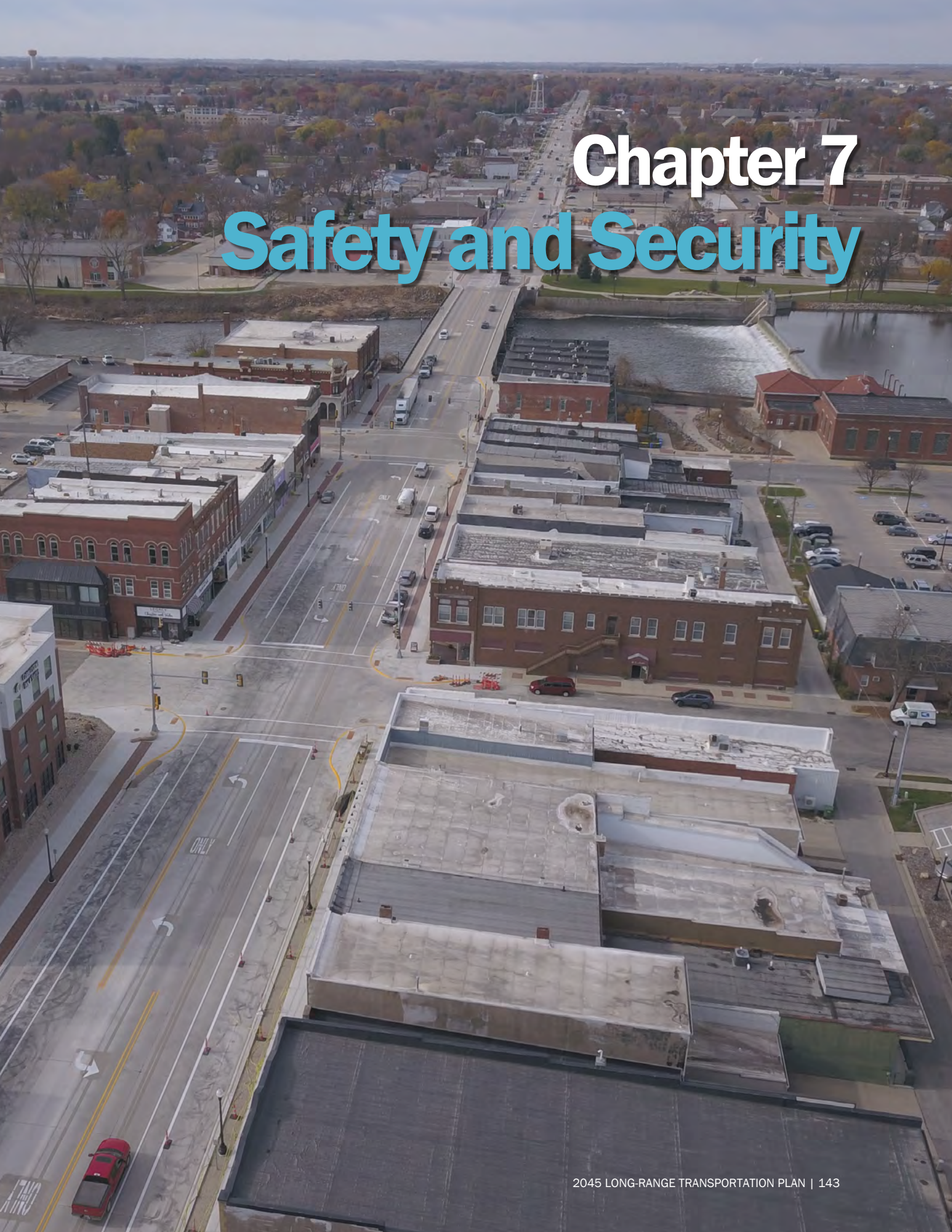


Chapter 7
Safety and Security

Chapter 7 – Safety and Security

National Crash Background

According to the National Highway Traffic Safety Administration (NHTSA), 36,560 people were killed in traffic crashes in 2018, a 2.4 percent decrease from 2017. The decrease in traffic deaths came as people drove even more. Estimated vehicle miles traveled increased by 0.3 percent from 2017 to 2018, while the fatality rate per 100 million vehicle miles traveled (VMT) decreased by over three percent, the lowest fatality rate since 2014. However, 6,283 pedestrians died, a more than three percent increase, and the most deaths since 1990; and 857 bicyclists were killed, a more than six percent increase.

Over the past 40 years, there has been a general downward trend in traffic fatalities. Safety programs such as those increasing seat belt use and reducing impaired driving have substantially lowered the traffic fatalities. In 2018, drunk driving fatalities dropped by four percent, accounting for 29 percent of 2018 traffic deaths – the lowest percentage since 1982 when NHTSA started reporting alcohol data.

Vehicle improvements such as air bags and electronic stability control have also contributed greatly to the reduction of traffic deaths on public roads. In 2018, there was a ten percent decrease in passenger vehicle occupants killed in rollover crashes.

Over the past ten years, the number of traffic deaths in urban areas has increased – surpassing deaths in rural areas since 2016. Among the fatal crash types that have risen since 2009 in urban areas, pedestrian deaths are up 69 percent, bicyclist fatalities increased 48 percent, and motorcycle deaths are up 33 percent.

Iowa Crash Statistics

For Iowa, the number of traffic fatalities has decreased substantially over time, though 2016 experienced the most traffic fatalities since 2008. In 2019, there were 336 fatalities on Iowa's roadways, an increase of 5.3 percent over 2018. Figure 7.1 shows the historical trend of traffic fatalities in Iowa, and Figure 7.2 provides additional fatality statistics for the state.

From 2010 to 2019, the number of non-motorist fatalities has been trending up, while non-motorist serious injuries have trended downward. On average, there are 28 fatalities and 116 serious injuries involving non-motorists each year. Rural areas continue to experience a disproportionate number of traffic fatalities. Over the past ten years, 31 percent of all crashes have occurred in rural areas, accounting for 70 percent of all fatalities.

