HIGHWAY SAFETY STRATEGIES FOR IOWA

Executive Summary of the Iowa SMS Toolbox

IOWA HIGHWAY SAFETY MANAGEMENT SYSTEM

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EXECUTIVE SUMMARY OF THE IOWA SMS TOOLBOX

This summary provides example strategies and key resources from the Iowa SMS *Toolbox of Highway Safety Strategies.* Please refer to the toolbox for additional strategies, details, and complete resources. For a full copy of the toolbox, contact Iowa SMS (515-239-1169) or you may view it and other Iowa SMS information and links at www.IowaSMS.org.

IOWA HIGHWAY SAFETY MANAGEMENT SYSTEM

IOWA SMS

Iowa's highway safety practitioners and advocates are determined to reduce the amount of death, human suffering, and economic loss that result from crashes on Iowa's roadways every year. In the service of this cause, leaders representing the public and private sectors and each the "4 E's" of highway safety—engineering, enforcement, education, and emergency response, as well as "everyone else"—have joined efforts under the banner of the Iowa Safety Management System. Iowa SMS uses multidisciplinary, multi-jurisdictional input and expertise to identify and implement highway safety strategies.

NOTE

The potential strategies listed in this document do not represent specific recommendations of Iowa SMS or any agency, group, or individual represented by Iowa SMS. The strategies represent a range of alternatives for legislators, department and agency directors, local governments, and citizen groups to consider when they elect to address a specific highway safety concern.

As a living document, the Iowa SMS toolbox will continue to provide information, direction, and ideas for highway safety decision makers. Any strategies selected for implementation by Iowa SMS or any other entity will require further development through identification and evaluation of potential partners, entities impacted, potential funding, and steps for implementation. Last updated November 2001.

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ENDORSEMENT

The Governor of Iowa and key Iowa state department administrators have endorsed this "toolbox" of potential highway safety strategies. For a list of Iowa SMS member organizations, see the Iowa SMS toolbox or visit www.IowaSMS.org.

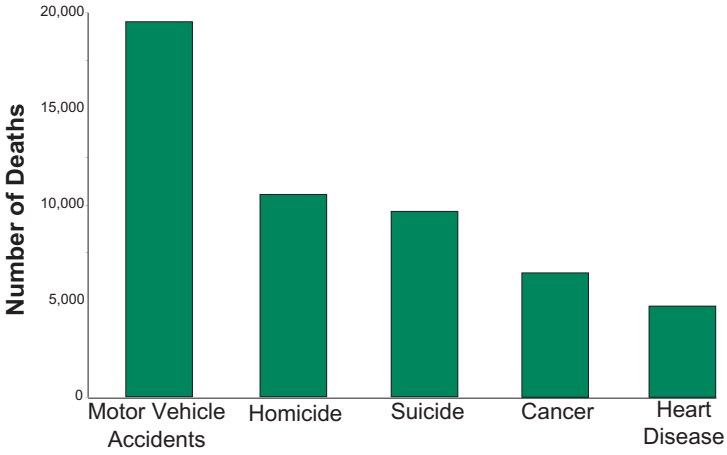
HIGHWAY DEATHS, INJURIES, AND DAMAGE: THE EPIDEMIC

Our Nation

Motor vehicle crashes are the leading cause of death among Americans 1–34 years old.[1] According to the U.S. Department of Transportation (U.S. DOT), the total societal cost of crashes exceeds $1.25 trillion annually.

U.S. Transportation Secretary Norman Mineta has announced that "Safety is President George W. Bush's No. 1 transportation priority. When it comes to safety, we can never rest on our past achievements—it's a never-ending job. Working together we can improve the transportation safety and security of our nation's people."[2]

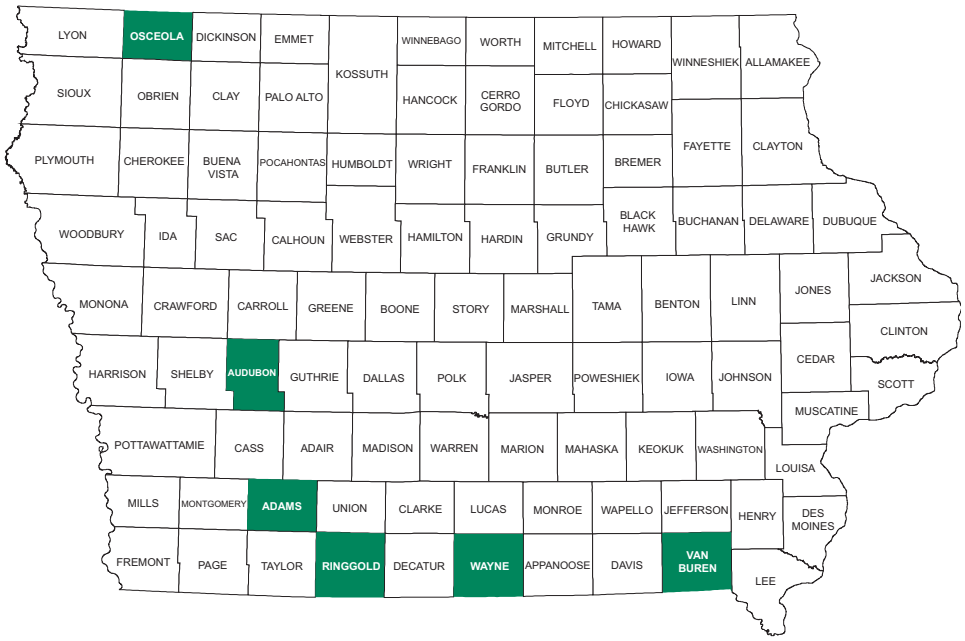
Leading Causes of Death for Americans Age 1–34



Our State

Iowa experiences 450 or more crash fatalities every year, along with over 35,000 injuries and millions of dollars in property damage. Compared with the rates of other forms of death and injury, vehicle crashes should be considered an epidemic-level public health issue in Iowa. In human terms, these tragic events are experienced one fatality and one family's loss at a time.

Iowa Population Victim of Crashes Over Next 10 Years



If current trends continue over the next 10 years, the number of Iowans who will die or be severely injured in a vehicle crash will be equivalent to every man, woman, and child living in the counties shown in the adjacent map (data from Iowa Department of Transportation [Iowa DOT] *1999 Iowa Crash Facts*).

[1] 1998 data from the Federal Highway Administration (FHWA) and Centers for Disease Control and Prevention.

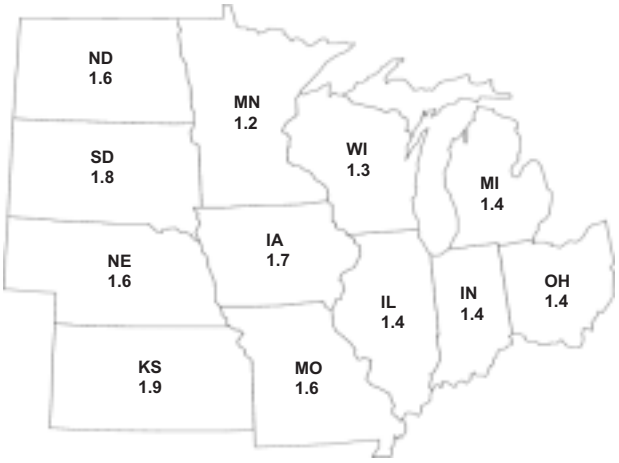
[2] Announcement made at the Western Hemisphere Initiatives Ministerial Meeting (March 2001).

The Epidemic Proportions

The number of vehicle miles driven nationally has risen dramatically over the past 15 years, yet the annual number of U.S. crash fatalities has remained relatively steady. This modest success can be attributed to aggressive efforts nationwide to reduce the risks of motor vehicle travel, as well as to improvements in vehicle design and roadway engineering.

Although Iowa has made its own strides in highway safety, Iowa's motor vehicle fatality rate is still among the highest in the Midwest (see map) and remains higher than the national rate of 1.55 fatalities per 100 million miles traveled.[3]

Midwest Crash Fatality Rates per 100 Million Miles Traveled



Iowa Crime vs. Crash Clock

1 murder every 10 days

1 violent crime every 78 minutes

1 property crime every 8 minutes

1 crime every 6 minutes

1 crash fatality every 18 hours

1 crash injury every 14 minutes

1 property damage crash every 13 minutes

1 crash every 8 minutes

A comparison of the losses that result from crimes in Iowa to the losses that result from vehicle crashes in Iowa (see crime vs. crash clock) further demonstrates the magnitude of the problem in Iowa.[4]

The good news is that these crash fatalities, injuries, and property losses suffered by Iowans, their families, and communities can be reduced with collaborative prevention efforts, as described in the Iowa SMS toolbox and this summary.

Toolbox of Highway Safety Strategies

The Iowa SMS *Toolbox of Highway Safety Strategies* is a comprehensive compilation of national and Iowa highway crash data, issue descriptions, and potential safety improvement strategies. The purpose of the toolbox is to assist Iowa's highway safety professionals, policy makers, and citizens in implementing ways to reduce death, injury, and economic loss on Iowa's roadways.

