, older adults and people of color suffer disproportionately from traffic violence, according to an examination of data from the U.S. Centers for Disease Control and Prevention.

Children

Fatal pedestrian injury remains a leading cause of death for those 15 years and younger. Nearly 18,000 children each year are admitted to the hospital for pedestrian injury nationwide, a figure that accounts for 31 to 61 percent of all injury-related hospital admissions. Eleven percent of those 18,000 children require surgical intervention for their injuries.[4] Children are especially vulnerable to pedestrian injury because their smaller size makes them less visible to motorists. But they are also at risk because their ability to judge the travel speed of oncoming traffic is not yet fully developed. A recent perceptual study of children aged 6 to 11 found that they lack the ability to detect vehicles moving faster than 20 mph.[5] They just don't see the cars coming.

Nationally, 4,394 children aged 1 to 15 were killed as pedestrians from 2003 through 2010 (the most recent year for which data was available). This includes 60 children in Missouri.

Federal, state, and local efforts through the Safe Routes to School program, which helped re-design streets near elementary schools and encourage kids to walk to school, show promising results: in census tracts with such programs, pedestrian injuries for children aged 5 to 19 declined by 44 percent during school hours. This compares to virtually no change in census tracts without SRTS projects.[6]

Older adults

Older adults suffer disproportionately from pedestrian deaths nationally. **While comprising 13.6 percent of Missouri's population, adults aged 65 and older account for 16.3 percent of pedestrian fatalities across the state from 2003-2010.**[7] Nationally, this age group is just 12.6 percent of the total population and represents nearly 21 percent of all pedestrian fatalities. The pedestrian fatality rate for older adults in Missouri is 2 per 100,000 people (nationally, 3.19), compared to a rate of 1.61 for people under 65 years old (nationally, 1.75).[8] Those 75 and older in Missouri suffer at a rate of 2.4 fatalities per 100,000 capita, which compares to a national rate of 3.96.[9] People 75 years and older account for 6.5 percent of Missouri's population, and 9.4 percent of pedestrian fatalities.[10]

Older adults face more risks as pedestrians because they may be less able to react quickly to an oncoming vehicle. Once struck, their increased frailty makes them less likely to recover from a

4 Merrell, G.A., Driscoll, J.C., Degutis, L.C., Renshaw, T.S. "Prevention of Childhood Pedestrian Trauma: A Study of Interventions over Six Years." *J Bone Joint Surg Am. 2002; 84-A(5): 863-867.*

5 Wann, J., Poulter, D., and Purcell, C. "Reduced Sensitivity to Visual Looming Inflates the Risk Posed by Speeding Vehicles When Children Try to Cross the Road." *Psychological Science*. 2011; XX(X): 1-6.

6 DiMaggio, C., and Li, G. "Effectiveness of a Safe Routes to School Program in Preventing Child Pedestrian Injury." *Pediatrics* 2013; 131; 290.

7 Analysis of CDC's Web-based Injury Statistics Query and Reporting System (WISQARS), 2003-2010.

8 Ibid.

9 Ibid.

10 Ibid.

serious collision. As this age group continues to grow, doubling nationally over then next 30 years, street design decisions must accommodate their desire to age in their communities, remain independent and access destinations on foot as well as by car.

People of Color

Like older adults, people of color are disproportionately represented among pedestrian fatalities. Nationally, non-Hispanic whites have a pedestrian fatality rate of 1.66 per 100,000 capita, while African Americans suffer a rate 60 percent higher, at 2.65 per 100,000 capita, and Hispanics of any race have a rate nearly 43 percent higher: 2.37 per 100,000 capita.

In Missouri from 2003 to 2010, the non-Hispanic white pedestrian fatality rate was 1.53. The rate for Hispanic people of any race was 1.59; for black people and African Americans, 2.58; and for Asians and Pacific Islanders, 1.51.

Street design improves safety

The data show that street design matters. When the needs of all users—all ages, all abilities and all modes of travel—are properly balanced, our streets are safer and easier to navigate for everyone.

In recognition of this fact, and the desire of many communities to promote health and safety, professional organizations that guide transportation engineering and planning decisions in recent years have introduced new best-practice manuals that emphasize the importance of providing safer streets and are backed by a growing body of research. Using the best and latest in design standards is especially important for the millions of miles of arterial roadways in our rural and urban communities.

> "Every transportation agency, including DOT, has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems."
>
> *– U.S. DOT Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations, March 2010*

The National Association of City Transportation Officials' recently released *Urban Street Design Guide* recognizes that a community's streets are fundamentally different than the roads and highways between communities, and provides transportation professionals guidance and additional flexibility to design streets that are not only safe for people walking, but also welcoming for everyone. As of early May 2014, the states of California, Massachusetts, Minnesota, Washington, Utah, the District of Columbia and more than thirty cities have endorsed the *Guide*.