Region Stats

12
People killed in crashes each year

43
People suffer major injuries from crashes each year

3.4%
Of crashes involve drivers under the influence of alcohol

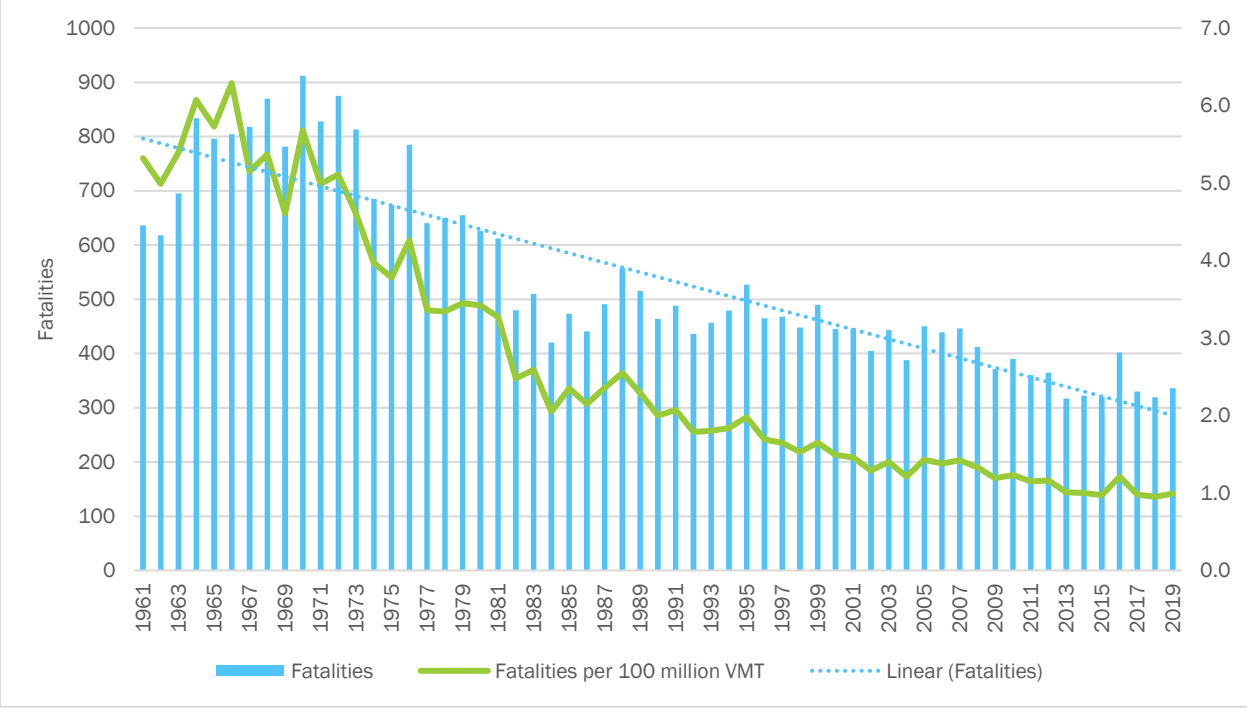
Every 6.8 hours
A crash occurs

30%
Of crashes are animal related

10-year statistics 2010-2019

https://icat.iowadot.gov

Figure 7.1: Historical Trend of Iowa Traffic Fatalities



Source: Iowa DOT Crash History, 2019

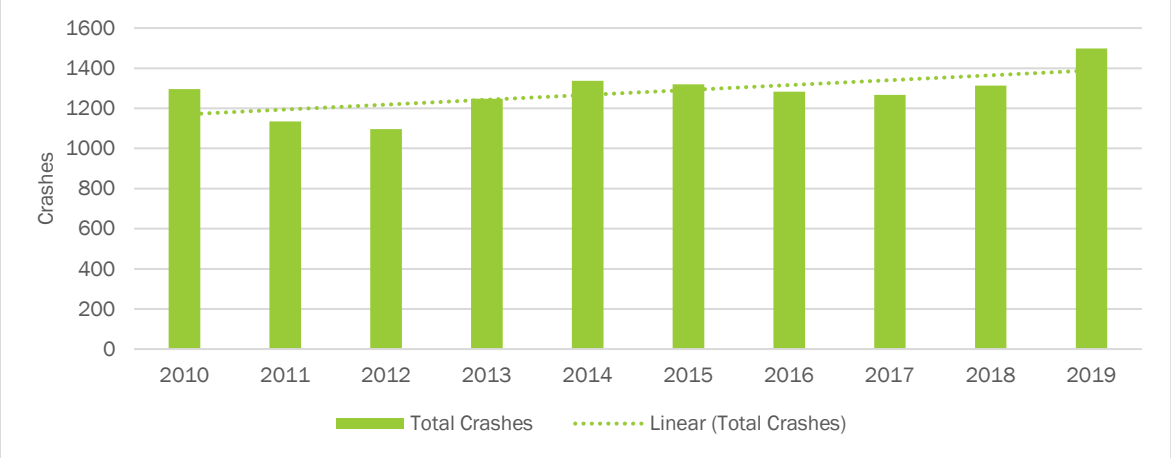
Figure 7.2: Traffic Fatality Statistics for Iowa, 2019

Source: Iowa Zero Fatalities

Region Crash Statistics

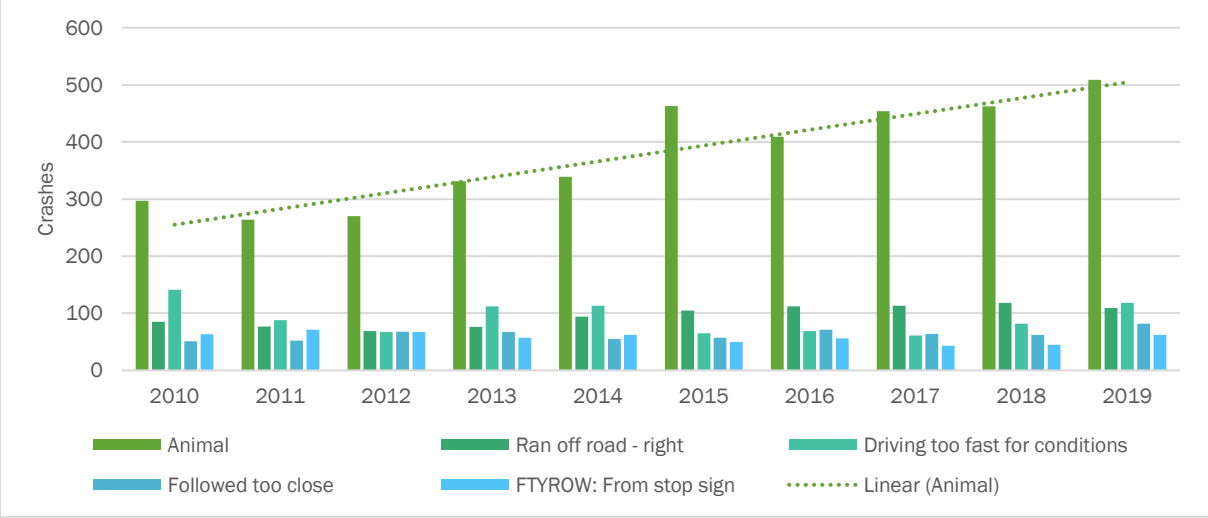
The total number of crashes has been on the rise (Figure 7.3). In 2019, the region experienced a ten-year high of 1,498 crashes. For comparison, the average number of crashes per year from 2010-2019 is 1,274. Figure 7.4 shows the top five major causes for crashes over the past 10 years. On average, these crash types have accounted for 54 percent of all crashes in the region. Animal-involved crashes account for approximately 30 percent of crashes annually, and this type of crash has been on the rise. From 2010 to 2019, crashes involving animals increased by 154 percent, and 2019 experienced a ten-year-high of 509 crashes (34 percent of crashes).