The toolbox consists of 28 chapters covering safety issues related to drivers, other users, highways, emergency response, and planning and management. Potential solutions to each of the safety problems are offered for consideration. The range of solutions reflects the multidisciplinary expertise of the contributors as well as the concerns and ideas of the general public and policy makers.

The toolbox challenges us to support local efforts, expand effective programs, and implement new initiatives. Iowa SMS and its participating members recognize that Iowa's population is changing and that its transportation needs are changing too. Improvements in highway design, applied technology, and transportation responsiveness are needed to meet Iowa's transportation safety needs.

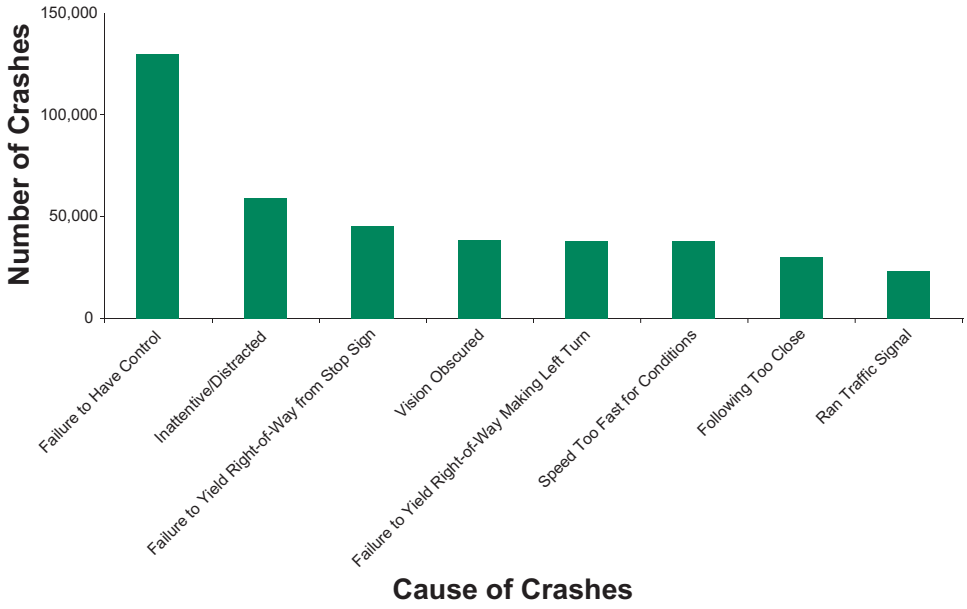
[3] 1999 data from the National Highway Traffic Safety Administration (NHTSA), *Traffic Safety Facts*.
[4] Data from Iowa Department of Public Safety *1999 Crime Report* and Iowa DOT *1999 Iowa Crash Facts*.

DRIVER BEHAVIOR AND SAFETY AWARENESS

Research indicates that approximately 85% of the causation factors associated with motor vehicle crashes can be attributed to the driver. Not all crashes can be prevented, but improved safety awareness can help to avoid some of the crashes resulting from driving behavior.

The adjacent chart and following sections illustrate the areas where improvements in driver behavior and awareness could help reduce crashes and crash severity on Iowa's roadways.

Iowa Driver-Related Causes of Crashes[5]



Seat Belts and Child Restraints Save Lives

Seat belts have been shown to reduce the risk of fatal injury by 45% and the risk of moderate-to-critical injury by 50%. The use of seat belts and child safety seats saved the lives of over 134,000 children and adults nationwide from 1975 to 1999.[6]

In 1985, before Iowa's primary seat belt law was enacted, Iowa's seat belt use rate was just 18%. Under the law it has grown to its present rate of 78%, placing Iowa among the top 10 states in seat belt usage. The Iowa DOT estimates that since the law went in effect 4,600 persons have been spared death or life-threatening injury in Iowa as a direct result of wearing seat belts. In addition to the lives saved, Iowa's seat belt law has been attributed with saving Iowans $11 million per year in insurance premiums.

Current Programs and Successes

- ☑ The Special Traffic Enforcement Program (STEP), administered by the Iowa Governor's Traffic Safety Bureau (Iowa GTSB), coordinates statewide seat belt awareness and enforcement efforts.
- ☑ Thanks to multidisciplinary and multi-agency efforts, Iowa now has 20 child seat fitting stations and (as of March 2001) 246 child seat technicians and nearly 20 certified instructors.

Potential Strategies to Consider

- ☐ Extend Iowa's seat belt law to apply to rear-seat passengers as well as front-seat passengers.
- ☐ Establish permanent child seat fitting stations in every one of Iowa's 99 counties.

[5] 1990–1999 data from the Iowa DOT Office of Traffic and Safety.
[6] As estimated by NHTSA.

Asleep at the Wheel

A Gallup poll conducted for the National Sleep Foundation found that 31% of adults have fallen asleep while driving. Driving while drowsy can be as deadly as driving while intoxicated. "Drowsy driving" took the lives of at least 18 Iowans between 1994 and 1995.[7]

"Many of us would never think about driving drunk, but by driving when we're sleep-deprived, we put ourselves and others at risk of a crash as severe as an alcohol-related crash."[8]

Current Programs and Successes

- [x] NHTSA teamed up with the National Center for Sleep Disorders Research in 1999 to develop the Program to Combat Drowsy Driving.
- [x] Iowa is currently installing two-foot paved shoulders on primary highways and rumble strips on much of Iowa's four-lane freeways and expressways.

Potential Strategies to Consider

- [ ] Install wider paved shoulders systemwide on four-lane and high-volume rural two-lane roadways. The Iowa DOT is currently evaluating the safety and budget impacts of various paved shoulder practices.
- [ ] Consider the use of center-line rumble strips in selected locations (motorists who run off the right side of the roadway onto a granular shoulder often oversteer back to the left and enter opposing traffic).

Driven to Distraction

Many crashes result from drivers who are distracted from their primary task of driving, thus endangering themselves and the lives of others. The two distractions most cited as causes of vehicle crashes are spilling food/beverages and dropping something on the floor of the car. In recent years the use of cell phones while driving has become a controversial issue.

A study in the *New England Journal of Medicine* reported that the risk of collision is four times greater when a driver is making a call on a cell phone. By one estimate, 85% of the 100 million U.S. cell phone subscribers regularly talk on the phone while driving.[9] Another survey found that 84% of cell phone users believe that using a phone while driving is a distraction, yet 61% of them use phones while driving and 30% do so frequently.[10]

Nearly three-fourths of Iowans surveyed in the Iowa SMS public opinion survey believe that "promoting focused driving" should receive high emphasis in the effort to reduce crashes and crash severity on Iowa's highways.

Potential Strategies to Consider

- [ ] Increase public awareness of distracted driving dangers.
- [ ] Review other states' experiences with cell phone legislation and enforcement to determine whether allowing only hands-free devices or banning cell phone use while driving except for emergencies are appropriate measures in Iowa.

[7] And maybe more, considering that drowsy driving is generally underreported as a crash cause.
[8] Jean Wilkins, associate professor of psychiatry, University of North Carolina at Chapel Hill.
[9] *Prevention* magazine survey.
[10] Survey by the Insurance Research Council.

Aggressive Driving

Aggressive driving is the operation of a motor vehicle without regard for other roadway users' safety. Examples include tailgating and erratic lane-changing. This dangerous driving behavior is often the result of anger or frustration and is becoming more and more prevalent.

Aggressive driving is treated as a traffic offense, as opposed to road rage, which is a deliberate attempt to harm other persons or property resulting from a driving incident and is considered a criminal offense.

Three-quarters of Iowans polled in the Iowa SMS public opinion survey believe that reducing aggressive driving should receive high emphasis in the effort to reduce crashes and crash severity on Iowa's highways.

The Price That's Paid for Aggressive Driving

Current Programs and Successes

- [x] Iowa has successfully converted a number of four-lane undivided urban roadways to three lanes where aggressive driving was identified as a community concern. Traffic calming measures such as four-lane-to-three-lane conversions could be effective at additional select locations.
- [x] The Iowa DOT publicizes roadway construction, conditions, and closings in order to provide drivers with the information needed to choose driving times and routes least likely to cause the frustration and impatience that lead to high-risk behaviors.
- [x] The Iowa DOT initiated its Des Moines area Highway Helper program early in 2001, providing rapid roadside assistance to motorists whose vehicles would otherwise cause traffic slowdowns or additional roadside hazards.

Potential Strategies to Consider

- [ ] Further ensure that traffic signals are installed only where warranted; where installed, signals should be efficiently timed and interconnected.
- [ ] Make additional progress in identifying and encouraging highway engineering design improvements that facilitate efficient traffic flow, thereby reducing the frustration and impatience that lead to high-risk and aggressive behaviors.

Excessive Speeding

Nationally, speeding-related crashes carry an economic cost to society of $28 billion per year. That's $53,243 per minute! Excessive speeding is defined as driving considerably faster than other vehicles in the traffic flow. Speeding of this type is a contributing factor in nearly one-third of all fatal motor vehicle crashes nationwide.[11]

During 1999, excessive speed was cited as a contributing factor in 47 of Iowa's 425 fatal crashes. The state of Iowa also suffers a comparable share of speed-related injuries, with over 200 persons sustaining severe speed-related injuries in 1999.[12]

Current Programs and Successes

- [x] The Iowa GTSB provides funding support for the Iowa State Patrol's Operation CARE and other public awareness and enforcement programs targeting excessive speeding (and other high-risk moving violations).

