



TRANSPORTATION REVIEW

BICYCLE AND PEDESTRIAN SAFETY

By Douglas Shinkle

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In 2010, NHTSA reported that 4,280 pedestrians were killed and an estimated 70,000 were injured. Approximately 620 bicyclists were killed in crashes that year, and approximately 52,000 were injured. Because bicyclist and pedestrian deaths make up about 14 percent of overall traffic fatalities, compared to about 12 percent of total trips, they are at more risk than most users. The number of people bicycling and walking for transportation continues to increase, almost doubling since 1995, and now nearly 12 percent of trips taken in the United States are by bike or foot. Intersections are especially dangerous for bicyclists and walkers; the Traffic Safety Coalition found that 24 percent of pedestrian deaths and 33 percent of bicyclist traffic fatalities occurred in an intersection.

FEDERAL ACTION

The Federal Transit Administration recently finalized a policy that allows grant funding for states and metropolitan planning organizations to be used to improve bicycling and walking infrastructure near transit stations and stops. Since all transit users are pedestrians for at least a portion of their trip and many access transit by foot or bike, this is an important acknowledgement of the connection between these modes. The policy will allow funding eligibility for “all pedestrian improvements located within one-half mile and all bicycle improvements located within three miles.”

The Federal Highway Administration recently launched a Walk Friendly Communities (WFC) program, in collaboration with the Pedestrian and Bicycle Information Center (PBIC). The purpose of the program is to encourage communities to create safe walking environments. To date, 21 communities have been awarded the program’s platinum, gold, silver, or bronze status. The program is meant to spur community-level dialogue and planning for pedestrians, and PBIC provides suggestions and resources about how to improve walkability and bring attention to the issue.

Congress is currently debating multiple transportation reauthorizations to fund transportation projects across the nation, some of which would completely eliminate funding for Transportation Enhancements, which serves as the main dedicated federal source of funding for bicycle and pedestrian facilities, as well as eliminate the Safe Routes to School program. Other proposals would largely maintain the status-quo for bicycle and pedestrian safety funding and programming. States will have to carefully follow these developments, as they may place more of the responsibility on states to fund and provide safe facilities and education for bicyclists and pedestrians.

SAFETY IN NUMBERS AND COMPLETE STREETS

During the last decade, it has become safer to walk or ride a bike. Even as walking and bicycling trips increased by about 25 percent, bicycle and pedestrian traffic fatalities declined by 6 percent and 16 percent, respectively. For bicyclists and pedestrians, there appears to be safety in numbers. The

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more bicyclists and walkers on the streets, the more attuned drivers are to their presence, according to studies in New York City, Portland and other American cities.

Research published in the *Injury Prevention Journal* showed that, “The likelihood that a given person walking or bicycling will be struck by a motorist varies inversely with the amount of walking or bicycling.” Researchers and transportation planners have theorized that the decrease in crashes has occurred because motorists have adjusted their driving to increased bicycling and walking traffic. Recent research, published in the journal *Environmental Practice*, builds on this theory, showing that cities in California with higher bicycling rates were safer for all users, including motorists, while communities with few bikes had higher traffic crash rates for all users. Early research indicates that the lower fatalities may be a result of slower vehicle speeds, which may be a function of how streets have been designed and built to accommodate all users. Cities where more bicycles are on the streets tended to have narrower roads that typically slow car speeds, and higher connectivity and density that increase bicyclists’ route choices and ease of use.



Many communities were not designed to make it easy for residents to walk, bicycle or use public transportation. The streets may be too wide for safe crossing, or a lack of sidewalks may inhibit a walk to the store or transit stop. Now, states are embracing “complete streets,” which entails planning, designing, constructing, maintaining and operating transportation projects and systems, keeping in mind the needs of all users—motorists, bicyclists, pedestrians and transit passengers—regardless of age and ability. Twenty-six states, the District of Columbia and Puerto Rico have some form of complete streets policy; in 17 states, policies were enacted by the legislature. In 2011, New York and Washington enacted complete streets legislation, and such measures typically are considered by a number of states and localities each year. The District of Columbia also enacted its Sidewalk Assurance Act, which requires installation of sidewalks to ensure a safe and accessible environment for pedestrians and those with disabilities. The law provides that, for road segments that lack sidewalks on both sides of the street, road reconstruction or curb and gutter replacement must include installation of a sidewalk on at least one side of the street.