Transportation professionals can also turn to the Institute of Transportation Engineers recommended practice *Walkable Urban Thoroughfares: A Context Sensitive Approach*; new crossing treatments proven to improve safety included in the *Manual on Uniform Traffic Control Devices*, published by the Federal Highway Administration; and the *Urban Bikeway Design Guide*, issued by NACTO.

The Federal Highway Administration offers comprehensive information and tools for transportation agencies in designing roadways that are safe for pedestrians. In addition to the research document *Countermeasures That Work*, its *Pedestrian Safety Guide and Countermeasure Selection System* is particularly useful in helping practitioners understand and apply 55 engineering and design approaches that have proven effective in improving pedestrian safety.

Generally, designing for safe, walkable communities begins with understanding how people use—and want to use—streets and public spaces to access destinations. From there flow general considerations such as: separate people walking from people driving vehicles; keep traffic speeds low; ensure all sidewalks and curb ramps are accessible to people with disabilities; and clarify where each road user should be expected to travel. With these principles set, transportation planners and engineers can select from a large set of nationally-used appropriate design elements, including but not limited to: wide sidewalks, curb extensions, refuge islands, pedestrian countdown signals, leading pedestrian interval signal timing, midblock crossings (especially at transit stops), pedestrian hybrid beacons, narrow travel lanes, planting street trees, restricted right turns on red, compact intersections, back-in angled parking and smaller curb radii.

Some common practices intended to improve safety sometimes have had the opposite effect: promoting speeding on streets intended for lower speeds and putting everyone on the road at risk.

Nationally, speeding is a leading cause of preventable deaths, causing nearly one-third of all traffic fatalities each year, or close to 10,000 lives. Speeding not only increases the likelihood of crashes with people on foot, it increases the probability that those crashes will cause injuries that are far more serious.[11] At 20 mph, the risk of death to a person on foot struck by the driver of a vehicle is just 6 percent. At 45 mph, the risk of death is 65 percent—11 times greater than at 20 mph. When struck by a car going 50 mph, pedestrian fatality rates are 75 percent and injury rates are above 90 percent.[12]

Changing conventional practice by instead setting a vision for safer, slower streets allows transportation agency staff to find the appropriate design solutions, regardless of prevailing speed. They can design and redesign streets to include features to encourage safer—and slower—driving and to provide people walking with sidewalks, frequent safe opportunities to cross streets, and, where possible, greater separation from traffic with landscaped buffers, protected bike lanes, and/or parked cars. In some cases, this means changing city or state policy to allow for lower speed limits, especially in residential areas or near parks and schools, regardless of prevailing speeds.

We must use every tool available to improve safety, through a concerted, collaborative approach among government officials, transportation staff, law enforcement, community members, public health professionals and private companies. These groups can work together to better track injuries and identify dangerous blocks and intersections. Improving enforcement efforts to ensure drivers understand that they will face a penalty for breaking the law also is important in changing culture and preventing injuries and deaths.

