

2019-2023 IOWA  
**STRATEGIC HIGHWAY  
SAFETY PLAN**



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## Safety leadership

Iowa is fortunate to have the dedicated support of various public and private entities with the ultimate goal of Zero Fatalities. These partners not only support the development of the Strategic Highway Safety Plan (SHSP) but also advocate for and implement strategies that ultimately result in fewer fatalities and injuries on Iowa's roadways.

The agencies and organizations below are recognized for their contribution of time and resources to the development of this plan.

### **Iowa Department of Transportation**

- Driver & Identification Services
- Office of Local Systems
- Motor Vehicle Enforcement
- Strategic Communications & Policy
- Office of Systems Planning
- Office of Traffic & Safety

### **Iowa Department of Public Safety**

- Iowa State Patrol
- Governor's Traffic Safety Bureau

### **Iowa Department of Human Rights**

- Criminal Juvenile Justice Planning

### **Iowa Department of Public Health**

- Bureau of Emergency and Trauma Services
- Office of Disability, Injury, and Violence Prevention

### **U.S. Department of Transportation**

- Federal Highway Administration
- Federal Motor Carrier Safety Administration
- National Highway Traffic Safety Administration

### **Iowa Association of Councils of Governments**

### **Iowa County Engineers Association**

### **Iowa Local Technical Assistance Program**

### **Iowa State University's Institute for Transportation**

### **The University of Iowa's Injury Prevention Research Center**

## Partner pledge

In this pledge, we formalize our support for the goals in Iowa's 2019-2023 SHSP and the overall vision of Zero Fatalities on Iowa's public roadways. Zero Fatalities is already the personal goal of every road user. Implementation of the safety strategies outlined in this SHSP will help road users keep that personal goal of staying safe while driving, walking, or riding on Iowa's roadways.

Iowa has shown that dedication to proven safety programs and projects can reduce traffic fatalities and serious injuries. We are committed to enhancing existing programs that work, and implementing the safety strategies outlined in the SHSP to continue to drive down fatalities and serious injuries.

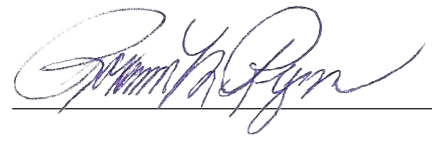
### We specifically commit to:

- leading implementation of SHSP strategies that relate to the work of our agency,
- providing necessary support and resources to implement SHSP strategies,
- supporting partner agencies as they lead SHSP strategy implementation,
- actively participating in SHSP events and initiatives, and
- promoting the SHSP and its goals whenever reasonably possible.



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Mark Lowe, Director  
Iowa Department of Transportation



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Dr. Roxann Ryan, Commissioner  
Iowa Department of Public Safety



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Gerd Clabaugh, Director  
Iowa Department of Public Health

## Executive summary

On December 4th, 2015, President Obama signed into law the Fixing America's Surface Transportation (FAST) Act, which continued many of the comprehensive approaches to highway safety from the previous legislation, Moving Ahead for Progress in the 21st Century Act (MAP-21), including the Highway Safety Improvement Program (HSIP). A key planning component of HSIP is the required Strategic Highway Safety Plan (SHSP). According to the U.S. Department of Transportation, an SHSP is a "statewide coordinated safety plan that provides a comprehensive framework for reducing fatalities and serious injuries on all public roads." The purpose of the SHSP is to identify effective safety strategies to address areas of greatest need to make roadways safer.

This document is an update to Iowa's 2017 SHSP, and is the fourth such effort in Iowa since it became a requirement. Iowa's SHSP was developed in consultation with the SHSP Implementation Team, which is composed of individuals representing the E's of safety (education, emergency medical services, enforcement, and engineering). These representatives provide updates on programs, policies, and educational campaigns for their respective organizations, as well as data on the latest research for their area of expertise. For this update, the prioritization of Iowa's 18 safety emphasis areas was supported by an analysis of crash data and an extensive statewide input process involving Iowa's traffic safety stakeholders. The result of these efforts was the prioritization of eight of the safety emphasis areas that are now considered priority safety emphasis areas. For each of the priority safety emphasis areas, the Implementation Team identified strategies that provide the greatest opportunity to reduce fatalities and serious injuries.








## Safety emphasis areas

Implementation of the following strategies will be carried out by the SHSP Implementation Team and broadly supported by traffic safety professionals from around the state. The implementation and progress of this plan will be evaluated on an annual basis over the five-year planning period starting January 2019 and ending December 2023. The ultimate goal of this plan is Zero Fatalities, however, interim annual goals aligning with the HSIP performance measures will be developed during the plan period. While the strategies identified in this plan represent the current focus of the Implementation Team, the Team recognizes the quickly changing landscape of transportation and technology and is prepared to be responsive and flexible to the needs of the state. Although the Implementation Team is fully committed to reducing the number of fatalities and serious injuries on Iowa's roadways, it recognizes that commitment pales in comparison to the cumulative impact every driver can have on the safety of Iowa's roadways.








### Lane departures and roadside collisions

-  Evaluate high lane departure crash corridors for two-lane highways and deploy road safety audit (RSA) teams to evaluate.
-  Evaluate high-friction surface treatments (HFST) at targeted locations on state-owned and local systems.
-  Place centerline and/or shoulder rumble strips on rural two-lane highways on state-owned and local systems. Where necessary, install or widen paved shoulders.
-  Continue median cable barrier installations on the Interstate system. Initiate median cable barrier installations on multi-lane divided highways.
-  Focus on the road, don't over-correct or veer for objects or animals in the roadway.



### Speed-related

-  Educate drivers on the importance of controlling and managing vehicle speed.
-  Identify corridors with a high frequency of speed-related crashes and implement high-visibility enforcement campaigns.
-  Evaluate and implement signing and geometric design strategies to moderate speeds and enhance safety.
-  Implement speed feedback signs at targeted locations.
-  Give yourself enough time to reach your destination. Be patient, slow down, and don't engage with aggressive drivers.

## Key to the 5 E's



Education



EMS



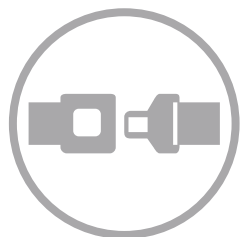
Enforcement



Engineering



Everyone



### Unprotected persons



Conduct public awareness campaigns focused on generating awareness of the risks associated with unprotected persons.



Include medical professionals in educational efforts.



Conduct highly publicized enforcement campaigns focused on restraint use.



Buckle up everyone and every time.



### Young drivers



Improve content and delivery of driver education curriculum.



Continue educating young drivers in school-based settings using various training techniques, including those that simulate impairment.









Support a broad-based coalition to plan for addressing age-based transportation needs.



Support young drivers to avoid distractions and impairment.



## Intersections

-  Develop educational resources informing the public of alternative intersection types, traffic signals, and laws.
-  Conduct enforcement campaigns related to bicycle and pedestrian awareness at targeted intersections.
-  Use systemic approaches to improve visibility and awareness of intersections.
-  Implement alternative intersection designs that reduce conflict points and enhance safety and mobility.
-  Develop an intersection configuration/evaluation tool to aid planners and designers in selecting appropriate intersection types.
-  Approach intersections with caution and get familiar with new designs in your community.








## Impairment involved

-  Educate drivers on the different types of impairments and their effects on driving.
-  Employ screening and brief interventions in healthcare settings.
-  Support trainings for 60 new drug recognition expert (DRE) officers and 500 new advanced roadside impaired driving enforcement (ARIDE) officers.
-  Develop and implement a standardized approach for law enforcement to identify impaired drivers.
-  Expand 24/7 program, place of last drink program, and ignition interlock program.
-  Enhance detection through special OWI patrols and related traffic enforcement.
-  Implement countermeasures at access locations to reduce wrong-way driving on multi-lane divided highways.
-  Designate a driver, call a cab, but don't risk driving impaired.








## Older drivers

-  Support a broad-based coalition to plan for addressing age-based transportation needs.
-  Provide educational and training opportunities for mature drivers that address driver safety, road engineering and signage, vehicle technology, driver licensing, health and vision concerns, and alternative transportation options.
-  Update publications and web resources for older drivers and their families to include safety strategies, warning signs, and planning for driving retirement.
-  Update procedures for assessing medical fitness to drive.
-  Know when to put the keys down, or when to have a conversation with family members who may pose a hazard to others on the road.



## Distracted or inattentive drivers

-  Develop targeted interventions and education programs for high-risk populations.
-  Support high-visibility enforcement campaigns for hands-free cell phone law.
-  Put the cell phone down, avoid distractions, be alert, and focus on the roadway.



# 1. INTRODUCTION & BACKGROUND



Traffic-related fatalities remain one of the leading causes of death by unintentional injury in the United States, according to the Centers for Disease Control and Prevention. In Iowa over the last 10 years, 3,587 people have lost their lives and 15,755 people have been seriously injured in vehicle related crashes. Significantly more Iowans have been impacted by minor injury and property damage crashes, which have both societal and economic impacts that extend beyond those involved in the crash. The challenge of reducing crashes on Iowa's roadways demonstrates the need to develop a strategic effort to save lives and prevent injuries.

## 1.1 Background of the Strategic Highway Safety Plan

On Dec. 4th, 2015, President Obama signed into law the Fixing America's Surface Transportation (FAST) Act, which continued many of the comprehensive approaches to highway safety from the previous legislation, Moving Ahead for Progress in the 21st Century (MAP-21) Act. One key provision that has been retained is the Highway Safety Improvement Program (HSIP). The HSIP is a core federal-aid program with the purpose of significantly reducing the number of traffic fatalities and serious injuries on all public roads through the implementation of infrastructure-related highway safety projects. The program is codified in 23 U.S.C 148 with implementing regulations in 23 C.F.R Part 924.

A key planning component of the HSIP program is the requirement for a Strategic Highway Safety Plan (SHSP). This plan has been a federal requirement for states since the adoption of Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users (SAFETEA-LU), which was signed into law by President George W. Bush in 2005. In order to obligate federally distributed HSIP funds, each state is tasked with developing an SHSP in collaboration with a diverse group of road safety professionals, including those from engineering, education, enforcement, and emergency medical services. These efforts must be evaluated and updated every five years.

Iowa has developed its SHSP to meet the significant challenge of reducing fatal and serious injury crashes. According to the Federal Highway Administration (FHWA), an SHSP "is a statewide coordinated safety plan that provides a comprehensive framework for reducing highway fatalities and serious injuries on all public roads." An SHSP must use a data-driven approach to identify key emphasis areas and strategies that have the greatest potential to reduce highway fatalities and serious injuries. Goals within the plan must be performance-based and should be consistent with other state highway safety programs. An SHSP is used to identify key safety needs and guide investment decisions. The development of an SHSP also brings together a broad range of like-minded safety partners who rely on each other's expertise. These safety partners typically leverage agency resources to collectively address the diverse safety challenges within the state. The most important aspect of an SHSP is that the strategies developed to address the safety issues are comprehensive and coordinated.

## 1.2 Iowa's safety context

Iowa's SHSP is a comprehensive transportation safety plan that identifies strategies and goals for the entire state, including all public roads. This plan will guide Iowa's traffic and safety efforts. To develop the most effective strategies and goals for the state, an understanding of the unique characteristics of Iowa's transportation system, its users, and the crashes that occur on its roadways is essential.

### System and travel characteristics

Iowa's transportation system includes a vast network of over 114,000 miles of roadway and more than 24,000 bridges. This network is composed of a broad range of facility types, from multilane divided interstates to gravel roads. Table 1.1 summarizes Iowa's public roadway system.

**Table 1.1: Summary of Iowa's public roadway system**

System	Mileage	Percent of total mileage	Number of bridges	Total VMT (millions)	Percent of total VMT
Primary	9,574	8%	4,101	20,645	61%
Secondary	89,834	79%	18,927	5,523	17%
Municipal	15,102	13%	1,151	7,095	21%
<b>Total</b>	<b>114,510</b>	<b>100%</b>	<b>24,179</b>	<b>33,263</b>	<b>100%</b>

(Source: Iowa DOT)

As can be seen in Table 1.1, the majority of roadway mileage is classified as secondary or municipal. This mileage belongs to the county and city governments, respectively, throughout the state. While county and city governments bear the responsibility for over 90 percent of Iowa's public road miles, over 60 percent of the Vehicle Miles Traveled (VMT) within the state occur on state-owned routes.

Most VMT is concentrated within metropolitan areas or along major interstate and U.S. highway routes. As Figure 1.1 illustrates, the counties and roadways with the most total VMT are those that are near a metropolitan area or interstate highway. The efforts within the SHSP consider all public roadways, including primary highways, secondary roads, and municipal streets. These include high-risk rural roads, which are defined as paved rural major and minor collectors and paved local roads. High-risk rural roads are further classified as routes with a posted speed limit greater than 45 miles per hour (mph) and with a paved surface width of less than 26 feet.

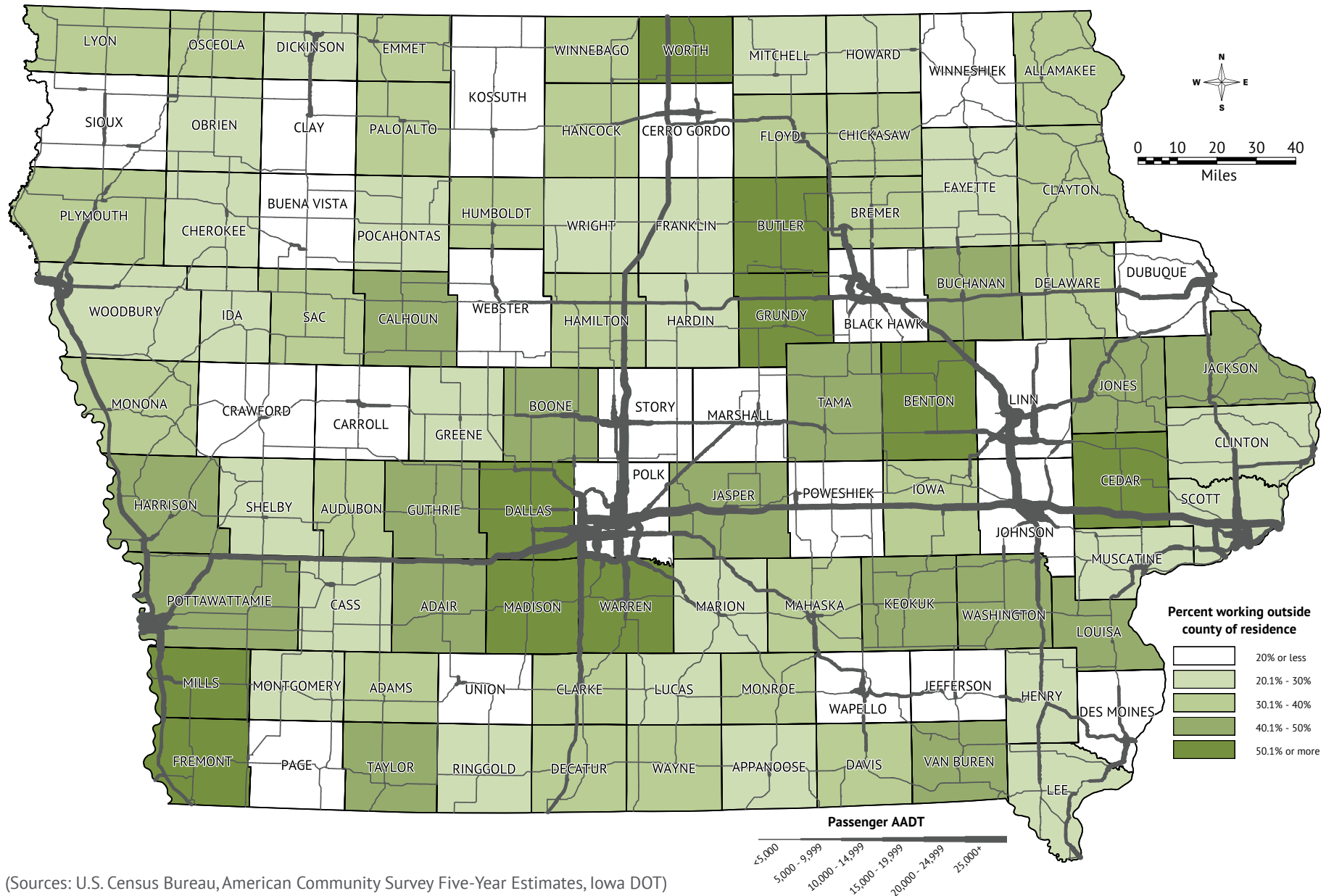
The overwhelming majority of Iowans drive to work alone. Table 1.2 depicts the mode of transportation to work used by Iowans from 1990-2016. In Table 1.2, the most significant changes in mode share occurred in the categories of drove alone, which saw a 7.3 percent increase, and carpool and walk, which decreased 3.3 percent and 2.3 percent, respectively. There was also a slight decline in the number of Iowans that worked from home. The use of public transportation and bicycling to work remained stable from 1990-2016, with less than a percent difference in change.

**Table 1.2: Iowans' mode of transportation to work 1990-2016**

	1990	2000	2012-2016
<b>Drove alone</b>	73.4%	78.6%	80.7%
<b>Carpool</b>	11.9%	10.8%	8.6%
<b>Public transportation</b>	1.2%	1.0%	1.1%
<b>Bicycle</b>	0.3%	0.4%	0.5%
<b>Walk</b>	5.8%	4.0%	3.5%
<b>Other (includes motorcycle and taxi)</b>	0.7%	0.6%	1.0%
<b>Worked at home</b>	6.7%	4.7%	4.5%

(Sources: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates)

**Figure 1.1: Commuting trends of passenger annual average daily traffic (AADT) on primary highways, and percent of workforce leaving county of residence to work, 2015**



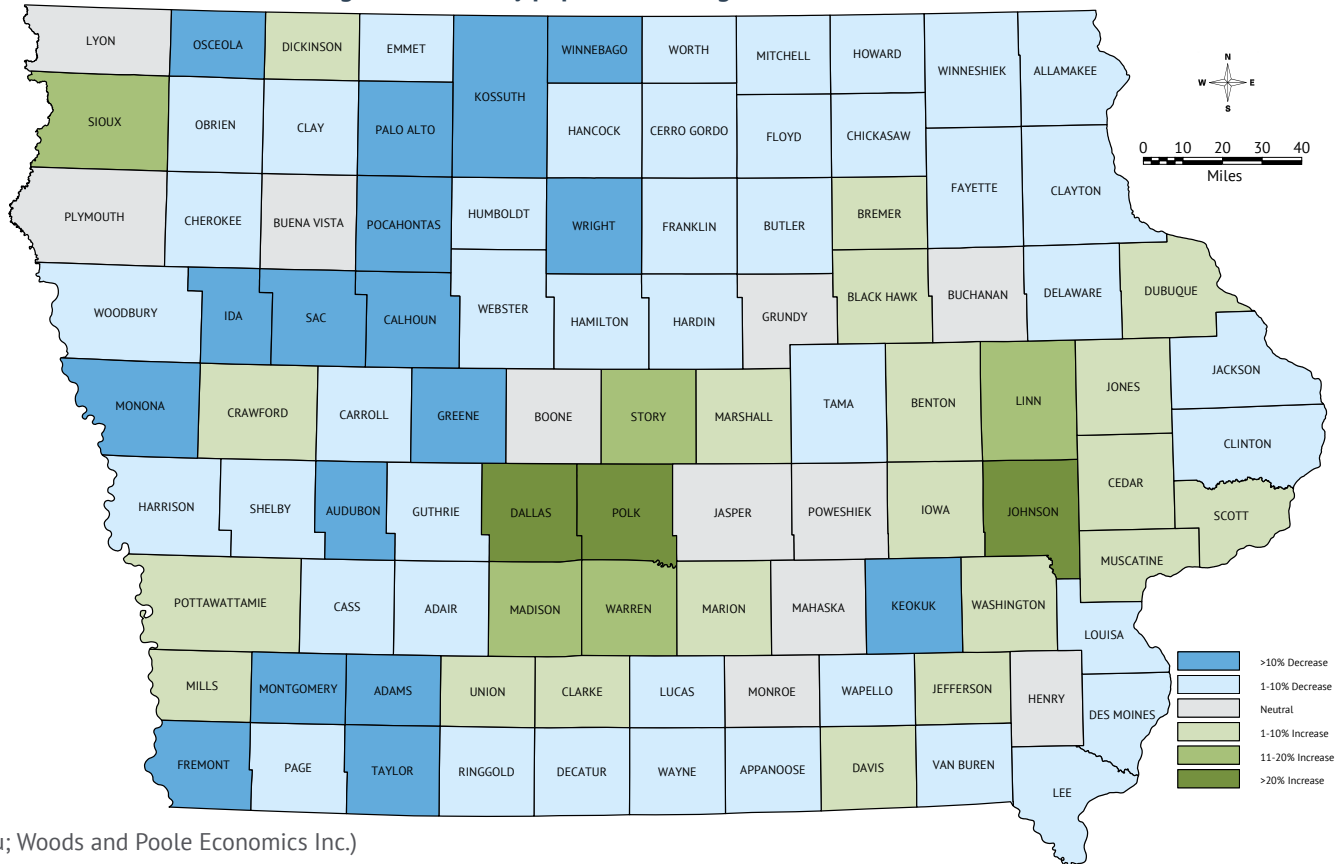
(Sources: U.S. Census Bureau, American Community Survey Five-Year Estimates, Iowa DOT)

## Sociodemographic characteristics

Iowa's population has increased 9.5 percent over the past 30 years, and it is projected that the population will continue to increase at nearly the same rate over the next three decades. Iowa's population growth between census years shows that it is growing at a slower rate than the national average according to the U.S. Census Bureau. Iowa's growth is not uniform as most growth seems to be concentrated in the counties near the nine metropolitan areas of the state. In other words, Iowa's population seems to be moving to the urban areas, which is illustrated in Figure 1.2. According to the U.S. Census Bureau, Iowa's population was estimated at 3.1 million in 2016 and by 2045 it is estimated to increase to approximately 3.4 million. In 1985, the ten most populous counties accounted for 44 percent of Iowa's population. It is projected that by the year 2045, 56 percent of the population will be living in the ten most populous counties.

Further, the median age of Iowans has increased from 30 years in 1980 to 38 years in 2016, and 15.5 percent of the population is older than 65. This suggests that Iowa's population is aging. Although the median age is increasing, Millennials (commonly defined as those born between 1981 and 2000) currently account for the majority of Iowa's population, followed by Baby Boomers (those born between 1946 and 1965).

**Figure 1.2: County population change, 2000-2015**



(Sources: U.S. Census Bureau; Woods and Poole Economics Inc.)

## Safety challenges facing Iowa

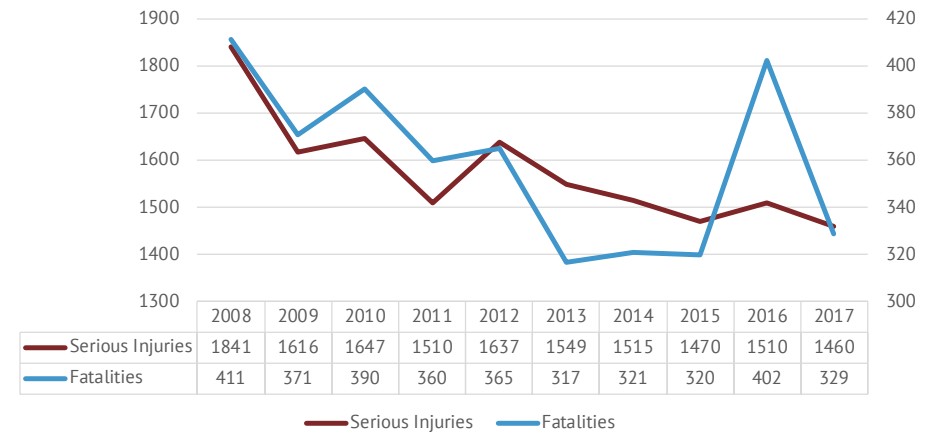
Nationally, in 2016 there were 37,461 traffic-related fatalities with a fatality rate of 1.18 per 100 million VMT (HMVMT). This was an increase of 6.7 percent from 2015. Many states around the nation saw an increase in fatalities from 2015-2016. Iowa was among those states, with a 26.5 percent increase in fatalities from 2015-2016. This was the largest increase in the number of fatalities over the last decade. Figure 1.3 presents the number of fatalities and serious injuries since 2008. Serious injury crashes have had only slight decreases over the last five years. In general, fatalities and serious injuries in Iowa have been trending downward over the previous decade (see Figure 1.3 and Figure 1.4). From 2008-2017, the rate of serious injury per HMVMT has decreased from 5.9 HMVMT to 4.3 HMVMT.

