



KANSAS

Strategic Highway Safety Plan

2020-2024



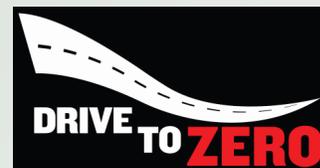
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Contents

1	Introduction	3
2	Roadway Departure	18
3	Occupant Protection	25
4	Impaired Driving	29
5	Older Drivers	33
6	Intersections	39
7	Local Roads	46
8	Teen Drivers	51
9	Pedestrians & Cyclists	55
10	Data Support	60
	Appendix A	63
	Appendix B	68
	Appendix C	69





Chapter 1 Introduction

A strategic highway safety plan is a coordinated and informed approach to reducing highway fatalities and serious injuries on all public roads.

By *coordinated*, we mean that many agencies staffed by people with a variety of skills representing the 4E's of highway safety take part—including engineering, education, law enforcement and emergency medical services.

Informed refers to a need for crash data. It also means using research results in the deployment of proven safety countermeasures to make travel safer.

All public roads include the 10,000 miles of road within the Kansas state highway system and the 130,000 miles of road owned by cities, counties and townships.

In 2017, almost 1,500 people died or suffered serious injuries in crashes on Kansas roads. That's just over four persons every day.

Some people call those events “accidents.” *We don't.*

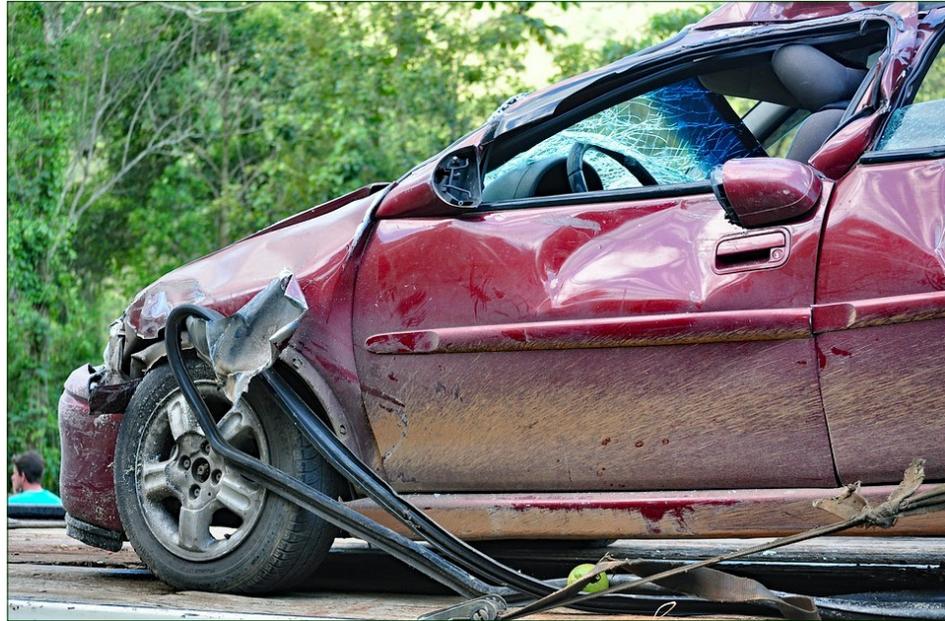
The word “accidents” implies such events are unavoidable. *They're not.*

Their number can be—must be—reduced.