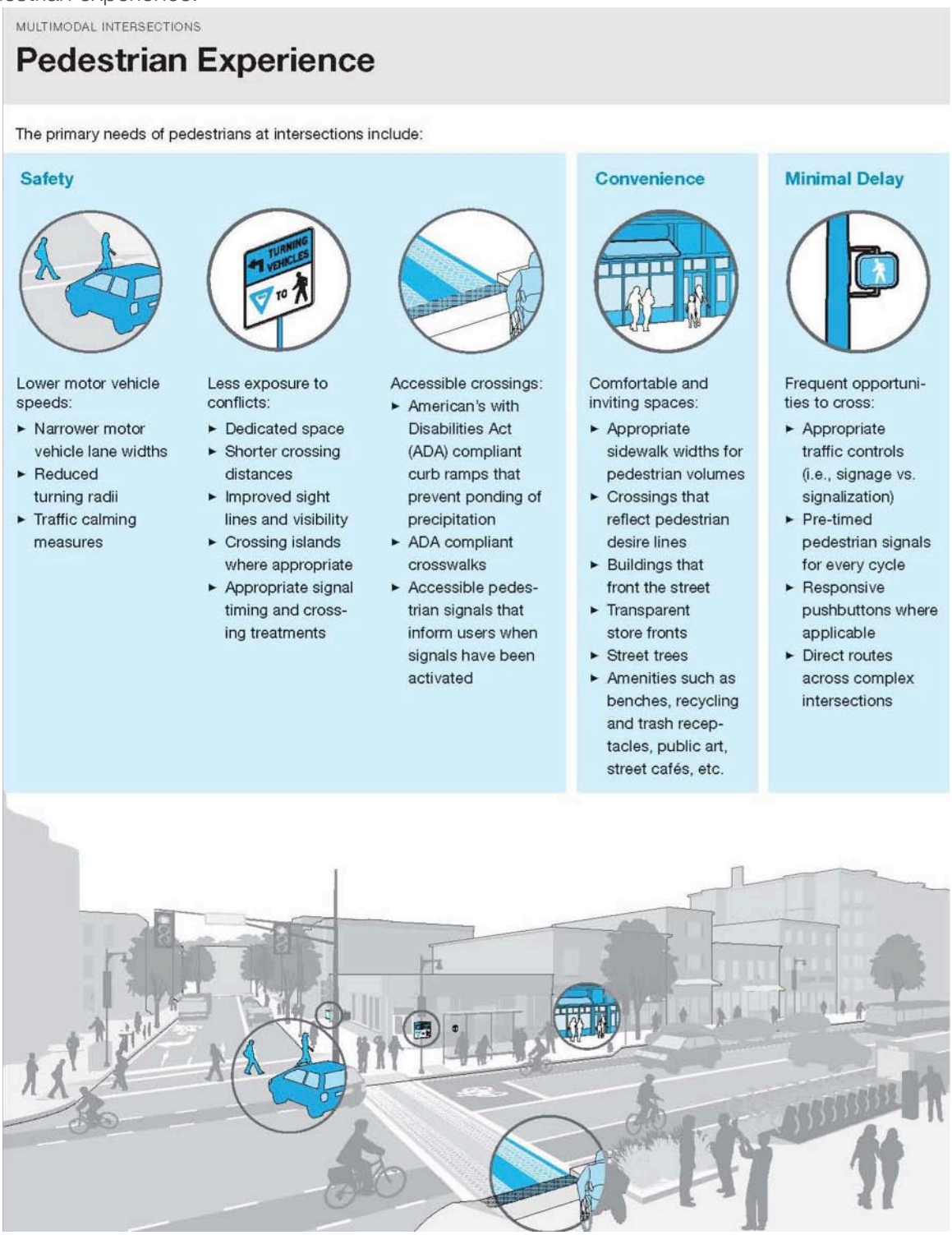
Planning and designing our streets for people on foot, in addition to those traveling by public transportation, bicycle and automobile, is the most important approach to improving street safety. Without sidewalks, safe and convenient street crossings, and slower design speeds, no amount of programmatic or regulatory efforts will curb the epidemic of pedestrian deaths.

Indianapolis, by Eric Fischer

11 Leaf, W.A. and D.F. Preusser. (1999). Literature Review on Vehicle Travel Speeds and Pedestrian Injuries Among Selected Racial/Ethnic Groups. U.S. Department of Transportation National Highway Traffic Safety Administration. Retrieved from http://www.nhtsa.gov/people/injury/research/pub/HS809012.html

12 Tefft, B. (2013). Impact Speed and a Pedestrian's Risk of Severe Injury or Death. *Accident Analysis and Prevention*, 50, 871-878.

Boston's *Complete Streets Design Guidelines* defines the primary design elements relevant to the pedestrian experience:



Boston Transportation Department

Recommendations: A national call to action

The Obama Administration and Congress have several near-term opportunities to help communities save lives and improve the safety and comfort for everyone who uses our roadways. Although almost 68 percent of all pedestrian fatalities occur on roads that are eligible for federal aid, from 2009 to 2013, less than one-half of one percent of all available federal safety-related funds was obligated to projects that improve safety for people walking. Federal transportation policy must help improve safety for all users—and put an end to the national epidemic of preventable pedestrian fatalities.

Strengthen the Transportation Alternatives Program (TAP). Since 1991, federal surface transportation laws have included funds specific to biking and walking projects, including its current iteration in the Transportation Alternatives Program (TAP). Investment of these dollars has helped cities and states improve safety, public health and the vitality of local economies. TAP should be retained in future laws and strengthened in several key ways. MAP-21 combined the popular Safe Routes to School, Transportation Enhancement and Recreational Trails programs to create TAP and unfortunately funding for combined program is much lower than the dedicated funding for the three programs under previous law. Specifically, funding was reduced from $1.12 billion to $808 million. Investment of TAP funding has helped cities and states improve safety, public health and the vitality of local economies. The program should be retained in future and strengthened by ensuring local communities have greater control over deciding how to invest these funds through increased sub-allocation of funding. Funding eligibilities should be extended to non-profits.

The U.S. Department of Transportation (USDOT) should follow Congressional intent and hold states accountable for traffic fatalities and serious injuries. In MAP-21, Congress required states to begin setting targets for performance, with safety a primary goal. However, USDOT's proposed rules could undermine the intent of that legislation. The proposed rules not only do not require separate measures for non-motorized and motorized travelers, but they also allow states to fail to achieve as many as half of their safety targets, with a definition of "significant progress" that could define an increase in deaths as progress. And those targets aren't based on a real vision for improved safety: They're based on historical trends. USDOT must require states to set, work toward and be held accountable for achieving real targets in reducing fatalities and serious injuries among people walking, bicycling, driving or riding in a bus or car.