Since 2008, 56 percent of all fatal and serious injury crashes have occurred in rural areas, whereas 44 percent have occurred in urban areas. Similarly, 55 percent of all fatal and serious injury crashes occurred on either the county system or municipal system, while the remaining 45 percent occurred on the primary highway system. This data demonstrates that even though a majority of the miles being traveled occurred on roads within the Iowa DOT's jurisdiction, many of the fatal and serious injury crashes did not.



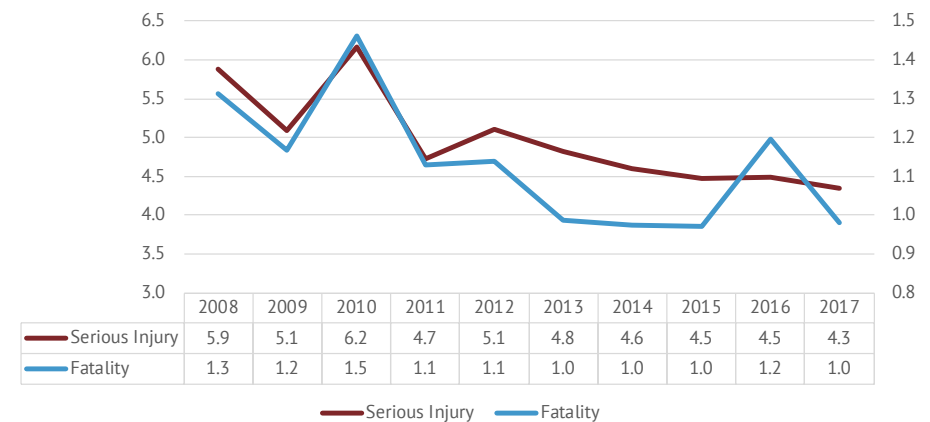
On average, nearly **37 PEOPLE**  
**ARE KILLED OR SERIOUSLY INJURED**  
 every week on Iowa's roadways

Figure 1.3: Fatalities and serious injuries 2008-2017



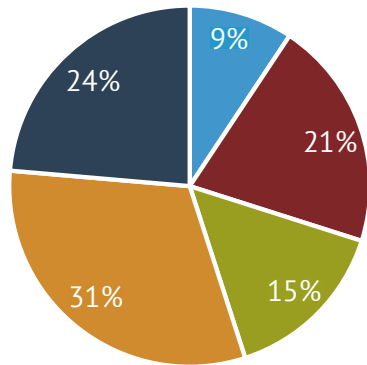
(Source: Iowa DOT)

Figure 1.4: Fatalities and serious injury rates per HMVMT 2008-2017



(Source: Iowa DOT)

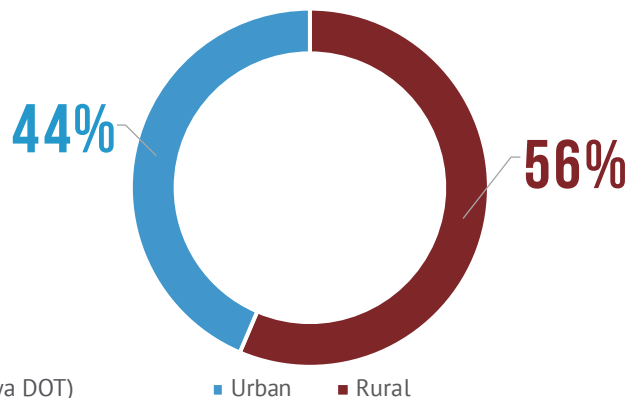
**Figure 1.5: Percentage of fatal and serious injury crashes by road class**



(Source: Iowa DOT)

■ Interstate ■ U.S. route ■ Iowa route ■ Secondary road ■ Municipal road

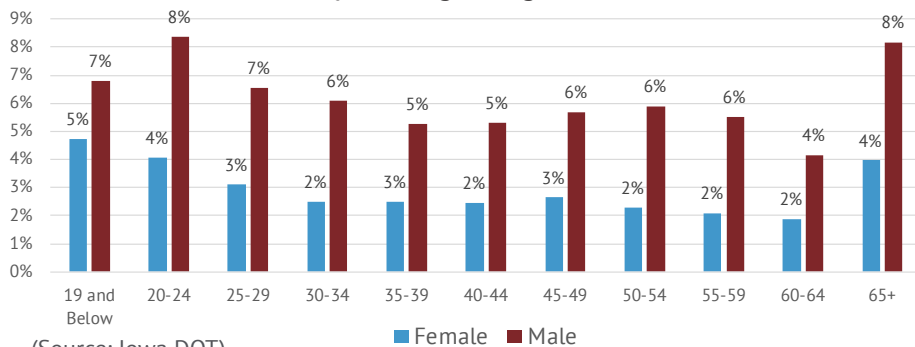
**Figure 1.6: Percentage of fatal and serious injury crashes 2008-2017**



(Source: Iowa DOT)

■ Urban ■ Rural

**Figure 1.7: Percent of fatal and serious injury crashes by driver age and gender**



(Source: Iowa DOT)

■ Female ■ Male

In Iowa, male drivers in every age group represent a disproportionately large percentage of the fatal and serious injury crashes. Further, for both male and female drivers, the age groupings with the largest proportions are those at either end of the spectrum. For example, the highest represented group, if age and gender are combined, is males under the age of 25. These drivers are represented in over 15 percent of the fatal and serious injury crashes between 2008-2017. Similarly, male drivers 65 and older were involved in 8 percent of the total fatal and serious injury crashes during the 10-year period.

### Implications for Iowa

- Iowans under the age of 25 and Iowans over the age of 65 represented over 35 percent of the drivers involved in fatal and serious injury crashes. However, these two demographics have drastically different driving behaviors and transportation safety needs.
- It is projected that Iowa's population will continue to urbanize; however, a larger proportion of Iowa's fatal and serious vehicle injuries are occurring in rural areas as opposed to urban areas. Consideration should be given to Iowa's high-risk rural roads.
- Even though more travel occurs on the primary system, more fatalities and serious injuries occur on county and municipal systems.
- In Iowa, male drivers are over-represented in fatal and serious injury crashes, often 2-3 times their female counterparts.



## 1.3 State legislation

Iowa's traffic safety culture is supported by policy and legislation that is focused on reducing the number and severity of vehicle crashes on Iowa's roadways. Although Iowa has passed many of the top-identified life-saving traffic safety laws, there are still others that could be implemented and existing laws that could be updated. This section provides a brief overview of the legislation related to traffic safety that has been passed since the previous update to Iowa's SHSP. These laws will support a stronger culture of traffic safety within the state and will act as a catalyst for future legislation within Iowa.

### Ignition interlock

In 2018, the Iowa legislature passed House File 2338, which requires first-time OWI offenders who seek a temporary restricted license to install an ignition interlock device on all vehicles owned and driven by the offender. An ignition interlock device requires a driver to blow into a mouthpiece, and if the device detects the presence of alcohol it prevents the vehicle from starting. Beyond reducing the number of alcohol-related traffic fatalities and serious injuries, the passage of the ignition interlock law also means that Iowa is eligible for federal grants from the National Highway Traffic Safety Administration (NHTSA).

### Statewide Sobriety and Drug Monitoring Program

Senate File 444, passed in 2017, established a Statewide Sobriety and Drug Monitoring Program (also known as a 24/7 program) that can be used by participating jurisdictions within Iowa. This program, which was modeled after a similar program from South Dakota, will require OWI offenders, under condition of bond, pretrial release, sentence, probation, parole, or a temporary restricted license, to be subject to twice-daily testing to determine whether alcohol and/or a controlled substance is present in the person's body. Offenders will also be required to install an approved ignition interlock device on all motor vehicles owned or operated by the offender. This program is initially being piloted in Woodbury County in the coming year.



### Use of electronic communication

Senate File 234, passed in 2017, banned the “use of hand-held electronic communication device to write, send or view an electronic message while driving a motor vehicle unless the vehicle is at a complete stop off the traveled portion of the roadway.” This use is now a primary offense and includes drivers viewing text messages, instant messages, e-mail, internet sites, social media applications, or games while driving.

### Homicide-by-vehicle

Also part of Senate File 444, the Iowa legislature expanded Iowa's homicide-by-vehicle statute. Those drivers who are using a device such as a cell phone and are involved in a vehicle crash that results in a fatality can now face felony charges. These charges will carry a sentence of up to 10 years in prison and a fine of up to \$10,000.

### Blue and white lights

Senate File 2163, passed in 2018, allows for the permanent use of amber, white, or blue reflector lights for Iowa DOT equipment that is being used for snow and ice treatment or removal on public roadways. This law essentially made permanent an existing law that had a repeal date of July 1, 2019. The addition of the white and blue lights makes the snow plows more visible to vehicles approaching them from behind. During the two years of piloting this project, Iowa DOT snowplows were involved in 10 crashes compared to 29 during the two years before the project.

### Move over or slow down

All 50 states have a version of the “Move Over” law which requires motorists to change lanes or slow down when approaching a stationary emergency vehicle with flashing lights. In 2018, Iowa expanded its original 2002 “Move Over” law to include any vehicle with flashing hazard lights. This expansion is designed to protect not only emergency personnel or those who maintain our roadways, but all motorists who might find themselves on the side of the road.

### Future legislative strategies

Although Iowa has made great strides in passing legislation that supports reducing the number of severe crashes on its roadways, there are still opportunities to improve traffic safety. Below are a number of initial legislative strategies the Implementation Team will undertake during the plan period to help improve safety, including providing information and supporting legislation related to:

- reducing distracted, drowsy, and impaired driving
- hands-free cell phone requirements
- all-passenger primary seatbelt requirements
- strengthening or enhancing graduated driver’s license (GDL) requirements
- requiring drivers to change lanes when passing bicyclists



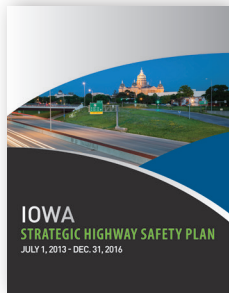
## 1.4 Previous Iowa safety planning efforts

Iowa has been developing safety plans since the 2006 Iowa's Comprehensive Highway Safety Plan. The 2019 SHSP is the fourth and most recent statewide safety plan to be adopted in Iowa.



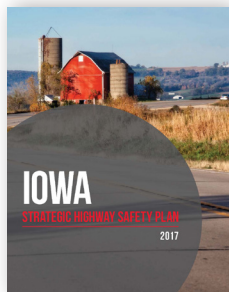
### Iowa Comprehensive Highway Safety Plan (2006)

In 2006, the Iowa DOT published its first highway safety plan, the Iowa Comprehensive Highway Safety Plan (CHSP). Iowa DOT had development of this plan underway before the federal requirement was laid out under SAFETEA-LU. In this plan, 13 emphasis areas were identified under two different categories: legislative and administrative. In consultation with stakeholders from across the state, strategies were identified for each emphasis area. It was estimated that implementation of the strategies identified in the plan would ultimately lead to significant reductions in fatalities. The ultimate goal of the plan was to have fewer than 400 annual fatalities on Iowa roadways by 2015. In 2009, this goal was achieved when 371 fatalities occurred on Iowa's roadways for that calendar year.



### Iowa Strategic Highway Safety Plan (2013)

As part of MAP-21, the requirement to develop an SHSP was continued and the Iowa DOT published the Iowa Strategic Highway Safety Plan in 2013. Similar to Iowa's CHSP published in 2006, Iowa's 2013 SHSP was developed in consultation with safety stakeholders from around the state, and employed a data-driven process that identified safety emphasis areas. For the 2013 SHSP, a total of ten safety emphasis areas were identified and were categorized between behavioral or roadway/infrastructure improvements. Of the ten emphasis areas, seven were considered high priority areas, two were medium priority areas, and an additional emphasis area of "traffic safety culture" was added under the behavioral improvement category. Strategies for each of the emphasis areas were developed and an overall goal to achieve a "15 percent reduction in fatalities and major injuries on Iowa highways by the year 2020" was established.



### Iowa Strategic Highway Safety Plan (2017)

Building on the success and progress of the previous efforts, Iowa's 2017 SHSP sought to expand on the strategies and goals defined in the 2013 SHSP while maintaining compliance with the passage of the FAST Act. Similar to the previous SHSP, the 2017 update included strategies for ten emphasis areas. However, strategies were also created for two "emerging trends" which included motorcyclists and older drivers. Both areas had seen slight increases in the number of severe injuries over the recent years of data collection. This increase prompted stakeholders to proactively set strategies and goals related to both emphasis areas. Stakeholders also agreed to two new overall SHSP goals that were based on exposure to life-altering injuries. The first was a fatality rate of 1 per HMVMT. The second set the target rate for serious injuries at 4.3 per HMVMT. Both targets were set for a horizon year of 2020 and will be examined in this update.



## 2. DEVELOPING IOWA'S SHSP

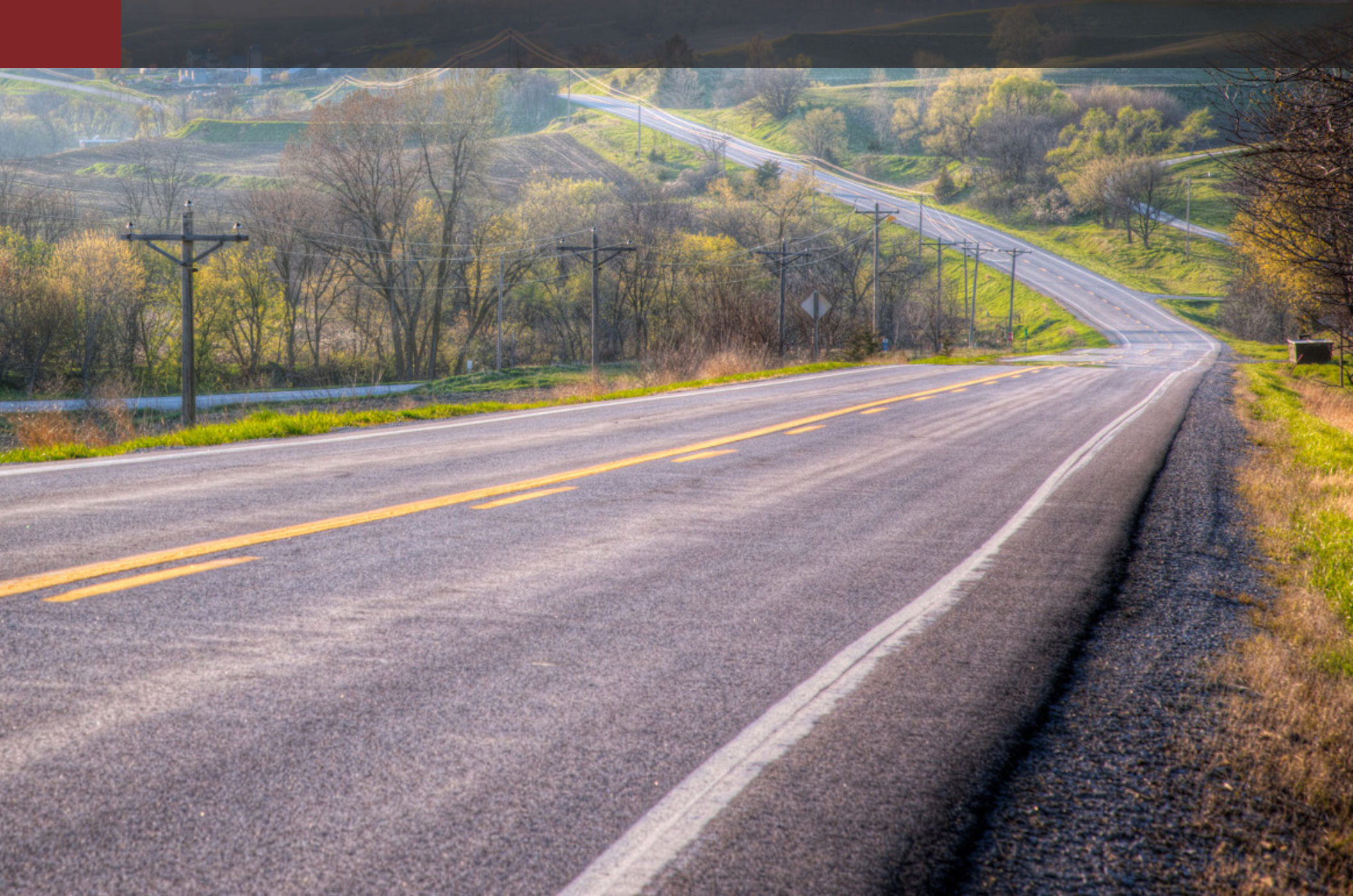
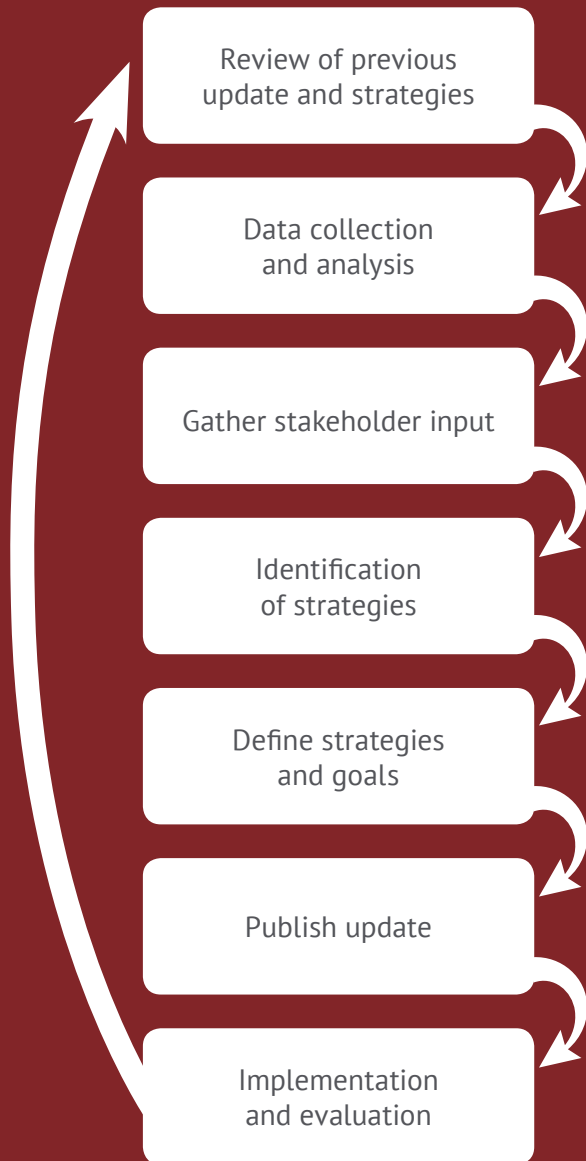


Figure 2.1: Iowa's SHSP update process



## 2.1 How was this plan developed?

Development of this plan began in June 2017, with review of peer state best practices and concluded in December of 2018, when the plan was signed and approved by the partner agencies and the Governor of Iowa. There are key requirements that must be met in developing this plan. First, the Strategic Highway Safety Plan (SHSP) must take a data-driven and performance-based approach. The entire process, from development to evaluation, is driven by the effective use of safety data. Second, the SHSP should be developed in consultation with safety stakeholders from a variety of disciplines and coordinated through relevant traffic safety efforts. Third, strategies must be developed along with a structure for implementing and evaluating the plan.

### Update process

Figure 2.1 illustrates Iowa's SHSP update process. This process is designed to accomplish a number of different tasks essential to and required of state DOTs when developing an SHSP. The process starts with a brief review of progress made towards the strategies and goals identified in the previous plan. The most recent crash data is then collected and reviewed to gain a better understanding of the issues being faced. This analysis will provide a framework for selecting safety emphasis areas of opportunity and identifying the strategies with the most potential for reducing fatal and serious injuries. After a listing of potential strategies is developed, input from various sources is collected to prioritize the emphasis areas and associated strategies. Input is gathered from the SHSP Implementation Team and agency leadership, as well as other stakeholders. After input has been collected, strategies are defined and the update is published. Following the publication of the newest update of the SHSP, the SHSP Implementation Team will work to routinely review and evaluate progress that has been made until the next update. The Iowa SHSP will follow a five-year update cycle beginning with this plan.

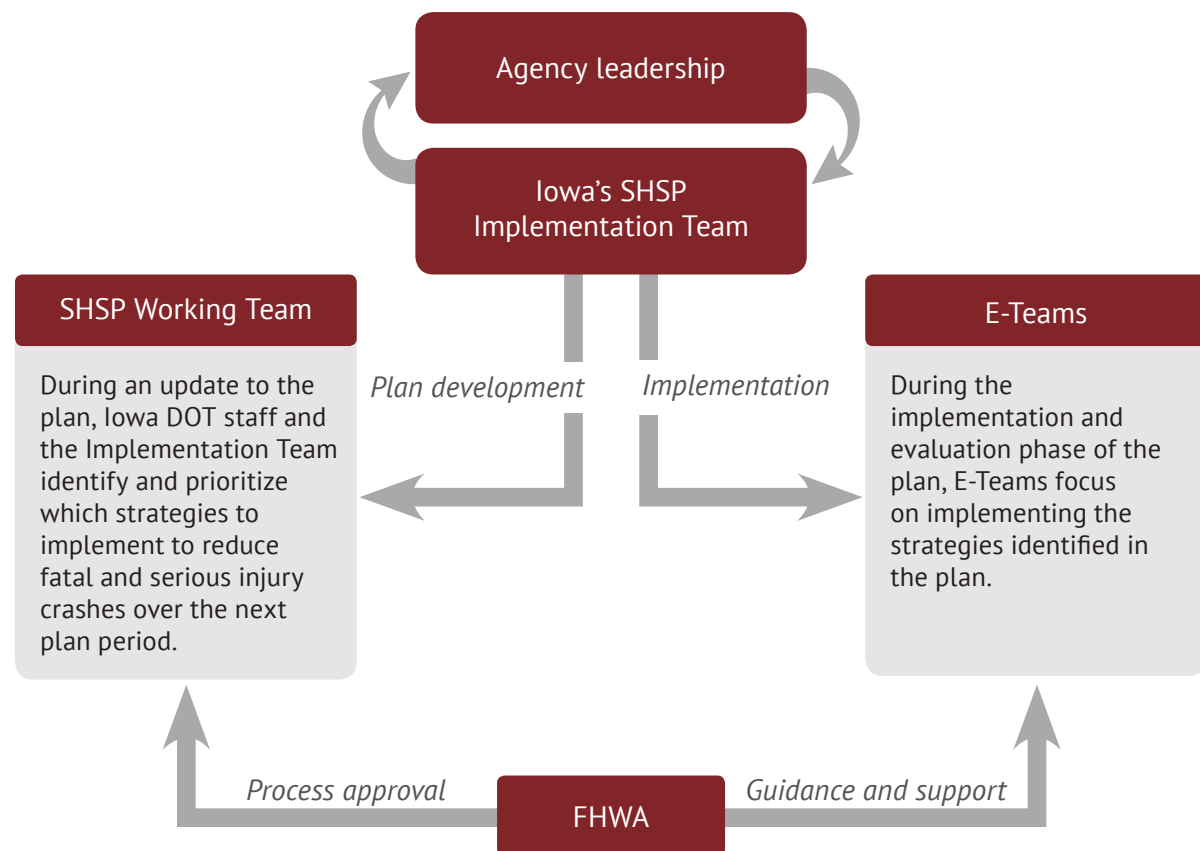
## Consultation structure

Figure 2.2 illustrates the current organizational structure for SHSP implementation. Iowa's SHSP is supported by a strong partnership of public agencies that collaborate on its development and implementation. Partner agencies recognize the importance of this plan and its goal of reducing fatalities and serious injuries on Iowa's roads. This recognition is realized by providing direction, contributing resources, and supporting staff time to implement the strategies and actions described in this plan.