Complete streets are especially important for vulnerable users such as children, older adults and the disabled. A 2008 AARP survey of Americans over age 50 found that more than half the respondents expressed a desire to walk, bike or use public transportation more often if the streets and transportation systems were safer and more accommodating. Nearly 40 percent reported a lack of sidewalks and safe crossings, bicycle lanes or safe places to catch the bus near their homes.

At the federal level, the U.S. Department of Transportation issued a policy statement on bicycle and pedestrian accommodations in March 2010. It states that, “The DOT policy is to incorporate safe and convenient walking and bicycling facilities into transportation projects. 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. Because of the numerous individual and community benefits that walking and bicycling provide—including health, safety, environmental, transportation, and quality of life—transportation agencies are encouraged to go beyond minimum standards to provide safe and convenient facilities for these modes.” It encourages states to adopt similar policies, which many states already have done.

BICYCLE HELMETS

As of February 2012, 21 states and the District of Columbia had laws that require bicycle riders of certain ages to wear helmets. Ninety-one percent of bicyclists killed in 2009 reportedly were not wearing helmets. No states require anyone over age 18 to wear a bicycle helmet, but most require children under age 15 to wear helmets or protective headgear while riding a bike. A number of research studies have examined the effectiveness of bike helmet laws; a 2008 macro-analysis of 12 studies in the journal *Injury Prevention* found that helmet laws seemed to be associated with an increase in helmet use ranging from 5 percent to more than 30 percent. The macro-study also indicated that, “Bicycle helmet legislation appears to be effective in increasing helmet use.” Some theorize that required helmet use may discourage bicycling for children, but little research has been conducted on this topic.

Enacting stricter helmet laws has not been a top priority during the past few years. In 2011, 19 bills in eight states were introduced regarding helmets; all either failed or still are under consideration. Some bills sought to create a helmet requirement, others seek to expand requirements and ages for use, and a few address helmet education awareness and ensuring helmets meet federal or other safety standards. A 2011 New York Senate bill (SB 4697) would exempt from sales and use taxes the sale of bicycle and other helmets.

Two bills that have been passed since 2008 strengthened a bicycle helmet law. Delaware passed legislation in 2008 requiring bicyclists under age 18 to use a helmet that meets “...the minimum bicycle helmet safety standards set by the Consumer Products Safety Commission.” Information from the National Conference of State Legislatures was used in this bill’s legislative findings. The Colorado General Assembly enacted a law in 2010 requiring the Department of Transportation to develop a school curriculum for non-motorized wheeled transportation, which would include instruction on proper use of a bicycle helmet.

A few states considered encouraging state awareness and study of helmet use. Illinois passed a resolution in 2011 urging the governor and the secretary of state to convene a task force to explore a public awareness campaign to educate the general public about the value of cycling to children, along with the safety benefits of children wearing bicycle helmets. Hawaii introduced a resolution that would have asked the Department of Health to gather statistics on injuries involving motorcycles, mopeds, bicycles and ATVs without helmets in the state.

State Bicycle Mandatory Helmet Use Laws

State/Jurisdiction	Age
Alabama	Under 16
California	Under 18
Connecticut	Under 16
Delaware	Under 16
Florida	Under 16
Georgia	Under 16
Hawaii	Under 16
Louisiana	Under 12
Maine	Under 16
Maryland	Under 16
Massachusetts	Under 17*
New Hampshire	Under 16
New Jersey	Under 17
New Mexico	Under 18
New York	Under 14*
North Carolina	Under 16
Oregon	Under 16
Pennsylvania	Under 12
Rhode Island	Under 16
Tennessee	Under 16
West Virginia	Under 15
District of Columbia	Under 16

*Laws in Massachusetts and New York prohibit bicyclists from transporting passengers younger than age 1.
Sources: AAA and NCSL, 2012.