Traffic Crashes: Down but Not Out

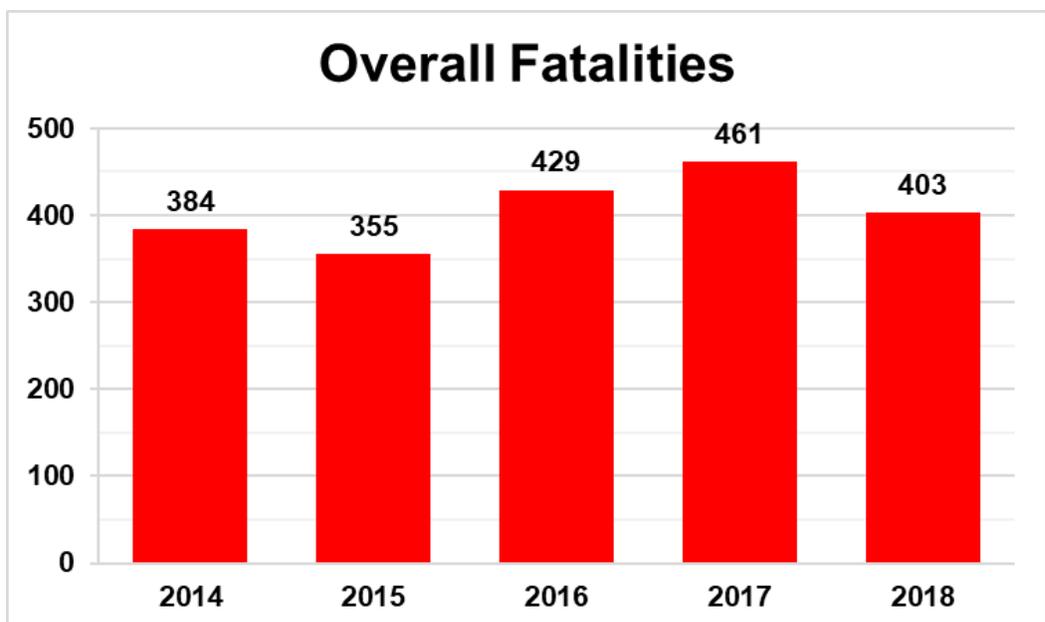
In 2009, we established a goal to cut fatalities and serious injuries in half by 2029. With a five-year average of 417 fatalities, the goal was to be at or below 208 fatalities by 2029. In 2017, the five-year average was 396. We saw record low years in 2013 and 2015, only to see fatalities reach 461 in 2017.

This pattern was seen nationally as well. However, we did see a significant drop in serious injuries in less than 10 years. The five-year average in 2009 was 1,762, and the goal was to be at or below 881 by 2029. In 2017, the five-year average was 1,211. It is difficult to understand the difference between fatality trends and serious injury trends, but the latter is certainly an encouraging sign. It is also encouraging to note that fatalities and serious injuries have dropped since 2009 even as traffic volumes have continued to increase statewide. This means the fatality *rate*, the number of fatalities per mile driven, has also dropped.

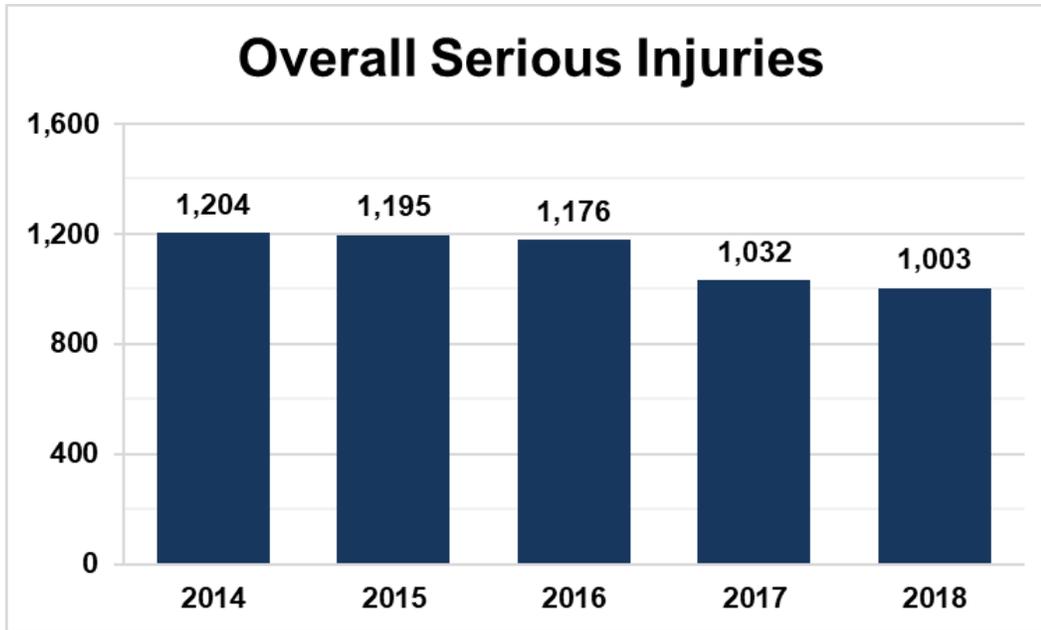


Part of the credit for the declines belongs to highway departments. They've worked for decades to make roadways safer, installing rumble strips to keep drivers in their lanes and engineering shoulders and adjacent spaces for those who leave them. Part of the credit goes to vehicle manufacturers and their introduction of such advances as air bags, seat belts and anti-lock brakes. Finally, drivers themselves have taken more personal responsibility. More are buckling up and "one for the road" is no longer acceptable.

Yet this stark fact remains: between 2014 and 2018 in Kansas, 2,032 people took the last drive of their lives.



The effects of the people who are seriously injured or killed in crashes are radiant. These losses touched many other lives.