Iowa's SHSP Implementation Team was created during the 2013 SHSP process and it oversees the ongoing development and implementation of SHSP traffic safety efforts. This team meets on a quarterly basis to review the progress of the plan during the update process. The Implementation Team is composed of representatives from a variety of disciplines including educators, emergency medical services, enforcement, engineering, planning, and research. These individuals provide updates on programs, policies, projects, and educational campaigns for their respective agencies/organizations during the quarterly meetings. The team also provides recommendations to agency leadership on policies and initiatives related to traffic safety.

The SHSP Implementation Team is supported by two different groups, the federal agencies involved in the process (Federal Highway Administration, Federal Motor Carrier Safety Administration, and the National Highway Traffic Safety Administration) and partner agency leadership. Iowa's SHSP Implementation Team functions in two different ways. During an update of the SHSP, Iowa DOT staff and a subset of the Implementation Team form the SHSP Working Team. The SHSP Working Team provides support and technical expertise during the plan update phase to identify and prioritize strategies. Outside of an update, the focus of the team is to implement and evaluate the status of the identified strategies. To do this, the Implementation Team has established "E-Teams" based on the E's of safety. These teams will reach out to a broader audience to disseminate the strategic direction laid out in this plan and support an improved traffic safety culture within the state.

Figure 2.2: Iowa's Implementation Team structure



## Stakeholder input process

An important component of the SHSP update process is the consultation with a broader group of traffic safety stakeholders. For this update, consultation with these stakeholders was done through an extensive statewide input process. This engagement process was designed to gather interdisciplinary input from federal, state, local, private sector, and safety stakeholders regarding how they would prioritize a select number of the safety emphasis areas. Additionally, the Implementation Team itself also prioritized the safety emphasis areas. The methodology for collecting input was based on a statewide examination of multidisciplinary interest groups that were willing to participate in a web-based pair-comparison poll. The web-based poll was delivered both in-person and online to maximize participation. The length of the pair-comparison poll was also considered in development of the stakeholder input process. To ensure that the poll was not excessive in length a select number of the safety emphasis areas were excluded. Those safety emphasis areas that were excluded from the input process were excluded because either A) they represented more than 50 percent of all fatal and serious injury crashes that would be considered during prioritization or B) limited opportunities to reduce the number of fatal and serious injury crashes under the safety emphasis areas were identified. The ultimate result of this statewide effort was to gather input from a broader audience on the prioritization of the safety emphasis areas.

During the stakeholder input process over 600 individuals participated in the survey. The results from the Implementation Team and broader stakeholder groups were kept separate because the Implementation Team was interested in how each stakeholder group would prioritize the safety emphasis areas, and how that compared to their own initial prioritization. The Implementation Team ultimately used a combination of crash data and the extensive input collected to support the development of a final prioritized safety emphasis area list. Additional information about the stakeholder input process can be found in Appendix 1.

### In-person poll surveys conducted at:

- Traffic Safety Forum
- Iowa County Engineers Association Conference
- Iowa Bicycle Summit
- Iowa American Public Works Association Conference
- Iowa Driver's Education Conference
- Governor's Highway Traffic Safety Conference

### Data-driven

A cornerstone to an SHSP is the reliance on, and utilization of, safety data. The Iowa DOT is fortunate to have an extensive database of roadway and crash data, and the most recent data was used in developing this plan. The crash data was categorized into 18 safety emphasis areas to be consistent with previous Iowa SHSPs. This categorization follows a process initially described by American Association of State Highway and Transportation Officials (AASHTO) in their 1997 SHSP. Categorizing the safety data consistently between plans allows for better evaluation of the performance of the selected strategies and better tracking of each safety emphasis area. This allows the SHSP Implementation Team to identify if there are any emerging trends or performance issues to be addressed. In February 2018, the SHSP Implementation Team reviewed the most recent breakdown of safety emphasis areas to identify any trends or changes from the previous update. Table 2.1 contains the final crash data ranking of the safety emphasis areas using the last five years' (2013-2017)<sup>1</sup> crash data from the Iowa DOT.

<sup>1</sup> Ten years of Iowa DOT crash data was used in the development of this plan (2008-2017). This data was accessed in July of 2018.

Table 2.1: Crashes and injuries by safety emphasis area, 2013-2017.

Emphasis area	Fatal crashes	Serious crashes	Severe crashes	Fatalities	Serious injuries	Severe injuries <sup>2</sup>	Severe injury rank	Percent of severe injuries
Lane departures	994	3,152	4,146	1,115	4,010	5,125	1	56%
Local roads	965	4,282	5,247	832	3,986	4,818	2	52%
Speed-related	791	3,146	3,937	881	3,818	4,699	3	51%
Roadside collisions	634	2,274	2,908	690	2,725	3,415	4	37%
Unprotected persons	743	1,701	2,444	834	2,257	3,091	5	34%
Younger drivers	427	2,043	2,470	495	2,580	3,075	6	33%
Intersections	354	1,913	2,267	403	2,311	2,714	7	30%
Impaired driving	504	1,083	1,587	573	1,405	1,978	8	22%
Older drivers	349	1,013	1,362	387	1,309	1,696	9	18%
Motorcycles	232	1,115	1,347	245	1,238	1,483	10	16%
Distracted driving	153	854	1,007	168	1,041	1,209	11	13%
Heavy trucks	232	499	731	280	647	927	12	10%
Winter road conditions	96	478	574	117	610	727	13	8%
Pedestrians	115	368	483	115	383	498	14	5%
Bicyclists	25	181	206	25	190	215	15	2%
Other special vehicles	41	101	142	45	134	179	16	2%
Work zones	36	86	122	38	116	154	17	2%
Train	12	22	34	15	27	42	18	<1%
<b>Totals<sup>3</sup></b>	<b>1,515</b>	<b>6,185</b>	<b>7,700</b>	<b>1,690</b>	<b>7,504</b>	<b>9,194</b>		

(Source: Iowa DOT)

<sup>2</sup> The severe injury field represents a summation of the fatal and serious injury crash fields.<sup>3</sup> Crashes and injuries can be represented in more than one safety emphasis area. These totals represent the actual number of crashes and injuries between 2013-2017.



Over the last five-year period, the safety emphasis areas of lane departures, local roads, and speed-related were represented in over 50 percent of fatal and serious injury crashes in Iowa. The ranking of the safety emphasis areas has remained relatively consistent since the previous plan period, with the exception of two areas. The safety emphasis areas of roadside collisions and distracted driving have risen two and three rankings, respectively. A comparison of the safety emphasis areas rankings between plan periods is illustrated in Table 2.2.

**Table 2.2: Safety emphasis area ranking comparison**

Safety Emphasis Area	Current plan period ranking 2013-2017	Previous plan period ranking 2010-2014	Rank difference
Lane departures	1	1	0
Local roads	2	2	0
Speed-related	3	3	0
Roadside collisions	4	6	2
Unprotected persons	5	4	-1
Younger drivers	6	5	-1
Intersections	7	7	0
Impaired driving	8	8	0
Older drivers	9	9	0
Motorcycles	10	10	0
Distracted driving	11	14	3
Heavy trucks	12	11	-1
Winter road conditions	13	12	-1
Pedestrians	14	13	-1
Bicyclists	15	15	0
Other vehicles	16	16	0
Work zones	17	17	0
Train	18	18	0

(Source: Iowa DOT)

### Performance-based

The effectiveness of Iowa's efforts will be consistently measured by a set of five safety performance measures that were established under MAP-21 and continued under the FAST Act. These performance measures and associated targets are required to be analyzed yearly by states and documented in their annual HSIP Report. Three of the established performance measures (number of fatalities, rate of fatalities per 100 million vehicle miles traveled, and number of serious injuries) are required to align with the Iowa Highway Safety Plan (HSP) developed by the Iowa Governor's Traffic Safety Bureau (GTSB). The development of the SHSP and the quarterly SHSP Implementation Team meetings provide a great opportunity for the Iowa DOT and Iowa's GTSB to coordinate the overlapping performance measures in the plans. The Iowa DOT also establishes targets for two measures that are not required for the HSP; these measures are the rate of serious injuries per one HMVMT and the number of non-motorized fatalities and serious injuries.

In order to provide the best opportunity to quantitatively evaluate the progress made within each safety emphasis area, quantifiable strategies were developed when possible. The associated measurement will provide an opportunity for the Implementation

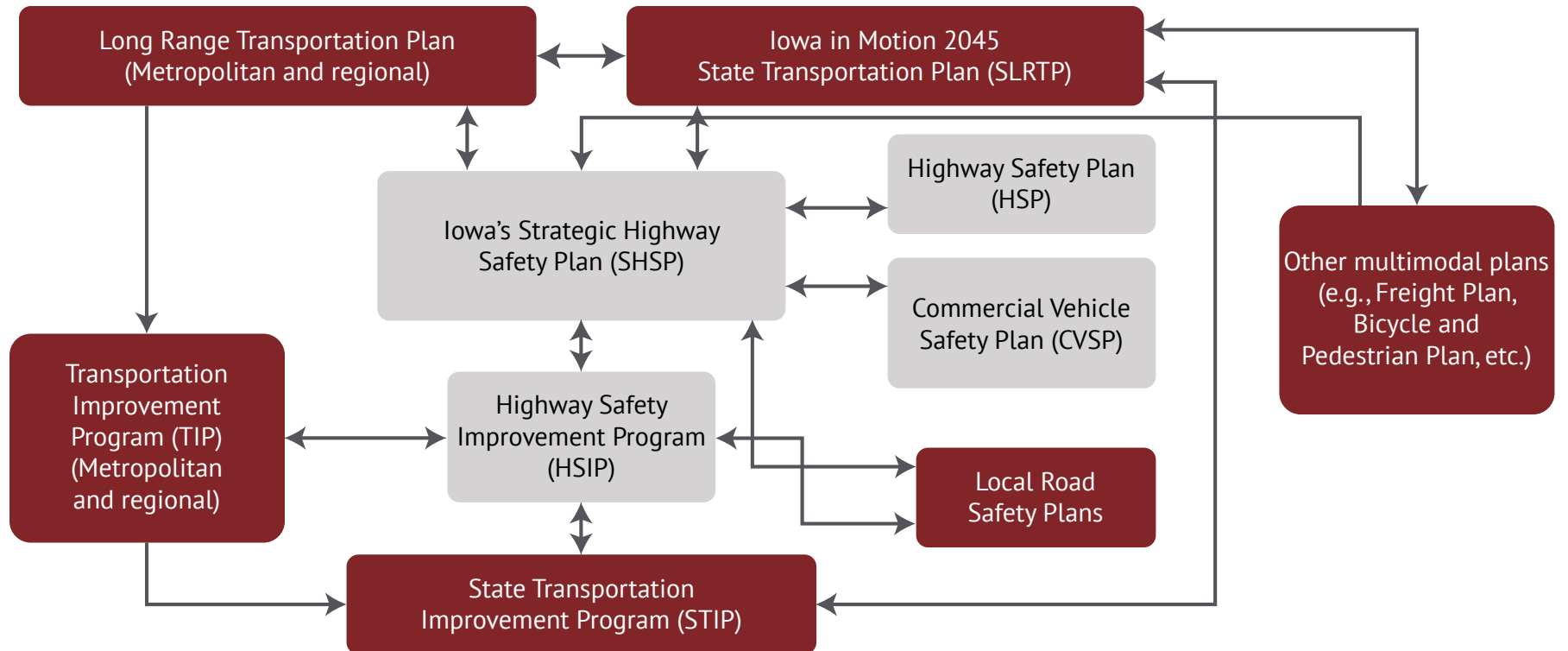
Team to evaluate the effectiveness of the strategies defined in this plan on a regular recurring time frame during the period following plan development.

### How does this plan relate to others?

For any SHSP to be effective, it must leverage and inform existing transportation planning activities. This includes any long-range planning activities performed by the state and partner planning agencies that integrate the goals and vision of the SHSP. Integrating aspects of the SHSP into planning efforts helps solidify those aspects as priorities. Since many of these plans help guide policy and investment decisions, building a connection with the SHSP will provide more opportunities for the strategies that are identified to be implemented. Further, long-range planning efforts within the state provide a framework to understand the complex issues that face Iowa's transportation system. A holistic perspective of these issues creates greater understanding of the connections between and the importance of each effort. Figure 2.3 illustrates how Iowa's SHSP is connected to many of the other planning and programming efforts within the state.



Figure 2.3: How the Strategic Highway Safety Plan relates to other plans and programs



(Source: Adapted from Strategic Highway Safety Plans: A Champion's Guidebook to Saving Lives Second edition Cambridge Systematics)

## How to use Iowa's SHSP

Iowa's SHSP is a strategic plan intended to focus and unite the State's safety stakeholders towards the common goal of reducing fatalities and serious injuries on Iowa's roadways. This plan is intended to complement and be incorporated into plans or programming efforts being carried out by other state agencies as well as other organizations and local governments.

Each safety emphasis area included in this plan has an associated list of strategies for achieving fewer fatalities and serious injuries over the next five years. Safety stakeholders who develop and implement projects and programs can utilize the strategies that are identified in this plan as they develop new projects and programs. The recommended strategies and performance measures can also be incorporated or referenced by other agencies and local governments throughout the state whenever traffic safety strategies are being considered.

## 2.2 Iowa's Five E's

One of the pioneers in highway safety and systematic approaches to safety was William Haddon. Haddon may be best known for the Haddon Matrix (Figure 2.4), which is commonly used in the public health field. The Haddon Matrix is a two-dimensional model that is used for analyzing motor vehicle crashes. The model demonstrates the idea that reducing motor vehicle crashes involves a systematic and multi-discipline approach. Consistent with this model, four primary categories of safety professionals drive the development of the strategies defined in this plan. These professionals include those in education, emergency medical services, enforcement, and engineering. Each discipline has a unique perspective on how to improve traffic safety while also remaining connected to the other disciplines. Iowa's SHSP also considers a fifth E of everyone because ultimately it is the responsibility of every driver on Iowa's roadways to make safe choices and drive responsibly.

**Figure 2. 4: Example of Haddon Matrix**

	Human	Vehicle/Equipment	Physical Environment	Social/Economic
Pre-Crash	<ul style="list-style-type: none"> <li>• Driver vision</li> <li>• Impairment</li> <li>• Driver attention</li> </ul>	<ul style="list-style-type: none"> <li>• Maintenance of brakes and tires</li> <li>• Speed of vehicle</li> <li>• Roadworthiness</li> </ul>	<ul style="list-style-type: none"> <li>• Road design and markings</li> <li>• Intersection configuration</li> <li>• Roadway lighting</li> </ul>	<ul style="list-style-type: none"> <li>• Public attitudes towards drinking and driving</li> <li>• Support of injury prevention efforts</li> <li>• Graduated licensing laws</li> </ul>
Crash	<ul style="list-style-type: none"> <li>• Use of restraints</li> <li>• Airbag use</li> <li>• Child restraint use</li> </ul>	<ul style="list-style-type: none"> <li>• Vehicle size</li> <li>• Crash size and protective design</li> <li>• Safety rating</li> </ul>	<ul style="list-style-type: none"> <li>• Presence of fixed objects near roadside</li> <li>• Roadside embankments</li> <li>• Guard rails and median barriers</li> </ul>	<ul style="list-style-type: none"> <li>• Seat belt and child restraint laws</li> <li>• Motorcycle helmet laws</li> <li>• Impaired driving laws</li> </ul>
Post-Crash	<ul style="list-style-type: none"> <li>• Severity of injuries</li> <li>• First-aid skills</li> <li>• Age of occupant</li> </ul>	<ul style="list-style-type: none"> <li>• Integrity of fuel system</li> <li>• Ease of access</li> <li>• Fire risk</li> </ul>	<ul style="list-style-type: none"> <li>• Distance from trauma center</li> <li>• Incident management</li> <li>• Roadway congestion</li> </ul>	<ul style="list-style-type: none"> <li>• Support for trauma care and rehabilitation</li> <li>• EMS training</li> <li>• Policies and funding supporting emergency medical services</li> </ul>

(Adapted from: Injury Prevention: Meeting the challenge. AJPM, 1989; Christoffel T. Galagher S. Prevention and Public Health, Gaithersburg, MD. 1999)



## Education

Education plays a key role in helping the public determine what they should and should not do when driving and how to safely navigate the transportation system. Effective education efforts can lead to a cultural change in road user behavior habits and ultimately a decline in fatalities and serious injuries on roadways. Educators direct campaigns toward all age groups and across numerous safety issues to encourage new roadway use behaviors.



## Emergency medical services

Swift response from emergency personnel can save the lives of those involved in a crash. While emergency medical personnel assist anyone injured in a crash, other emergency responders can clear roadways and manage traffic, and therefore reduce the risk of secondary crashes.



## Enforcement

Enforcement is needed to remind people of the laws associated with the use of our transportation system. Even with driver education and carefully designed roadways, the role of enforcement remains vital in encouraging road users to adhere to the rules of the road. State, county, and municipal law enforcement agencies work alongside highway safety partner agencies to enforce traffic laws during regular patrols, as well as during specialized mobilization efforts.



## Engineering

The focus on safety within engineering begins with designing and constructing our roadways. Transportation engineers use design principles that are reliable and reduce the risk of crashes. National standards are used for signs and traffic markings to provide consistency for the traveling public. In addition to using proven design methods, engineers continue to research new ways to make transportation safer.



## Everyone

Since the adoption of the 2013 SHSP, Iowa has aligned itself with the national vision to eliminate all traffic fatalities, partnering with several state departments to develop Iowa's Zero Fatalities campaign. The significant challenge of reaching Zero Fatalities requires not only the dedication of committed professionals who represent the four E's of roadway safety, but also those who use Iowa's roadways. NHTSA reports that for 94 percent of crashes nationwide the critical reason for the vehicle crash can be attributed to driver error. This finding suggests the important role that everyone plays in ensuring not only their safety but the safety of others traveling on the roadway. Further, this statistic also points to a broader need for Iowa to develop a culture of traffic safety.

## Faces of the Five E's

The Five E's aren't just concepts. They are embodied by individuals across the state that play a role in transportation safety. Here are several of those individuals and their own words on the importance of traffic safety and how it impacts their careers and lives.



**DANIEL V. MCGEHEE, PHD**  
**Associate Professor,**  
 Mechanical and Industrial  
 Engineering, Emergency  
 Medicine, Occupational  
 and Environmental Health;  
**Director,** National Advanced  
 Driving Simulator Laboratories,  
 University of Iowa

"Traffic safety is one of the largest public health issues, but it flies under the radar with the public. Ironically, most of us have been affected by a car crash – be it ourselves, friends or family – we have all known someone who has been injured or killed in a crash. My interest in traffic safety goes way back, as I study driver performance and how to make up for our limitations (be they attention based or other). Reducing the impact speed or impact altogether is the main goal for us. When a crash does happen, we are looking for ways to make the transition from crash scene to the appropriate level hospital the smoothest possible so that we don't lose anyone along the way.

I've been around for a long time. I'm happy to say that in the 30 years I have been in this field, I have had the great fortune to work with many great people on projects that can save lives. These projects have included crash avoidance system development, teen driver research, and automated vehicle work. I'm confident that each project and research has made a difference, and that's why I do what I do."



**CORINNE PEEK-ASA**  
**Associate Dean for Research,**  
 College of Public Health;  
**Professor,** Occupational  
 and Environmental Health;  
**Director,** Injury Prevention  
 Research Center, University  
 of Iowa

"I am so acutely aware of the burden of motor vehicle crashes on individuals, families, and communities, and I want to play a role in reducing this burden. We think a lot about the immediate medical outcomes, but there can be very long-term impact from psychological trauma, days of missed work and school, and family stress. I just don't want families to have to go through this trauma when it can be prevented. I am drawn to research in motor vehicle crashes because I feel like my work can have an immediate impact – many of the approaches we can use to reduce crashes work very quickly, and it's rewarding to think that work I've done has helped – even if no one noticed that we've prevented a crash from occurring.

So many different community groups are impacted by motor vehicle crashes: parents, schools, hospitals, businesses...basically everyone in the community. And, many of these groups want to contribute to prevention. My work engages many of these groups in lots of ways. With a new intervention, we seek a lot of community input to make sure the intervention will work well in the community. Then, we rely on community connections to implement and evaluate the approach. And, community groups are essential for the dissemination of approaches that work. Some of our best research ideas have come from community members because they are experiencing the roadway firsthand, and often have great ideas about how we can use systematic approaches to address hazards they encounter."

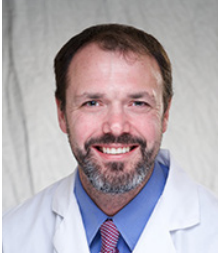


**SGT. GLENN GOODE**  
**Hazardous Materials  
 Specialist**  
 Iowa DOT Motor  
 Vehicle Enforcement

"Working with motorists every day, I see motivation in each face to do whatever I can to reduce the number of injured and killed. Seeing the face of a father who has lost his daughter motivates me or of a son who has lost his mother. A young brother and sister never playing together again motivates me. Someone suffering from a life-altering injury motivates me. The carnage, chaos, and emotional distress suffered during a motor vehicle crash motivates me.

Traffic is everywhere and it affects everyone. Whether you are a driver, a passenger or a pedestrian, traffic affects you. Traffic safety is of the utmost importance and it takes a community effort to ensure that families stay together and undue hardships are not endured. As a peace officer, I am a member of the community who is afforded the opportunity to teach others how to effectively play their part in affecting traffic safety.

There really is no way to gauge how many lives have been positively impacted by the work that law enforcement does on a day-to-day basis, but I truly believe we are making a difference. Whatever the actions we take, big or small, we will never know the size of the impact, but we have to keep trying to impact safety - all day, every day."



**DR. CHRISTOPHER BURESH, MD, MPH**

**Representative**, State EMS Advisory Council; **Medical Director**, Keokuk County Ambulance Service; **Ambassador to Haiti**, American College of Emergency Medicine; **Clinical Professor of Emergency Medicine**, University of Iowa

“Personally, I have four young kids, but I know that one day soon I’ll wake up and they’ll be driving. I want to make sure that the roads are as safe as possible for them, and everyone else that uses them. Telling a family that their loved one has died from a crash is awful. I cannot even fathom what it would be like to be on the other side of that conversation.

Too often, I see the devastation a crash can bring. I work at the only level 1 trauma center in this part of the state. We see around 600 crashes per year. There are at least one or two on every shift. These injuries can be devastating, and a lot of them are fatal. We lose between 300 and 400 Iowans per year to a phenomenon that is mostly preventable. If we had two plane loads of our citizens fall out of the sky every year, it would be a public health emergency. For some reason, most people sort of look at this as an acceptable risk of driving.

There is a tremendous amount of research and effort that goes into figuring out the optimal way to care for them so that they have the best possible outcomes. It is really a privilege to be part of such a dedicated and talented community that works on bending the curve on this problem. The methods we use to take care of this injured population are pretty good, but I also think that we can make them better.

A program we are using, TraumaHawk, allows law enforcement to send information ahead of the patient in the form of photos of the crash. It helps us

to understand the sorts of forces that the patient was exposed to in the crash and gives us critical clues to the types of injuries that we can expect. TraumaHawk is an important step in building a better trauma system. Our hope is that by refining the model we can use these pictures to more intelligently deploy response resources to a scene, like sending a helicopter instead of an ambulance. We also hope to be better able to direct where that patient goes, whether they go to the nearest available small hospital for initial treatment and stabilization, or whether they bypass that facility in order to get to a higher level trauma center more quickly. Finally, we hope that some of the findings from our work can also be used to help make cars a little safer in the event of an impact.

TraumaHawk has led to some really amazing connections in the community. Most directly, it has really led to close ties with law enforcement, fire, and EMS. They have become some of our greatest champions. Crashes and crash fatalities are complex problems that require a lot of different perspectives to really understand. We’ve been fortunate enough to get to know and work with all sorts of people from public health, state and federal government, medicine, engineering, nursing, computer science, and automotive design. We think that only this sort of multidisciplinary approach can really be effective.”