FAILURE TO YIELD

States have aggressively expanded their laws to enforce the right-of-way for pedestrians and the requirement for motor vehicles to yield. Since 2008, at least six states—Florida, Hawaii, Illinois, Louisiana, New Jersey and Texas—and the District of Columbia have strengthened their laws by clarifying when a vehicle must yield or increasing fines and penalties for failure to yield. Florida, Hawaii, Illinois and New Jersey enacted laws stating that drivers must stop their vehicles when a pedestrian is present in a crosswalk. Hawaii’s law, for example, requires a vehicle to stop if a pedestrian is in a crosswalk and is upon the half or roadway closest to the vehicle, or close enough to be in danger.

The District of Columbia created a Pedestrian Safety Fund, using money from failure-to-yield fines, and an enhanced neighborhood parking control initiative. The fund is to be used solely to enhance the safety and quality of pedestrian and bicycle transportation, including traffic calming and Safe Routes to School enhancements. Two new Illinois laws specifically target school zone areas, with an additional \$50 fine directed to the school district where the violation occurred to be used for school safety purposes. An increased portion of New Jersey’s fine for failure to yield goes into the state’s Pedestrian Safety Enforcement and Education Fund, created in 2005. Texas passed a law increasing fines and punishment for a crash involving failure to yield to a blind and/or disabled pedestrian.

RUMBLE STRIPS

Rumble strips, which can be effective in reducing drowsy driving crashes, can unfortunately present a dangerous obstacle for bicyclists who are riding on a road shoulder. In 2011, FHWA released rumble strip recommendations that are “broader than in the past, but are intended to be flexible to meet the needs of both agencies and stakeholders.” This technical advisory was in response to concerns for bicyclist safety, and several bike advocacy groups met with the DOT to refine rumble strips and develop best practices that improve motorist and bicyclist safety. State legislatures have acted on this issue as well; Maine and New Hampshire have enacted laws in the past few years regarding rumble strip safety for bicyclists.

New Hampshire required its state DOT to develop and implement standards for design and placement of rumble strips, drain grates and road surface treatments that eliminate foreseen hazards for bicyclists. A 2010 Maine law requires the state Department of Transportation to erect signs on roads where rumble strips are present.

CELL PHONES AND BICYCLE OPERATION

In 2011, California nearly became the first state to ban the use of cell phones or other wireless devices while operating a bicycle. Senate Bill 28 passed both chambers of the Legislature but was vetoed by the governor in September. The bill would have imposed a \$20 fine for a first offense on a bicycle, followed by a \$50 fine for subsequent offenses. Bicyclists would not have received a point violation for the offense.

BICYCLE LIGHTING EQUIPMENT

Bicyclists and motorists must be vigilant when riding in the dark. According to a North Carolina study, about 21 percent of bicycle crashes in that state occurred at night. NHTSA suggests that bicyclists increase their visibility by wearing brightly colored clothing or placing retro-reflective tape on their equipment or clothing. In 2009, 25 percent of bicyclist deaths occurred between 9 p.m. and 6 a.m., despite the low-rate of bicycling at those times. Another 22 percent occurred between 6 p.m. and 9 p.m.

Several states have enacted legislation to increase and clarify requirements for lighting on bicycles. Tennessee and Vermont now require a bicycle to be equipped with a lamp emitting light on the front and a lamp or reflector on the rear. Vermont's requirements are in effect from a half-hour after sunset to a half-hour before sunrise, while Tennessee's are simply for "nighttime." Many states, however, do not require a front light, a notable example of the wide variance in state laws governing bicycle lighting. Louisiana now requires all bicycles used at night to have a red light on the rear of the vehicle.

California modified its requirements to clarify that lights also must be used by bicyclists authorized to ride on a sidewalk. As an alternative, the law allows bicyclists to substitute reflectors on shoes or ankles instead of using pedal reflectors.

3-FEET/SAFE BICYCLE PASSING

A bicycle safety policy that has gained significant interest and activity in state legislatures is 3-foot or safe passing laws. These laws seek to ensure that, when passing bicycles, motor vehicles allow adequate space to avoid sideswiping bicyclists or causing them to overcorrect to avoid a vehicle. Skeptics doubt such laws can be enforced and whether 3 feet allows sufficient space for bicyclists. In addition, many bicyclists feel that laws dictating they must ride to the far right of a lane are of more concern because they often encourage too-close passing and leave bicyclists vulnerable to being "doored" by a parked car or to encountering roadside debris. Advocates state that these passing laws at least create a legal framework to protect bicyclists who are hit or buzzed from behind, create a less arbitrary standard and raise awareness of the importance of safe passing.