Make safety for people on foot or bicycle a clear performance measure for future federal transportation law. Though the intent to provide for those walking and bicycling is clear in MAP-21, the section related to performance measures doesn't spell out the need for a separate target for non-motorized modes. In the reauthorization bill this year, Congress should require states to set and meet goals that reduce the number of people who are seriously injured or die while walking and bicycling. That goal should be separate from the goal to continue significantly reducing the number of vehicle drivers and passengers who are seriously injured or die.

Adopt a national Complete Streets policy. Congress should require all federally funded road projects consider the safety of all travelers, including those who are walking, taking public transportation, bicycling and driving, regardless of age or ability. Doing so fulfills our national responsibility to make roads safe. The Safe Streets Act (S. 2004/H.R. 2468) will ensure

consistency and flexibility in the processes and standards that direct road-building at all levels of governance and reflects the 600-plus local- and state-level Complete Streets policies already adopted. A national Complete Streets policy is a forward-looking strategy, applied to new and reconstruction projects, to gradually improve roads through cost-effective best practices and proven safety measures.

Increase the federal cost share for certain safety programs. The safety of all users of the transportation system is critical. Safety project investments are some of the most important projects that communities invest in. A 100 percent cost share eligibility should be extended to pedestrian hybrid beacons, medians and pedestrian crossing islands, and Safe Routes to Schools Projects.

Ensure better data collection. Without more complete information about who is killed and injured on our streets—including better measures of where and how often—our ability to effectively prevent these tragic deaths is limited. Federal data collection should be improved with a uniform methodology to include additional information about fatalities and injuries with additional clarity from states regarding how they spend their federal safety funds to improve walking environments. A recommended system to routinely collect more information about how often and where people walk, in addition to commuting, and the number and location of fatalities and injuries suffered, will help transportation agencies better plan for walking and understand high-risk areas.

State activities to improve pedestrian safety

While the federal government sets the tone for a national approach to safety, states—as recipients of federal transportation funds—have the ultimate responsibility to reduce pedestrian fatalities and injuries and should set aggressive goals to do so. With that goal in place, they can then align all other plans, policies and processes to achieve it. Below are some suggested activities to improve safety from the state level.

Adopt a Complete Streets policy and comprehensive implementation plan. States can commit to a Complete Streets vision that fully integrates the needs of all users, regardless of mode, age or ability into the project development and delivery system and then develop a plan to examine and update their processes, manuals and practices to remove barriers to improved pedestrian safety; ensure staff at every level understand and follow this goal in their everyday work; and collect and measure the outcomes of their projects as they relate to non-motorized as well as motorized users.

Emphasize walking and bicycling in the Strategic Highway Safety Plan (SHSP). States are required to develop data-driven SHSPs, which define state safety goals, rank dangerous locations and include a list of projects. States use the SHSP to decide how to spend the money allotted in the federal Highway Safety Improvement Program. In the past, these plans have failed to emphasize non-motorized safety, so very little available money was spent to make walking and bicycling safer. MAP-21 doubled the amount of money available for states to spend on improving roadway safety and made clear that eligible projects included those to make streets safer for people walking and bicycling and those with disabilities. States should capitalize on this opportunity by prioritizing and funding such projects through their SHSPs.

Maximize the use of all federal funding programs for walking and bicycling projects. MAP-21 allows states to spend money from several other major programs on walking and

bicycling projects, including the Surface Transportation Program (STP), Congestion Mitigation and Air Quality (CMAQ) program, and the Transportation Alternatives Program (TAP). TAP funds, particularly, should be reserved to help those who are walking or bicycling. In addition to planning and building streets, states should employ full-time staff to provide policy, planning and technical expertise related to walking and bicycling facilities.

Reform methods for evaluating roadway performance to account for the needs of all travelers. Measures of congestion such as "level of service," or LOS, are often cited as a major reason for making expensive capacity additions—sometimes to the detriment of people walking. LOS only measures whether drivers can move quickly along a specific stretch of roadway. Redefining LOS to look at overall corridor travel speed and time, to consider "person delay" rather than vehicle delay and/or to account for the needs of people who are walking, bicycling and taking public transportation will help ensure that streets through communities are better planned and designed for walking, as well as driving.

Use practical design and Context Sensitive Solutions (CSS). Rather than a one-size-fits-all approach with rigid minimum requirements and outputs, states can design projects to be context sensitive, taking into account the surrounding community, environment, and specific transportation needs. Effective CSS initiatives involve a commitment to changing both agency culture and the way the agency communicates with the public. To ensure design flexibility, CSS may require a review and update of existing state design standards or the introduction of new design standards (below).

Update design policies and standards. While groups such as the American Association of State Highway and Transportation Officials (AASHTO), the Institute of Transportation Engineers (ITE), the National Association of City Transportation Officials (NACTO) and others have produced guidelines and recommended practices for context-sensitive, multimodal design, many state-level guidelines follow conservative minimums for walking and bicycling and preclude responsible design flexibility. DOTs can achieve better design outcomes by reviewing and revising their existing standards, allowing the use of a wider range of guidelines (including those from ITE and NACTO), and providing additional support to explore feasible design alternatives. Agency guidelines are helpful for local and county transportation agencies as well.