Potential Strategies to Consider

- [ ] Increase speed enforcement, especially on rural two-lane highways with higher crash rates than interstates.
- [ ] Consider the use of photo enforcement in school zones and work zones. Although controversial, numerous research and pilot studies around the country have shown speed-monitoring cameras to be effective in the enforcement of excessive speeding. A national survey conducted by NHTSA found that the public supports the use of photo enforcement to reduce speeding by a margin of seven to three.

Red Light Running

Red light running—entering an intersection after the traffic signal has changed to red—is another major growing dangerous driving behavior. According to Former U.S. Transportation Secretary Rodney Slater, "98% of Americans agree that red light running is dangerous, but over half admit deliberately running red lights because they are in a hurry." The prevalence of this problem was corroborated by a survey of Iowans, nearly 80% of whom reported that running a red light was a serious and dangerous practice where they live and work.[13]

Current Programs and Successes

- [x] The Stop Red Light Running program has been developed by FHWA to reestablish respect for traffic signals and reduce the number of trauma center admissions caused by red light running.
- [x] The Iowa DOT Office of Traffic and Safety sponsored the study *Red Light Running in Iowa: The Scope, Impact, and Possible Implications,* which found up to 38 red light running violations per 1,000 vehicles at selected intersections in Iowa.

Potential Strategies to Consider

- [ ] Reduce driver frustration by implementing programs to improve traffic signal timing and coordination, thereby reducing the number and duration of required vehicle stops at signalized intersections.
- [ ] Consider the use of photo enforcement. Although controversial, numerous research and pilot studies around the country have shown red light running cameras to be effective in the enforcement of the practice. A national survey conducted by NHTSA found that the public supports the use of photo enforcement to reduce red light running by a margin of seven to three. Support in Iowa is even higher (79.5%) than the national average, according to the results of the Iowa SMS public opinion survey conducted early in 2000. The *Red Light Running in Iowa* study confirms these findings: "Responses from the surveys agree and indicate that support exists for enabling legislation permitting red light cameras to be used to help reduce red light running."

[11] NHTSA, *1999 Crash Fact Sheet.*
[12] Iowa data from Iowa GTSB, *Speed Fact Sheet* (Jan. 2001).
[13] *Red Light Violations: A Survey of Adult Iowans,* conducted by the College of Social and Behavioral Sciences, University of Northern Iowa.

LICENSING AND DRIVER COMPETENCY

Impaired Driving

Nationally, alcohol-related fatalities dropped 30% from 1989 to 1999. Iowa's alcohol-related fatal crashes have also seen reductions, from more than 250 in 1988 to 132 in 1999.

But even with these successes, there are still over 16,000 such deaths nationwide every year. The facts are staggeringly grim:[14]

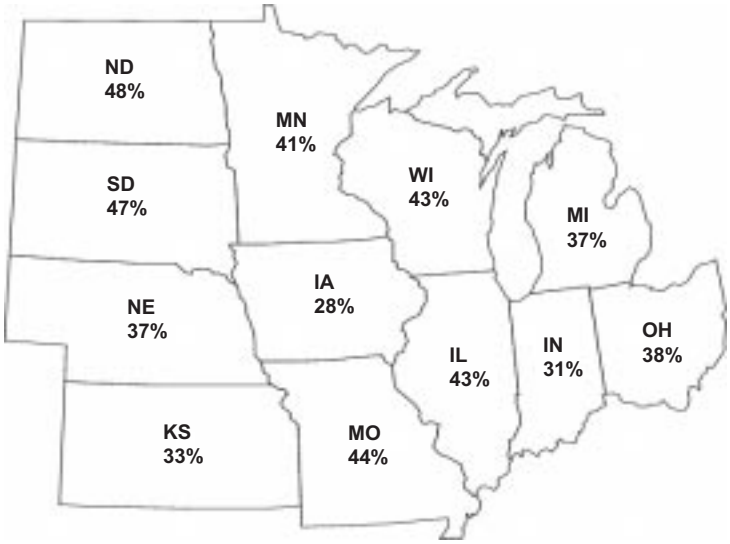
- 38% of fatal crashes involve alcohol.
- An alcohol-related fatality occurs every 33 minutes on average in the United States.
- Nearly one-third of Americans will be involved in an alcohol-related crash in their lifetime.
- In Iowa, 16–25 year olds make up 30% of all alcohol-related crash fatalities.
- Iowa has the lowest rate of alcohol-related fatalities in the Midwest (see map); however, with over 100 such deaths every year in Iowa, the enormous loss of lives is still troubling.

"The vast majority of the American public considers drunk driving the No. 1 major highway safety problem."[15] Four out of five Iowans polled in the Iowa SMS public opinion survey believe that reducing drunk driving should receive high emphasis in the effort to reduce crashes and crash severity on Iowa's highways.

Current Programs and Successes

- ☑ The Iowa GTSB funds traffic enforcement efforts, including those that target impaired driving, to nearly 200 Iowa law enforcement agencies, representing 85% of Iowa's 99 counties.
- ☑ Iowa retains administrative license revocation for operating while intoxicated offences.

Percent of Traffic Fatalities That Are Alcohol Related (2000)



- ☑ Iowa's Rocket Docket program swiftly disposes of certain driving while license suspended cases that clog up court dockets by establishing special days to resolve all issues related to unresolved and unpaid cases at once.

Potential Strategies to Consider

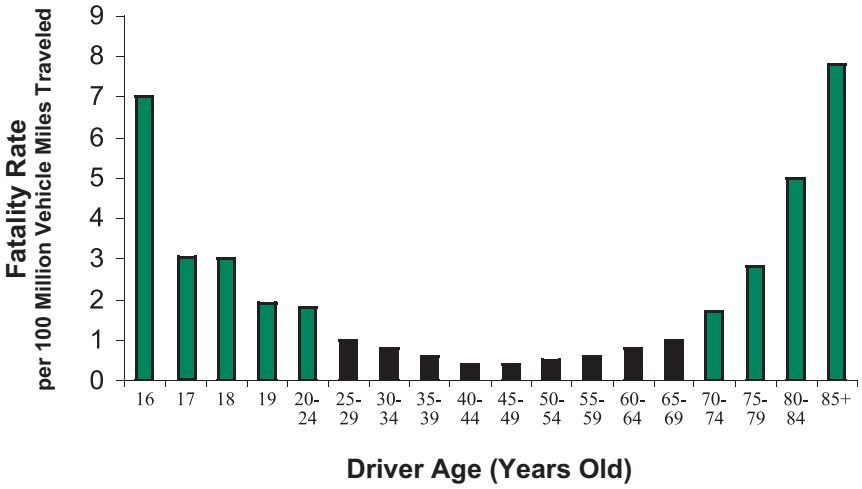
- ☐ Change Iowa's blood alcohol concentration (BAC) law, which makes it illegal to drive at or above a set BAC limit whether or not a driver exhibits signs of intoxication, from 0.10 to 0.08. Twenty-nine states have enacted 0.08 BAC laws as of August 2001. National studies show that 300–500 lives are currently being saved annually because of such laws. By changing the BAC limit from 0.10 to 0.08, Iowa could save 10–16 lives per year and gain four million dollars in federal safety incentive funds.[16]
- ☐ Review the safety impacts that have resulted from changing the Iowa law that formerly called for the arrest of drivers caught driving with suspended or revoked licenses and currently calls for the issuance of a citation instead. An arrest is most probably a greater deterrent; recommendations should be made upon review.

[14] National 1999 data from NHTSA.
[15] NHTSA, *Setting Limits, Saving Lives* (2001).
[16] National and Iowa data reported by Iowa GTSB, *BAC Fact Sheet* (Sept. 2000).

Young Drivers

The fatality rate for teenage drivers is four times as high as the rate for drivers 25–69 years old (see chart).[17] While driver inexperience is an important factor, many crashes involving young drivers are attributable to drinking and driving. Young Iowans surveyed in 2001 listed "drinking and driving" as the single most important safe driving topic they would choose for a public service announcement for their peers.[18]

National Driver Fatality Rates by Age



NHTSA estimates that restoring the minimum drinking age to 21 saved about 20,000 lives from 1975 to 1999. Still, 21% of the young drivers killed in 1999 crashes were intoxicated. In Iowa, drivers ages 16–20 are at least 50% more likely to be involved in alcohol-related fatal crashes when compared to the entire driving population.[19]

The National Safety Council's *Safety Agenda for the Nation* reports that graduated driver licensing (GDL) programs, which increase parental involvement and require new drivers to earn privileges, prevent 10% of the expected fatalities among enrolled drivers. GDL efforts are supported by 63% of Iowans.[20]

Current Programs and Successes

- ☑ Iowa adopted GDL in January 1999. During the first year, 16-year-old driver violations were reduced by 10%. In the second year, violations were reduced 27% from the first year!
- ☑ A new driver education video for use in driver education classrooms across Iowa was completed in 2001.
- ☑ A survey of model Iowa driver education programs, materials, and curricula is being developed jointly by the Iowa Departments of Transportation and Education.