**TIM CROUCH, P.E., PTOE**

**Traffic Safety Engineer**  
Iowa Department of  
Transportation

“My younger sister, Sarah, was killed in a crash in March 1982. I can’t say that Sarah’s crash was the main reason for me doing the work I do, but it is one of the big reasons I have satisfaction in knowing that what I do hopefully keeps another family from going through what we did.

Our family rarely used seatbelts before Sarah’s crash, but because of her death, not one of us gets in the car without buckling up now. It’s sad that we waited for something tragic to happen before we changed our behavior. Sarah may have (likely would have) survived that crash if she had been wearing a seatbelt.

I do what I do for safety so that everyone makes it home safely at the end of the day, for dinner and holidays. The goal is no one will open the door to see a law enforcement officer there to tell you that your loved one will not be coming home.”



# 3. SAFETY EMPHASIS AREAS





## 3.1 What are safety emphasis areas?

In 1997, the American Association of State Highway and Transportation Officials (AASHTO) published a national Strategic Highway Safety Plan (SHSP), which was later updated in 2005. This plan addressed the significant challenge of highway safety and outlined strategies to tackle specific safety issues. Since its publication, AASHTO's SHSP has been one of the leading documents for highway safety. AASHTO's plan identified 22 key emphasis areas that affect highway safety and provided guidance for states to develop their own highway safety plans. Since the publication of AASHTO's SHSP, the Federal Highway Administration (FHWA) has required that a state's "SHSP update shall identify key emphasis areas and strategies that have the greatest potential to reduce highway fatalities and serious injuries and focus resources on areas of greatest need." Therefore, many states have modeled their analysis off the work done by AASHTO in its SHSP, which also satisfies the federal requirement.

A safety emphasis area analysis is typically conducted by identifying and attributing crashes to one or several of the designated emphasis areas, such as lane departures or older drivers. By doing so, states are able to prioritize and develop strategies for those areas that they feel have the greatest opportunity for reducing fatal and serious injury crashes. In this update and the previous two updates of the SHSP, Iowa has analyzed 18 (some in combination) different safety emphasis areas and developed strategies for those that had the greatest opportunity to reduce fatal or serious injury crashes.

To facilitate the prioritization process, the Implementation Team decided to group the safety emphasis areas into three broad categories: infrastructure, road users, and driver behavior. Figure 3.1 demonstrates the relationships between these categories and the safety emphasis areas analyzed in this plan. This illustration also reveals how strategies related to each of these safety emphasis areas might also have an impact on secondary areas as well.

### 3.2 Prioritization of Iowa’s safety emphasis areas

Iowa’s SHSP Implementation Team considered three different sources of information in order to prioritize the safety emphasis areas:

- Crash data ranking of safety emphasis areas by fatal and serious injuries
- Implementation Team ranking of safety emphasis areas
- External stakeholders ranking of safety emphasis areas

For the safety emphasis areas that were considered during the stakeholder input process, Table 3.1 presents the final rankings from the crash data, the Implementation Team, and broader external stakeholders. As a reminder, some of the safety emphasis areas were excluded from the input process and have therefore been excluded from Table 3.1. Those that were omitted include: lane departures, local roads, speed-related, roadside collisions, winter road conditions, and other special vehicles. Additional information about the stakeholder input process can be found in Appendix 1.

Figure 3.1: Relationship between safety emphasis areas

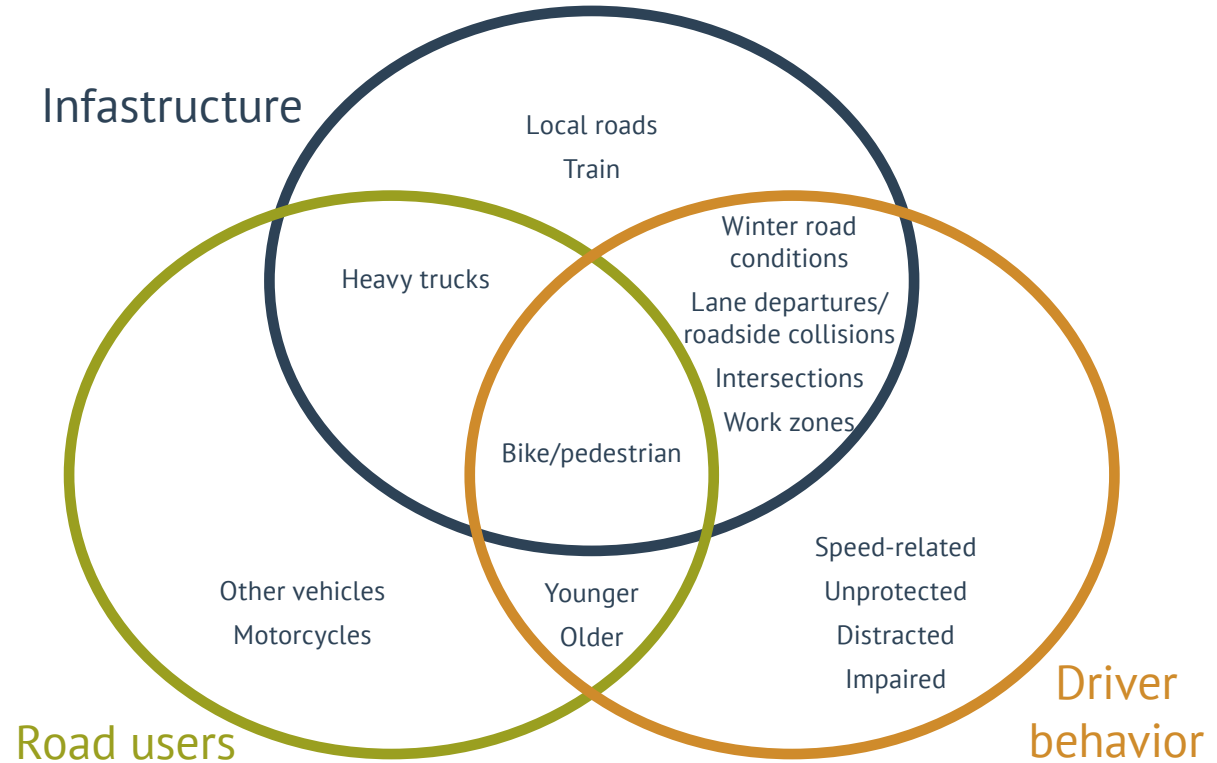


Table 3.1: Rankings of the safety emphasis areas

Safety emphasis area	Crash data	Implementation team	External groups
Unprotected persons	1	4	8
Younger drivers	2	3	3
Intersections	3	5	4
Impaired driving	4	2	2
Older drivers	5	6	6
Motorcycles	6	9	9
Distracted driving	7	1	1
Heavy trucks	8	7	10
Bike/ped	9	10	7
Work zones	10	8	5

In considering this information, the Implementation Team went through an exercise to determine which safety emphasis areas to prioritize. The Implementation Team recognized that in order to be effective in implementing the strategies of the SHSP, they needed to limit the number of safety emphasis areas they intended to focus on. Below are the priority safety emphasis areas that the Implementation Team decided to focus on over the plan period.

- Lane departures and roadside collisions
- Speed-related
- Unprotected persons
- Young drivers
- Intersections
- Impairment involved
- Older drivers
- Distracted or inattentive drivers

The safety emphasis areas that were not identified as priorities will still be evaluated. Summary level information for these safety emphasis areas has been included in this plan. In some cases, strategies were also identified for these safety emphasis areas at the discretion of the Implementation Team.

### 3.3 Strategy identification and development

The core objective of the SHSP is to identify the most effective strategies for reducing fatalities and serious injuries. For each safety emphasis area, there are innumerable strategies that could be used to support the core objective. In order to focus on the most effective

strategies for Iowa, the Implementation Team consulted a number of different resources during strategy development. These resources included National Cooperative Highway Research Program (NCHRP) Report 500 Series; State Strategies to Reduce Highway and Traffic Fatalities: A Road Map for States; and Iowa DOT plans including previous Iowa SHSPs, Iowa in Motion 2045: State Transportation Plan (2017), Iowa State Freight Plan (2017), and Iowa Bicycle and Pedestrian Long-Range Plan (2018). Related strategies identified from these sources populated an initial listing of over 400 strategies to consider for inclusion in the SHSP.

After an initial listing of strategies was identified, discussions were held with members of the SHSP Implementation Team to identify which strategies from the initial listing might be successful in Iowa and should be considered for inclusion in the plan. Those strategies identified for the plan were approved by the Implementation Team and are included under their respective safety emphasis area. Some strategies identified by the Implementation Team could be considered an effective countermeasure for multiple safety emphasis areas. In such cases, the strategy was listed under the primary safety emphasis area within the plan. However, an effort was made to identify all the relevant safety emphasis areas that a strategy might be an effective countermeasure for. This effort is summarized in the Strategy Matrix in Appendix 2.

While the strategies identified in this plan represent the current focus of the Implementation Team, it does not mean that these are the only strategies that will be pursued during the plan period. Iowa's SHSP is a "living" document that will be flexible as strategies are fully implemented or new strategies are defined. The Implementation Team is prepared to be responsive to the safety culture in Iowa and the quickly changing landscape of transportation safety.

## Unprotected persons

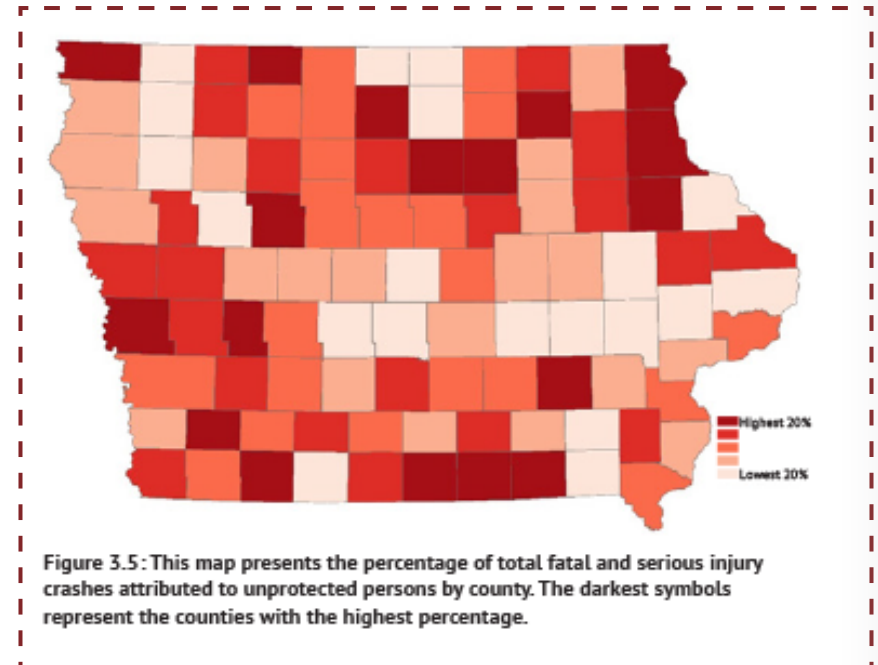
Crashes involving unprotected persons include those where no restraint or protective device (such as a seatbelt, child restraint system, helmet, or other device) was used by the driver or occupant involved in the crash. Research has found that restraint use can reduce the risk of fatal injury for front seat passengers by up to 45 percent and reduce the risk of serious injury by 50 percent. Similarly, child restraint is also effective in reducing the number of ejections from the vehicle, which are the most injurious events that can occur during a crash. In 2016, NHTSA reports that only one percent of passenger vehicle occupants in fatal crashes who were wearing seatbelts were totally ejected.<sup>4</sup>

Fatalities and serious crashes attributed to safety emphasis area by county.

In nearly 34 percent of all of Iowa's fatal and serious injury crashes, an unprotected person was involved. Between 2013 and 2017, there has been a six-percent decrease in the number of fatal and serious injury crashes associated with unprotected persons. Figure 3.6 presents the percentage of unprotected persons that were fatally or seriously injured by age between 2013-2017. Thirty percent of those individuals were younger than 25 years old.

Annual fatal and serious injury crashes attributed to safety emphasis area.

Iowa has had two seat belt laws that have been amended several times but were originally made effective July 1st, 1986 (Iowa Code 321.445 and Iowa Code 321.446). The laws require that front seat occupants to be properly restrained, and children under the age of 13 to be secured by a child restraint system. Seatbelt usage in Iowa is high. Based on the 2018 Observational Safety Belt Usage Study conducted by Iowa State University, Iowa's overall seatbelt usage was 93.9 percent. This was an increase of 2.5 percent from the 2017 observation study. Similarly, in Iowa's 2018 Child Passenger Restraint Survey, 95.4 percent of children under the age of 17 were properly restrained.



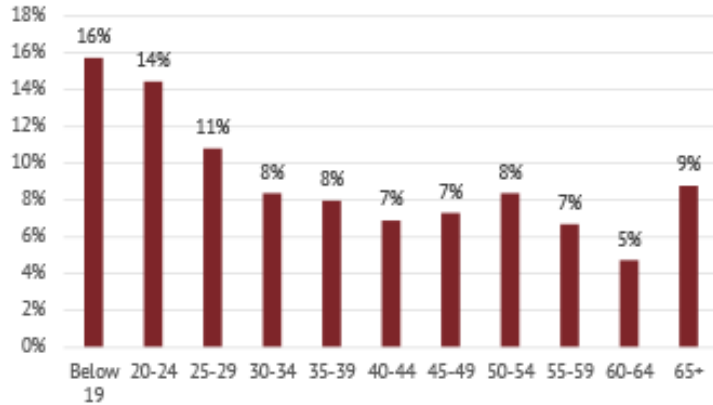
<sup>4</sup> National Center for Statistics and Analysis. (2018, February). *Occupant protection in passenger vehicles: 2016 data (Traffic Safety Facts, Report No. DOT HS 812 494)*. Washington, DC: National Highway Traffic Safety Administration.



**Strategies for safety emphasis areas.**

Wearing a seatbelt is a simple and effective way of being safe while riding in a vehicle. Iowa's Governor's Traffic Safety Bureau (GTSB) has implemented several programs to increase restraint and seat-belt use in Iowa. Iowa's Special Traffic Enforcement Program (sTEP) is a cooperative statewide "high visibility" traffic enforcement campaign with the main objective of raising awareness in safety belt use. In Iowa, over 170 local and county enforcement agencies participated in Iowa's sTEP program by conducting high visibility enforcement.

**Figure 3.6: Percentage of unprotected persons fatally or seriously injured by age**



**Strategies**

- Conduct public awareness campaigns focused on generating awareness of the risks associated with being an unprotected person.
- Include medical professionals in educational efforts.
- Conduct highly publicized enforcement campaigns focused on restraint use.
- Buckle up everyone and every time.



OVER THE PAST 10 YEARS, AN AVERAGE OF **11** PEOPLE DIED OR WERE SERIOUSLY INJURED EACH WEEK DUE TO BEING UNRESTRAINED.

Percentage of fatal and serious injury crashes that involved the safety emphasis area.

*Note: A crash may involve more than one safety emphasis area, and therefore the sum of these percentages will not be 100.*

Weekly fatalities or serious injuries attributed to safety emphasis area.

**Associated safety emphasis areas**

Lane departures



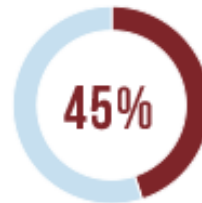
Speed-related



Local roads



Roadside collisions



Younger drivers

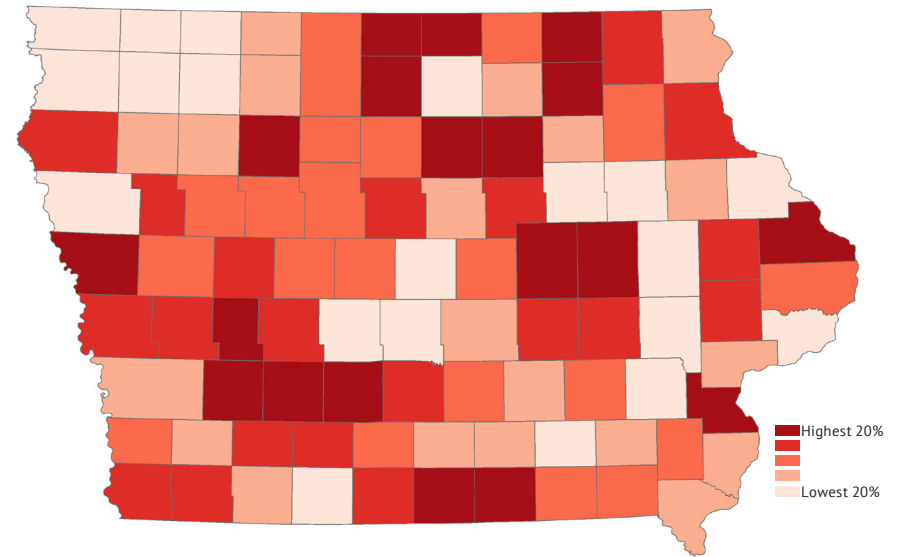


Associated safety emphasis areas.

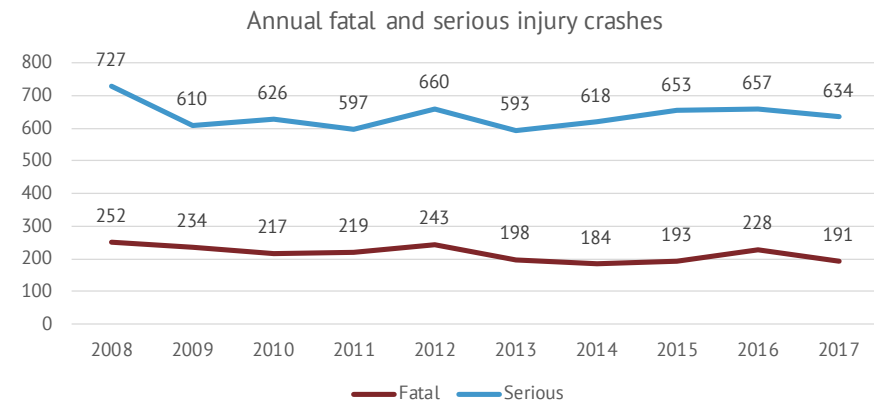
## Lane departures and roadside collisions

Lane departure crashes are crashes that occur when a vehicle leaves the travel lane, encroaches onto the shoulder, or crosses the centerline or median, and crashes. The reasons for lane departure crashes are varied but a short list includes: avoiding a vehicle, object, or animal, distraction, or the effects resulting from a weather event such as heavy snow or rain. After a vehicle departs from the lane, it is very likely to be involved in a roadside collision with either a natural or artificial object. Because roadside collisions are highly associated with, and are often a result of lane departures, the Implementation Team’s priority is on reducing lane departures.

Crashes involving lane departure are the most common crash type in Iowa and are represented in 56 percent of the total fatal and serious injury crashes. The number of crashes in Iowa involving lane departure has remained consistent over the last ten years with small spikes in both 2012 and 2016 and a five-percent increase since 2013. 70 percent of lane departure crashes were single vehicle crashes with many occurring during dry surface conditions (78 percent). Maintaining a vehicle on the roadway is often easier in areas where design and geometry of the roadway are more forgiving. Not surprisingly, 44 percent of fatal and serious injury lane departure crashes occurred on rural two-lane roadways.



**Figure 3.2:** This map presents the percentage of total fatal and serious injury crashes attributed to lane departures by county. The darkest symbols represent the counties with the highest percentage.





Iowa has been proactive in trying to reduce the number of fatal and serious injury lane departure crashes. Since 2003, the Iowa DOT has been installing cable median barrier on Iowa's interstates to reduce the number of median crossover crashes. Cable median barriers are cost effective solutions that reduce the opportunity for errant vehicles to leave the roadway and either hit a fixed object or enter opposing traffic and hit another vehicle head on. After installation, cable medians barriers have been shown to reduce the number of fatal crashes by up to 69 percent.

Iowa has also participated in the FHWA Every Day Counts (EDC) Initiative to advance the deployment of High Friction Surface Treatment (HFST). HFST is the application of high-quality aggregate to the pavement, which dramatically increases the friction of the roadway and reduces the number of lane departure crashes, especially those associated with wet weather conditions. Although the application of HFST is not new in Iowa, the Iowa DOT has recently partnered with the Center for Transportation Research and Education (CTRE) to evaluate the performance of HFST at nine new locations from across the state to better understand how resilient the aggregate is and how much it reduces crashes.

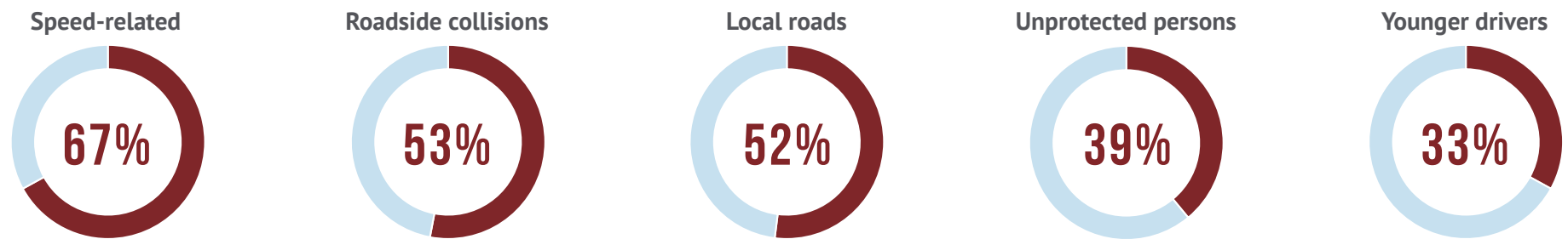
### Strategies

- Evaluate high lane departure crash corridors for two-lane highways and deploy road safety audit (RSA) teams to evaluate.
- Evaluate high-friction surface treatments (HFST) at targeted locations on the primary and local systems.
- Place centerline and/or shoulder rumble strips on rural two-lane highways on the primary and local systems. Where necessary, install or widen paved shoulders.
- Continue median cable barrier installations on the Interstate system. Initiate median cable barrier installations on the multi-lane divided highways.
- Focus on the road, don't over-correct or veer for objects or animals in the roadway.



OVER THE PAST 10 YEARS, AN AVERAGE OF **16** PEOPLE DIED OR WERE SERIOUSLY INJURED EACH WEEK DUE TO LANE DEPARTURES OR ROADSIDE COLLISIONS.

### Associated safety emphasis areas



## Speed-related

Excessive speeding significantly reduces a driver's ability to react to roadway conditions or maneuver around obstacles. Speeding is typically the result of a driver consciously choosing an inappropriate speed or inappropriately responding to the roadway conditions (e.g., during weather events such as ice or fog). Speeding can also increase the severity of crashes, which is especially true in crashes that involve non-motorists or unprotected persons who are vulnerable to the increased impact forces.

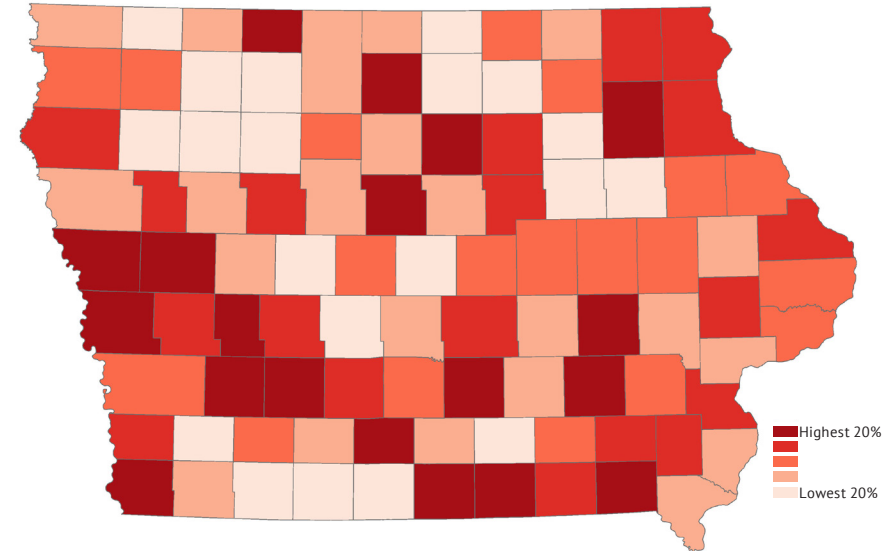
Speed-related crashes accounted for 51 percent of the total fatal and serious injury crashes in Iowa over the past five years. During that same five-year period, the number of fatal and serious injury crashes attributed to speed increased slightly, by about five percent since 2013. Over half (53 percent) of speed-related crashes occurred between Friday and Sunday, and 66 percent occurred in rural areas. Speed-related crashes are associated with young drivers (35 percent) who are likely to take more risks while driving, or those who engage in risky behavior such as lack of restraint use (40 percent) or impairment (30 percent).