In addition, every Kansan is economically impacted by these events. The first Kansas Strategic Highway Safety Plan (SHSP), published in October 2006, estimated the economic loss resulting from traffic crashes in Kansas to be about \$1.9 billion annually—or about \$680 per Kansan.

Driving Force: 2006

In February 2006, Governor Kathleen Sebelius announced the creation of the Driving Force Task Force. The task force was charged with developing recommendations to reduce the number of fatalities and injuries on Kansas roadways. More than 20 leaders from around the state were involved.

The task force was convened after a campaign led in 2005 by then Secretary of Transportation Deb Miller, Colonel William Seck of the Kansas Highway Patrol and Secretary of Health and Environment Roderick Bremby. Six community forums were organized as the first step in that effort, called the Safer Driving, Safer Roads campaign, to raise awareness about the number of fatalities and injuries on Kansas roads. The task force continued these conversations, identified 11 crash causes and formulated a three-year plan to implement recommendations related to those causes.

One result of this effort has been the enactment of laws in Kansas aimed at some of the significant causes of crash injuries and fatalities such as:

- 2006 - A booster seat bill became law. Children who outgrow a harness child safety seat must ride in a belt positioning booster seat until they are 8, unless the child weighs more than 80 pounds or is taller than 4'9"; at that point children must use adult seat belts. Studies show that booster seats, properly used, are 59 percent more effective in preventing injuries to children during crashes than seat belts alone.
- 2009 - Passage of a graduated driver's license law. The purpose of this law is to help reduce the risks for teenagers learning to drive.

- 2010 - Passage of a primary seat belt law.
Allows law enforcement officials to stop cars in which occupants were not buckled up, without needing another cause to pull these vehicles over.
- 2010 – Passage of a texting law.
Makes it illegal to send or read electronic text while driving, except in a narrow range of circumstances.

Many other activities (see Appendix A) have resulted from the work of the task force, from the first SHSP and from other initiatives.

SHSP One: 2006

As the Driving Force Task Force effort was unfolding, Kansas began work on a state highway safety plan. At a safety summit convened February 2 and 3, 2006, representatives of 17 agencies with an interest in transportation safety drafted the first SHSP.

The stated mission of that plan was to “reduce deaths, injuries and economic costs resulting from motor vehicle crashes in Kansas.” Its goal was fatalities would not exceed 400 in 2008 or 365 in 2010 and disabling injuries would not exceed 1,600 by 2008 or 1,400 by 2010.

The plan focused on six causes for crashes or means to prevent them. Among the causes were driver and passenger behaviors, driver demographics and crash locations, including:

- impaired driving because of alcohol or drugs
- occupant protection (use of seat belts and child safety seats)
- lane departure (crossing the center line or going off the shoulder)
- intersections
- inexperienced/novice/teen drivers
- driver behavior and awareness (as it is affected, for example, by use of electronic devices)

Each of these causes was designated an “emphasis area,” and strategies to address them were formulated during planning sessions at the safety summit.

But Kansas did not meet its goals related to injuries and fatalities. Three years later, a new planning process began.

SHSP Two: 2009 to Present

The Executive Safety Council (ESC) first met on May 14, 2009. It is comprised of administrators, engineers, planners, medical care providers, trainers/educators and law enforcement personnel. The council has championed transportation safety on all public roads in Kansas by developing an SHSP that will drive the formulation and implementation of safety-related programs. Mike Floberg, of the Kansas Department of Transportation (KDOT), and Jim Hanni, of the Automobile Association of America (AAA), were the first co-chairs. The current chairs are Brian Gower, of KDOT, and Lisa Harris, of the University of Kansas Transportation Center. A complete list of ESC agencies and representatives can be found in the Partners, Roles and Processes section below.

The ESC’s continued challenge is to take charge of the plan’s results and encourage participation in implementation. The ESC identifies statewide goals and emphasis areas based on data and statistics; recruits stakeholders to direct and serve on emphasis area teams; and supports the appropriate agencies as they implement strategies developed by the teams.

Mission

The mission of the Kansas SHSP is to drive strategic investments that reduce traffic injuries and deaths and the emotional and economic burdens of crashes, utilizing the 4E's (education, enforcement, engineering and emergency medical services) in a collaborative process.