Potential Strategies to Consider

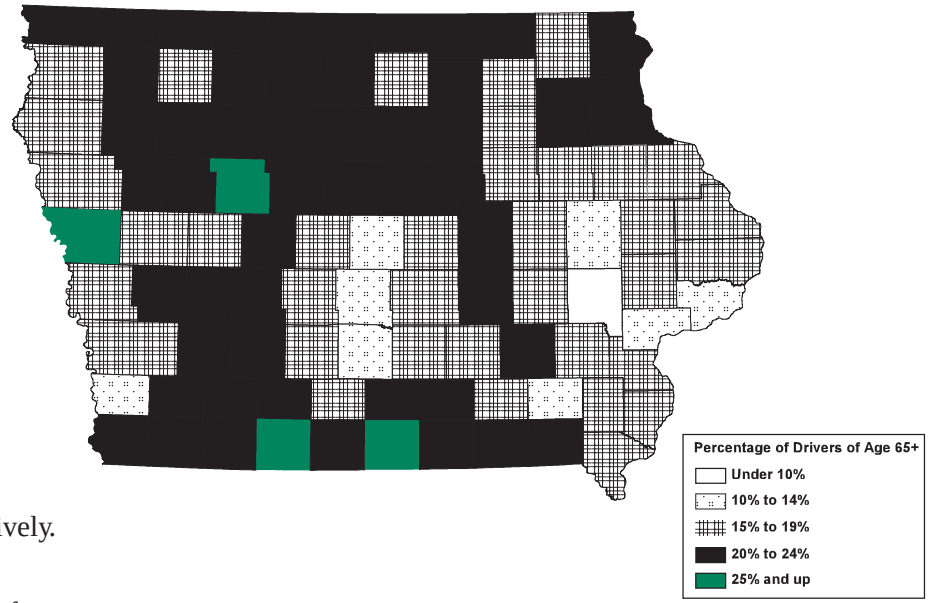
- ☐ Collaborate to provide web-based access resources for driver education instructors and students statewide. Initial planning for this initiative includes the Iowa Departments of Education and Transportation, as well as students and teachers.
- ☐ Enhance GDL by strengthening restrictions where data indicate there is a safety benefit.

[17] NHTSA, *Traffic Safety Facts—Young Drivers* (1999). Chart based on 1996 NHTSA data.
[18] Survey conducted as part of the Get a Grip Youth Leadership Conference.
[19] Iowa GTSB, *Young Driver Fact Sheet* (June 1999).
[20] Based on response results of the Iowa SMS public opinion survey.

Older Drivers

In Iowa, at least 20% of all occupants killed in traffic crashes are 65 years of age or older. Iowa has the second highest percentage of licensed drivers over the age of 85, trailing only Florida. Nearly 16% of all licensed drivers in the state of Iowa are over the age of 65[21]—and that age group is expected to increase by 50% in the next 20 years! Drivers ages 85, 75, and 65 represent Iowa's fastest, second fastest, and third fastest growing groups of drivers, respectively.

Percentage of Drivers 65 Years of Age or Older



The FHWA[22] collected the results of numerous studies detailing the changing physical (especially visual) and mental changes that occur with age. Among the findings, more than half of older drivers have difficulty distinguishing the width of travel lanes, existence of pavement markings, lighting at intersections, and number of left-turn lanes. Making roadway design improvements to accommodate older drivers improves conditions for drivers of all ages.

Current Programs and Strategies

- [x] An older drivers conference is scheduled (June 2002) to increase practitioner knowledge and raise Iowans' public awareness of issues relating to older drivers.
- [x] Iowa SMS and the Iowa DOT Office of Driver Services are developing an older drivers video for use in license stations and other venues.
- [x] Iowa SMS partners are developing a decision-making and referral guide of senior resources and services for older citizens. A handbook for improving rural transit services and use is also being completed.

Potential Strategies to Consider

- [ ] Promote AARP's 55 Alive and other programs to help experienced drivers compensate for diminishing capabilities and stay abreast of current laws, roadway design features, and assistive technologies.
- [ ] Require graduated (restricted) licensing for older drivers where appropriate to ensure that each license allows driving within the driver's capabilities. Eighty-three percent of those polled nationally support more frequent testing for older drivers.[23]
- [ ] Make improvements to roadway design features to accommodate older drivers (this strategy received great support in the Iowa SMS public opinion survey): provide improved pavement markings, increase use of rumble strips, and install offset left- and right-turn lanes at high-volume intersections. (The Iowa DOT has already changed rural intersection design to better accommodate older drivers.)
- [ ] Use bigger and brighter traffic signs, larger legends, and more print contrast.

[21] The ratio of older driver to total population is even greater in many of Iowa's more rural, low-population counties; see map.
[22] In the *Older Driver Highway Design Handbook* (1998).
[23] By the Advocates for Highway and Auto Safety.

MAKING ROADWAYS SAFER FOR ALL USERS

Pedestrians and Bicyclists[24]

Six thousand pedestrians and nearly 1,000 bicyclists are killed every year in traffic crashes across the country. In the state of Iowa, an average of 28 pedestrians are killed and over 700 pedestrians are injured each year in traffic crashes. Over 500 bicyclists suffer injuries and an average of eight bicyclists are killed in Iowa traffic crashes each year.

Alcohol involvement—either for the driver or for the pedestrian—has been reported in nearly half of traffic crashes that resulted in pedestrian fatalities and nearly one-third that resulted in bicyclist fatalities. Pedestrians under 16 and over 70 years old are most at risk, making up 19% and 17% of pedestrian traffic fatalities, respectively.

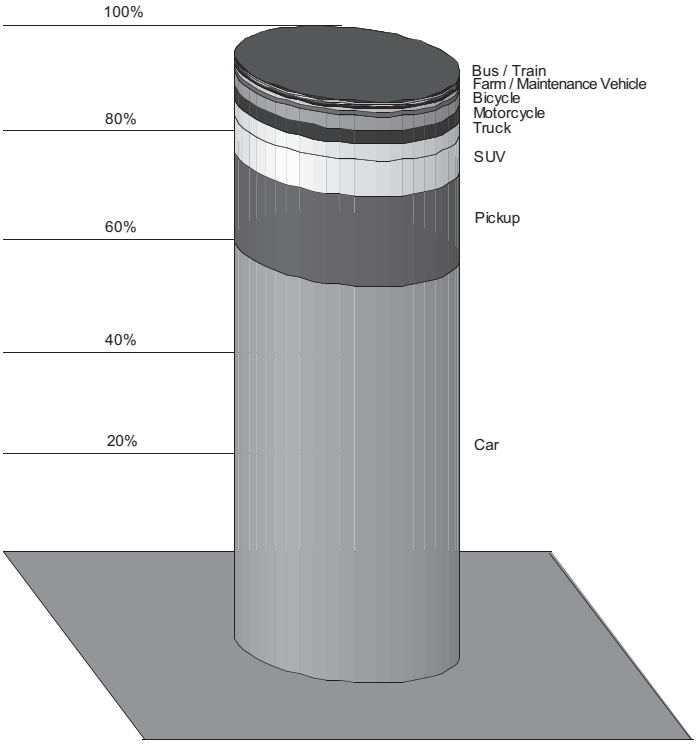
Current Programs and Successes

- [x] The Iowa DOT has developed guidelines to provide consistent and adequate pedestrian and bicycle facilities in both urban and rural areas. The agency now considers the need for bicycle and pedestrian accommodation as a part of every state highway improvement project.
- [x] Iowa SMS is providing assistance for a Des Moines area pedestrian safety effort. A trauma prevention group will target problem locations for neighborhood education and awareness.
- [x] Iowa SMS sponsored the development and piloting of a school-based bicycle and helmet safety program.[25]

Potential Strategies to Consider

- [ ] Continue ADA compliance efforts to meet and exceed requirements for accommodating the disabled and elderly (such as elimination of curbs at intersections).
- [ ] Consider adopting a bicycle helmet law, at least requiring helmet use for all bicyclists under 16 years of age (Iowa currently has no bicycle helmet law).

Iowa Crashes by Vehicle Type (1990–1999)



School Buses and Public Transit

The school bus is one of the safest forms of transportation in the United States. Each year, roughly 440,000 public school buses travel 4.3 billion miles, transporting 23.5 million children safely to and from school-related activities. Nationwide there are fewer than 10 school bus passenger fatalities annually, compared with 600 school-aged children killed in passenger cars and other private vehicles during school hours. In fact, school bus fatalities make up only about 0.3% of all fatal traffic crashes.[26] The state of Iowa has experienced just two school bus crashes resulting in passenger fatalities since 1955.[27]

[24] National data from NHTSA, 1999; Iowa data from Iowa DOT, *1999 Iowa Crash Facts.*
[25] In association with the Iowa Association for Health, Physical Education, Recreation and Dance.
[26] NHTSA, *Traffic Safety Facts* (1999).
[27] Iowa school bus crash data were first recorded in 1955.

Public transit is also a very safe form of transportation nationwide and in Iowa. There are 19 urban transit systems and 16 regional transit systems that serve Iowa. In 1999, 248 bus crashes were reported in Iowa, involving one fatality and 181 injuries.