Iowa's focus on reducing speed-related crashes has been on increased high-visibility enforcement and educational campaigns. Since 2013, Iowa State Patrol has seen a 133-percent increase (see Figure 3.4) in the number of citations issued for drivers exceeding 100 miles per hour (MPH).

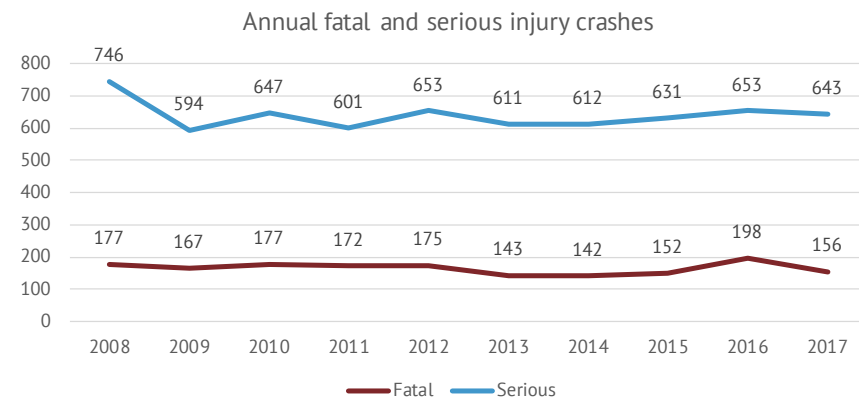
**58%**

of speed-related fatal and serious injury crashes occurred on roadways with a speed limit of

**55 MPH OR GREATER.**



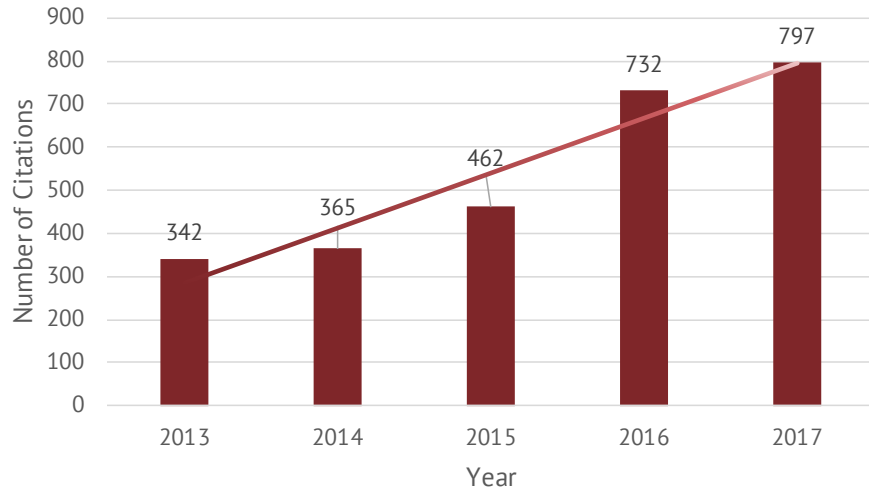
**Figure 3.3: This map presents the percentage of total fatal and serious injury crashes attributed to speed by county. The darkest symbols represent the counties with the highest percentage.**







**Figure 3.4: Number of citations issued by the Iowa State Patrol over 100 Miles Per Hour (MPH)**



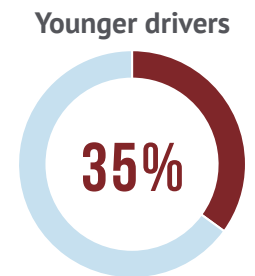
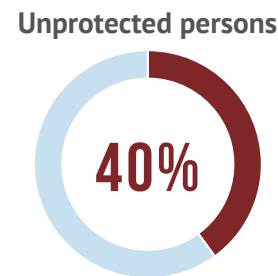
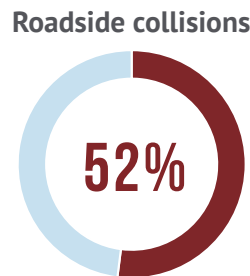
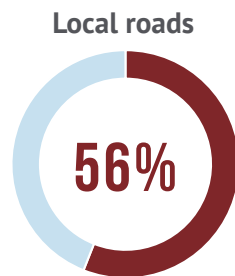
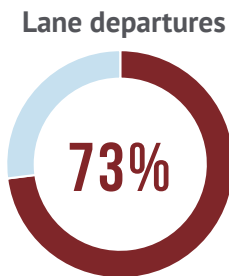
### Strategies

- Educate drivers on the importance of controlling and managing vehicle speed.
- Identify corridors with a high frequency of speed-related crashes and implement high-visibility enforcement campaigns.
- Evaluate and implement signing and geometric design strategies to moderate speeds and enhance safety.
- Implement speed feedback signs at targeted locations.
- Give yourself enough time to reach your destination. Be patient, slow down, and don't engage with aggressive drivers.



OVER THE PAST 10 YEARS, AN AVERAGE OF **15** PEOPLE DIED OR WERE SERIOUSLY INJURED EACH WEEK DUE TO SPEED-RELATED CRASHES.

### Associated safety emphasis areas

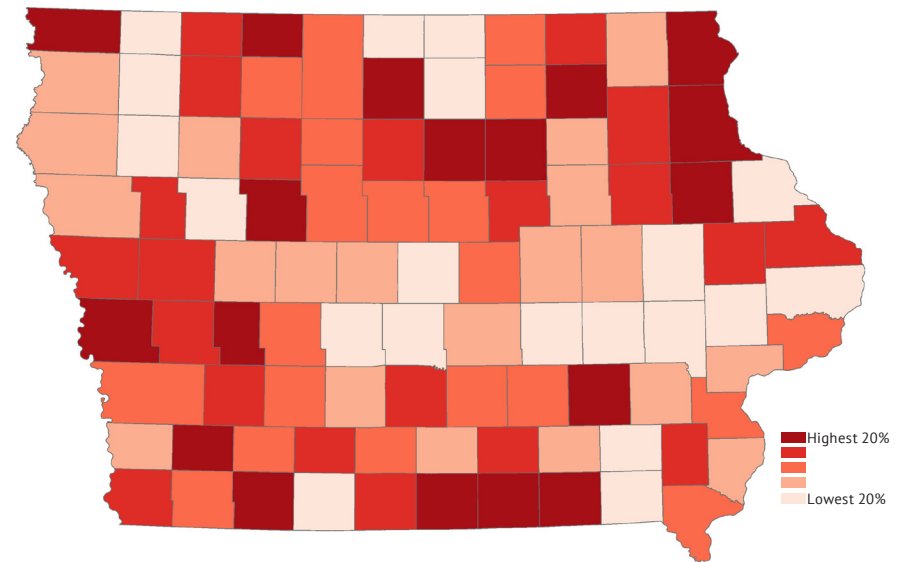


## Unprotected persons

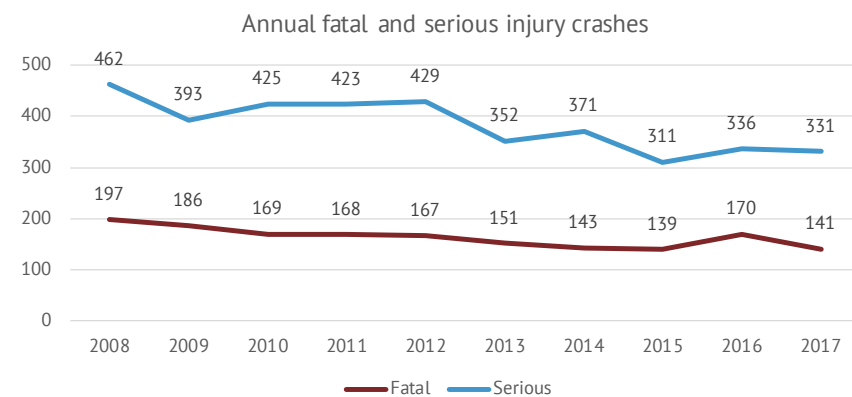
Crashes involving unprotected persons include those where no restraint or protective device (such as a seatbelt, child restraint system, helmet, or other device) was used by the driver or occupant involved in the crash. Research has found that restraint use can reduce the risk of fatal injury for front seat passengers by up to 45 percent and reduce the risk of serious injury by 50 percent. Similarly, use of a restraint is also effective in reducing the number of ejections from the vehicle, which are the most injurious events that can happen during a crash. In 2016, NHTSA reports that only one percent of all passenger vehicle occupants in fatal crashes who were wearing a restraint were totally ejected.<sup>4</sup>

In nearly 34 percent of all of Iowa's fatal and serious injury crashes, an unprotected person was involved. Between 2013 and 2017, there has been a six-percent decrease in the number of fatal and serious injury crashes associated with unprotected persons. Figure 3.6 presents the percentage of unprotected persons that were fatally or seriously injured by age between 2013-2017. Thirty percent of those individuals were younger than 25 years old.

Iowa has had two seat belt laws that have been amended several times but were originally made effective July 1st, 1986 (Iowa Code 321.445 and Iowa Code 321.446). The laws require that front seat occupants to be properly restrained, and children under the age of six be secured by a child restraint system. Seatbelt usage in Iowa remains high. Based on the 2018 Observational Safety Belt Usage Survey conducted by Iowa State University, Iowa's overall seatbelt use rate was 93.9 percent. This was an increase of 2.5 percent from the 2017 observation study. Similarly, in Iowa's 2018 Child Passenger Restraint Survey, 95.4 percent of children under the age of 17 were properly restrained.

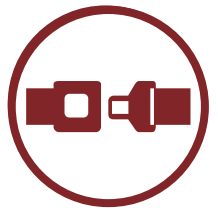


**Figure 3.5:** This map presents the percentage of total fatal and serious injury crashes attributed to unprotected persons by county. The darkest symbols represent the counties with the highest percentage.



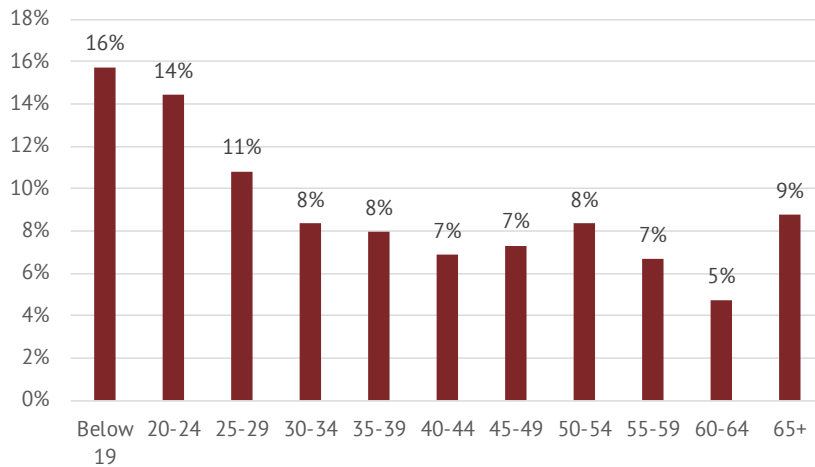
<sup>4</sup> National Center for Statistics and Analysis. (2018, February). *Occupant protection in passenger vehicles: 2016 data (Traffic Safety Facts. Report No. DOT HS 812 494)*. Washington, DC: National Highway Traffic Safety Administration.





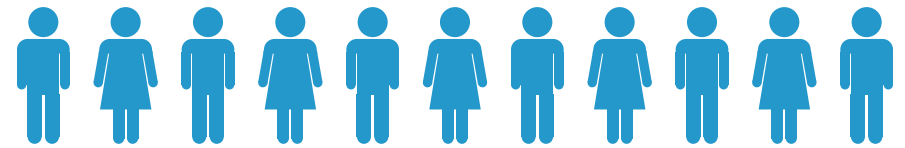
Wearing a seatbelt is a simple and effective way of being safe while riding in a vehicle. Iowa's Governor's Traffic Safety Bureau (GTSB) has implemented several programs to increase restraint and seat-belt use in Iowa. Iowa's Special Traffic Enforcement Program (sTEP) is a cooperative statewide "high-visibility" traffic enforcement campaign with the main objective of raising awareness in safety belt use. In Iowa, over 170 local and county enforcement agencies participated in Iowa's sTEP program by conducting high-visibility enforcement.

Figure 3.6: Percentage of unprotected persons fatally or seriously injured by age



### Strategies

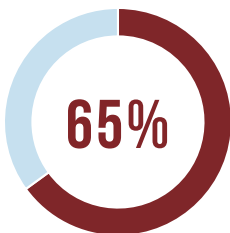
- Conduct public awareness campaigns focused on generating awareness of the risks associated with being an unprotected person.
- Include medical professionals in educational efforts.
- Conduct highly publicized enforcement campaigns focused on restraint use.
- Buckle up everyone and every time.



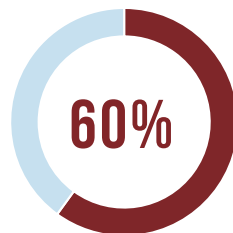
OVER THE PAST 10 YEARS, AN AVERAGE OF **11** PEOPLE DIED OR WERE SERIOUSLY INJURED EACH WEEK DUE TO BEING UNRESTRAINED.

### Associated safety emphasis areas

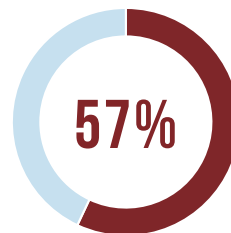
Lane departures



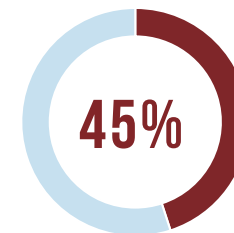
Speed-related



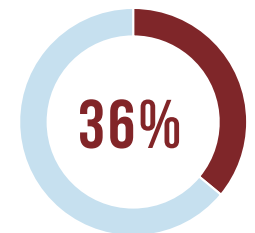
Local roads



Roadside collisions



Younger drivers



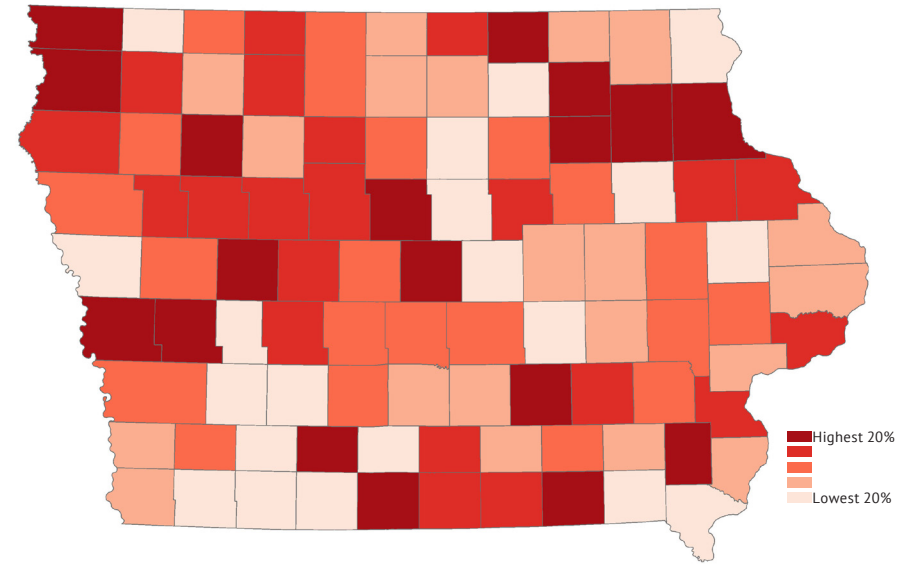
## Young drivers

For this plan, young drivers are defined as those between the ages of 14 and 24. For young drivers, a combination of factors contribute to their susceptibility of being involved in a fatal or serious injury crash. Young drivers often lack experience and are likely to underestimate dangerous situations or hazards along the roadway, especially new or very young drivers such as those holding minor school licenses. Young drivers are also likely to engage in risky behaviors that can often result in fatal or serious injury crashes such as speeding, impairment, or distraction.

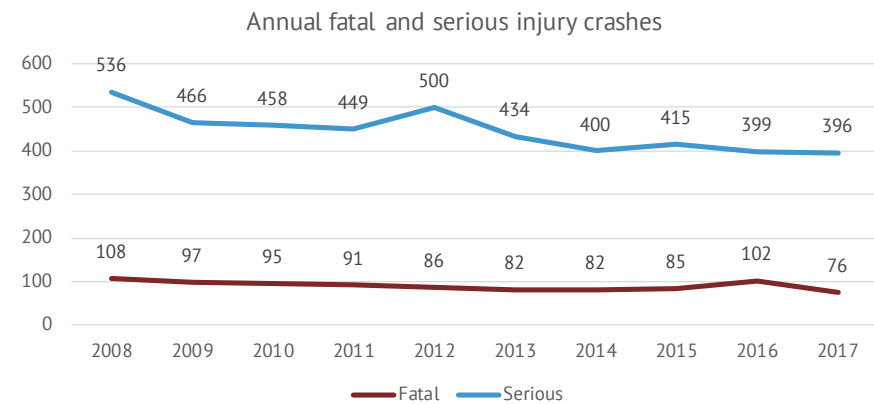
According to the Centers for Disease Control and Prevention (CDC), between 2013-2017, fatalities resulting from motor vehicle crashes were the leading cause of death in the United States for those ages 14-24. On average in the United States, 18 people per day within that age group die as a result of a motor vehicle crash. In Iowa, motor vehicle crashes are the second leading cause of death among those ages 14-24.<sup>5</sup> Young drivers were represented in just over 33 percent of all fatal and serious injury crashes. Since 2013, the number of severe injury crashes involving young drivers has decreased by 8 percent.

In fatal and serious injury crashes, young drivers **UNDER THE AGE OF 25** accounted for **29%** of all the drivers found to be impaired.

Like many other states, Iowa has a graduated driver licensing (GDL) program for young drivers under the age of 18. Iowa's GDL program was implemented in 1999. The GDL program is designed to provide experience to young drivers as they improve skills and confidence behind the wheel. Shown in Figure 3.8, Iowa's GDL program consists of three required steps and a fourth optional step. GDL programs, combined with parent involvement, have been shown to reduce both crashes and risky behavior involving younger drivers.



**Figure 3.7: This map presents the percentage of total fatal and serious injury crashes attributed to young drivers by county. The darkest symbols represent the counties with the highest percentage.**



<sup>5</sup> Centers for Disease Control and Prevention. Web-based Injury Statistics Query and Reporting System (WISQARS) [Online]. (2016). National Center for Injury Prevention and Control, Centers for Disease Control and Prevention.





Figure 3.8: Iowa's Graduated Driver's License Program (GDL)

**Instruction permit**

- Eligible at age 14 with approval from parent/guardian
- Pass the written and vision test

**Minor school license (optional)**

- Eligible at age 14 ½
- Must have completed a driver education course
- Must live at least 1 mile from school
- Hold an instruction permit for at least six consecutive months before applying
- If attending a public school, you must have the school superintendent, principal or school board chair and your parent or guardian sign an Affidavit for School License

**Intermediate license**

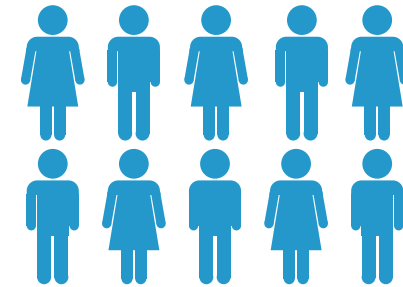
- Eligible at age of 16
- Must have held an instruction permit for six months
- Must have completed a driver education course
- May not drive between 12:30 a.m. and 5 a.m.

**Full license**

- Eligible at age of 17 with written approval from parent or guardian and must have held the intermediate license for 12 months
- Must have a clean driving record (no crashes or violations)

Strategies

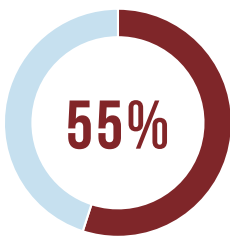
- Improve content and delivery of driver education curriculum.
- Continue educating young drivers in school-based settings using various training techniques, including those that simulate impairment.
- Support a broad-based coalition to plan for addressing age-based transportation needs.
- Support young drivers to avoid distractions and impairment.



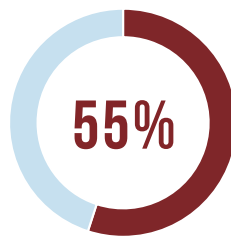
OVER THE PAST 10 YEARS, AN AVERAGE OF **10** PEOPLE DIED OR WERE SERIOUSLY INJURED EACH WEEK DUE TO YOUNG DRIVERS.

Associated safety emphasis areas

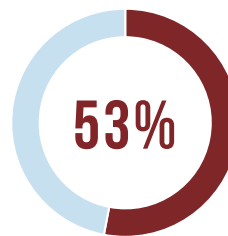
Lane departures



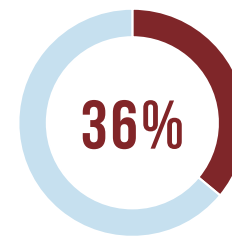
Local roads



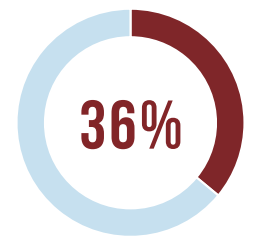
Speed-related



Unprotected persons



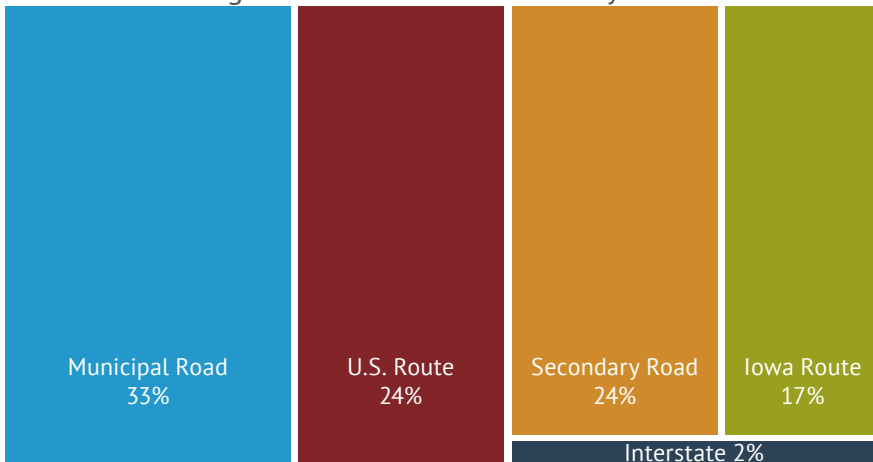
Roadside collisions



## Intersections

One of the greatest opportunities for a crash to occur is at an intersection where vehicles, pedestrians, and bicyclists cross paths. Intersections are planned points of conflict and are often the places with the highest concentrations of crashes along a roadway. The design of an intersection can come in many different forms. Conventional forms of intersections are the most recognizable and include signalized and unsignalized designs. Innovative intersections, which typically address either safety concerns related to points of conflict or operational concerns, include designs such as roundabouts, restricted crossing u-turns (RCUT), or jughandle.

Percentage of Intersection Crashes by Road Class



In Iowa, 30 percent of all fatal and serious injury crashes were intersection-related between 2013-2017. Over that same five-year period, there was a slight two-percent increase in the number of severe injury crashes. Largely, the number of intersection-related crashes has remained consistent with relatively few spikes. Many of Iowa's fatal and serious injury crashes occurred on local municipal routes (33 percent), U.S. Highways (24 percent), or the secondary county system (24 percent). Similarly, 60 percent of fatal and serious injury crashes related to intersections occurred in urban areas where there is a high density of them, while 40 percent occurred in rural areas.