Figure 7.3: Historical Trend of Crashes in the Region



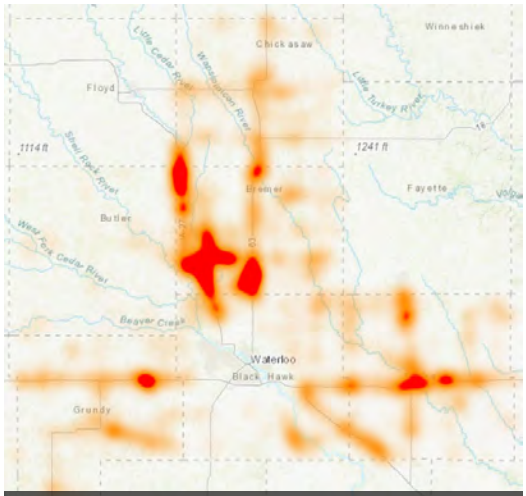
Source: Iowa DOT, Crash Analysis Tool

Figure 7.4: Top Five Major Causes of Crashes in the Region



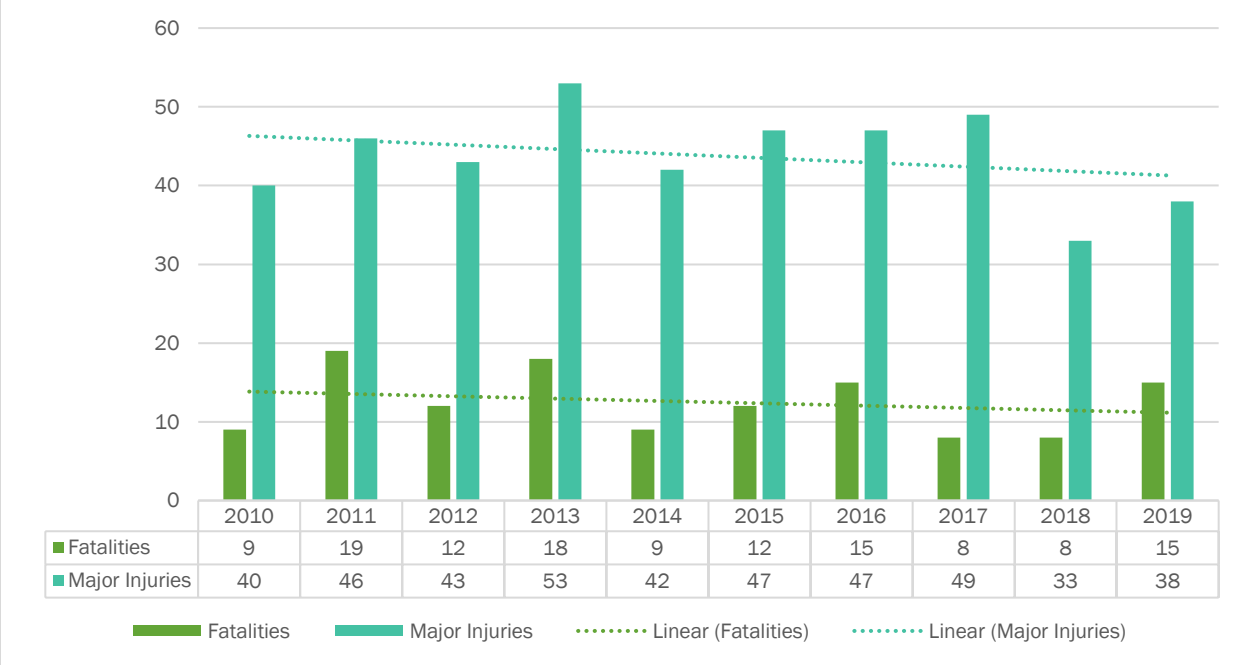
Source: Iowa DOT, Crash Analysis Tool

Though total crashes have been on the rise, fatalities, major injuries, minor injuries, and crashes involving someone under the influence of alcohol have all been on the decline. In 2018, the region experienced a ten-year low of 33 major injuries, and 24 crashes involving someone under the influence of alcohol. Figure 7.5 shows a historical trend of fatalities and major injuries, and Figure 7.6 shows a historical trend of crashes involving someone under the influence of alcohol.



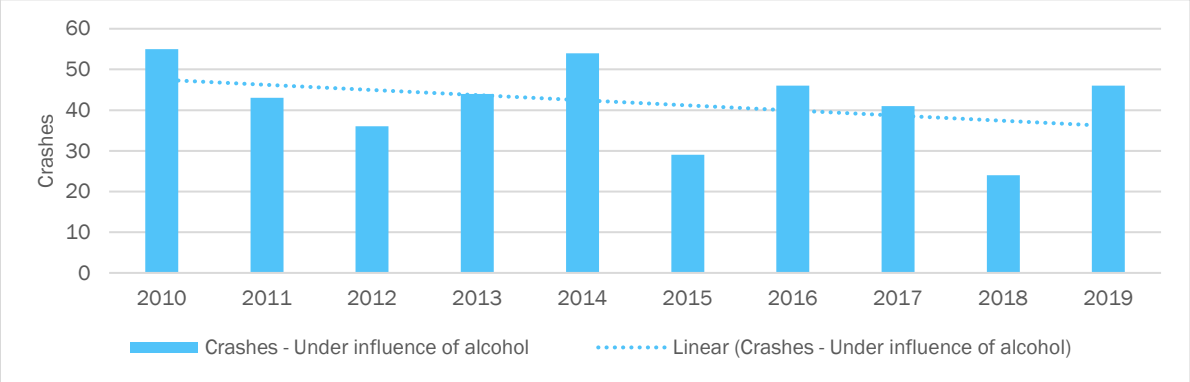
Animal crashes heat map, 2010-2019

Figure 7.5: Historical Trend of Fatalities and Major Injuries in the Region



Source: Iowa DOT, Crash Analysis Tool

Figure 7.6: Historical Trend of Crashes in the Region Involving Someone Under the Influence of Alcohol



Source: Iowa DOT, Crash Analysis Tool

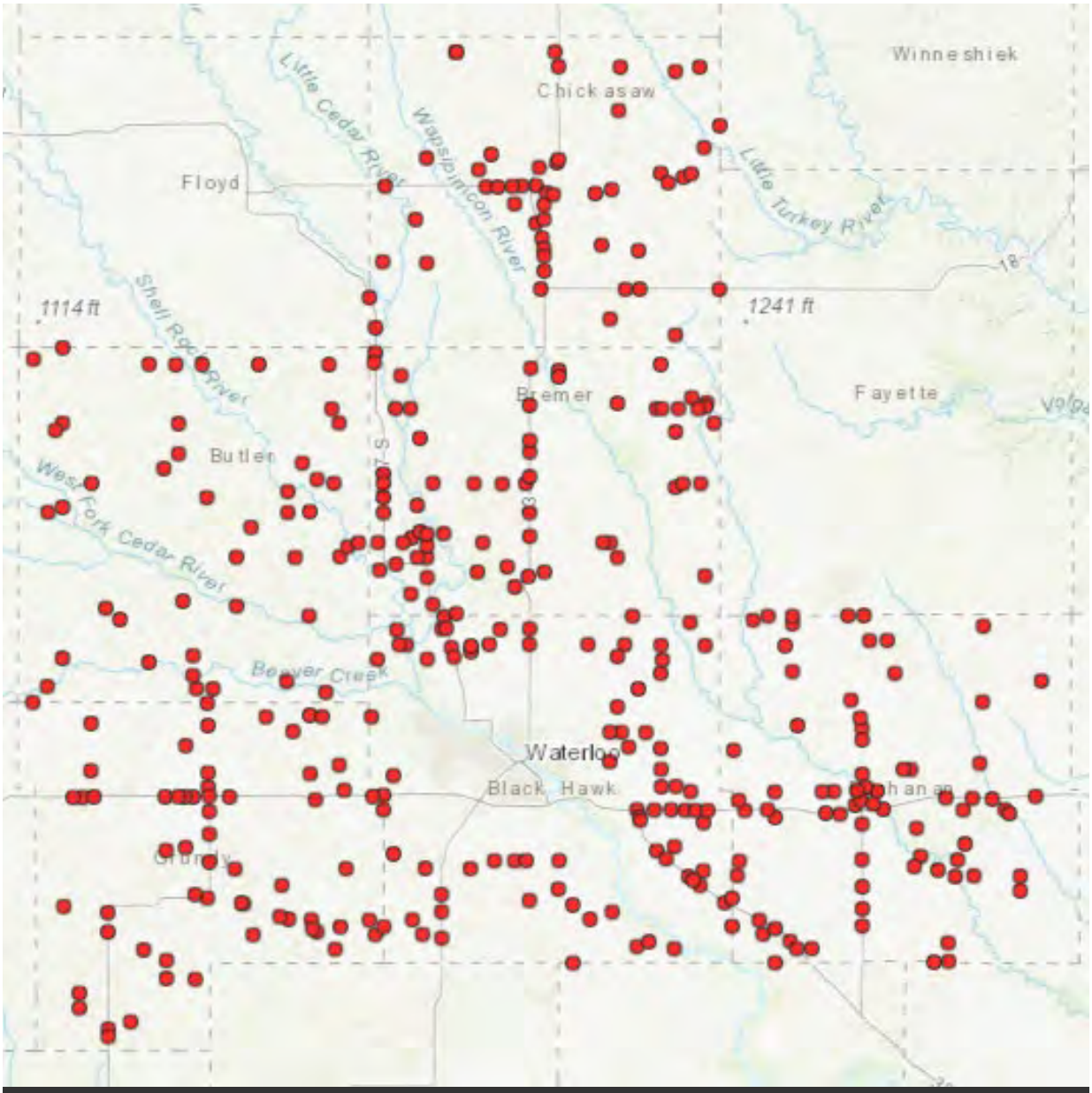
The following page shows fatality and major injury crash statistics for the region, and Table 7.1 provides a summary by county.

Table 7.1: Fatal and Major Injury Crash Statistics, by County, 2010-2019

	Total Crashes	Total Vehicles	Fatalities	Serious Injuries	Minor Injuries	Possible Injuries
Black Hawk	102	160	29	99	42	19
Bremer	82	143	19	83	35	20
Buchanan	91	135	21	87	25	20
Butler	53	78	14	51	7	17
Chickasaw	57	85	20	54	19	9
Grundy	71	104	22	64	20	14
Total	456	705	125	438	148	99

Source: Iowa DOT, Crash Analysis Tool

Map 7.1: Fatal and Major Injury Crashes, 2010-2019



Source: Iowa DOT, Crash Analysis Tool

Additional Information:

- Top five major causes: (68) Crossed centerline (undivided), (52) Ran off road – right, (40) Swerving/Evasive Action, (36) Ran off road – left, (29) FTYROW: From stop sign
- 54 percent or crashes were non-collision (single vehicle)
- 71 percent of crashes were in dry conditions
- Property Damage Total: $7,304,207

Safety Plans and Efforts

The Iowa DOT has been involved in several initiatives related to improving safety. There is an abundance of crash information and several tools for users located on the Iowa DOT website, as well as documents and plans outlining safety efforts.