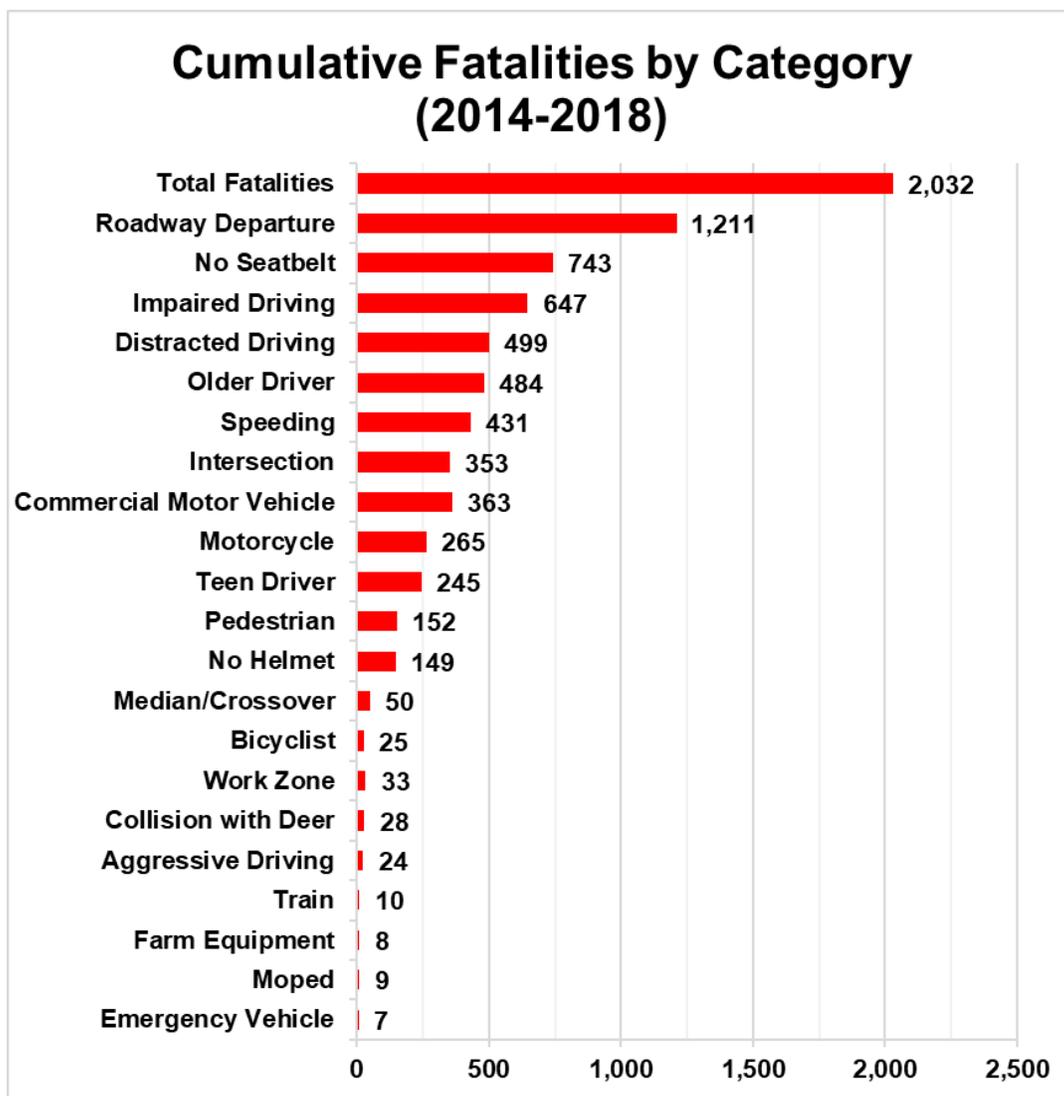
The key ideas here are those of strategic investment and statewide collaboration.

Strategic Investment

Kansas could make a wide range of investments to lessen fatalities and serious injuries in crashes. The ESC focuses on these investments. It attends first to the variables most frequently involved in crashes that kill or injure drivers and passengers in Kansas.

A fatal injury often involves more than one contributing circumstance. The total number of fatalities is less than the sum of the factors because crashes sometimes result from a combination of factors. For example, a fatal crash at an intersection involving an unbuckled teen driver would appear in three places on the chart. The chart below is a visual representation of contributing circumstances for each fatal crash. The top three contributing circumstances reflect the following percentages of all fatal injuries between 2014 and 2018:

- Roadway departure – 60%
- Unbelted – 37%
- Impaired driving – 32%





Statewide Collaboration

A 2010 Federal Highway Administration document, *Noteworthy Practices: Addressing Safety on Locally-Owned and Maintained Roads - A Domestic Scan*, states that “collaboration between different organizations, including engineers, planners, educators, community leaders, activists, law enforcement and emergency medical services can bring diverse safety expertise to existing programs and produce ideas for innovative approaches.”