Map existing infrastructure, including facilities under local jurisdiction, to identify gaps in the walking and bicycling network. Working with regional and local agencies and plans, states can identify state-owned roads, state-owned lands (such as parks) and state-funded projects under local jurisdiction that can provide missing links in the network. Such connections are especially important where employment centers, retail destinations or residential developments are only accessible by using a state highway or state-funded roadway. These gaps, as well as high-crash locations, can inform priorities and projects in the SHSP.

Gather good data. States should develop and implement a plan to collect and analyze data related to non-motorized use and crashes that is complete, accurate, uniform and accessible. Activities could include regular statewide surveys of socioeconomic characteristics and travel behavior of households and of knowledge and attitudes about pedestrian and bicycle safety. States can work within and across agencies to link crash, injury, violation and registration records to better their understanding of all traffic crashes and fatalities, including pedestrians.

Reform policy for establishing speed limits to provide local control. State legislation can prevent local governments from controlling the safety of their streets by forcing them to submit to arduous processes and expensive engineering studies to lower speed limits; setting minimum speed limits above 20 mph; or mandating that the limits be set at the speeds that 85 percent of drivers are currently traveling on a street. Local governments are most familiar with their roadways, so allowing them to set safe and reasonable speed limits on their own streets is a common-sense move.

Encourage collaboration across transportation, public health and law enforcement agencies. State transportation agencies should lead these efforts, but other agencies and organizations must work collaboratively with them. Health departments, state and regional transportation professional organizations, law enforcement, academia, media and other public interest groups can collaborate on data collection efforts, public outreach and educational campaigns.

Appendix A: Resources for transportation professionals

Transportation planners, engineers and designers play a key role in making streets safe and comfortable for people traveling by foot or wheelchair. They may look to dozens of resources and guidance. A sampling of recent resources and nationally recognized best practices are listed here.

State-of-the-practice design guidance

- *Urban Street Design Guidelines*, National Association of City Transportation Officials (2013)
- *Designing Walkable Urban Thoroughfares: A Context Sensitive Approach: An ITE Recommended Practice*, Institute of Transportation Engineers and the Congress for the New Urbanism (2010)
- *A Policy on Geometric Design of Highways and Streets, 6th Edition*, American Association of State Highway and Transportation Officials (2011)
- *Manual on Uniform Traffic Control Devices*, Federal Highway Administration (2009, with revisions)
- *Proposed Guidelines for Pedestrian Facilities in the Public Right of Way*, US Access Board (2011)
- *U.S. Traffic Calming Manual*, APA Planners Press (2009)
- *Guide for the Planning, Design, and Operation of Pedestrian Facilities, 1st Edition*, American Association of State Highway and Transportation Officials (2004, update forthcoming)

Template design guidance

- *Complete Streets, Complete Networks: A Manual for the Design of Active Transportation*, Active Transportation Alliance (2012)
- *Model Design Guide for Livable Streets*, Los Angeles County Department of Public Health (2011)
- *Re:Streets*, National Endowment for the Arts (n.d.)

Sample design guides

- *Active Design Guidelines*, New York City (2010)
- *Better Streets Plan: Policies and Guidelines for the Pedestrian Realm*, City and County of San Francisco (2010)
- *Boston Complete Streets Design Guidelines*, City of Boston (2013)
- *Complete Streets Chicago: Design Guidelines*, City of Chicago (2013)
- *Urban Street Design Guidelines*, City of Charlotte (2007)

Research and reports

- *Practice-Ready Papers*, Transportation Research Board. These peer-reviewed research papers contribute to the solution of current or future transportation problems or issues for practitioners. Information is ready for immediate implementation or requires minimal additional research or implementation effort. Recent papers related to non-motorized transportation can be found online: http://prp.trb.org/results.aspx?q=&subject=Pedestrians+and+Bicyclists#
- *Pedestrian Safety Guide and Countermeasure Selection System*, Federal Highway Administration (2013)

- *Countermeasures That Work: A Highway Safety Countermeasure Guide for State Highway Safety Offices, Seventh Edition*, Federal Highway Administration (2013)
- *Evaluation of Pedestrian-Related Roadway Measures: A Summary of Available Research*, Pedestrian and Bicycle Information Center for Federal Highway Administration (2013)
- *Steps to a Walkable Community: A Guide for Citizens, Planners, and Engineers*, America Walks and Sam Schwartz Engineering (2012)
- *The Innovative DOT: A Handbook of Policy and Practice*, State Smart Transportation Institute and Smart Growth America (2014)
- *Public Policies for Pedestrian and Bicycle Safety and Mobility: An Implementation Project of the Pedestrian and Bicyclist Safety and Mobility International Scan*, Federal Highway Administration (2010)
- *Planning Complete Streets for an Aging America*, AARP (2009)
- *How to Develop a Pedestrian Safety Action Plan*, Federal Highway Administration and National Highway Traffic Safety Administration (2006)