Iowa Strategic Highway Safety Plan 2019

One method States conduct safety planning is through the development of a highway safety plan. A Strategic Highway Safety Plan (SHSP) is a statewide-coordinated safety plan that provides a comprehensive framework for reducing highway fatalities and serious injuries on all public roads. The SHSP establishes statewide goals, objectives, and key emphasis areas developed in consultation with federal, state, local, and private sector safety stakeholders. The 2019 SHSP is the fourth statewide safety plan to be adopted in Iowa.

The 2019 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. The eight priority safety emphasis areas are as follows:

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

Implementation of the priority safety emphasis areas and 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 the plan will be evaluated on an annual basis of the five-year planning period ending December 2023. The goal of this plan is **Zero Fatalities**, however, interim annual goals aligning with the Highway Safety Improvement Program performance measures will be developed during the plan period. 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** (fifth "E") can have on the safety of Iowa's roadways.

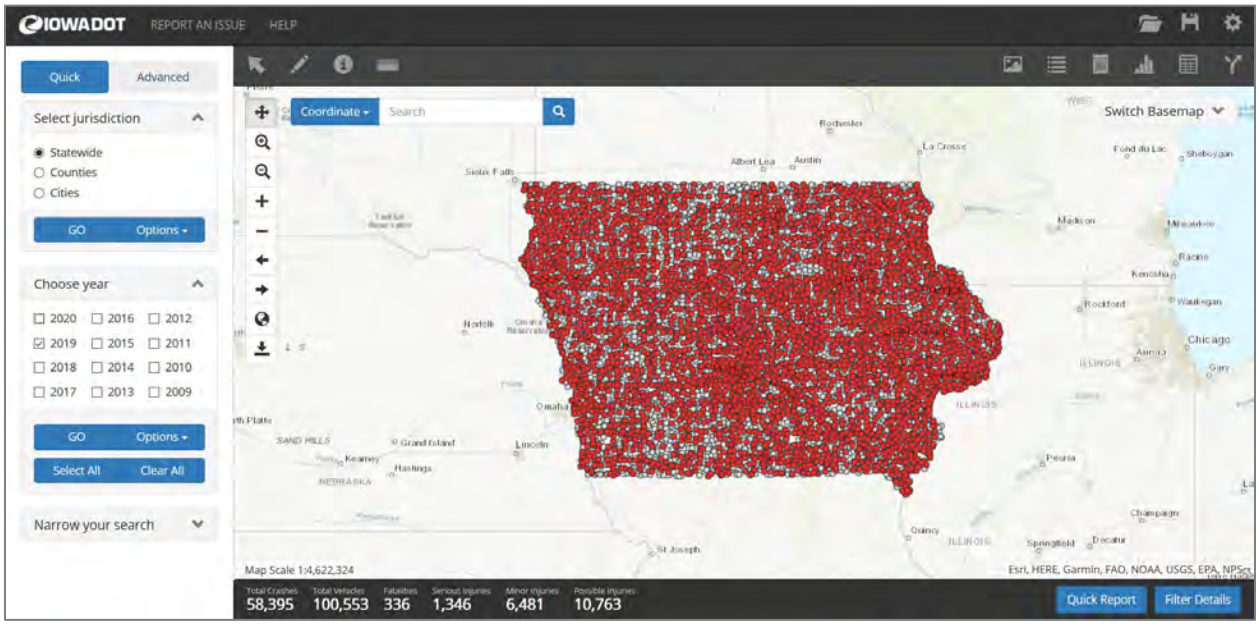
Although Zero Fatalities is Iowa's long-term vision, the state also recognizes the need to establish short term goals in pursuit of this vision. In 2016, FHWA published the Highway Safety Improvement Program (HSIP) and Safety Performance Management (Safety PM) Final Rules. As part of these rules, states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

www.iowadot.gov/traffic/shsp/home

Iowa Crash Analysis Tool

The Iowa DOT provides public access to a web-based Iowa Crash Analysis Tool (ICAT). This tool provides quick, user-friendly functionality to review and analyze ten-years of crash data. Through the online interface, users can select geographic boundaries, query crash records, export crash data, and produce summary charts and reports.

https://icat.iowadot.gov



Local Road Safety Workshops

The Iowa State University Institute for Transportation (InTrans) holds a series of workshops which are funded by the Iowa DOT Traffic Safety Bureau and Local Systems Bureau, FHWA – Iowa Division, Governor's Traffic Safety Bureau (GTSB), and the Iowa Local Technical Assistance Program (LTAP). These workshops are presented annually across the state to provide the most current information and advice for improving safety on local roads and streets in terms of planning, law enforcement, education, and engineering.

Iowa DOT Top 200 Safety Improvement Candidate Locations

The Iowa DOT routinely updates a list of the top 200 Safety Improvement Candidate Location (SICL) intersections and targets these locations for funding assistance to develop safety improvements under the Iowa Transportation Safety Improvement Program. The list is developed by analyzing all intersections in Iowa with at least one crash. The intersections are then ranked by a detailed methodology that focuses on the number of crashes, severity of the crashes, and rate at which the crashes occur per average daily traffic. The Iowa DOT utilizes crash reports filed by city police departments, county sheriffs, the Iowa State Patrol, and individual drivers in determining the listings.

In the most recent listing (2013-2017), the region had no intersections ranked in the top 200. However, there were seven intersections in the Waterloo and Cedar Falls metropolitan area ranked in the Top 200. These locations are of concern when it comes to safety improvements as they have been rated as among the worst crash locations on a statewide level. Planning and mitigation efforts are discussed in Table 7.2.

Table 7.2: Metro Area Intersections Included in the Top 200 Safety Improvement Candidate Locations

Statewide Ranking	City	Intersection	Mitigation Efforts
14	Cedar Falls	IA Hwy 58 & Viking Rd	Interchange constructed (2019)
17	Cedar Falls	University Ave & Cedar Heights Dr	Roundabout constructed, corridor speed limit reduced to 35 MPH (2018)
43	Cedar Falls	IA Hwy 58 & Greenhill Rd	Interchange identified in IA Hwy 58 Environmental Assessment Proposed Action
44	Waterloo	I-380 & U.S. Hwy 218/Washington St & Mitchell Ave	No mitigation efforts currently planned
56	Cedar Falls	IA Hwy 58 & Ridgeway Ave	System interchange and access control identified in IA Hwy 58 Environmental Assessment Proposed Action
173	Waterloo	W 6th St & Commercial St	Intersection improvements completed as part of Traffic Safety Improvement Program project
197	Waterloo	W San Marnan Dr & E San Marnan Dr & Kimball Ave	Intersection improvements completed (2015)

Source: Iowa DOT, 2013-2017 SICL

Drive Safe Cedar Valley

A local effort aimed at improving driving habits and decreasing the number of crashes is Drive Safe Cedar Valley. The goal of Drive Safe Cedar Valley is to change the culture of driving in the region. The public awareness program has used spokespersons, special events, targeted education programs, children's coloring books, and other public awareness initiatives to highlight community-wide safe-driving issues. The campaign is a partnership between the City of Waterloo, the Iowa DOT, and INRCOG, and the project continues to be funded in part with MPO Surface Transportation Block Grant program funds.

New interchange at IA Hwy 58 and Viking Road

Local Road Safety Plans

Fatal and serious injury crashes that occur on Iowa's local road system represent a unique challenge. Although the Primary Highway System is the most heavily traveled, most of the system mileage comes from the secondary and municipal 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 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. Black Hawk, Buchanan, Butler, and Grundy Counties have completed LRSPs.

State Safety 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. This section provides a brief overview of the legislation related to traffic safety that has been passed in recent years, and future legislative strategies.

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 that can be used by participating jurisdictions within Iowa. This program requires 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.

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 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 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. Initial legislative strategies that the Iowa Strategic Highway Safety Plan Implementation Team will undertake in the coming years include the following:

- 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

Safety Improvements

There are many safety improvements, techniques, and countermeasures that can be used to mitigate existing safety problems or prevent safety issues from developing. The information on the following pages is from the FHWA (www.safety.fhwa.dot.gov/provencountermeasures) and outlines techniques that can be used in certain situations to improve safety.