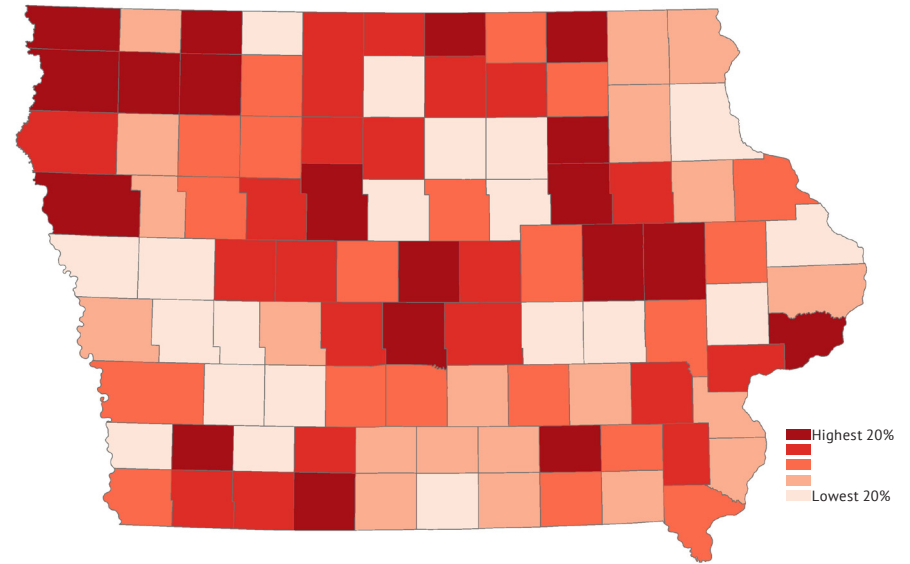
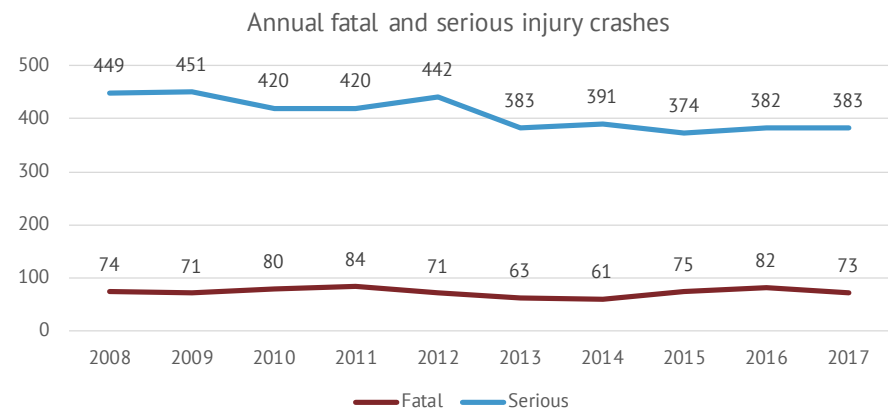


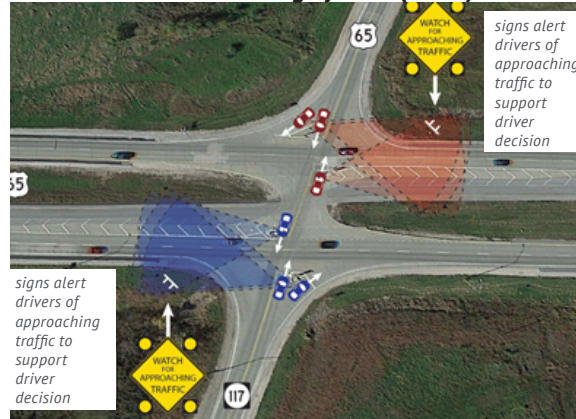
Figure 3.9: This map presents the percentage of total fatal and serious injury crashes attributed to intersections by county. The darkest symbols represent the counties with the highest percentage.











Several strategies have been deployed in Iowa to reduce the number and severity of crashes at intersections. Solutions for these crashes may be as simple as updating and upgrading signage and/or pavement markings, or as complex as changing geometry or design. The goal is to match the solution to the problem. One effective countermeasure that has been implemented in Iowa is the intersection conflict warning system (ICWS). In Iowa, ICWS are installed at intersections that are located along divided highways. The system warns both the driver on the divided highway and those approaching on the minor roadway (see Figure 3.10 for a typical installation). Currently there are six ICWS deployed in Iowa, and there has been an estimated 20 percent reduction of targeted crashes.

**Figure 3.10: Typical installation of intersection conflict warning system (ICWS)**



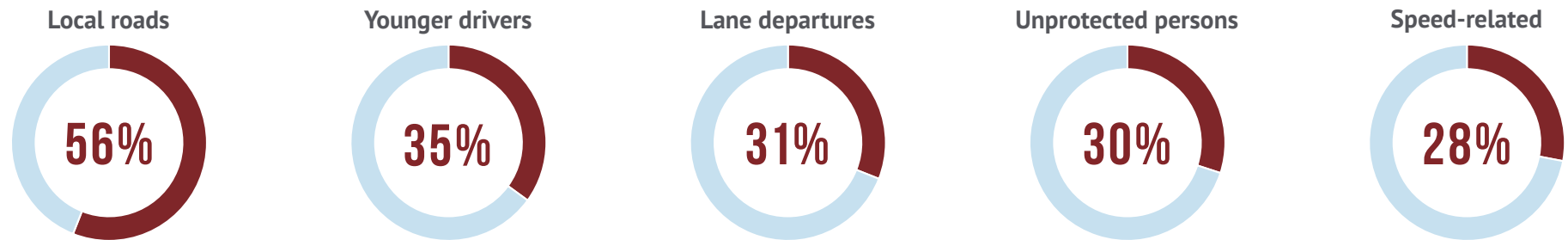
### Strategies

-  Develop educational resources informing the public of alternative intersection types, traffic signals, and laws.
-  Conduct enforcement campaigns related to bicycle and pedestrian awareness at targeted intersections.
-  Use systemic approaches to improve visibility and awareness of intersections.
-  Implement alternative intersection designs that reduce conflict points and enhance safety and mobility.
-  Develop an intersection configuration/evaluation tool to aid planners and designers in selecting appropriate intersection types.
-  Approach intersections with caution and get familiar with new designs in your community.



OVER THE PAST 10 YEARS, AN AVERAGE OF **9** PEOPLE DIED OR WERE SERIOUSLY INJURED EACH WEEK DUE TO INTERSECTION CRASHES.

### Associated safety emphasis areas

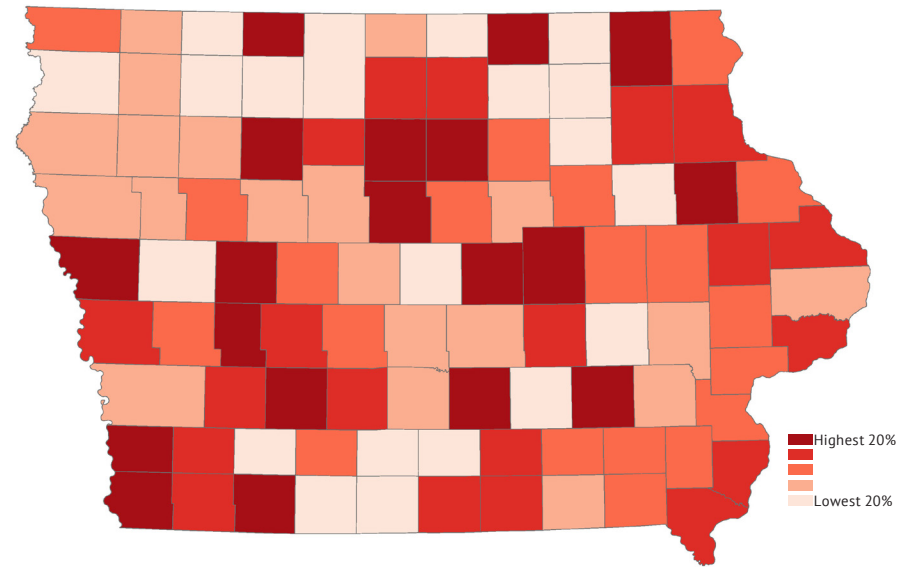


## Impairment involved

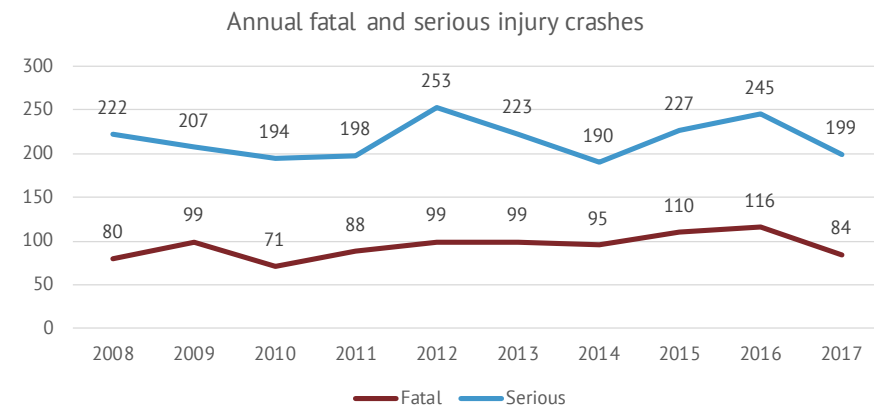
Impaired driving is one of the most common contributors to vehicle crashes. For the purposes of this plan, impaired driving is considered to be when any driver or non-motorist is found to be under the influence of drugs or alcohol, which includes those that have a positive drug or alcohol test or who refused to be tested.

In Iowa since 2013, there have been 1,588 fatal or serious injury crashes that involved impairment. These crashes accounted for nearly 22 percent of the total fatal and serious injury crashes in Iowa over the past five years. Over that same five-year time period there has been a 14.7 percent reduction in number of fatal and serious injury crashes involving impairment. Unsurprisingly, most crashes involving impairment occurred between Friday and Sunday (63 percent) and in the evening or early morning hours from 8 p.m. to 4 a.m. (56 percent). Figure 3.12 presents the percentage of impaired drivers involved in fatal and serious injury crashes, which is largely represented by young males. In many cases the number of impaired males involved in these crashes were five times greater than their female counterparts. One in three drivers who were impaired in a fatal or serious injury crash was a male under the age of 30.

In February 2016, the Iowa Impaired Driving Coalition was formed to address the high percentage of fatalities associated with impaired driving. The coalition, which is composed of a diverse representation of stakeholders, recognizes the need to address impairments of all kinds and understands that impaired driving is a statewide problem with many solutions. With that understanding, the coalition developed the Iowa Statewide Impaired Driving Plan in September 2016, which is a comprehensive plan that identifies strategies to reduce impaired driving fatalities within the state.



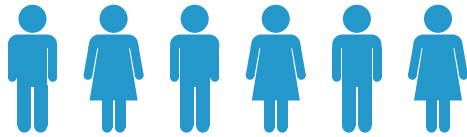
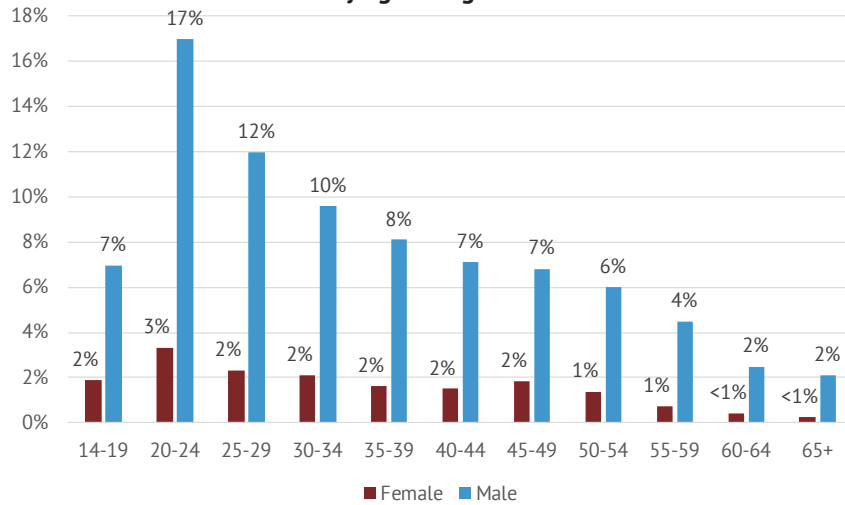
**Figure 3.11: This map presents the percentage of total fatal and serious injury crashes attributed to impaired driving by county. The darkest symbols represent the counties with the highest percentage.**





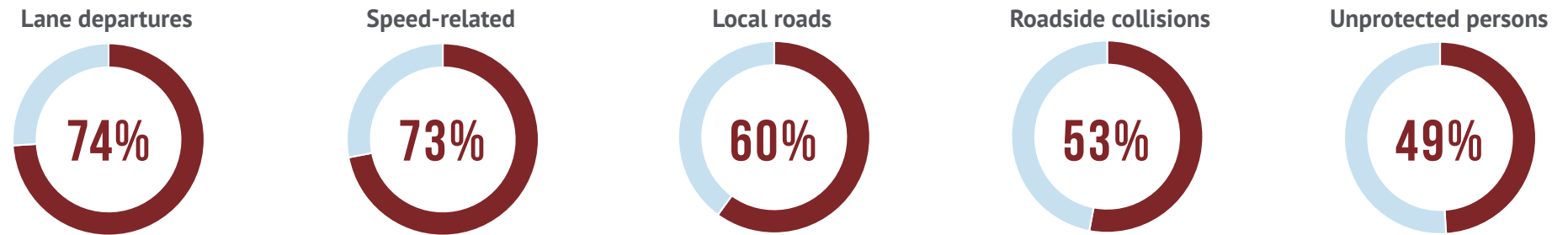


**Figure 3.12: Impaired driver involved in fatal or serious injury crashes by age and gender**



OVER THE PAST 10 YEARS, AN AVERAGE OF **6** PEOPLE DIED OR WERE SERIOUSLY INJURED EACH WEEK DUE TO IMPAIRED DRIVING.

Associated safety emphasis areas



Strategies

- Educate drivers on the different types of impairments and their effects on driving.
- Employ screening and brief interventions in health care settings.
- Support trainings for 60 new drug recognition expert (DRE) officers and 500 new advanced roadside impaired driving enforcement (ARIDE) officers.
- Develop and implement a standardized approach for law enforcement to identify impaired drivers.
- Expand 24/7 program, place of last drink program, and ignition interlock program.
- Enhance detection through special OWI patrols and related traffic enforcement.
- Implement countermeasures at access locations to reduce wrong-way driving on multi-lane divided highways.
- Designate a driver, call a cab, but don't risk driving impaired.

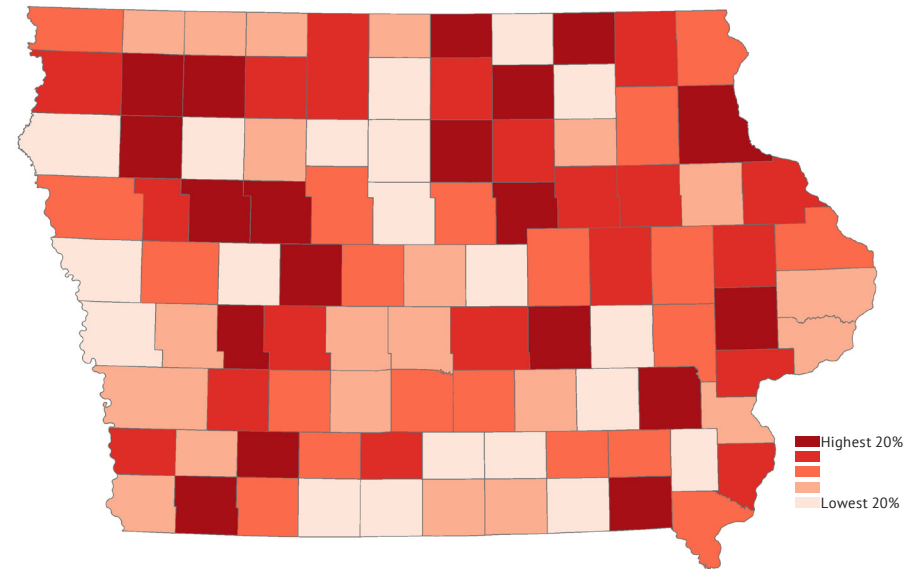


## Older drivers

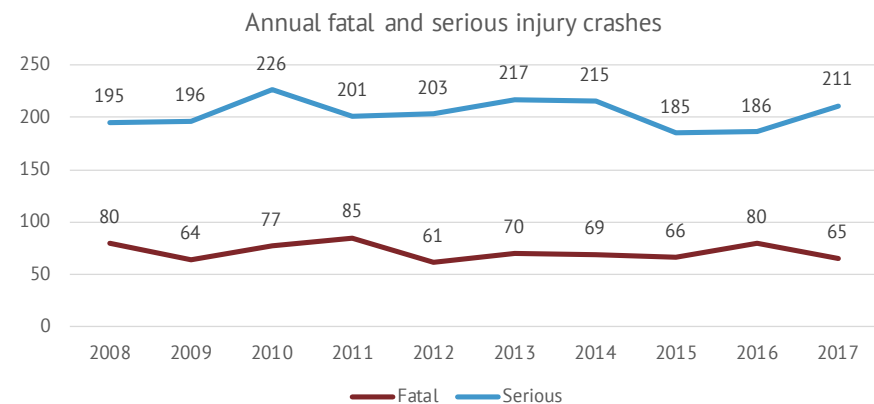
Over 15 percent of Iowa's population is over the age of 65. This segment of the population stands to increase in terms of proportion to the total state population as Iowa's baby boomers (those born between 1946-1965) continue to move into this segment of the population. Aging can have an impact on a number of skills related to driving, including strength, flexibility, visual acuity, or cognitive functions. Deterioration in any of these functions can negatively affect an older driver's ability to safely navigate a roadway environment. Further, older pedestrians are at a greater risk and are more vulnerable to severe injuries when involved in a vehicle crash. As part of Iowa's HSIP annual report, the Iowa DOT is required to determine if the rate of older driver and pedestrian fatalities and serious injuries has increased over the previous two years. Based on the most recent calculation of this rate, Iowa has not seen an increase; however, the Implementation Team decided it was important to include strategies for older drivers as they represent such a significant proportion of Iowa's population.

Older drivers were involved in just over 18 percent of total fatal and serious injury crashes from 2013-2017. There has been a three percent decrease in the number of severe injury crashes in older driver crashes over that same five-year period. Fifty-six percent of severe injury crashes involving older drivers occurred in rural areas of Iowa. Of the fatal and serious injury crashes involving older drivers, 76 percent occurred between daytime hours of 8 a.m. and 6 p.m.

In addressing crashes involving older drivers, Iowa has taken proactive steps to ensure that Iowans are able to maintain mobility while remaining safe on the roadways. After the age of 70 when a driver's license expires, Iowans are required to renew their license in person. Also, after the age of 70, licenses can only be renewed for a two-year period. In some cases, older drivers may be asked to take a knowledge test in addition to the vision test to ensure the drivers have both the visual and mental acuity to be behind the wheel.



**Figure 3.13: This map presents the percentage of total fatal and serious injury crashes attributed to older drivers by county. The darkest symbols represent the counties with the highest percentage.**










Outside of renewing their license, older drivers are also encouraged to seek opportunities to see how well their vehicle “fits” them. Programs such as AARP’s CarFit provide a quick and comprehensive review of how older drivers and their cars work together. The focus of the CarFit program is to provide older drivers the tools needed to ensure their position within the vehicle is comfortable and safe and that they understand the crucial safety features within their vehicle.

For those aged **65 OR OLDER**,  
the risk of having an **AT-FAULT CRASH**  
**increases** by as much as **64%**  
**WITHIN 30 DAYS OF RECEIVING A TRAFFIC VIOLATION**

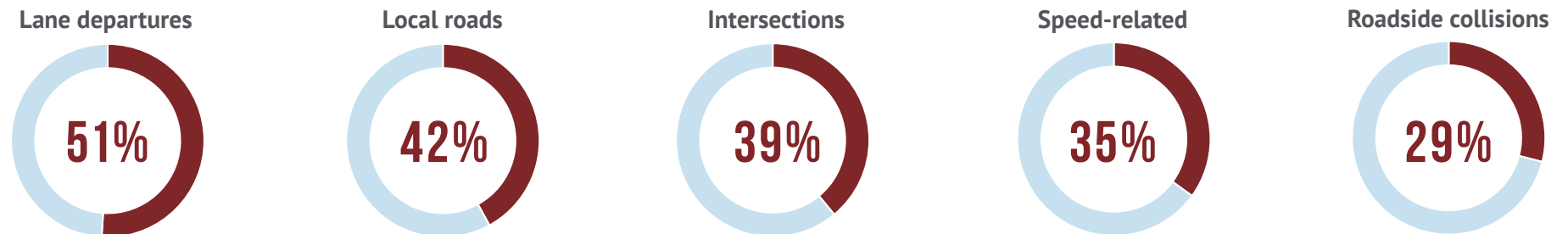
### Strategies

-  Support a broad-based coalition to plan for addressing age-based transportation needs.
-  Provide educational and training opportunities for mature drivers that address driver safety, road engineering and signage, vehicle technology, driver licensing, health and vision concerns, and alternative transportation options.
-  Update publications and web resources for older drivers and their families to include safety strategies, warning signs, and planning for driving retirement.
-  Update procedures for assessing medical fitness to drive.
-  Know when to put the keys down, or when to have a conversation with family members who may pose a hazard to others on the road.



OVER THE PAST 10 YEARS, AN AVERAGE OF **5** PEOPLE DIED OR WERE SERIOUSLY INJURED EACH WEEK DUE TO OLDER DRIVERS.

### Associated safety emphasis areas



## Distracted or inattentive drivers

Distraction or inattentiveness can include any driving or non-driving activity that takes a driver's or non-motorist's focus off the task of navigating the roadway. Contributing factors can include phone use, eating, drinking, smoking, passengers, or fatigue. Because distraction and inattentive driving is largely underreported, it is unknown what impact it has on the number of fatal and serious injury crashes. This point is illustrated in Figure 3.15. This presents challenges in both analyzing the issue of distracted driving and identifying solutions.

**29%**

of all the drivers found at fault for fatal and serious injury crashes involving distraction or inattentiveness were **UNDER THE AGE OF 25.**

Crashes involving distracted or inattentive drivers may be largely underrepresented, but they still comprise over 13 percent of all fatal and serious injury crashes between 2013-2017 in Iowa. There was a 257 percent increase in the number of distracted or inattentive crashes between the years 2014-2015. This increase is due in part to a change in the crash report form that gave officers the ability to provide more specific information in detailing crashes. In Iowa, males and females under the age of 25 account for 29 percent of all the drivers found at fault for fatal and serious injury crashes involving distraction or inattentiveness.