Current Programs and Successes

- [x] Drivers of publicly and privately owned and operated school buses and public transit vehicles are required to hold a commercial driver's license with a class designation appropriate for the vehicle they will be operating.
- [x] Iowa SMS is funding a study using school bus mounted video cameras to observe the frequency and types of school bus passing in selected Iowa school districts. This is a response in part to school bus driver reports of increasing numbers of school bus passing occurrences on their routes.
- [x] Iowa SMS is developing a handbook for assisting communities in improving rural transit.

Potential Strategies to Consider

- [ ] Conduct statewide and local public information and awareness campaigns in conjunction with National School Bus Safety Week each October. In Iowa, illegal school bus passing, passenger safety while loading and unloading, and adequately trained and competent drivers are key bus safety areas.
- [ ] Study whether school bus passing citations are dismissed too often and whether compliance could be enhanced through law changes or other methods.
- [ ] Promote more public transit use by older, impaired, or disabled persons as a safer transportation alternative.

Motorcycles[28]

A motorcyclist is 16 times more likely to die in a crash and four times more likely to suffer an injury than an automobile driver per mile driven. Motorcycle crash injuries often include serious damage to the head, require prolonged care or rehabilitation, and exact large emotional and economic tolls from families and communities. In both 1999 and 2000, Iowa experienced 30 motorcycle fatalities.

Helmet use remains the most visible and perhaps most important issue related to motorcycle safety. Riders who don't wear helmets are 40% more likely to sustain a fatal injury in a crash than helmeted motorcycle riders. Over the last five years, more than 85% of all motorcyclists killed in Iowa were not wearing helmets. NHTSA estimates that helmets saved the lives of 551 motorcyclists in 1999. An additional 325 lives could have been saved nationwide if all motorcyclists wore helmets.

Current Programs and Successes

- [x] NHTSA and the Motorcycle Safety Foundation have teamed up to create the *National Agenda for Motorcycle Safety*, which promotes the safety of motorcyclists and provides recommendations for addressing motorcycle safety.
- [x] Iowa requires all motorcycles built in 1977 or after to be operated with the headlight on at all hours.

Potential Strategies to Consider

- [ ] Revise motorcycle operator licensing so that motorcyclists are licensed according to the size of motorcycle they demonstrate proficiency to ride and all first-time motorcyclists (regardless of age) are required to pass a motorcycle rider course.
- [ ] Require helmet use for all motorcycle drivers and passengers under the age of 18 and for all new drivers, if not for all drivers. Previously licensed drivers could be exempt. Although helmet laws are controversial, the Iowa SMS public opinion survey shows that over three-quarters of Iowans support requiring motorcycle helmet use. Still, Iowa remains one of only five states without some form of motorcycle helmet law.

[28] National data from NHTSA, *Traffic Safety Facts—Motorcycles* (1999); Iowa data from Iowa GTSB, *Motorcycle Fact Sheet* (June 2001).

Large Trucks and Farm Vehicles

Between 4,000 and 5,000 deaths annually involve large truck crashes on the nation's roadways. By a wide margin (greater than 6 to 1 in 1995) the fatalities were the occupants of the other (nontruck) vehicles. Because of vehicle weight, drivers and passengers are more likely to be injured or killed if a crash involves a large truck.

Because of Iowa's location in the heart of the nation, through traffic has a large impact on the state's travel safety. Iowa's highways carry thousands of cross-country trucks between the state's borders. As a result, nearly a third of all fatal crashes on interstates in Iowa involve trucks.[29] The trucking practices of these carriers are often dictated by federal rather than state regulations.

Iowa also experiences almost 300 collisions every year involving farm vehicles on public roads and right-of-ways. Agriculture remains an important part of Iowa's economy and heritage; safe farm-related transportation practices must be ensured.

Current Programs and Successes

- ☑ The U.S. DOT has shown commitment to reducing large truck crashes and crash severity, with the goal of reducing truck-related fatalities by 50% from 1999 to 2009. The Motor Carrier Safety Improvement Act of 1999 strengthened commercial driver's license requirements with increased compliance reviews and inspections.
- ☑ Iowa is the lead state in the Performance and Registration Information Systems Management (PRISM) program, which targets carriers that have a disproportionate number of crashes. Iowa is also a candidate for piloting the new Commercial Vehicle Analysis Reporting System.
- ☑ The Iowa GTSB has funded the youth-focused rural driver safety education program Farm Safety Just 4 Kids.
- ☑ Iowa law requires slow-moving vehicle emblems on all vehicles traveling under 25 mph and lights on self-propelled farm vehicles traveling roadways between dusk and dawn.

Potential Strategies to Consider

- ☐ Continue to enhance motor carrier enforcement by weigh station or patrols. Also monitor conditions such as hours of service and rest area availability.
- ☐ Increase integration of large truck crash reporting and standard crash reporting support at both state and federal levels to better document safety issues.
- ☐ Promote or require more installation and use of roll-over protective structures, seat belts, and higher reflectivity materials on farm vehicles. Many fatalities and injuries occur when farm vehicles roll over or drivers are ejected. Higher reflectivity materials can increase the visibility of slow-moving agricultural vehicles.

[29] 1999 data from the Iowa DOT.

CRASHES WITH TRAINS AND ANIMALS

Train-Vehicle Crashes

Thousands of collisions occur at railroad-highway grade crossings in the United States each year. Most of the crashes are the result of motor vehicle driver behavior.

In Iowa, while rail traffic measured in ton-miles increased by 77% from 1988 to 1998, total accidents decreased by 49%. The increased safety at Iowa's railroad-highway crossings is the result of improvements in warning devices, the closing of some crossings, and investments in public awareness campaigns.

Current Programs and Successes

- ☑ The U.S. DOT has produced several reports[30] that provide specific recommendations for improving railroad-highway crossing safety.
- ☑ The Federal Railroad Administration, charged with the responsibility of ensuring railroad safety throughout the nation, has made great strides in achieving this with many programs and initiatives, including the public awareness campaign *Highways or Dieways—the Choice Is Yours.*
- ☑ Operation Lifesaver is a national nonprofit education and public awareness program dedicated to reducing collisions, fatalities, and injuries at railroad-highway crossings. In Iowa, Operation Lifesaver has collaborated with the Iowa GTSB and Iowa DOT to produce a video that dramatizes the reality of train crossing crashes. (The video and Operation Lifesaver brochures should be provided at all driver's license stations.)

Potential Strategies to Consider

- ☐ Monitor and consider installing new products designed to increase safety at railroad-highway crossings (e.g., automated horns, reflective tape on railroad cars, and fluorescent yellow signs).
- ☐ Close selected railroad-highway crossings to reduce the number of crossings (and consequently the number of crossing crashes). This strategy has been effective elsewhere (Kentucky and Texas).

Vehicle-Animal Crashes

Three-quarters of a million vehicle-deer crashes occur every year in the United States, resulting in more than 200 motorist deaths.[31] Individual motorists usually pay at least $2,000 in vehicle repair every time they hit a deer. The annual cost to society for vehicle-animal crash fatalities and injuries is estimated to be $200 million.

With a 281% increase in the number of deer in Iowa and a 62% increase in the number of vehicle miles traveled over the last decade, it is no surprise that vehicle-deer crashes have become a major highway safety issue in the state. In 1999, there were an estimated 11,366 vehicle-deer crashes in Iowa. On average, Iowa experiences two vehicle-deer crash related fatalities on average every year.

Current Programs and Successes

- ☑ The Iowa DOT is working with 11 other states to evaluate the feasibility of an active deer warning system that detects deer in the roadside and provides a warning to approaching motorists.

Potential Strategies to Consider

- ☐ Use "Do Not Veer for Deer" public service announcements to communicate the message that hitting a deer generally carries less risk than veering or leaving the roadway to avoid a hit.
- ☐ Reduce Iowa's deer population by extending the hunting season and/or increasing the number of deer hunting permits granted. Reducing the size of Iowa's deer herd remains one of the most promising, though controversial, strategies for reducing vehicle-deer crashes in the state.

[30] *Accidents that Shouldn't Happen* and *Implementation Report of the U.S. DOT Grade Crossing Safety Task Force.*

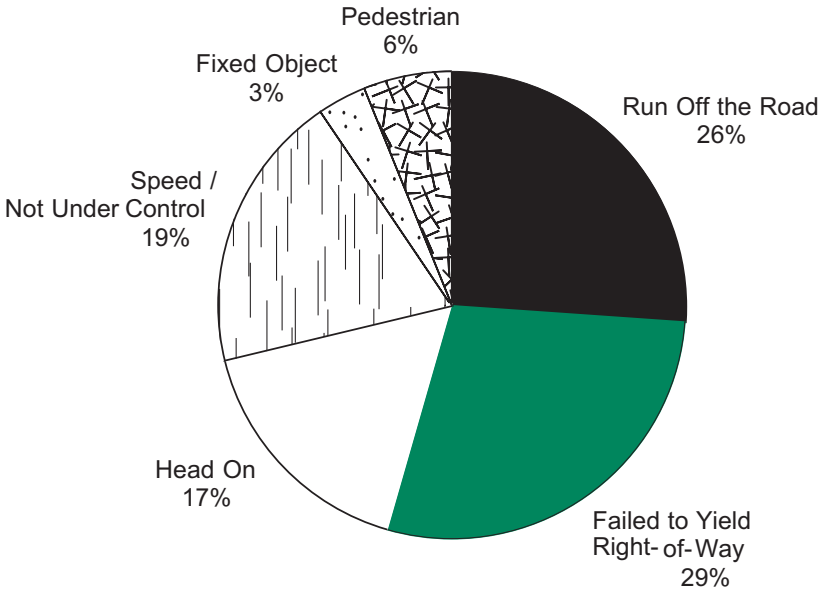
[31] According to the Wildlife Society.