Appendix B: Metropolitan-level data

Metropolitan Area	Total traffic fatalities (2003–2012)	Total pedestrian fatalities (2003-2012)	Percentage of traffic deaths that were pedestrians (2003-2012)	Annual pedestrian deaths per 100,000 (2008–2012)	Percentage of pedestrian fatalities by posted speed limit (2003–2012)			Percentage of pedestrian fatalities on arterials (2003-2012)
					Under 20 mph	Under 30 mph	40 mph and over	
Cape Girardeau-Jackson, MO-IL	137	12	8.8%	1.45	0.0%	0.0%	91.7%	33.3%
Columbia, MO	241	18	7.5%	0.81	0.0%	0.0%	83.3%	50.0%
Fayetteville-Springdale-Rogers, AR-MO	664	41	6.2%	0.90	0.0%	7.1%	66.7%	41.5%
Jefferson City, MO	297	13	4.4%	0.80	0.0%	0.0%	92.3%	46.2%
Joplin, MO	363	25	6.9%	1.14	0.0%	4.0%	80.0%	32.0%
Kansas City, MO-KS	2,185	228	10.4%	1.13	1.8%	9.3%	58.2%	27.3%
Springfield, MO	663	53	8.0%	1.05	3.8%	7.7%	80.8%	32.1%
St. Joseph, MO-KS	216	15	6.9%	0.94	0.0%	14.3%	50.0%	13.3%
St. Louis, MO-IL	3,299	364	11.0%	1.22	2.5%	9.6%	51.5%	43.6%

Appendix C: County-level data

County	Total traffic fatalities (2003-2012)	Total pedestrian fatalities (2003-2012)	Percentage of traffic deaths that were pedestrians (2003-2012)	Annual pedestrian deaths per 100,000 (2003-2012)	Percentage of pedestrian fatalities by posted speed limit (2003-2012)			Percentage of pedestrian fatalities on arterials (2003-2012)
					Under 20 mph	Under 30 mph	40 mph and over	
Adair County	26	1	3.8%	0.40	100.0%	100.0%	0.0%	0.0%
Andrew County	45	3	6.7%	1.77	0.0%	0.0%	100.0%	0.0%
Atchison County	12	0	0.0%	0.00	N/A	N/A	N/A	N/A
Audrain County	53	2	3.8%	0.78	0.0%	0.0%	0.0%	50.0%
Barry County	138	6	4.3%	1.69	0.0%	0.0%	66.7%	50.0%
Barton County	44	0	0.0%	0.00	N/A	N/A	N/A	N/A
Bates County	38	1	2.6%	0.59	0.0%	0.0%	100.0%	100.0%
Benton County	63	2	3.2%	1.06	0.0%	0.0%	50.0%	0.0%
Bollinger County	27	1	3.7%	0.80	0.0%	0.0%	100.0%	0.0%
Boone County	215	18	8.4%	1.15	0.0%	0.0%	83.3%	50.0%
Buchanan County	113	10	8.8%	1.14	0.0%	20.0%	30.0%	10.0%
Butler County	135	14	10.4%	3.31	0.0%	21.4%	57.1%	28.6%
Caldwell County	30	0	0.0%	0.00	N/A	N/A	N/A	N/A
Callaway County	121	7	5.8%	1.61	0.0%	0.0%	85.7%	28.6%
Camden County	128	8	6.3%	1.89	0.0%	0.0%	75.0%	50.0%
Cape Girardeau County	82	7	8.5%	0.95	0.0%	0.0%	100.0%	28.6%
Carroll County	21	0	0.0%	0.00	N/A	N/A	N/A	N/A
Carter County	36	1	2.8%	1.63	0.0%	0.0%	100.0%	0.0%
Cass County	108	3	2.8%	0.31	0.0%	0.0%	66.7%	33.3%
Cedar County	28	0	0.0%	0.00	N/A	N/A	N/A	N/A
Chariton County	20	0	0.0%	0.00	N/A	N/A	N/A	N/A
Christian County	100	4	4.0%	0.56	0.0%	0.0%	66.7%	0.0%
Clark County	24	0	0.0%	0.00	N/A	N/A	N/A	N/A
Clay County	244	21	8.6%	0.99	0.0%	0.0%	95.2%	14.3%
Clinton County	37	2	5.4%	0.97	0.0%	0.0%	100.0%	0.0%
Cole County	105	3	2.9%	0.40	0.0%	0.0%	100.0%	66.7%
Cooper County	51	3	5.9%	1.72	0.0%	0.0%	100.0%	33.3%
Crawford County	81	5	6.2%	2.04	0.0%	0.0%	100.0%	0.0%
Dade County	25	0	0.0%	0.00	N/A	N/A	N/A	N/A
Dallas County	48	3	6.3%	1.80	0.0%	33.3%	33.3%	66.7%
Daviess County	29	1	3.4%	1.21	0.0%	0.0%	100.0%	0.0%
DeKalb County	29	1	3.4%	0.78	N/A	N/A	N/A	0.0%
Dent County	45	0	0.0%	0.00	N/A	N/A	N/A	N/A
Douglas County	42	2	4.8%	1.47	0.0%	0.0%	100.0%	50.0%
Dunklin County	100	4	4.0%	1.24	0.0%	25.0%	75.0%	25.0%
Franklin County	260	15	5.8%	1.50	6.7%	6.7%	53.3%	33.3%
Gasconade County	41	1	2.4%	0.65	0.0%	0.0%	100.0%	100.0%
Gentry County	11	0	0.0%	0.00	N/A	N/A	N/A	N/A
Greene County	359	37	10.3%	1.39	5.4%	8.1%	83.8%	29.7%
Grundy County	21	1	4.8%	0.98	0.0%	0.0%	100.0%	0.0%
Harrison County	39	1	2.6%	1.13	0.0%	0.0%	100.0%	0.0%
Henry County	64	2	3.1%	0.90	0.0%	0.0%	100.0%	50.0%
Hickory County	33	0	0.0%	0.00	N/A	N/A	N/A	N/A
Holt County	15	0	0.0%	0.00	N/A	N/A	N/A	N/A