Longitudinal Rumble Strips and Stripes

Longitudinal rumble strips are milled or raised elements on the pavement intended to alert drivers through vibration and sound that their vehicles have left the travel lane. They can be installed on the shoulder, edge line of the travel lane, or at or near the centerline of an undivided roadway. *Rumble stripes* are edge line or centerline rumble strips where the pavement marking is placed over the rumble strip, which can result in an increased visibility of the pavement marking during wet or nighttime conditions. These treatments are designed to address roadway departure crashes caused by distracted, drowsy, or otherwise inattentive drivers who drift from their lane. They are most effective when deployed in a systemic application since driver error may occur on all roads.

Longitudinal Rumble Strips and Stripes

SAFETY BENEFITS:

Center Line Rumble Strips

44-64%

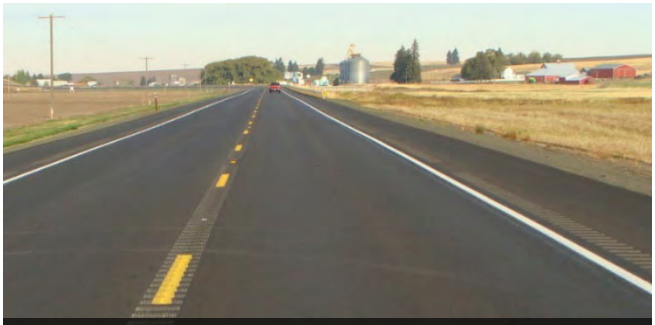
Head-on, opposite-direction, and sideswipe fatal and injury crashes

Shoulder Rumble Strips

13-51%

Single vehicle, run-off-road fatal and injury crashes

Source: NCHRP Report 641, *Guidance for the Design and Application of Shoulder and Centerline Rumble Strips.*

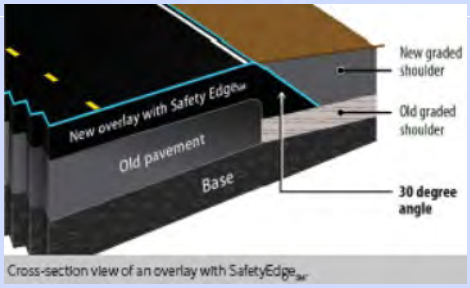


Centerline and edge line rumble stripes
Source: FHWA

SafetyEdge$_{SM}$

SafetyEdge$_{SM}$ technology shapes the edge of the pavement at approximately 30 degrees from the pavement cross slope during the paving process. This systemic safety treatment eliminates the vertical drop-off at the pavement edge, allowing drifting vehicles to return to the pavement safely. It has minimal effect on asphalt pavement project cost with the potential to improve pavement life.

SafetyEdge$_{SM}$



Cross-section view of an overlay with SafetyEdge$_{SM}$

SAFETY BENEFIT:

11%

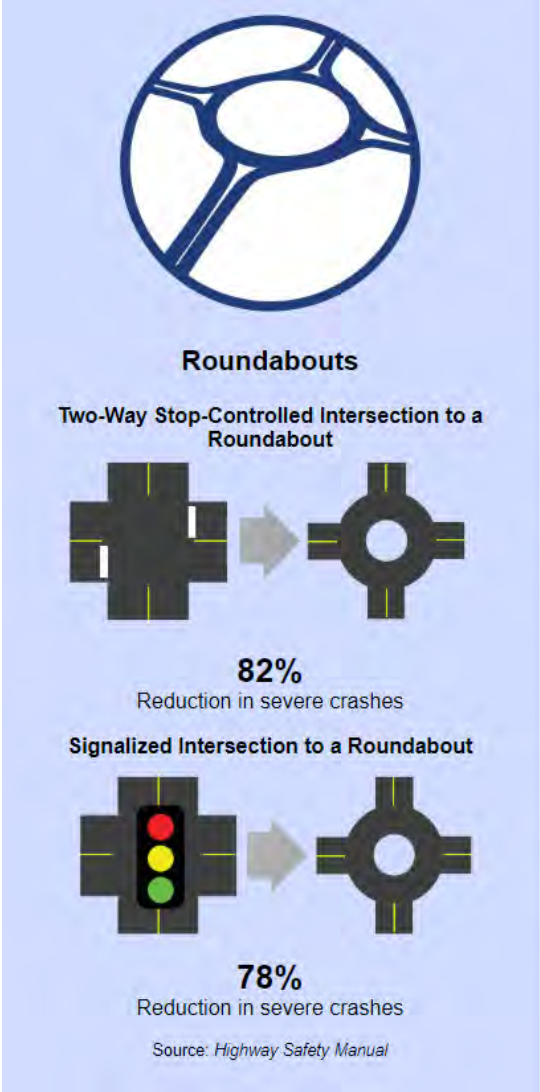
Reduction in fatal and injury crashes

Source: Safety Effects of the SafetyEdge$_{SM}$, FHWA-SA-17-044.

Roundabouts

The modern roundabout is a type of circular intersection configuration that safely and efficiently moves traffic through an intersection. Roundabouts feature channelized approaches and a center island that results in lower speeds and fewer conflict points. Entering traffic yields to vehicles already circulating, leading to improved operation performance.

Roundabouts have been proven to provide substantial safety and operational benefits compared to other intersection types, most notably a reduction in severe crashes. They can be implemented in both urban and rural areas under a wide range of traffic conditions. They can replace signals, two-way stop controls, and all-way stop controls. Roundabouts are an effective option for managing speed and transitioning traffic from high-speed to low-speed environments, such as freeway interchange ramp terminals, and rural intersections along high-speed roads.

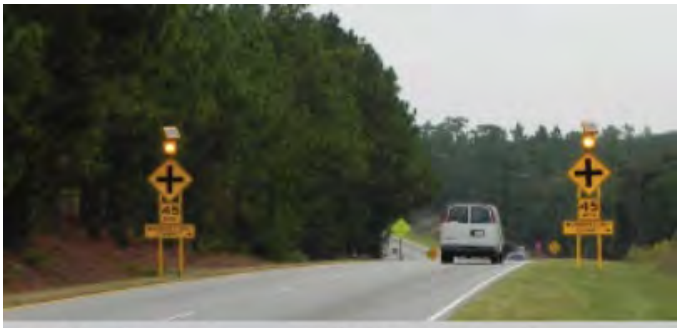


Roundabout on U.S. 218 off-ramp at C50

Roundabout at the intersection of C57 and V62

Systemic Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections

This systemic approach to intersection safety involves deploying a group of multiple low-cost countermeasures, such as enhanced signing and pavement markings, at many stop-controlled intersections within a jurisdiction. It is designed to increase driver awareness and recognition of the intersections and potential conflicts.



Example of countermeasures on the through approach.

Source: South Carolina DOT

Average Benefit-Cost Ratio

12:1

The systemic approach to safety has three components: 1) analyze system-wide data to identify a problem, 2) look for similar risk factors present in severe crashes, and 3) deploy on a large-scale low-cost countermeasure that address the risk factors contributing to crashes.

The low-cost countermeasures for stop-controlled intersections generally consist of the following treatments:

On the Through Approach

- Doubled up (left and right), oversized advance intersection warning signs, with street name sign plaques
- Enhanced pavement markings that delineate through lane edge lines

On the Stop Approach

- Doubled up (left and right), oversized advance "Stop Ahead" intersection warning signs
- Doubled up (left and right), oversized Stop signs
- Retroreflective sheeting on sign posts
- Properly placed stop bar
- Removal of any vegetation, parking, or obstruction that limits sight distance
- Double arrow warning sign at stern of T-intersections