ROADWAY DESIGN AND CRASH TYPES

Roadway design and geometry can have a significant effect on crash rates. Consider the following crash facts:[32]

- Intersections: 55% of all urban vehicle crashes occur at intersections.
- Run-off-the-road: The FHWA has determined that single-vehicle run-off-the-road crashes constitute 37% of all vehicle crashes. In Iowa, vehicles leaving the roadway result in an average of 150 fatalities and 5,000 injuries annually, with a societal cost to Iowa's citizens of $30 million each year.
- Head-on/across-median: One of the most severe types of crashes occurs when a vehicle shifts into an opposing flow traffic lane and crashes head-on with an oncoming vehicle. In Iowa, about 17% of crash fatalities are the result of head-on or across-median crashes. Ninety percent of these fatal head-on crashes occur on rural roads in the state.

Causes of Iowa Crash Fatalities



Current Programs and Successes

☑ Iowa has two specific traffic safety programs used to improve safety at high-crash locations. The Hazard Elimination Program is a federally funded program that targets the top 200 high-crash locations. The Iowa Traffic Safety Fund program provides funding to Iowa cities and counties to improve traffic safety. A recent roadway safety audit[33] showed that safety projects funded by these programs have resulted in a mean crash reduction of 23%, with a mean benefit/cost ratio of 6.3 to 1.

☑ Iowa has initiated a proactive safety program identifying high-crash locations by highway features (e.g., curves, posts, intersection types, and use).

☑ The Iowa DOT Office of Traffic and Safety conducts an annual forum to help keep state and local engineers abreast of standards and innovations.

Potential Strategies to Consider

☐ Focus safety improvements on areas with greatest risk. A national survey by the Advocates for Highway and Auto Safety shows that 85% of those polled want more attention paid to intersection safety problems.

☐ Further improve the effectiveness of Iowa's Traffic Safety Fund program by increasing funding from one-half percent to one percent of the state road use tax fund.

☐ Invest in more proactive highway improvements systemwide or at targeted locations. Some examples follow:

[32] 2000 Iowa crash data from the Iowa DOT Office of Traffic and Safety.

[33] In the form of the *Effectiveness of Roadway Safety Improvements* study conducted by the Center for Transportation Research and Education (CTRE) at Iowa State University.

- WARNING DEVICES: Consider installing larger or higher reflectivity warning signs on selected curves and illuminating roadway locations where warranted.
- PAVEMENT MARKINGS: Enhance pavement markings by painting more frequently or using more durable materials. Consider the use of raised pavement markings in selected locations and advance warning pavement markings for high-crash horizontal curves.
- RUMBLE STRIPS: Complete the installation of rumble strips on Iowa's four-lane freeways and expressways. On high-volume rural roadways, motorists who run off the right side of the roadway onto a granular shoulder often oversteer back to the left and enter the opposing traffic. The use of center-line rumble strips should be considered in selected locations where these incidents occur. Stop sign rumble strips may also be considered at selected locations.
- PAVED SHOULDERS: Provide partially paved shoulders with rumble strips on all expressways, freeways, and Super 2 highways (as opposed to the granular shoulders that are currently provided on most roadways in Iowa). Substantial safety benefits would be expected from such a change in practice.
- CLEAR ZONES: Improve clear zones and access control along selected roadways.
- CONVERSIONS: Convert selected four-lane undivided urban roadways to three-lane roadways with two-way left-turn lanes in appropriate locations statewide. A recent study[34] has documented the safety benefits gained by such conversion in specific conditions.

WORK ZONES

Nearly 800 fatalities and 37,000 severe injuries occur from vehicle accidents in work zones each year.[35] Iowa suffers its share of the nation's work zone crashes, with an annual average of 358. In the period 1991–2000, an average of eight people per year died from work zone crashes in Iowa.

Current Programs and Successes

- ☑ Iowa has implemented a regulatory 55 mph speed limit in rural expressway/freeway work zones.
- ☑ As of 2000, all Iowa DOT project flaggers are required to go through flagger training. Iowa's award-winning Safety Circuit Rider program[36] also offers flagging workshops to local agencies and other interested parties.
- ☑ The Iowa DOT has established the goal of having all work zone signs meet retroreflectivity standards and be crashworthy by 2002.

Potential Strategies to Consider

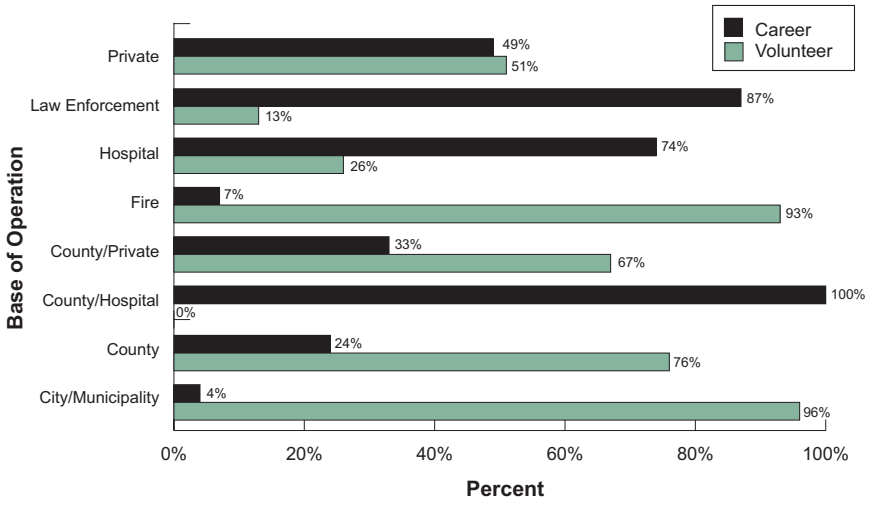
- ☐ Implement targeted public education and awareness campaigns, as these are critical to the success of work zone crash reduction strategies. Public service announcements and other multimedia materials such as the AAA Foundation for Traffic Safety's *Getting Safely Past the Orange Barrels* video could be included in driver training courses.
- ☐ Study and implement appropriate advanced technologies and other innovations—such as changeable message signs and temporary rumble strips.
- ☐ Increase funding for extra speed enforcement in work zones.
- ☐ Use photo enforcement for the reduction of excessive speeding in work zones. Although controversial, numerous research and pilot studies around the country have shown speed-monitoring cameras to be effective in the enforcement of excessive speeding. A national survey conducted by NHTSA found that the public supports the use of photo enforcement to reduce speeding by a margin of seven to three and by a margin of four to one at high-crash sites.

[34] CTRE, *Guidelines for the Conversion of Urban Four-Lane Undivided Roadways to Three-Lane Two-Way Left-Turn Lane Facilities.*
[35] According to FHWA.
[36] Part of the Local Technical Assistance Program housed at CTRE.

EMERGENCY RESPONSE

Not all crashes can be eliminated. Initial survivability and timely trauma care are "after crash" factors that determine the actual number of fatalities, severity of injuries, and recovery needs of crash victims. Emergency response is an important part of the "4 E's" of highway safety (the others are engineering, enforcement, and education, plus the fifth "E," everyone else).

Iowa EMS Providers by Personnel Type



Emergency response providers include emergency medical technicians (EMTs), paramedics, and a wide range of other certified providers, including hospital emergency room care staff. See chart of Iowa emergency medical services (EMS) providers by type. Depending on the location of a crash and availability of responders, there may ultimately be as many as 30–40 individuals on the scene to provide various levels of emergency response. One challenge faced by Iowa and other rural states is the level of volunteers needed as first responders, especially in low-population areas.

Current Programs and Successes

- ☑ The Crash Outcome Data Evaluation System (CODES) matches hospital admissions data with crash records to demonstrate actual injury treatment costs for various crash scenarios.[37]
- ☑ The Emergency Response Information System (ERIS), funded by Iowa SMS and partners, is currently documenting the boundaries and assets available in 17 pilot counties throughout the state. A survey is underway to help identify existing training levels and needs.
- ☑ Iowa SMS has commissioned a report on statewide emergency response conditions to address current resources, strengths, challenges, and needs, as well as projected trends.

Potential Strategies to Consider

- ☐ Increase emergency medical training efforts to require dispatch training for all EMS dispatchers and emergency traffic control training for all EMT personnel.
- ☐ Study the effectiveness of reducing fatalities and health costs through the development of a comprehensive emergency preparedness model in three high-incident interstate settings (urban, rural, and wilderness).
- ☐ Continue studying emergency response patterns with respect to roadways, crash sites, dispatch points, and trauma center destinations. Geographic information systems (GIS) tools could be used to map capabilities and model effectiveness.
- ☐ Implement global positioning system (GPS) technologies when and if appropriate for improving emergency response.

[37] NHTSA's CODES was adapted for this purpose by the Iowa Department of Public Health (Iowa DPH).