County	Total traffic fatalities (2003-2012)	Total pedestrian fatalities (2003-2012)	Percentage of traffic deaths that were pedestrians (2003-2012)	Annual pedestrian deaths per 100,000 (2003-2012)	Percentage of pedestrian fatalities by posted speed limit (2003-2012)			Percentage of pedestrian fatalities on arterials (2003-2012)
					Under 20 mph	Under 30 mph	40 mph and over	
Howard County	26	0	0.0%	0.00	N/A	N/A	N/A	N/A
Howell County	117	7	6.0%	1.77	0.0%	14.3%	85.7%	57.1%
Iron County	47	0	0.0%	0.00	N/A	N/A	N/A	N/A
Jackson County	778	122	15.7%	1.83	0.0%	9.9%	50.4%	28.7%
Jasper County	184	11	6.0%	0.97	0.0%	0.0%	72.7%	27.3%
Jefferson County	368	19	5.2%	0.89	5.6%	11.1%	83.3%	31.6%
Johnson County	101	8	7.9%	1.54	0.0%	14.3%	71.4%	62.5%
Knox County	13	0	0.0%	0.00	N/A	N/A	N/A	N/A
Laclede County	101	5	5.0%	1.43	0.0%	20.0%	60.0%	80.0%
Lafayette County	83	4	4.8%	1.20	0.0%	0.0%	100.0%	0.0%
Lawrence County	118	5	4.2%	1.32	0.0%	0.0%	100.0%	20.0%
Lewis County	26	1	3.8%	0.98	0.0%	0.0%	100.0%	100.0%
Lincoln County	104	4	3.8%	0.80	0.0%	0.0%	25.0%	50.0%
Linn County	25	0	0.0%	0.00	N/A	N/A	N/A	N/A
Livingston County	29	0	0.0%	0.00	N/A	N/A	N/A	N/A
Macon County	37	0	0.0%	0.00	N/A	N/A	N/A	N/A
Madison County	45	0	0.0%	0.00	N/A	N/A	N/A	N/A
Maries County	36	0	0.0%	0.00	N/A	N/A	N/A	N/A
Marion County	58	7	12.1%	2.45	0.0%	0.0%	71.4%	85.7%
McDonald County	96	2	2.1%	0.88	0.0%	0.0%	50.0%	50.0%
Mercer County	11	0	0.0%	0.00	N/A	N/A	N/A	N/A
Miller County	113	3	2.7%	1.22	0.0%	0.0%	33.3%	66.7%
Mississippi County	37	4	10.8%	2.85	0.0%	25.0%	25.0%	50.0%
Moniteau County	31	1	3.2%	0.65	0.0%	0.0%	100.0%	100.0%
Monroe County	30	0	0.0%	0.00	N/A	N/A	N/A	N/A
Montgomery County	56	4	7.1%	3.28	0.0%	0.0%	100.0%	25.0%
Morgan County	62	2	3.2%	0.98	0.0%	0.0%	100.0%	50.0%
New Madrid County	89	9	10.1%	4.76	0.0%	0.0%	87.5%	11.1%
Newton County	179	14	7.8%	2.45	0.0%	7.1%	85.7%	35.7%
Nodaway County	50	0	0.0%	0.00	N/A	N/A	N/A	N/A
Oregon County	46	3	6.5%	2.80	0.0%	0.0%	66.7%	33.3%
Osage County	40	2	5.0%	1.46	0.0%	0.0%	100.0%	50.0%
Ozark County	31	0	0.0%	0.00	N/A	N/A	N/A	N/A
Pemiscot County	72	6	8.3%	3.20	0.0%	0.0%	60.0%	0.0%
Perry County	43	1	2.3%	0.53	N/A	N/A	N/A	0.0%
Pettis County	97	4	4.1%	0.97	0.0%	0.0%	66.7%	50.0%
Phelps County	133	8	6.0%	1.82	0.0%	0.0%	87.5%	12.5%
Pike County	63	6	9.5%	3.23	0.0%	0.0%	100.0%	50.0%
Platte County	128	15	11.7%	1.74	7.1%	21.4%	71.4%	13.3%
Polk County	74	4	5.4%	1.32	0.0%	0.0%	100.0%	50.0%
Pulaski County	101	7	6.9%	1.44	0.0%	28.6%	57.1%	42.9%
Putnam County	12	1	8.3%	1.98	0.0%	0.0%	0.0%	100.0%
Ralls County	28	0	0.0%	0.00	N/A	N/A	N/A	N/A
Randolph County	44	1	2.3%	0.39	N/A	N/A	N/A	0.0%
Ray County	46	2	4.3%	0.85	0.0%	0.0%	100.0%	50.0%
Reynolds County	34	0	0.0%	0.00	N/A	N/A	N/A	N/A
Ripley County	51	1	2.0%	0.71	0.0%	0.0%	100.0%	100.0%