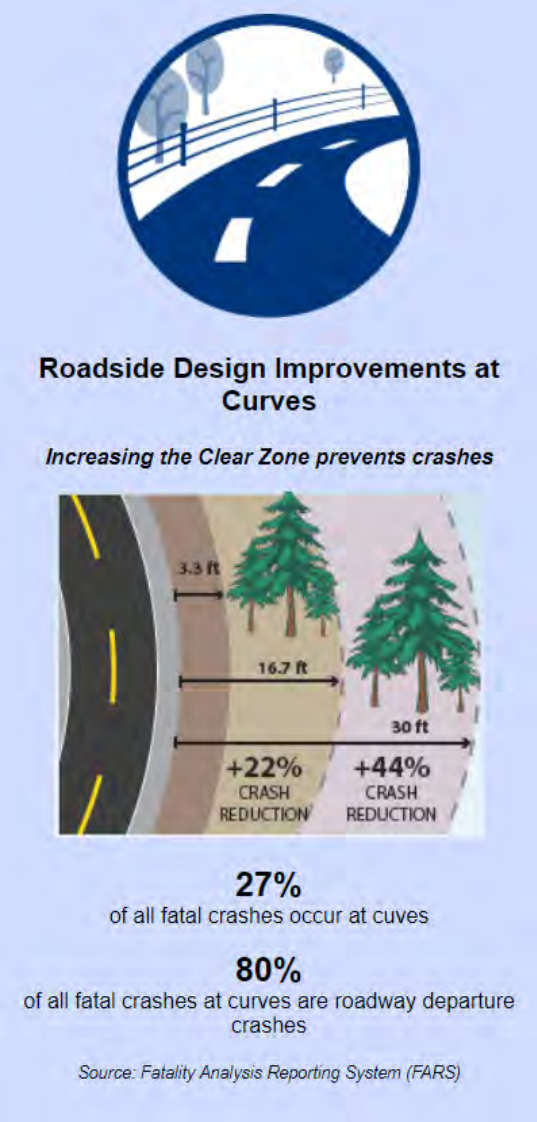
Reflective strips on stop sign post, Buchanan County

Roadside Design Improvements at Curves
Roadside design improvements at curves is a strategy encompassing several treatments that target the high-risk environment along the outside of horizontal curves. These treatments prevent roadway departure fatalities by giving vehicles the opportunity to recover safely and by reducing crash severity.

Roadside design improvements can be implemented alone or in combination and are particularly recommended at horizontal curves – where data indicates a higher-risk for roadway departure fatalities – and where cost effectiveness can be maximized.

Roadside Design Improvements to Provide for a Safe Recovery
In cases where a vehicle leaves the roadway, strategic roadside design elements, including clear zone addition or widening, slope flattening, and shoulder addition or widening, can provide drivers with an opportunity to regain control and re-enter the roadway.

- A **clear zone** is an unobstructed, traversable area beyond the edge of the through traveled way for the recovery of errant vehicles. Clear zones are free of rigid fixed objects such as trees and utility cabinets or poles.
- **Slope flattening** reduces the steepness of the side slope to increase drivers' ability to keep the vehicle stable, regain control of the vehicle, and avoid obstacles.
- **Adding or widening shoulders** gives drivers more recovery area to regain control in the event of a roadway departure.



Roadside Design Improvements to Reduce Crash Severity
Since not all roadside hazards can be removed at curves, installing roadside barriers to shield unmovable objects or embankments may be an appropriate treatment. Roadside barriers come in three forms:

- **Cable barrier** is a flexible barrier made from wire rope supported between frangible posts.
- **Guardrail** is a semi-rigid barrier, usually either a steel box beam or W-beam. These deflect less than flexible barriers, so they can be located closer to objects where space is limited.
- **Concrete barrier** is a rigid barrier that does not deflect. These are typically reserved for use on divided roadways.

Road Diet

A Road Diet, or roadway reconfiguration, typically involves converting an existing four-lane undivided roadway to a three-lane roadway consisting of two through lanes and a center two-way left-turn lane (TWLTL). This improvement can be a low-cost safety solution when planned in conjunction with a simple pavement overlay, and the reconfiguration can be accomplished at zero to minimal additional cost.

Benefits of Road Diet installations may include:

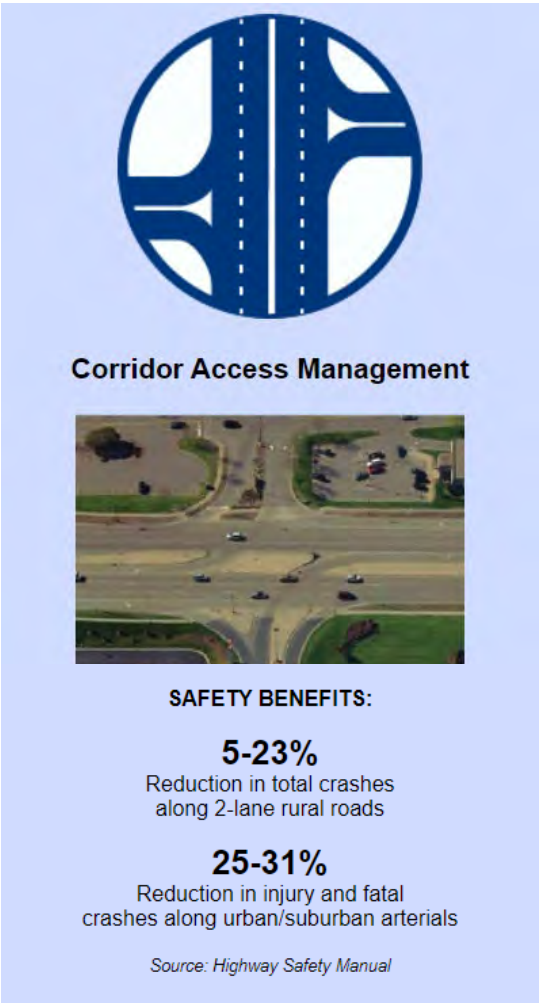
- An overall crash reduction of 19 to 47 percent.
- Reduction of rear-end and left-turn crashes.
- Reduced right-angle crashes as side street motorists cross three versus four travel lanes.
- Fewer lanes for pedestrians to cross.
- Opportunity to install pedestrian refuge islands, bicycle lanes, or transit stops.
- Traffic calming and more consistent speeds.
- A more community-focused, Complete Streets environment that better accommodates the needs of all road users.

Corridor Access Management

Access management refers to the design, application, and control of entry and exit points along a roadway. This includes intersections with other roads and driveways that serve adjacent properties. Access management along a corridor can simultaneously enhance safety for all modes, facilitate walking and biking, and reduce trip delay and congestion. Successful corridor access management involves balancing overall safety and corridor mobility for all users along with the access needs of adjacent land use.

The following access management strategies can be used individually or in a combination with one another:

- Driveway closure, consolidation, or relocation
- Limited-movement designs for driveways (i.e. right-in/right-out only)
- Raised medians that preclude across-roadway movements
- Intersection designs such as roundabouts or those with reduced left-turn conflicts (i.e. J-turns)
- Turn lanes (left-only, right-only, two-way left)
- Lower speed one-way or two-way off-arterial circulation roads



Medians and Pedestrian Crossing Islands in Urban and Suburban Areas

A *median* is the area between opposing lanes of traffic, excluding turn lanes. Medians in urban and suburban areas can be defined by pavement markings, raised medians, or islands to separate motorized and non-motorized road users. A *pedestrian crossing island* (or refuge area) is a raised island, located between opposing traffic lanes at intersection or midblock locations, which separates crossing pedestrians from motor vehicles.

Source: pedbikeimages.org

For pedestrians to safely cross a roadway, they must estimate vehicle speeds, adjust their walking speed, determine gaps in traffic, and predict vehicle paths. Installing raised medians or pedestrian crossing islands can help improve safety by simplifying these tasks and allowing pedestrians to cross one direction of traffic at a time.

Leading Pedestrian Intervals

A leading pedestrian interval (LPI) gives pedestrians the opportunity to enter an intersection three to seven seconds before vehicles are given a green indication. With this head start, pedestrians can better establish their presence in the crosswalk before vehicles have priority to turn left. LPIs provide increased visibility of crossing pedestrians, reduced conflicts between pedestrians and vehicles, increased likelihood of motorists yielding to pedestrians, and enhanced safety for pedestrians who may be slower to start into the intersection.

FHWA's *Handbook for Designing Roadways for the Aging Population* recommends use at intersections with high turning vehicle volumes. Implementation costs are very low, making it an easy and inexpensive countermeasure.

Medians and Pedestrian Crossing Islands in Urban and Suburban Areas

Median and pedestrian crossing islands near a roundabout.

Source: www.pedbikeimages.org / Dan Burden

SAFETY BENEFITS:

Raised Median

46%

Reduction in pedestrian crashes

Pedestrian Crossing Island

56%

Reduction in pedestrian crashes

Source: Desktop Reference for Crash Reduction Factors, FHWA-SA-08-011, September 2008, Table 11.