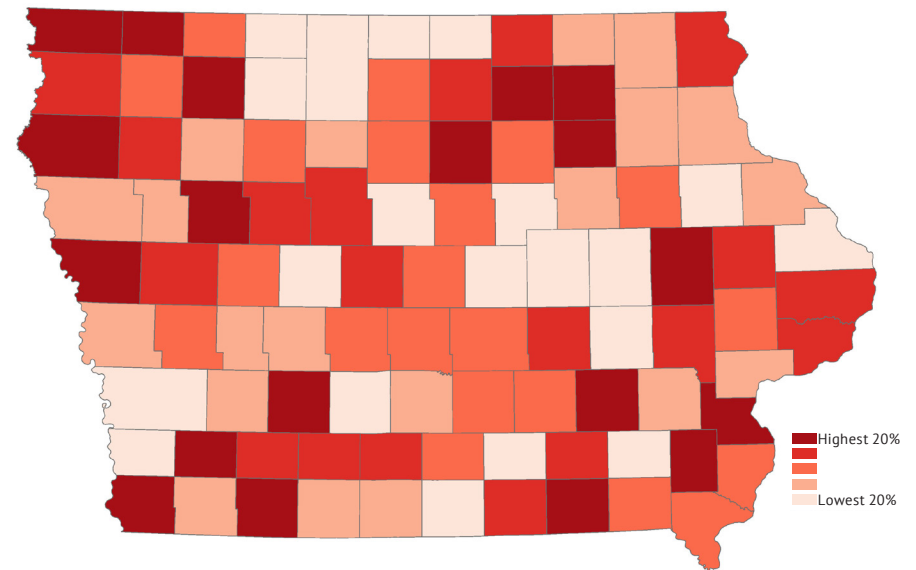
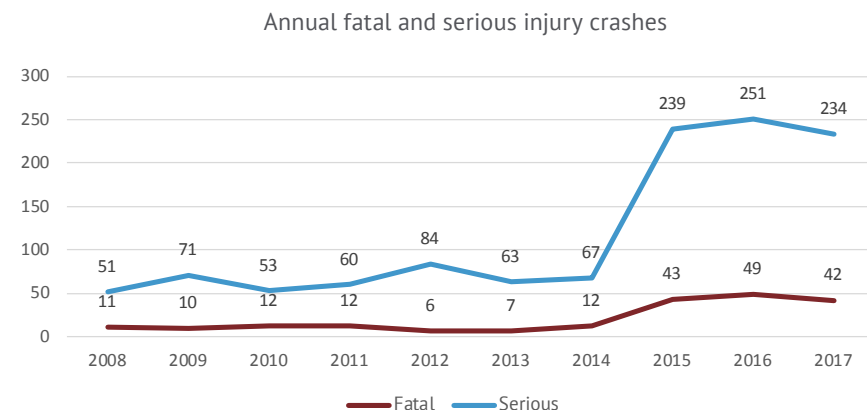


Figure 3.14: This map presents the percentage of total fatal and serious injury crashes attributed to distracted or inattentive driving by county. The darkest symbols represents the counties with the highest percentage.





Reducing the number of crashes involving distracted and/or inattentive drivers has been a significant emphasis for Iowa's safety stakeholders over the last plan period. In 2016, Iowa held the first Drowsy Driving Summit, which focused on the magnitude of the issue and how drowsy driving can cause effects similar to distracted or impaired driving by reducing the driver's ability to react or make clear judgements. Iowa has also recently passed a hands-free cell phone law that went into effect in July 2017. That law bans all text and electronic messaging while driving.

### Strategies

- Develop targeted interventions and education programs for high-risk populations.
- Support high-visibility enforcement campaigns for hands-free cell phone law.
- Put the cell phone down, avoid distractions, be alert, and focus on the roadway.

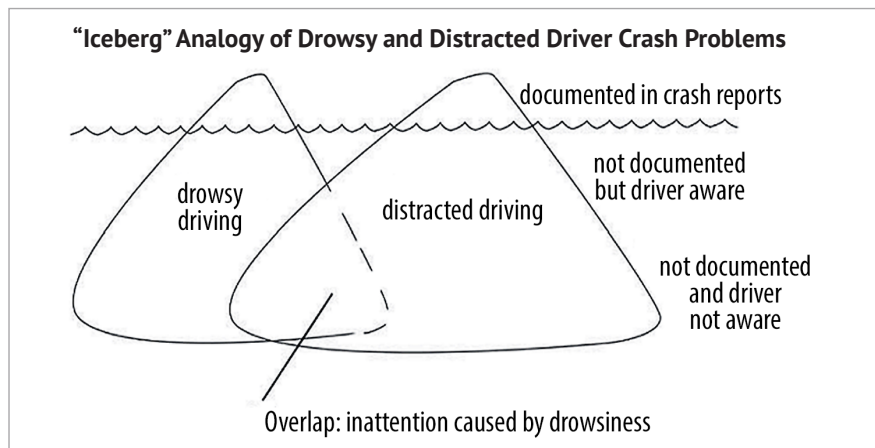
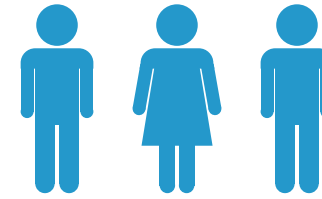
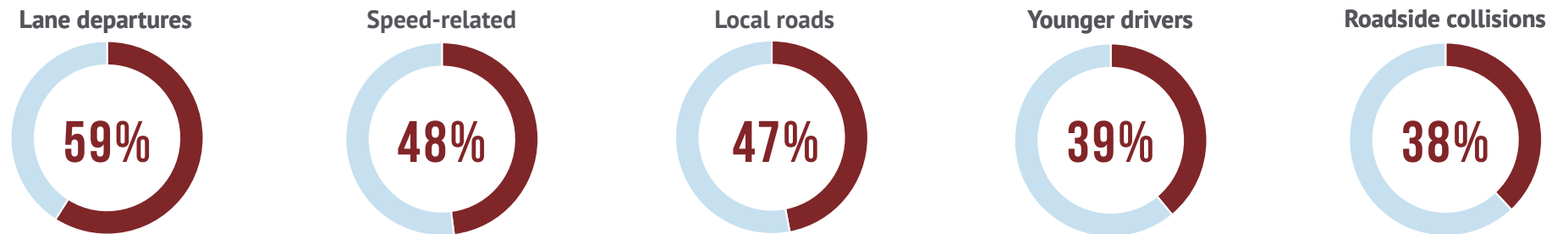


Figure 3.15: Source NCHRP 500: A Guide for Reducing Crashes Involving Drowsy and Distracted Drivers.



OVER THE PAST 10 YEARS, AN AVERAGE OF **3** PEOPLE DIED OR WERE SERIOUSLY INJURED EACH WEEK DUE TO DISTRACTED OR INATTENTIVE DRIVING.

### Associated safety emphasis areas



The following safety emphasis areas were not identified as priorities for this plan, but are still important to consider as they relate to traffic safety within Iowa. Summary-level information has been included to help highlight these additional safety emphasis areas for fatal and serious injury crashes.

## Local roads

Fatal and serious injury crashes that occur on Iowa's local road system represent a unique challenge. Although the Primary Highway System (interstate, U.S., and Iowa highways) is the most heavily traveled, most of the system mileage comes from the secondary (county) and municipal (city) systems. Fatal and serious injury crashes that occurred on the local system accounted for over 52 percent of the total fatal and serious injury crashes from 2013-2017. To address this challenge, the Iowa DOT has been developing local road safety plans (LRSP) since the fall of 2014. LRSPs provide a systemic approach to safety improvements on the transportation system. Instead of identifying high-crash locations, which can often be infrequent, LRSPs screen the roadway network for high-risk roadway features before they become crash sites. The result is a prioritized list of curves, intersections, and segments where proactive countermeasures may save a life. Similar to the SHSP, LRSPs focus on the Five E's of safety and are developed by a diverse group of practitioners devoted to solving their local road safety issues. Since 2014, 47 counties have either completed or started the process of developing a LRSP.

## Motorcycles

Motorcycle use in Iowa only represents a small fraction of the total amount of VMT (0.41 percent within the state), however, motorcycles were involved in over 16 percent of the total fatalities and serious injuries within the state between 2013-2017. This overrepresentation of motorcycle fatalities and serious injuries is further magnified when one considers the fact that motorcycle use is typically constrained to warm weather months in Iowa. In order to reduce the number of severe crashes, the Iowa DOT has led a Motorcycle Safety Forum. This forum brings together riders, industry experts, and public officials to discuss advances in technology and policy as it relates to the field of motorcycle safety. The Iowa DOT also administers a Motorcycle Rider Education (MRE) program, which teaches the Basic Rider Course (BRC) and the Basic Rider Course II (BRC II) of the Motorcycle Safety Foundation (MSF).



## Heavy trucks and other vehicles

For this plan, heavy trucks are defined as having a gross vehicle weight rating (GVWR) of 10,000 pounds or more, and other special vehicles include buses and farm equipment. Heavy trucks were represented in 10 percent of the fatal and serious injury crashes between 2013-2017, while other special vehicles were only accounted for in just under two percent. Much of Iowa's economic vitality is driven by the transport of goods and services on its dense transportation network, including highways, pipelines, railroads, and waterways. On Iowa's highway system, heavy truck traffic accounted for 11 percent of total VMT within the state. Of that truck traffic, almost 92 percent of it occurred on the Primary Highway System. However, heavy trucks, buses, and farm equipment can also pose higher risk of death and serious injury when they are involved in a crash due to their size and weight. The largest proportion of individuals seriously or fatally injured in a heavy truck crashes are those outside of the heavy truck, particularly occupants of other vehicles.

Improving freight and motor carrier safety is critically important to the efficient transport of goods in Iowa. The state of Iowa is committed to reducing the number of traffic crashes resulting in injury or loss of life involving a commercial motor vehicle. In pursuit of this goal, the state is supported by the Motor Carrier Safety Assistance Program (MCSAP), which is administered by the Federal Motor Carrier Safety Administration (FMCSA). To be eligible for this program's funding, states must produce a commercial vehicle safety plan, which serves as the MCSAP grant project plan and budget. Iowa also published a FAST Act compliant State Freight Plan in 2017, which not only serves as a guide for freight investment decisions within the state, but also aligns with the national freight goals to improve the safety, security, efficiency, and resiliency of the multimodal freight transportation system.

## Work zones

Just under two percent of Iowa's fatal and serious injury crashes occurred in work zones from 2013-2017. For drivers, work zones represent a change from the expected roadway conditions. In work zones, drivers must exercise extra caution and focus their attention on the movements of traffic around them, traffic control devices, and the location of workers. Many of Iowa's work zones start appearing in the month of March and are present through November. Some of these work zones are for long-term projects that last several months or years, whereas others are short-term and only last several days or weeks.

In Iowa, both the safety of the workers, and those traveling through a work zone, are of highest priority during the construction and maintenance of Iowa's transportation system. Since 1999, Iowa has been a part of the Smart Work Zone Deployment Initiative (SWZDI), which is a pooled-fund study to investigate better ways of controlling traffic through work zones. Several other states are part of the pooled-fund study, including Kansas, Missouri, Nebraska, and Wisconsin. The goal of SWZDI is to research and identify ways to reduce the number and severity of crashes in work zones and improve the efficiency of traffic operations under work zone conditions.



## Bike and pedestrian

In combination, bike and pedestrian fatal and serious injury crashes represented just over seven percent of Iowa's total fatal and serious injury crashes from 2013-2017. There are numerous traffic violations and behaviors committed by bicyclists, pedestrians, and motorists that contribute to the number of crashes. Reviewing data to identify the behaviors and violations that most often result in a crash, and implementing strategies to reduce the occurrence of them, will help reduce these numbers. However, when pedestrians and bicyclists are involved in a crash, they are often more vulnerable because of the effects of speed and lack of physical protection. This is especially true for pedestrians, where vehicle speed at impact directly increases the likelihood and risk of severe injuries. Although only a combined four percent of Iowans reported walking or bicycling to work in the most recent five-year American Community Survey (ACS) estimate, mobility and safety for these users is still very important in Iowa. This importance is illustrated in the recently completed Iowa Bicycle and Pedestrian Long-Range Plan, which outlines a future vision of bicycle and pedestrian mobility. The key objectives of the plan are:

- To serve as the primary guide for Iowa DOT decision-making regarding bicycle and pedestrian programs and facilities.
- Help achieve improved project-level coordination within the Iowa DOT.
- Provide consistency and mobility for bicycle and pedestrian users statewide.

The Bicycle and Pedestrian Long-Range Plan will serve as the guide for the state to ensure that the needs for all users are considered in the future.

## Trains

Iowa's rail system includes both commercial freight and passenger rail. Due to the large number of rail and highway intersections, rail crossing safety is critical. In Iowa, less than one percent of fatal and serious injury crashes involved a train from 2013-2017. Several rail crossing safety programs are administered by the Iowa DOT, including the federal-aid Highway Railroad Crossing Safety Program, the Grade Crossing Surface Repair Program, and Iowa's Highway Railroad Grade Crossing Safety Program. Safety programs support projects such as grade separations, track maintenance, and signal upgrades. The Iowa DOT also cooperates with the implementation of the National Rail Safety Action Plan and supports Operation Lifesaver, which is a nonprofit education and awareness program dedicated to ending highway-rail collisions.

In 2017, the Iowa DOT published the Iowa State Rail Plan in pursuit of the goals of promoting access to rail transportation, helping to improve the freight railroad transportation system, expanding passenger rail service, and promoting improved safety both on the rail system and where the rail system interacts with people and other transportation modes. The Iowa State Rail Plan serves as the guide for the state in all rail activities.





## Winter driving conditions

Winter weather related crashes were represented in just over eight percent of Iowa's fatal and serious injury crashes from 2013-2017. Driving in Iowa during the winter months often means that weather events that include snow and ice are common. The Iowa DOT has been innovative in its approach in maintaining the roadways during these events and informing the public of the current conditions. Every year the Iowa DOT promotes and administers a snow fence program with landowners to help reduce the amount of blowing and drifting onto state highways. Landowners agree to keep rows of corn standing as a natural snow fence, or stack bales in strategic locations in exchange for a per-foot rental payment from the DOT. They can also receive payment for a permanent fence or agree to let a fence be temporarily installed on their land. These programs are extremely successful in preventing drifts in problem locations and can prevent problems before they start. The Iowa DOT also has recently completed research in alternative snow fence designs that may allow the placement of snow fence within state-owned right of way.

The Iowa DOT's plow truck fleet is equipped with automatic tracking and communication systems which provide information on plow location, spreading status, vehicle status, and dash-cam imagery. The information is used extensively for managing in-storm operations, collecting data for operational analysis, and providing baseline data for several research and optimization projects. In addition, live information and photos are provided to travelers on the Iowa 511 and Track-a-Plow websites so they can make informed winter travel decisions.

The Iowa DOT is constantly researching ways to improve its response to severe winter weather events. The Iowa DOT, in partnership with Iowa State University, is currently developing a winter operations dashboard that will link current operations to expected level of service and visualize where resources are being used.

This data will help highway maintenance supervisors better plan operations during storms for improved and more consistent winter road conditions. The Iowa DOT is also currently seeking approval to begin investigating a prototype plow guidance system that could be used in low-visibility situations. Ideally, this system would provide enough guidance to a plow driver related to driving path and obstacle avoidance that they could continue plowing and keep roads open in even the most severe blizzards.





# 4. IMPLEMENTATION & EVALUATION



## 4.1 Iowa's long-term safety vision and short-term targets

Since the adoption of the 2013 SHSP, Iowa has continued to align with the national vision to eliminate all traffic fatalities. In order to do this, Iowa's Zero Fatalities campaign was developed in 2014 as part of the state's first SHSP implementation effort. Several different state departments partnered to develop the Zero Fatalities campaign, including the Iowa Department of Transportation, Iowa Department of Public Safety, and Iowa Department of Public Health. While the partner agencies realize that zero fatalities is a challenging goal for the state, messaging strategies focus on the fact that zero is the only acceptable goal for individuals when it comes to their loved ones. Messaging is meant to help people to understand that every fatality is a life that was important to someone and not just a statistic.

Although Zero Fatalities is Iowa's long-term vision, the state also recognizes the need to establish short term goals in pursuit of this vision. In 2016, the Federal Highway Administration (FHWA) published the Highway Safety Improvement Program (HSIP) and Safety Performance Management (Safety PM) Final Rules. As part of these rules, states are required to develop statewide targets annually for five safety performance measures, including:

- Number of fatalities
- Rate of fatalities per 100 million vehicle miles traveled (VMT)
- Number of serious injuries
- Rate of serious injuries per 100 million VMT, and
- Number of non-motorized fatalities and non-motorized serious injuries

These targets will serve as the short-term goals for the state. In developing the strategies and content within this plan, the Implementation Team considered how they would support the targets and goals that are defined annually by the state. As these targets are established, adjustments will be considered to either the targets or strategies in order to align with Iowa's long-term vision of Zero Fatalities.

## 4.2 How this plan will be implemented

Iowa's SHSP Implementation Team is charged with leading the implementation of strategies and programs detailed in this plan. The success of this plan will be dependent upon continued collaboration of the agency partners. Over the plan period, the Implementation Team will focus on:

- Meeting on a regular basis to update fellow team members
- Tracking the progress of strategies defined by the team
- Adopting, evaluating, or modifying strategies that are either existing or new to the plan
- Providing guidance on safety-related programs
- Supporting local agencies and organizations wishing to adopt the strategies or programs defined in the plan
- Facilitating future updates of the SHSP

The implementation of the strategies defined within this plan are financially supported by a number of federal and state sources, most notably the Highway Safety Improvement Program (HSIP) facilitated by the Iowa DOT and Section 402 and 405 National Priority Safety Program funds facilitated by the Governor's Traffic Safety Bureau (GTSB).

## E teams

In order to support broader adoption of the strategies throughout the state, the SHSP Implementation Team decided to establish teams based on the E's of safety: Education, Enforcement, Engineering, and Emergency Medical Services. Each team will be composed of relevant members from the Implementation Team and external representatives from public and private organizations, advocacy groups, and individuals passionate about traffic safety in Iowa. These teams will help disseminate and implement the relevant strategies from the plan to a broader audience, including local and regional agencies. As experts in their particular fields, the representatives of each team will also support implementation by providing real evidence of how the strategies that have been implemented are performing. The teams will also be a great resource for developing new strategies and supporting future plan updates.



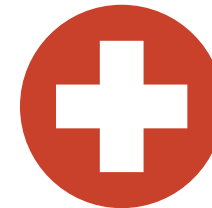
Education



Enforcement



Engineering



EMS

## 4.3 How SHSP implementation will be evaluated

### Hierarchy of evaluation

This plan can be evaluated at many different levels. In general, the highest level of evaluation for this plan is in evaluating progress in meeting the safety performance targets discussed previously, which includes how many fatalities and serious injuries have occurred on Iowa's roadways. The second level of evaluation is found at the safety emphasis area level. Similar to the plan level, evaluation at the safety emphasis area level is measured by how many fatalities and serious injuries are associated with that particular safety emphasis area. This will allow the Implementation Team to identify how each of the safety emphasis areas are trending and focus their attention and resources towards those areas that need support. The final way this plan can be evaluated is at the strategy level. Although many strategies defined in this plan do not have a quantifiable measure, it is assumed that the strategies identified will have a recognizable impact that can be evaluated at the safety emphasis area level. In other words, if a concentrated effort is made in implementing the strategies, associated reductions of fatalities and serious injuries attributable to that safety emphasis area should be seen. This evaluation structure provides feedback loops that the team can monitor both up and down the levels of evaluation.

### Frequency of evaluation

Evaluation of the plan will occur on an annual basis in conjunction with setting the annual safety performance targets. The Implementation Team will consider the progress made over the previous year in both the overall goals highlighted in the safety performance measures and also within each safety emphasis area and strategy.



## 4.4 Preparing for the future and next steps

Beyond the strategies identified in this plan, the partner agencies and the Implementation Team are committed to proactively addressing safety through existing and future initiatives in Iowa. The following is a brief listing of programs, projects, and technology that are anticipated to impact the future of traffic safety in Iowa.

### Crash data records and accuracy

A critical component to developing the SHSP is the availability of reliable crash data. Iowa is fortunate to have an extensive library of traffic records data to utilize. This library is composed of six core data systems, including crash, driver, vehicle, roadway, citation adjudication, and injury surveillance. Promoting the use and improvement of these systems is the mission of Iowa's Statewide Traffic Records Coordinating Committee (STRCC). Iowa's STRCC, which has met since 1994, is a multidisciplinary committee composed of safety professionals involved in the collection, management, and application of data. STRCC provides a forum for agencies to discuss traffic records issues and develop projects to improve the quality and use of Iowa's traffic records.

Iowa's STRCC will continue to partner and define projects that support and enhance the quality of Iowa's traffic records data. This will ultimately help support Iowa's goal of providing timely, accurate, and accessible data, thereby supporting the goal of reducing fatalities and serious injuries.

### Safety analysis

In 2010, the American Association of State Highway and Transportation Officials (AASHTO) published the Highway Safety Manual (HSM). As many transportation agencies move towards performance-based processes for developing and designing projects, the HSM provides an opportunity for agencies to analyze the safety performance of roadways similar to how they analyze other aspects

of a roadway, such as capacity. This allows safety professionals the ability to accurately estimate where there are safety issues on the system and how their future design decisions will impact the safety performance of the roadway.

In 2016, the Iowa DOT formed the Safety Analysis Incorporation (SAI) Committee focused on integrating the methodologies identified in the HSM into Iowa's transportation project development process. This effort will not only result in identifying the areas of greatest need, but will also help identify the most reliable and cost effective ways of addressing those needs.

### TSMO & traffic incident management

When a vehicle crash happens on any of Iowa's roadways, the traumatic impacts do not stop with those included in the crash. They also extend to others on that roadway in the form of associated delay cost and increased risk of secondary crashes. In order to address the frequency and extent of these incidents, the Iowa DOT has focused on using a transportation systems management and operations (TSMO) approach. To implement a TSMO approach, the Iowa DOT is incorporating key operational strategies that support utilizing the transportation system's full capacity while still retaining a sufficient level of travel time reliability and safety for Iowans.

One TSMO approach that the Iowa DOT is actively utilizing to minimize the impacts of incidents, such as vehicle crashes or hazardous spills, is traffic incident management (TIM). TIM provides a systematic approach to managing incidents on Iowa's highway system through coordination of emergency response and clearing incidents quickly after they occur. One of the major benefits of implementing a TIM approach is that multiagency coordination and response to incidents improves over time, which has a positive impact on the response time and efficiency of clearing the roadway.

## Automated and connected vehicle technology

In terms of the potential to reduce the frequency of fatalities and serious injuries, automated vehicles (AV) and connected vehicles (CV) are the most anticipated technological advancements in the transportation industry. Although both AV and CV technologies are often talked about synonymously, the two are distinctly different. AV technology uses a combination of light detection and ranging (LIDAR), global positioning systems (GPS), optical cameras, and processing power to analyze the roadway and position the vehicle. In contrast, CV uses wireless communication, such as dedicated short-range communication (DSRC), to help the vehicle communicate with surrounding vehicles, infrastructure, or non-motorists.

The largest potential safety benefits of AV and CV technology will come from reducing the impact of human error. The National Highway Transportation Safety Administration (NHTSA) suggests

that nearly 94 percent of motor vehicle crashes are caused in part by human error. By using advanced technology and communications, AV and CV technologies could reduce the amount of human input (and therefore human error) required for the task of driving. Although fleet integration of fully automated or connected vehicles is likely many years down the road, many of today's vehicles are being equipped with lower levels of automation, such as adaptive cruise control, lane keeping assist, blind spot monitoring, automatic parallel parking, and adaptive headlights. These features and future AV and CV technology will likely have a dramatic impact on the frequency of fatal and serious injuries on Iowa's roads. Although most of the potential impacts of full AV and CV technology are only speculative at this point, Iowa is already taking steps to prepare for this technology through pilot projects on the state's roadways or addressing the technology through strategic planning.



## Next steps

Development of this SHSP update is just the first step in the effort of improving the safety of Iowa's roadways. Implementation of the strategies identified in this plan will require the concentrated effort of all of Iowa's traffic safety stakeholders. To successfully implement this plan, the Implementation Team and safety stakeholders around the state should commit to the following in order to support change in Iowa's traffic safety culture.

- Create a sense of urgency and establish an environment of traffic safety culture.
- Continue to share and communicate Iowa's Zero Fatalities vision with users and agencies across the state.
- Identify opportunities to incorporate the strategies and goals within this plan into other long-range planning activities.
- Build a coalition of stakeholders and empower them with data and information.
- Evaluate progress made towards strategies for each safety emphasis area and document which strategies are effective.
- Support projects, programs, and policies that promote safety on Iowa's roadways.