INFORMATION AND TECHNOLOGY

Intelligent Transportation Systems (ITS)

Intelligent transportation systems—applications of information and technologies designed to improve the movement of people and goods—are an important tool for improving highway safety. The U.S. DOT reports that ITS applications have directly resulted in a 50% decrease in freeway crashes.[38]

Current Programs and Successes

- ☑ The Iowa DOT has developed an integrated ITS deployment plan, which identifies key problems, defines objectives of ITS solutions, and describes an organizational structure and programming process. For the most current information on ITS in Iowa, visit the Iowa DOT On-Track web site (www.iowaontrack.com).
- ☑ The ITS Heartland Chapter of ITS America facilitates information sharing for ITS projects and activities in Iowa. ITS Heartland works to improve the quality of life for transportation users in the region through advanced transportation technologies and communications.
- ☑ Iowa SMS funded enhancements for the Iowa Highway Patrol Road Conditions Service, which provides more timely winter conditions information by telephone and on the Internet.

Data Systems

Data knowledge is probably the most powerful tool available in the campaign for highway safety. When traffic safety practitioners can use data to identify repeating patterns in the dynamic interaction of people, vehicles, pavement, traffic, and other conditions, there is increased potential for effectively reducing the number and severity of crashes.

There is no shortage of data. In addition to crash data, behavioral and sociological information, roadway engineering research, and health and demographic statistics are all available. These data are made useful for modeling and analysis through the development of complex databases and geographic information systems (GIS).

Highway safety professionals and advocates face the challenge of making the best use of the data by integrating various sources of relevant and reliable information and incorporating a multidisciplinary approach to analyzing the facts. Many useful products—such as maps, tables, and charts—result from data gathering, integration, and analysis efforts in Iowa; see the examples on the following pages.

Current Programs and Successes

- ☑ Iowa's Statewide Traffic Records Advisory Committee (STRAC) is a multidisciplinary safety group working to improve highway safety through numerous data-related projects. STRAC has been key in Iowa's role as host state for the National Model program, which improves data acquisition for roadway incidents, leverages proven technologies for law enforcement, and expands the use of this information for safety programs.
- ☑ The Iowa Traffic Safety Data Service (ITSDS) creates maps, charts, and reports for safety practitioners at all levels and disciplines to use in communicating highway safety information to the public and policy decision makers.[39]

Potential Strategies to Consider

- ☐ Improve the quality and timeliness of crash data available to state and local highway safety data analysts.
- ☐ Increase support and promotion of "cross-pollination" and use of relevant data across disciplines for traffic safety practitioners who rely on access to quality data in their efforts to improve highway safety.

[38] ITS applications have also contributed a 48% decrease in freeway travel times, according to the same report.

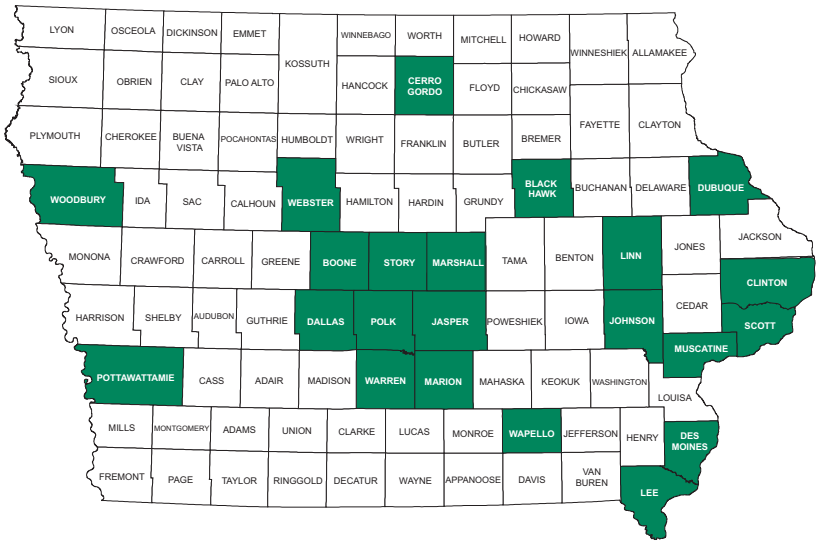
[39] The service is funded by the Iowa GTSB and Iowa DOT and is housed at CTRE.

Iowa Governor's Traffic Safety Bureau, Iowa Department of Public Safety

The Iowa GTSB identifies counties with traffic safety problems by giving equal weight to each of eight quantifiable measures:

1. fatalities
2. alcohol-related fatalities
3. injuries
4. serious injuries
5. alcohol-related injuries
6. vehicle miles traveled
7. operating while intoxicated revocations
8. motorcycle/pedestrian/bicycle fatalities/injuries

Iowa Counties Identified as Having Most Significant Traffic Safety Problems (FY 2001)



Office of Traffic and Safety, Iowa Department of Transportation

The Iowa DOT Office of Traffic and Safety determines safety improvement candidate locations based on a formula that gives equal weight to the number of crashes, crash rate (number of crashes per average daily traffic volume), and severity (loss value) of the crashes over a five-year period.

Locations Identified as Top Candidates for Highway Safety Improvement Projects (1995–1999)

Statewide Rank	Route	City	Location	Total Number of Crashes	Number of Crash Fatalities	Number of Crash Injuries	Calculated Value Loss
1	City Street	Des Moines	Porter Ave and SW 9th St	104	2	43	$3,666,776
2	US 69	Des Moines	Guthrie Ave and E 14th St	115	1	36	$2,546,700
3	US 6	Des Moines	Merle Hay Rd from Ovid Ave to Douglas Ave	98	1	24	$3,048,478
4	Eastbound IA 100	Cedar Rapids	Collins Rd and Northland Ave NE	140	1	34	$1,942,299
5	City Street	Sioux City	14th St and Douglas St	61	1	29	$1,911,180
6	US 69	Des Moines	Park Ave and SE 14th St	146	0	38	$1,792,923
7	Eastbound US 6	Davenport	US 6 and Welcome Way	183	0	45	$1,896,643
8	Eastbound US 6	Altoona	NB US 65 Ramp @ US 6	62	0	36	$1,370,851
9	City Street	Council Bluffs	24th St and 27th Ave	71	1	23	$1,365,854
10	US 6	Des Moines	Beaver Ave and Douglas Ave	122	0	35	$1,434,881

HIGHWAY SAFETY STRATEGIES FOR IOWA

Center for Transportation Research and Education, Iowa State University

CTRE, through its Iowa Traffic Safety Data Service, generates maps, charts, and reports for the Iowa DOT and other agencies.

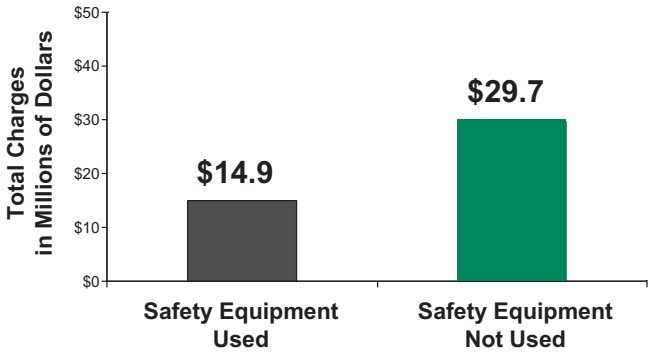
This map was created to show which US and IA highway curves in the state have the greatest crash problems. The numbers represent ranking (the lower the number, the greater the problem). Eleven percent of all crashes and 12% of fatal crashes occur at the top 36 locations, which make up only 1% of all highway curves in the state.

Curves on US and IA Highways in Iowa with Greatest Non-Animal Crash Problems (1989–1998)

Crash Outcome Data Evaluation System, Iowa Department of Public Health

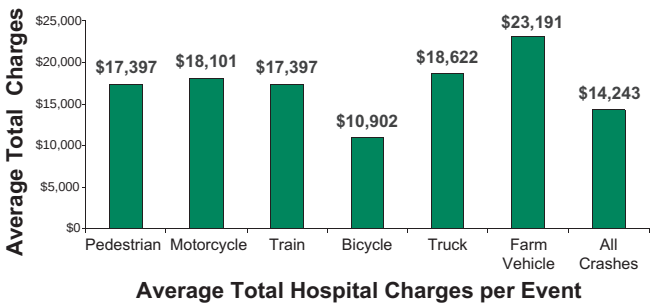
The Iowa DPH's charts and reports are based on data from over 6,000 crash records linked to hospital discharge records in the Crash Outcomes Data Evaluation System (CODES).

Safety Equipment Use in Non-Fatal Crashes Linked to Hospital Charges (1996–1998)



(Total Hospital Charges = $44.6 Million)

Hospital Charges Linked to Vehicle Crashes by Type (1996–1998)



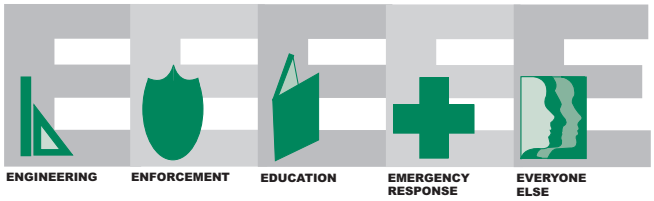
SAFETY MANAGEMENT SYSTEMS AND TEAMS

"Safety management is a systematic process which increases the chances of reaching safety goals by ensuring that all opportunities to improve highway safety are identified, considered, and implemented as appropriate, and evaluated in all phases of highway planning, design, maintenance, and operations."[40]

An effective highway safety management system must be multidisciplinary, incorporating the "4 E's + 1"—engineering, enforcement, education, and emergency response, plus "everyone else." The process requires communication, collaboration, coordination, and cooperation (the "4 C's").