Leading Pedestrian Intervals

SAFETY BENEFIT

60%

Reduction in pedestrian-vehicle crashes at intersections

Walkways

A walkway is any type of defined space or pathway for use by a person traveling by foot or using a wheelchair. These may be pedestrian walkways, shared use paths, sidewalks, or roadway shoulders. With more than 5,000 pedestrian fatalities and 70,000 pedestrian injuries occurring in roadway crashes annually, it is important for communities to improve conditions and safety for pedestrians and to integrate walkways more fully into the transportation system[1]. Well-designed pedestrian walkways, shared use paths, and sidewalks improve the safety and mobility of pedestrians.

Pedestrian Hybrid Beacons

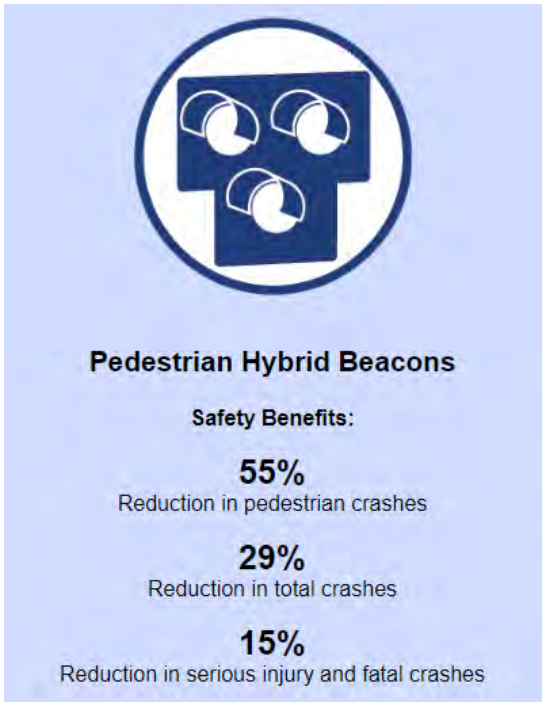
A pedestrian hybrid beacon (PHB) is a traffic control device designed to help pedestrians safely cross busy or higher-speed roadways at midblock crossings and uncontrolled intersections. The beacon head consists of two red lenses above a single yellow lens. The lenses remain "dark" until a pedestrian desiring to cross the street pushes the call button to activate the beacon. The signal then initiates a yellow to red lighting sequence consisting of steady and flashing lights that directs motorists to slow and come to a stop.

More than 75 percent of pedestrian fatalities nationwide occur at non-intersection locations, and vehicle speeds are often a major contributing factor[1]. The PHB is an intermediate option between a flashing beacon and a full pedestrian signal because it assigns right of way and provides positive stop control. It also allows motorists to proceed once the pedestrian has cleared their side of the travel lane, reducing vehicle delay.

Source: FHWA

[1]National Highway Traffic Safety Administration, *Traffic Safety Facts 2015 Data – Pedestrians. Report DOT HS 812 375.*

Source: pedbikeimages.org / Burden



Funding Programs for Safety Projects

There are a variety of state and federal funding programs available through the Iowa DOT to help fund safety improvements. RTA jurisdictions are encouraged to consider the programs outlined below to implement safety improvements.

Traffic Safety Improvement Program (TSIP)

TSIP is funded by one half of one percent of the Road Use Tax Fund. Cities, counties, and the Iowa DOT can apply for three types of projects. *Site-specific* projects account for $5-6 million per year, and a maximum of $500,000 can be awarded to a project. The other two project types are *traffic control devices* and *traffic safety studies*; each program has $500,000 to distribute annually.

www.iowadot.gov/traffic/traffic-and-safety-programs/tsip/tsip-program

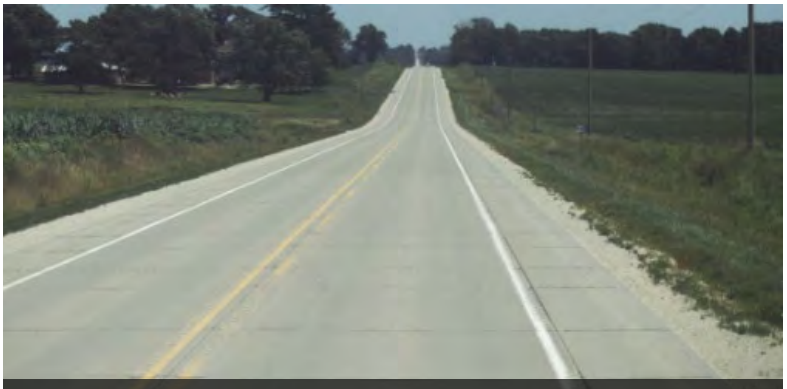
TSIP used for 2-foot base widening, milled rumble strips, and 6-inch pavement markings on C57, Black Hawk County

Highway Safety Improvement Program (HSIP) – Secondary

This program utilizes a $2 million set-aside from the HSIP which provides a 90 percent federal reimbursement for safety projects on the county road system. TSIP provides the 10 percent matching funds which results in a net zero funding requirement for counties. This program promotes a greater number of safety projects on the county road system by focusing on low cost, systemic improvements along a corridor. The goal of the program is to reduce lane departure crashes. Table 7.3 shows HSIP – Secondary projects that have been funded in the region in the past five years.

Table 7.3: HSIP – Secondary projects, FY 2017-2021

County	Project Description	Total Cost ($)	HSIP – Secondary Funds ($)
Buchanan	D22, Frost Ave to Golf Course Blvd; shoulder paving	890,000	665,000
Grundy	Intersections of T55/D19 & T29/D55; solar stop lights and rumble strips	39,000	35,000
Bremer	C33, C50, V14, V43, V49, V56, V62; traffic signs	59,500	54,500



HSIP – Secondary used for paved shoulders on D22, Buchanan County

www.iowadot.gov/traffic/traffic-and-safety-programs/hsip-secondary-program

Iowa Traffic Engineering Assistance Program (TEAP)

TEAP provides traffic engineering expertise to cities and counties without the resources of a staff traffic engineer. The purpose is to identify cost-effective traffic safety and operational improvements as well as potential funding sources to implement the recommendations. Typical studies include high-crash locations, unique lane configurations, obsolete traffic control devices, school pedestrians, truck routes, parking issues, and other traffic studies.

TEAP was used for the 1st Street Intersection Study, Independence

www.iowadot.gov/traffic/traffic-and-safety-programs/traffic-engineering-assistance-program-teap

Sign Replacement Program for Cities and Counties

This program provides funding to replace regulatory, warning, and school area signs and posts that are damaged, obsolete, or substandard. The program will provide up to $5,000 for cities and $10,000 for counties per grantee on a first-come, first-served basis.

Example of replacement signs

www.iowadot.gov/traffic/traffic-and-safety-programs/sign-replacement-program

Security Planning

The security of the transportation system is a primary concern at the federal, state, and local levels. Security is essential for every mode of transportation, for both freight and passengers. Natural disasters, such as floods, blizzards, or tornadoes, and manmade accidental or intentional incidents (i.e. industrial plant emergencies, acts of terrorism), can cause serious disruption to the transportation system and pose danger to the public. Conversely, the transportation system is also what provides a means for exit during an emergency when people need to evacuate or be routed around an area. Transportation considerations are important at all levels of emergency management and planning. These include preventing incidents, preparing for potential events, quickly and efficiently responding to events, recovering from incidents, and applying lessons learned for future planning.

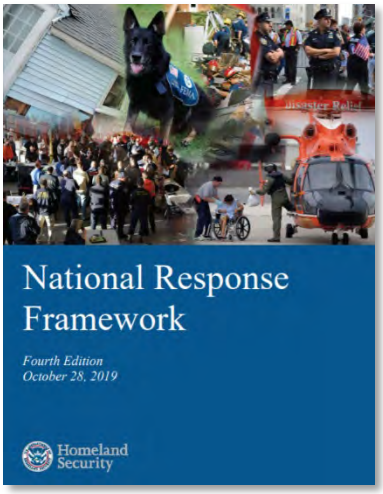
U.S. DOT Strategic Plan

The U.S. Department of Transportation Strategic Plan for FY 2018-2022 establishes the DOT's strategic goals and objectives. Objectives discussed range from system-level to individual modes of transportation. An objective applicable to RTA transportation security planning is "*to encourage, coordinate, facilitate, and foster world-class research and development to enhance the safety, security, and performance of the Nation's transportation system.*"

www.transportation.gov/dot-strategic-plan

National Response Framework and National Incident Management System

The National Response Framework (NRF) is a guide to how the Nation responds to all types of disasters and emergencies. It is built on scalable, flexible, and adaptable concepts identified in the National Incident Management System to align key roles and responsibilities across the Nation. The document describes specific authorities and best practices for managing incidents that range from the serious but purely local to large-scale terrorist attacks or catastrophic natural disasters.