In 1973, Wisconsin became first state to enact such a law; several more states have since enacted such measures. As of October 2011, 20 states—Arizona, Arkansas, Colorado, Connecticut, Delaware, Florida, Georgia, Illinois, Kansas, Louisiana, Maine, Maryland, Minnesota, Mississippi, Nevada, New Hampshire, Oklahoma, Tennessee, Utah and Wisconsin—and the District of Columbia have enacted 3-foot passing laws. Since 2008, 12 states have enacted 3 foot passing measures.

Delaware, Georgia, Kansas and Nevada laws were enacted in 2011. Not all legislation introduced in 2011 passed, however. California's bill was vetoed, as was a 5-foot passing measure in New Mexico. Bills in Iowa and Missouri did not pass. An attempt failed in Rhode Island to amend its law to require 3-foot passing, rather than safe passing. Virginia introduced legislation to increase the passing buffer from 2 feet to 3 feet, but that measure also failed.

A few states—including New York, Rhode Island, South Carolina, Vermont (its law applies to all vulnerable users) and West Virginia—have more general “safe passing laws. These laws typically state that vehicles must pass bicyclists at a safe distance and speed, but usually are not more specific. Statutes in states with 3-foot passing laws contain varying degrees of detail. Some simply lay out the 3-foot threshold, while others are more distinct. The New Hampshire language, for example, is quite specific, stating “The distance shall be presumed to be reasonable and prudent if it is at least 3 feet when the vehicle is traveling at 30 miles per hour or less, with one additional foot of clearance required for every 10 miles per hour above 30 miles per hour.”

The Colorado law, passed in 2009, reads, “Allow the bicyclist at least a three-foot separation between the right side of the driver’s vehicle, including all mirrors or other projections, and the left side of the bicyclist at all times.”

State penalties for violating 3-foot passing laws also vary. Florida law states that a violation is a noncriminal traffic infraction that carries a \$60 fine and three points on the license. Louisiana law carries a maximum fine of \$250. The Arkansas law carries a \$100 fine, although the fine for causing physical injury or death is only \$1,000.

VULNERABLE USERS

Another trend in the past decade has been to increase protection for vulnerable roadway users—bicyclists, pedestrians, motorcyclists, etc. Such laws typically not only define vulnerable user, but also prescribe increased penalties for endangering such users.

Since 2008, at least eight states—Colorado, Delaware, Illinois, Louisiana, Mississippi, New York, Vermont and Washington—have enacted measures related to protecting vulnerable users. Vermont, for example, defines a vulnerable user as: “A pedestrian; an operator of highway building, repair, or maintenance equipment or of agricultural equipment; a person operating a wheelchair or other personal mobility device, whether motorized or not; a person operating a bicycle or other nonmotorized means of transportation (such as, but not limited to, roller skates, roller blades, or roller skis); or a person riding, driving, or herding an animal.”

Colorado, Louisiana, Mississippi and Vermont specifically passed measures to protect bicyclists from aggressive and deviant motorist behavior, such as passing too closely. All include language restricting throwing an object at bicyclists or taunting or harassing them. Louisiana law, for example, states: “It shall be unlawful to harass, taunt, or maliciously throw objects at or in the direction of any person riding a bicycle. Any person who violates this Section shall be fined not less than two hundred dollars or imprisoned for not more than thirty days.” Mississippi law contains similar language. Colorado and Vermont also extended such protections to pedestrians.

SAFE ROUTES TO SCHOOL

State departments of transportation (DOT) continue to award grants for education and infrastructure from the federal Safe Routes to School (SRTS) program. The National Highway Traffic Safety Administration estimated 23,000 children were injured by cars while walking and bicycling in 2009; more specific numbers for travel to school are not available. According to the Safe Routes to School

National Partnership, since 2005 almost \$1 billion has been allocated to state DOTs, which then fund local government and nonprofit efforts to improve walking and bicycling safety and conditions near schools. Most of this funding is used for infrastructure improvements, and approximately 10 to 30 percent is used for education programs. As of this publication, some versions of the current federal transportation reauthorization debate would zero-out funding for the Safe Routes to School programs, although others have proposed to keep the program.