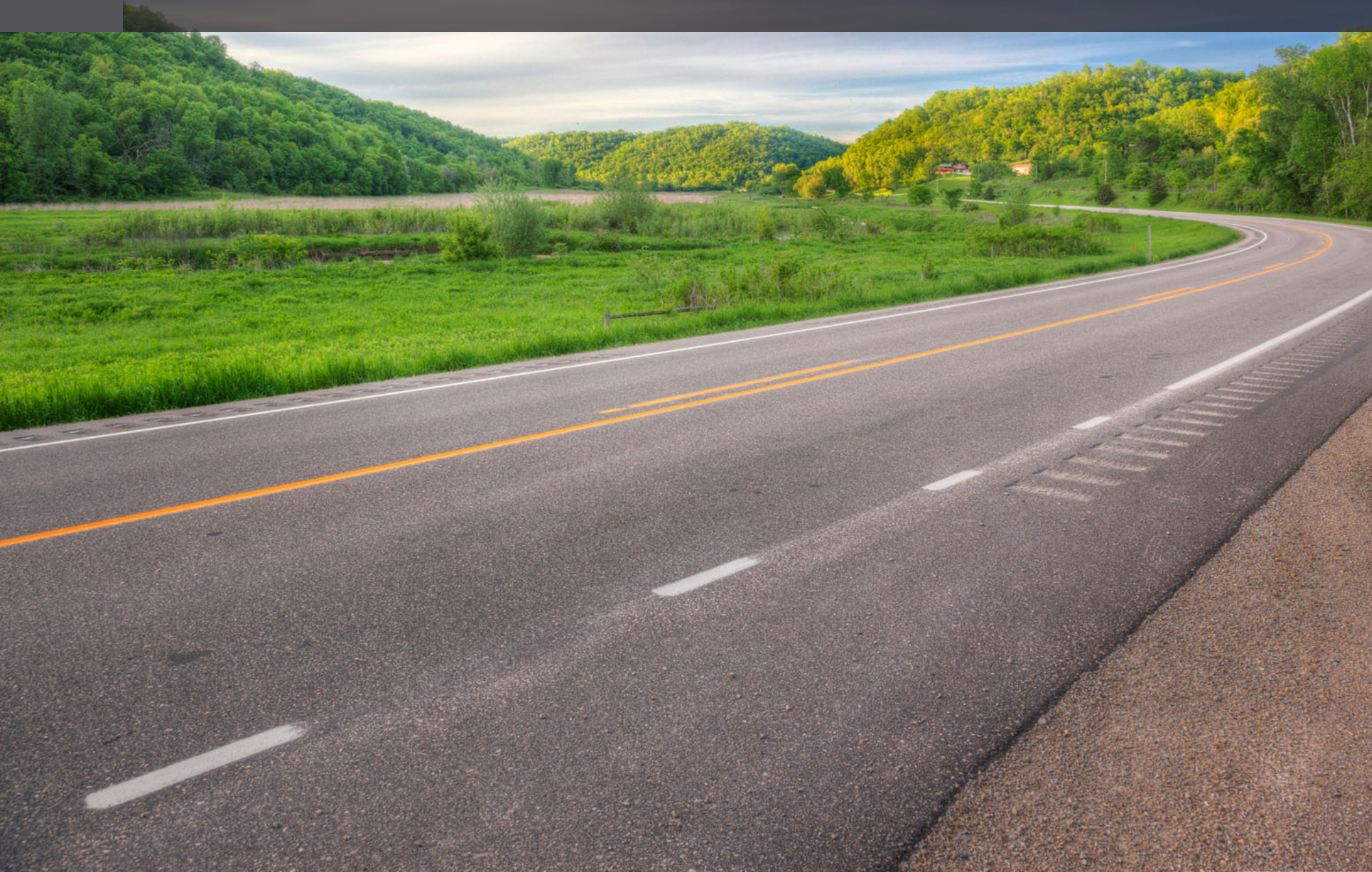
As the partner agencies and Implementation Team move forward with implementing the strategies identified within this plan, we are committed to reducing the number of fatalities and serious injuries on Iowa's roadways to zero. The impact of this commitment pales in comparison to the cumulative impact every driver can have on the safety of Iowa's roadways. Iowa challenges everyone to commit to the following to ensure that Zero Fatalities is not just the state's goal, but everyone's.

- Put the cell phone down, avoid distractions, be alert, and focus on the roadway.
- Designate a driver, call a cab, but don't drink and drive.
- Give yourself enough time to reach your destination. Be patient, slow down, and don't engage with aggressive drivers.
- Buckle up everyone and every time.
- Focus on the road, don't overcorrect or veer for objects or animals in the roadway.
- Approach intersections with caution and get familiar with new designs in your community.
- Know when to put the keys down, or when to have a conversation with family members who may pose a hazard to others on the road.
- Support young drivers to avoid distractions and impairment.



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# APPENDIX 1: SHSP STAKEHOLDER INPUT PROCESS



According to the Federal Highway Administration (FHWA), the Strategic Highway Safety Plan (SHSP) should be a consultative approach that involves key multidisciplinary stakeholders continuously during plan development and implementation. For this update, the focus was on getting quality feedback from a diverse group of statewide safety stakeholders, which would inform the prioritization of the safety emphasis areas by the SHSP Implementation Team. The Implementation Team was then tasked with prioritizing the safety emphasis areas and identifying the strategies that would provide the greatest opportunities to reduce the number of fatalities and serious injuries on Iowa’s roadways.

In this update, and the previous two updates of the SHSP, Iowa has analyzed 18 different safety emphasis areas, some in combination. For the purpose of collecting stakeholder input, which was an effort supported by Snyder & Associates, the safety emphasis areas were organized into three different groups (see Figure A.1). The identification of these groups helped determine the emphasis areas that were going to form part of the public involvement process. The green group of safety emphasis areas are represented in 50 percent or more of Iowa’s fatal and serious injury crashes and were automatically considered priority safety emphasis areas by the Implementation Team. Therefore, the safety emphasis areas in green were not considered during the stakeholder input process. The red group contains safety emphasis areas that the Implementation Team considered low opportunity to reduce associated fatal and serious injury crashes. The yellow group contains the remaining safety emphasis areas that were considered during the stakeholder input process.

Following the determination of which safety emphasis areas to focus on during stakeholder input, a pair comparison poll was developed using a web-based platform. The poll was designed to include pair comparison combinations among the ten safety emphasis areas that were selected for the public involvement process, resulting in 45 different combinations. These 45 couplets were utilized to make one-to-one comparisons of one safety emphasis area versus another. The comparison poll was developed with the intention of simplifying the process for the stakeholders to compare the relative priority of ten different emphasis areas at once.

**Figure A.1: Safety emphasis areas**

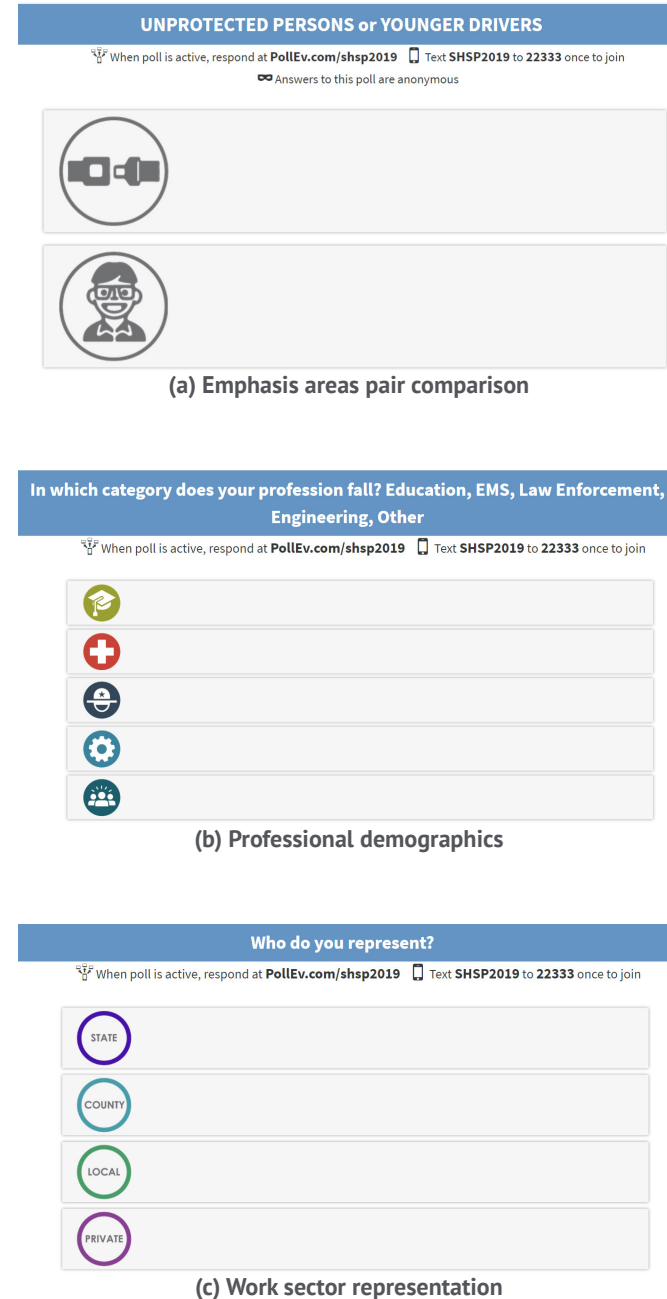


In addition to the 45 pair comparison questions, two professional demographic questions were added to the list. The first question asked the stakeholder to identify which of the Five E's best represented their profession: education, emergency medical services, enforcement, engineering, or everyone/other. The second question asked the stakeholder to identify which of the working sectors they represented: State, County, Local, or Private. The nature of these two questions provided the Implementation Team insight into the mix of representation of the stakeholders who participated. The complete set of questions remained the same for all groups involved in order to guarantee consistency. All three types of questions that were included in the participation poll are shown in Figure A.2.

One of the most important components of the SHSP update process is consultation with a broader group of traffic safety stakeholders. For this plan, the Implementation Team decided to consult with many groups (including the Team itself) using the pair comparison poll. The following groups, attendees, or organizations participated in the stakeholder input process:

- American Public Works Association
- Driver's Education Conference
- Governor's Highway Traffic Safety Conference
- Iowa Bicycle Summit
- Iowa County Engineers Association
- Metropolitan Planning Organization and Regional Planning Affiliation Staff and Policy Boards
- Office of Local Systems E-mail Subscribers
- SHSP Implementation Team
- Traffic and Safety Forum

**Figure A.2: Web-based pair-comparison participation poll sample questions**

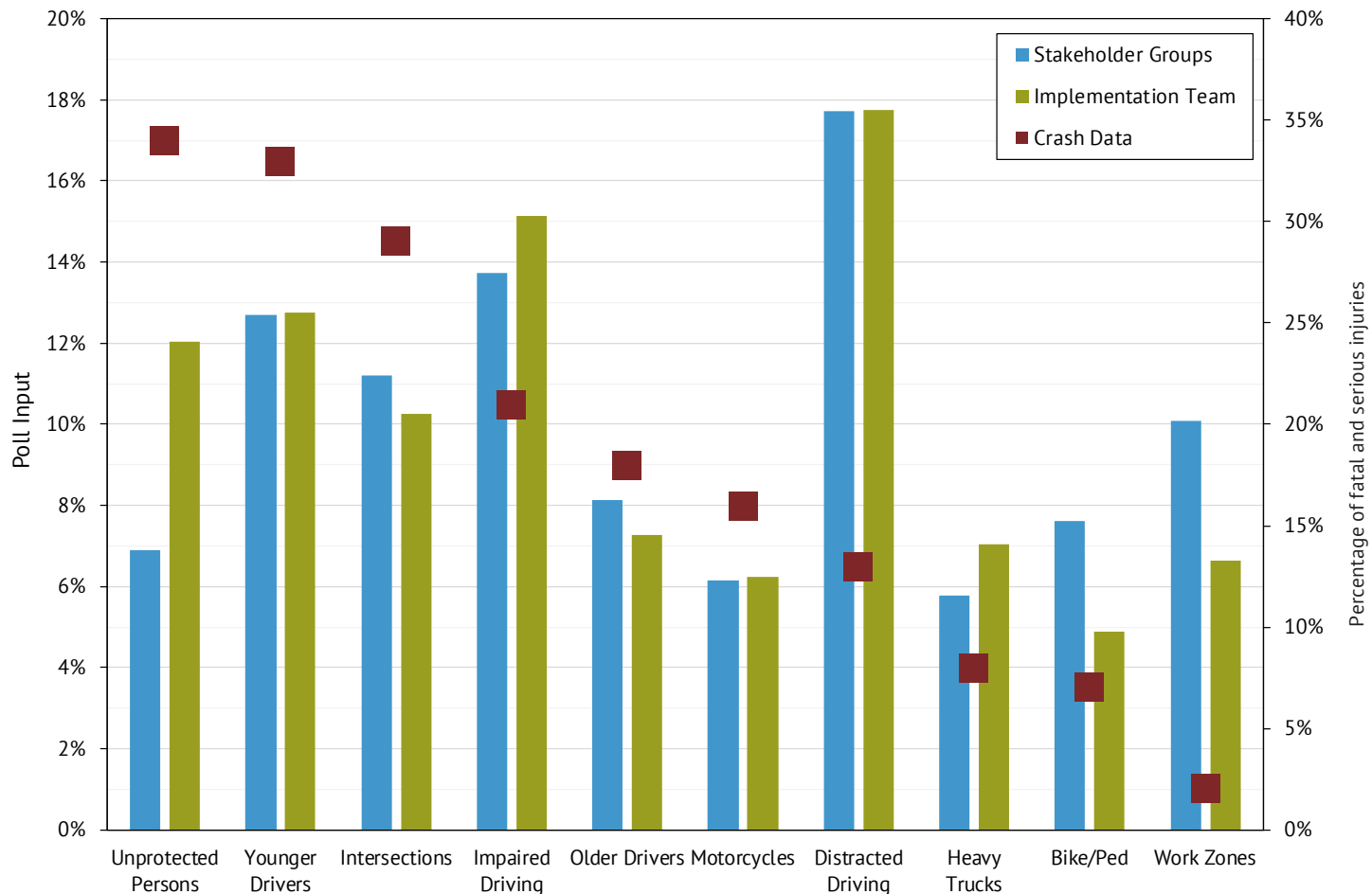


## Results

More than 600 stakeholders participated in the pair comparison poll. The data obtained through the polling software was downloaded into a .csv file, analyzed, refined, and shared with the Implementation Team at the quarterly meetings. The following sections describe results obtained from the stakeholder input efforts; the safety emphasis areas shown in the results are limited to those included in the participation poll.

All of the input gathered from the stakeholder groups was combined with the exception of responses from the Implementation Team, which were kept separate for comparison purposes. Input from the 'Implementation Team' and 'stakeholder groups' refers to the y-axis label on the left side of the chart; the percentage of fatal and serious injuries obtained from the crash data refers to the y-axis label on the right, seen in Figure A.3.

**Figure A.3: Cross comparison among stakeholder groups, Implementation Team, and crash data**



The purpose of the comparison between the results of the Implementation Team and the other stakeholder groups was to demonstrate any discrepancies concerning the prioritization of safety emphasis areas. Figure A.3 shows evident agreement for safety emphasis areas such as driver distraction, younger drivers, and motorcycles between the Implementation Team and the other stakeholder groups. However, minor discrepancies are observed for other safety emphasis areas, such as unprotected persons, work zones, and bicycle/pedestrian. The contrast of opinions between groups is important to take into consideration when developing and determining strategies for Iowa’s future safety investments.

Figure A.3 also includes the percentage of severe injuries obtained from the five-year (2013-2017) crash data analysis, with the safety emphasis areas ordered from higher to lower crash frequency. The percentage of severe injuries and stakeholder prioritization do not directly align. However, the comparison among all three sets of data helps contextualize the difference between public safety concerns and actual frequency of severe injuries among safety emphasis areas.

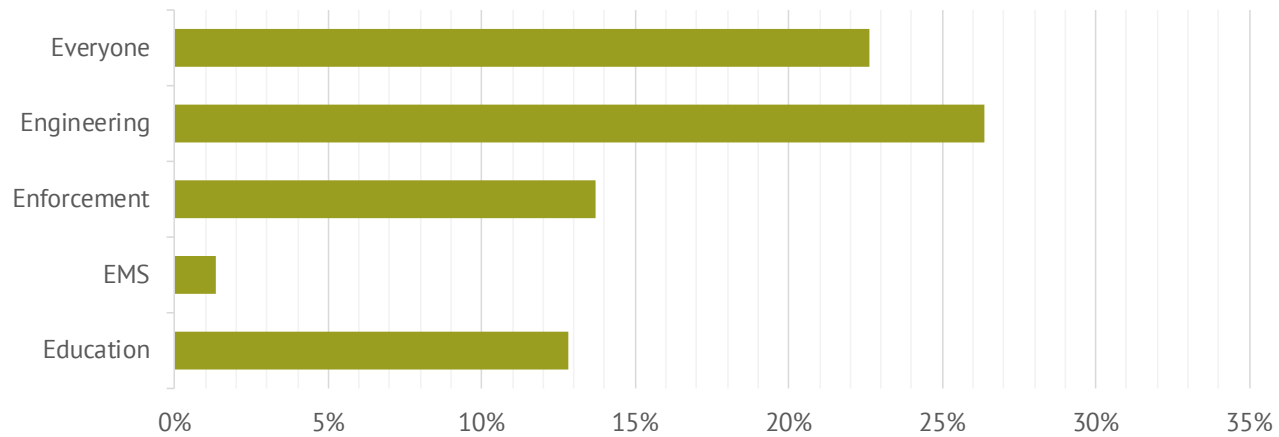
Participation poll results from the public input process of the Implementation Team and the other stakeholder groups were ranked and included in Table A.1, below. Frequency of severe injuries were also featured for reference.

**Table A.1: Cross comparison safety emphasis areas ranking**

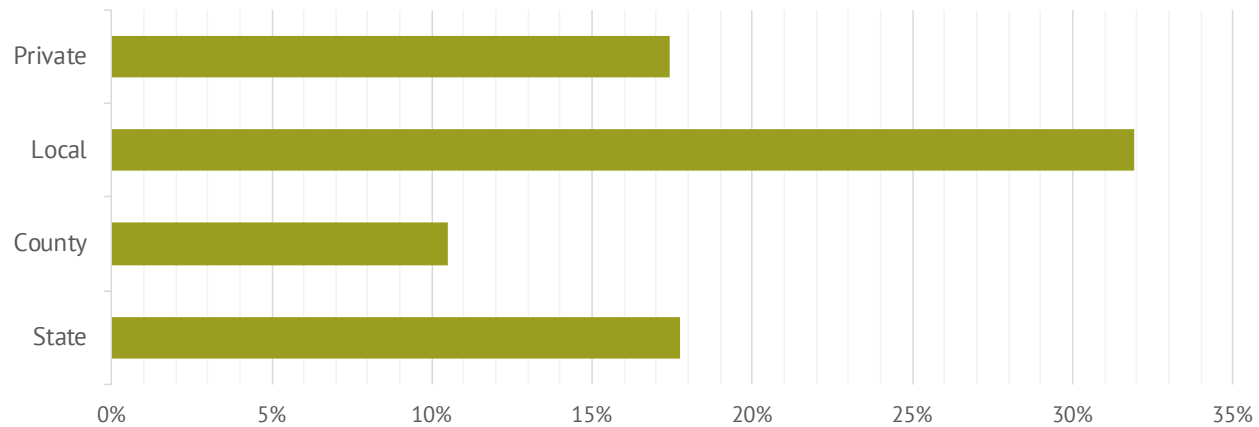
Safety emphasis area	Crash data	Implementation Team	Stakeholder groups
Unprotected persons	1	4	8
Younger drivers	2	3	3
Intersections	3	5	4
Impaired driving	4	2	2
Older drivers	5	6	6
Motorcycles	6	9	9
Distracted driving	7	1	1
Heavy trucks	8	7	10
Bicycle/pedestrian	9	10	7
Work zones	10	8	5

Professional demographics of the stakeholders involved in the participation poll are shown in Figure A.4, below. Overall, the public involvement effort managed to reach all Five E's at some level, and there was good representation across work sectors.

**Figure A.4: Professional demographics of stakeholders**



**(a) Profession of participants**



























































































**(b) Employment sector representation**



# APPENDIX 2: SAFETY EMPHASIS AREA STRATEGY MATRIX







 Primary safety emphasis area  
 Other relevant safety emphasis areas

<b>STRATEGY</b>		Lane departure and roadside collisions	Speed related	Unprotected persons	Young drivers	Intersections	Impairment involved	Older drivers	Distracted or inattentive drivers	Local roads	Motorcycles	Heavy trucks and other vehicles	Winter driving conditions	Bike and pedestrian	Work zones	Trains	<b>E</b>	
<b>EDUCATION</b>	Educate drivers on the importance of controlling and managing vehicle speed.																Education	
	Conduct Public Awareness campaigns focused on generating awareness of the risks associated with being an unprotected person.																	Education
	Improve content and delivery of driver education curriculum.																	Education
	Continue educating young drivers in school-based settings using various training techniques, including those that simulate impairment.																	Education
	Support a broad-based coalition to plan for addressing age-based transportation needs.																	Education
	Develop education resources informing the public of alternative intersection types, traffic signals, and laws.																	Education
	Educate drivers on the different types of impairments and their effects on driving.																	Education
	Support a broad-based coalition to plan for addressing age-based transportation needs.																	Education
	Provide educational and training opportunities for mature drivers that address driver safety, road engineering and signage, vehicle technology, driver licensing, health and vision concerns, and alternative transportation options.																	Education
	Update publications and web resources for older drivers and their families to include safety strategies, warning signs, and planning for driving retirement.																	Education
Develop targeted interventions and education programs to high risk populations.																	Education	

 Primary safety emphasis area  
 Other relevant safety emphasis areas

<b>STRATEGY</b>		Lane departure and roadside collisions	Speed related	Unprotected persons	Young drivers	Intersections	Impairment involved	Older drivers	Distracted or inattentive drivers	Local roads	Motorcycles	Heavy trucks and other vehicles	Winter driving conditions	Bike and pedestrian	Work zones	Trains	E	
<b>EMS</b>	Include medical professionals in educational efforts.																EMS	
	Employ screening and brief interventions in health care settings.																EMS	
	Update procedures for assessing medical fitness to drive.																EMS	
<b>ENFORCEMENT</b>	Evaluate high lane departure crash corridors for two-lane highways and deploy Road Safety Audit (RSA) teams to evaluate.																Enforcement	
	Identify corridors with a high frequency of speed-related crashes and implement high visibility enforcement campaigns.																Enforcement	
	Conduct highly publicized enforcement campaigns focused on restraint use.																	Enforcement
	Conduct enforcement campaigns related to bicycle and pedestrian awareness at targeted intersections.																	Enforcement
	Support trainings for 60 new DRE officers and 500 new ARIDE officers.																	Enforcement
	Develop and implement a standardized approach for law enforcement to identify impaired drivers.																	Enforcement
	Expand 24/7 program, place of last drink program and ignition interlock program.																	Enforcement
	Enhance detection through special OWI patrols and related traffic enforcement.																	Enforcement
	Support high visibility enforcement campaigns for hand free cell phone law.																	Enforcement

 Primary safety emphasis area  
 Other relevant safety emphasis areas

STRATEGY		Lane departure and roadside collisions	Speed related	Unprotected persons	Young drivers	Intersections	Impairment involved	Older drivers	Distracted or inattentive drivers	Local roads	Motorcycles	Heavy trucks and other vehicles	Winter driving conditions	Bike and pedestrian	Work zones	Trains	E
ENGINEERING	Evaluate high-friction surface treatments at targeted locations on the primary and local systems.	Primary	Other						Other	Other	Other	Other	Other				Engineering
	Place centerline and/or shoulder rumble strips on rural two-lane highways on the primary and local systems. Where necessary install or widen paved shoulders.	Primary	Other							Other	Other	Other	Other				Engineering
	Continue median cable barrier installations on the Interstate system. Initiate median cable barrier installations on multi-lane divided highways.	Primary	Other							Other	Other	Other					Engineering
	Evaluate and implement signing and geometric design strategies to moderate speeds and enhance safety.	Other	Primary			Other					Other	Other	Other		Other		Engineering
	Implement speed feedback signs at targeted locations.		Primary								Other	Other	Other		Other		Engineering
	Use systemic approaches to improve visibility and awareness of intersections.					Primary		Other			Other	Other	Other			Other	Engineering
	Implement alternative intersection designs that reduce conflict points that enhance safety and mobility.					Primary					Other	Other	Other		Other		Engineering
	Develop an intersection configuration/evaluation tool to aid planners and designers in selecting appropriate intersection types.					Primary									Other		Engineering
	Implement countermeasures at access locations to reduce wrong-way driving on multi-lane divided highways.	Other				Other	Primary										Engineering



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