The National Incident Management System (NIMS) is a comprehensive, national approach to incident management. NIMS provides a consistent nationwide framework, approach, and command structure to enable government at all levels, the private sector, and non-governmental organizations to work together to prepare for, prevent, respond to, recover from, and mitigate the effects of incidents. The document uses the Incident Command System (ICS) as a basis for organizational structure.

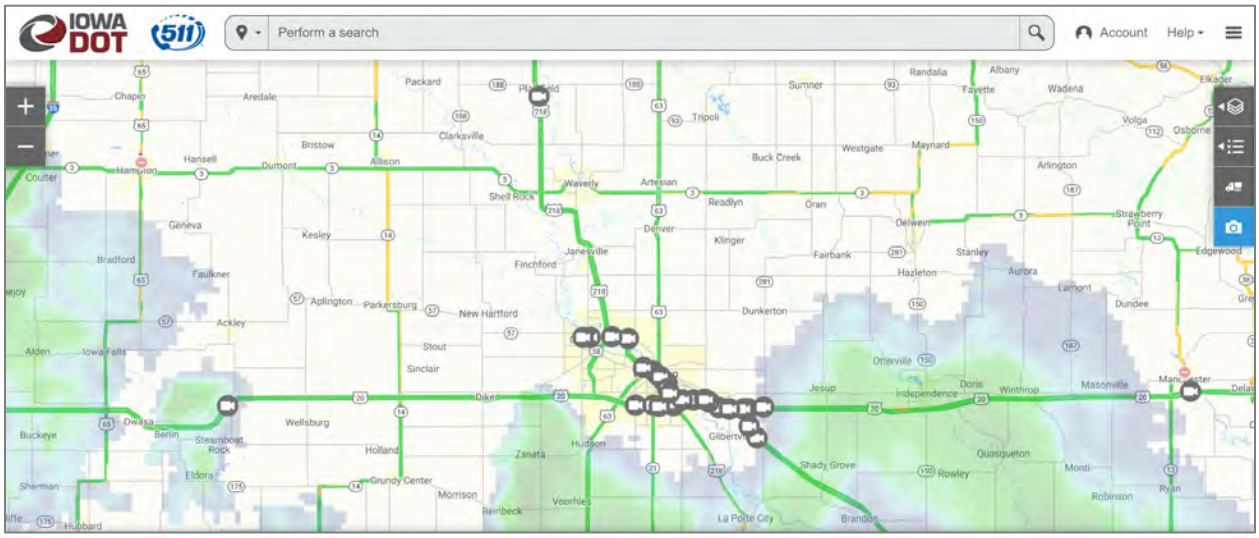
Iowa Statewide Traffic Management Center (TMC)

The TMC is a 24/7 center located in the Motor Vehicle Division building in Ankeny. The TMC is one of the Iowa DOT's key strategies to proactively manage the transportation system by addressing recurring and nonrecurring congestion in real-time. Using advanced technology, the TMC proactively monitors the transportation system for disruptions in traffic flow, such as crashes, work zone delays, congestion, stalled vehicles, special events, or bad weather. When disruptions occur, the TMC coordinates with internal and external partners to provide safe and quick clearance, detour routing, traffic control, and accurate and timely information to the public. The TMC uses tools such as Iowa 511, social media, and Dynamic Message Signs (DMS) to help protect on-scene responders and to prevent secondary crashes when disruptions occur.

Intelligent Transportation Systems (ITS)

There are several ITS safety and security activities undertaken by the Iowa DOT. This includes the Iowa 511 Traveler Information System which provides citizens with real-time information on roadway travel conditions, incidents, and construction activities. The 511 system can be accessed via phone, web, or mobile application and provides a way to quickly communicate with the traveling public. Many metropolitan areas have cameras on major routes and speed sensors that monitor congestion. The first installation of cameras and speed sensors in the region were part of the Interstate 380 reconstruction project in 2012. Since then, the Iowa DOT has expanded the system to include U.S. 218 and U.S. 20. In 2020, the Iowa DOT launched an updated web application with additional features and layers.

www.511ia.org



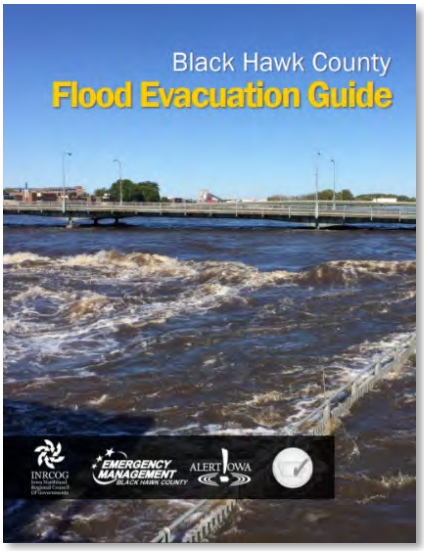
Another ITS activity undertaken by the Iowa DOT is the use of dynamic message signs (DMS). Large overhead signs can be found throughout the state on many interstates and primary highways. These signs can be used to communicate information to drivers on weather, incidents, diversions, Amber Alerts, public reminders, and other topics. DMS have been installed in the Waterloo and Cedar Falls metropolitan area on U.S. 218, U.S. 20, and Interstate 380.

Every Monday since 2013, the Iowa DOT has been utilizing dynamic message signs across the state to provide a safety message and the number of people who have been killed on Iowa's roads so far in the year. "Message Monday" is meant to increase awareness, change driver behavior, and reduce accidents and fatalities. To make messages more memorable, movie quotes, song lyrics, and puns are used, and no message is reused. The Iowa DOT also has a Transportation Matters Blog where each Message Monday is discussed and additional information and tips for motorist safety are provided.

www.ia.zerofatalities.com

2018 Black Hawk County Evacuation Plan

The purpose of the Evacuation Plan is to provide the Black Hawk County Emergency Management Agency (EMA) and responders an initial framework of information to be used for an orderly and coordinated evacuation in the event of a disaster. The Plan does not address normal day-to-day emergencies or procedures used in coping with such emergencies. The concept of operations reflected in the document focuses on potential large-scale disasters that were identified in the *2015 Black Hawk County Multi-Jurisdictional Hazard Mitigation Plan* and provides a framework for addressing emergency situations. The Black Hawk County Evacuation Plan is designed to be implemented under NIMS. In addition to the Plan, a Flood Evacuation Guide was developed to aid the public in preparing for an evacuation due to flooding which is one of the most likely natural disasters to impact the county.



Multi-Jurisdictional Hazard Mitigation Plans

Each county in the Iowa Northland Region has adopted a multi-jurisdictional Hazard Mitigation Plan (HMP). The documents outline the potential for natural and manmade disasters and the potential impact of those disasters. Plans identify local community policies, actions, and tools for ongoing, short-, mid-, and long-term implementation to reduce risk and potential future losses of property and lives. The development of the documents involved a local planning committee reviewing potential hazards and threats from these hazards. Reviews included a hazards and risk assessment of the transportation network itself due to the potential for vehicular and other types of crashes or events. Current HMPs can be found on the INRCOG publications page.

www.inrcog.org/pdf/Black_Hawk_County_Evacuation_Plan.pdf

www.inrcog.org/pub.htm

2020 Public Input Survey

In September 2020, RTA staff conducted a public input survey to gain input from across the Iowa Northland Region. Surveys were mailed to 1,000 randomly generated households in the region, and a total of 118 were returned.

Respondents were also asked what the number one transportation problem in their life is, and what will be the biggest transportation challenge in the next 25 years. Notable findings pertinent to this chapter include the following:

What is the number one transportation problem in your life?

- 9.3 percent of survey respondents reported a safety issue (road, railroad crossing, bicycle, and pedestrian).

What will be the biggest transportation challenge in the next 25 years?

- Two respondents said safety would be the biggest challenge.

Additional Comments

- One survey respondent said to add continuous centerline rumble strips.
- One survey respondent mentioned on-road bicycle safety and an acquaintance being hit by a vehicle that failed to move over.
- Five survey respondents perceived biking on road to be dangerous.