County	Total traffic fatalities (2003-2012)	Total pedestrian fatalities (2003-2012)	Percentage of traffic deaths that were pedestrians (2003-2012)	Annual pedestrian deaths per 100,000 (2003-2012)	Percentage of pedestrian fatalities by posted speed limit (2003-2012)			Percentage of pedestrian fatalities on arterials (2003-2012)
					Under 20 mph	Under 30 mph	40 mph and over	
Saline County	53	1	1.9%	0.43	0.0%	0.0%	100.0%	0.0%
Schuyler County	9	0	0.0%	0.00	N/A	N/A	N/A	N/A
Scotland County	6	0	0.0%	0.00	N/A	N/A	N/A	N/A
Scott County	79	7	8.9%	1.77	0.0%	0.0%	85.7%	14.3%
Shannon County	41	0	0.0%	0.00	N/A	N/A	N/A	N/A
Shelby County	21	0	0.0%	0.00	N/A	N/A	N/A	N/A
St. Charles County	260	22	8.5%	0.64	0.0%	4.5%	81.8%	9.1%
St. Clair County	56	3	5.4%	3.09	0.0%	0.0%	100.0%	100.0%
St. Francois County	136	8	5.9%	1.26	0.0%	12.5%	75.0%	50.0%
St. Louis city, Missouri	469	120	25.6%	3.72	0.0%	14.7%	23.3%	43.3%
St. Louis County	614	87	14.2%	0.87	7.1%	8.2%	57.6%	34.1%
Ste. Genevieve County	41	0	0.0%	0.00	N/A	N/A	N/A	N/A
Stoddard County	80	2	2.5%	0.67	0.0%	0.0%	100.0%	50.0%
Stone County	91	3	3.3%	0.95	0.0%	0.0%	66.7%	0.0%
Sullivan County	13	0	0.0%	0.00	N/A	N/A	N/A	N/A
Taney County	104	5	4.8%	1.04	0.0%	20.0%	60.0%	20.0%
Texas County	87	5	5.7%	1.97	0.0%	0.0%	100.0%	80.0%
Vernon County	59	4	6.8%	1.92	0.0%	0.0%	50.0%	50.0%
Warren County	70	2	2.9%	0.65	0.0%	0.0%	50.0%	50.0%
Washington County	111	2	1.8%	0.81	0.0%	0.0%	100.0%	50.0%
Wayne County	69	2	2.9%	1.49	0.0%	0.0%	100.0%	0.0%
Webster County	82	5	6.1%	1.42	0.0%	0.0%	80.0%	40.0%
Worth County	6	0	0.0%	0.00	N/A	N/A	N/A	N/A
Wright County	42	1	2.4%	0.54	0.0%	0.0%	100.0%	0.0%
State total	**9,978**	**762**	**7.6%**	**1.29**	**1.6%**	**8.7%**	**62.6%**	**34.1%**
US Total	**383,489**	**47,025**	**12.3%**	**1.56**	**1.0%**	**9.8%**	**61.3%**	**52.3%**

Smart Growth America is the only national organization dedicated to researching, advocating for and leading coalitions to bring better development to more communities nationwide. From providing more sidewalks to ensuring more homes are built near public transportation or that productive farms remain a part of our communities, smart growth helps make sure people across the nation can live in great neighborhoods. For more information visit www.smartgrowthamerica.org.