Iowa's safety management system, Iowa SMS, has been strong since its inception under the federal Intermodal Surface Transportation Efficiency Act (ISTEA) in the early 1990s, winning the FHWA's Partnership in Excellence Award in 1999.

The "4E's + 1" of Highway Safety



Current Programs and Successes

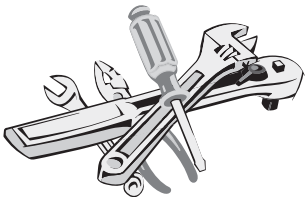
- ☑ The American Association of State Highway and Transportation Officials (AASHTO) *Strategic Highway Safety Plan* provides a model for state safety management teams to use in developing their own plans.[41]
- ☑ NHTSA's Safe Communities model offers a template for forming local multidisciplinary multi-jurisdictional groups focused on highway safety and preventing motor vehicle fatalities and injuries.
- ☑ The Iowa DOT Office of Traffic and Safety sponsored the *Traffic and Safety Informational Series*, which makes available clear, concise, and consistent answers to common traffic and safety questions.
- ☑ The Iowa SMS web site (www.IowaSMS.org) has been created and is being developed to include easy-to-access and up-to-date safety management information, documents, resources, and links for Iowa's highway transportation safety practitioners and advocates as well as for the interested public.
- ☑ Iowa SMS and FHWA sponsored a multi-state peer exchange (in October 2000), where representatives from many states shared multidisciplinary highway safety successes and challenges, and where ideas for future efforts and strategies were generated.
- ☑ Iowa SMS has partnered with the Iowa Traffic Control Safety Association to host a peer exchange for potential and active local highway safety teams to share resources and experiences.

Potential Strategies to Consider

- ☐ Expand funding of Iowa's Traffic Safety Fund program from one-half percent to one percent of the road use tax fund to optimize the effectiveness of the program. The Traffic Safety Fund program provides funding to Iowa cities and counties to improve traffic safety. A recent roadway safety audit[42] showed that safety projects funded by the program have resulted in a mean crash reduction of 21%, with a mean benefit/cost ratio of 6.9 to 1.
- ☐ Implement local multidisciplinary safety teams in each of Iowa's nine major urban areas.

[40] FHWA statement.
[41] Note that Iowa SMS used the AASHTO model in developing its 1999 *Iowa Strategic Highway Safety Plan* draft, which was revised with multidisciplinary expertise and public comment into the current living document *Toolbox of Highway Safety Strategies.*
[42] CTRE, *Effectiveness of Roadway Safety Improvements.*

RESOURCES AND ABBREVIATIONS



The information in this document is drawn from many individuals and sources. Key resources are listed here; full references are provided in the Iowa SMS *Toolbox of Highway Safety Strategies* and are available from Iowa SMS. Visit www.IowaSMS.org for all Internet links.

AAA Foundation for Traffic Safety
www.aaafts.org

Advocates for Highway and Auto Safety
www.saferoads.org

American Association of State Highway and Transportation Officials (AASHTO)
www.transportation.org

Center for Transportation Research and Education (CTRE), Iowa State University
www.ctre.iastate.edu

Crash Outcome Data Evaluation System (CODES)
See Iowa DPH

Federal Highway Administration (FHWA)
www.fhwa.dot.gov

Federal Motor Carrier Safety Administration (FMCSA)
www.fmcsa.dot.gov

Federal Railroad Administration (FRA)
www.fra.dot.gov

Federal Transit Administration (FTA)
www.fta.dot.gov

Iowa Department of Public Health (Iowa DPH)
www.idph.state.ia.us

Iowa Department of Public Safety (Iowa DPS)
www.state.ia.us/government/dps/

Iowa Department of Transportation (Iowa DOT)
www.dot.state.ia.us

Iowa Governor's Traffic Safety Bureau (Iowa GTSB), Iowa DPS
www.state.ia.us/government/dps/gtsb/

Iowa Safety Management System (Iowa SMS)
www.IowaSMS.org

Iowa Traffic Safety Data Service (ITSDS)
www.ctre.iastate.edu/itsds/

National Highway Traffic Safety Administration (NHTSA)
www.nhtsa.dot.gov

Office of Traffic and Safety, Iowa DOT
www.dot.state.ia.us/traffic_safety/

Special Traffic Enforcement Program (STEP)
See Iowa GTSB

Statewide Traffic Records Advisory Committee (STRAC)
See Iowa SMS

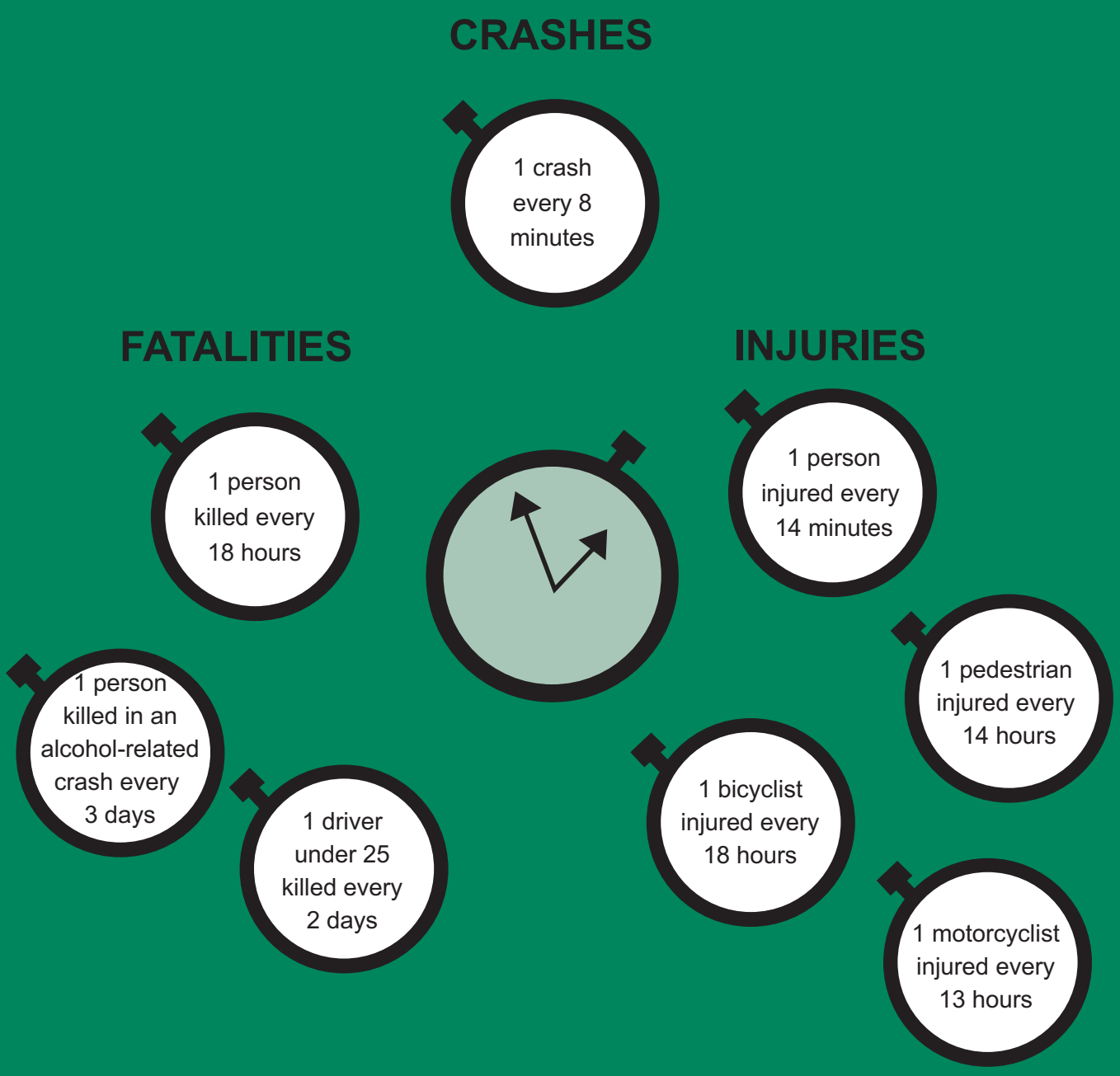
U.S. Department of Transportation (U.S. DOT)
www.dot.gov

IOWA HIGHWAY SAFETY MANAGEMENT SYSTEM

IOWA SMS
800 Lincoln Way, Ames, Iowa 50010
Phone 515-239-1169 / Fax 515-239-1891
www.IowaSMS.org

* Iowa's Crash Clock on the back cover is based on data from the Iowa DOT's *1999 Iowa Crash Facts.*

Iowa's Crash Clock



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