Many states use SRTS grants to provide bicycle and pedestrian education at schools statewide. In Texas, for example, BikeTexas, the statewide bicycle advocacy and education organization, received \$1.4 million in the latest funding grant cycle to continue its Safe Routes to School Statewide Teacher Certification Program. This involves certifying physical education teachers, public safety officers and other youth program professionals to teach bicycle and pedestrian safety to Texas schoolchildren; since 1998, BikeTexas has certified more than 3,700 people. In Maine, a statewide pedestrian and bicycle safety program reaches more than 10,000 students. Using a different tactic, the Colorado General Assembly enacted a law that requires development of a school curriculum about safe use of public streets by users of nonmotorized wheeled transportation.



At this point, most state DOTs have established a process to evaluate and select projects to receive funding. State legislatures, however, continue to bolster and refine state guidelines to allocate funds and to incorporate SRTS principles into school and transportation plans. In 2010, for example, California AB 2147 added to the grant process consideration of a proposal's benefit to a low-income school and the degree to which the proposal reflects the participation, input and priorities of community stakeholders. Massachusetts enacted HB 4459 in 2010, which requires a school's wellness policy to include a plan to implement a SRTS program to encourage students who reside within walking (one mile) or bicycling (three miles) distance from school to bike and walk to school. Such policies may entail working with local municipalities to create infrastructure improvements to aid bicycling and walking.

Utah requires every elementary and middle school to detail a Student Neighborhood Access Program, which includes safe walking and bicycling routes for students living within one mile of school. Washington also now requires elementary schools to identify walking routes.

DRIVER'S EDUCATION

Educating motorists about how to share the road with bicyclists and pedestrians is integral to bicyclist and pedestrian safety. Awareness of the laws with regard to yielding, passing and other situations is important to predict how bicyclists, pedestrians and motorists interact. States have taken steps to integrate information about the roles and responsibilities of motorists with regard to pedestrians and bicyclists and how to drive safely in their presence.

Minnesota requires the driver education classroom curriculum to include instruction on duties of a driver when encountering a bicycle, other non-motorized vehicles or a pedestrian. Louisiana and Washington also added bicyclist and pedestrian safety information to their driver's education cur-

riculum. The Washington law was intended to extend information about how to drive safely among bicyclists and pedestrians to those cited for traffic infractions who must take a driver safety course.

Louisiana also requires a summary of the 3-foot bicycle passing law (See section on passing laws on pages 4-5) in any instructional publication for drivers. New Hampshire now requires the Department of Safety to inform driver licensees about laws relating to blind pedestrians and to include questions about such laws on first-time driver's license applicants.

CONCLUSION

Pedestrian and bicycle fatalities continue to be a disproportionate share of traffic fatalities, despite improvements in the past 10 years. The exposed nature of walking and bicycling, infrastructure design that does not provide safe bicycling and walking environments, high vehicle speeds, lack of education and many other challenges continue to threaten bicyclists and pedestrians. State legislative efforts to increase safety, however, appear to be positively affecting safety, and the level of awareness seems to be increasing. As bicycling and walking continue to rise in popularity for transportation and recreational purposes, it will be interesting to see whether injury and fatality rates continue to improve.

FOR MORE INFORMATION

League of American Bicyclists: <http://www.bikeleague.org/>

FHWA Pedestrian and Bicycle Safety: http://safety.fhwa.dot.gov/ped_bike/

National Center for Safe Routes to Schools: <http://www.saferoutesinfo.org/>

NCSL Transportation Program: <http://www.ncsl.org/Default.aspx?TabID=756&tabid=951,72,106#951>

NCSL/NHTSA Traffic Safety Legislation Database: <http://www.ncsl.org/?tabid=13590>

NHTSA: <http://www.nhtsa.gov/Bicycles> and <http://www.nhtsa.gov/Pedestrians>

Pedestrian and Bicycle Information Center: <http://www.pedbikeinfo.org> and <http://www.walkinginfo.org>



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