Aware of this dynamic, the ESC staffed the following emphasis area teams with persons possessed of the requisite skills in the 4E’s:

- Roadway Departure
- Occupant Protection
- Impaired Driving
- Older Drivers
- Intersections
- Local Roads
- Teen Drivers
- Pedestrians & Cyclists

A ninth team, Data, serves as a support team as the work it does supports the work of the eight emphasis area teams.

Creating a safe transportation system can’t be purely a top-down or bottom-up proposition. In addition to the ESC, local traffic safety coalitions will serve as a platform to keep traffic safety conversation flowing in both directions. Besides the safety coalitions, Kansas has several organizations dedicated to research and training that can support SHSP implementation. A partial list of these organizations and description of their work appears in Appendix B.

Safety advocates from the following partners currently serve on an emphasis area team:

AAA of Kansas
AARP Kansas
Alzheimer's Association
American Traffic Safety Services Association (ATSSA)
Americans for Older Driver Safety
Avenues Driving Rehabilitation Program
Barton County Engineer Office
BikeWalkKC
BikeWalkWichita
Children's Mercy Hospital
City of Olathe Traffic Engineering

City of Overland Park Traffic Engineering
City of Topeka Traffic Engineering
DCCCA
East Topeka Senior Center
Federal Highway Administration (FHWA)
Federal Motor Carrier Safety Administration (FMCSA)
Flint Hills Metropolitan Planning Organization
Jayhawk Area Agency on Aging
Kansas Association of Chiefs of Police (KACP)
Kansas Association of Counties (KAC)
Kansas Board of Emergency Medical Services (BEMS)
Kansas Bureau of Investigation (KBI)
Kansas Department of Health and Environment (KDHE)
KDHE State Trauma Program
KDHE EMS for Children
Kansas Department of Revenue (KDOR)
KDOR Division of Vehicles
Kansas Department of Transportation (KDOT)
KDOT Bureau of Construction & Materials
KDOT Bureau of Design
KDOT Bureau of Local Projects
KDOT Bureau of Maintenance
KDOT Bureau of Transportation Planning
KDOT Bureau of Transportation Safety & Technology
KDOT District Two
KDOT Highway Safety Section
KDOT Law Enforcement Liaisons
Kansas Emergency Nurses Association
Kansas Highway Patrol (KHP)
KHP Breath Alcohol Unit (BAU)
Kansas Motor Carriers Association (KMCA)
Kansas State University - Department of Civil Engineering
Kansas Traffic Safety Resource Office (KTSRO)
Kansas Traffic Safety Resource Prosecutor (KTSRP)
Kansas Turnpike Authority
KU Health Partners Driving & Mobility Services
Lawrence-Douglas County Metropolitan Planning Organization
Live Well Finney County
Lyon County Sheriff's Office
Mid-America Regional Council (MARC)
Mothers Against Drunk Driving (MADD)
National Highway Traffic Safety Administration (NHTSA)
Office of Kansas Attorney General - State Child Death Review Board
Office of Information Technology Services (OITS) - KDOT Transportation
& Planning Support Group
Pottawatomie County Public Works
Riley County Police Department
Safe Kids Kansas
Sedgwick County Public Works
Sedgwick County Sheriff's Office
Silver Haired Legislature
Stormont Vail Health
Stormont Vail Trauma Services
Thrive Allen County
Topeka Metro Bikes
TranSystems Corporation
University of Kansas Health System
University of Kansas Transportation Center
WSP USA, Inc.

Goal

Every successful person, team, organization, and plan has a goal. To be meaningful it must be specific, measurable, attainable, relevant and time-based. Many factors will give indication as to the success of this plan—most notably a reduction in fatalities. However, while this plan is motivated by the need to reduce fatalities and serious injuries statewide, the strategies within will have an influence on reducing all crashes.

For this reason, the overall goal of this five-year plan is to achieve a fatal and injury crash rate of less than 35 crashes per 100-million vehicle-miles travel by 2024.

In 2010, the five-year average was 51; by 2018 it had dropped to 42. Projecting a ten-year trendline to 2024 predicts 35; projecting a five-year trendline predicts 37. The goal then is to return to and improve upon the ten-year trend.

Vision: Drive to Zero

The Executive Safety Council’s vision is that a day will come when no life will be lost, no person seriously injured, in a traffic crash. In its words:

Drive to Zero — Every One Matters

Influence

As noted in our Mission Statement, the SHSP is intended to drive our strategic investment in safety. Specific to KDOT, the SHSP should guide how dedicated safety funding—both engineering and behavioral—is spent. The figure below is an example of the various programs that may be funded over the five-year life of this plan. However, this plan should also contribute to other activities within not only KDOT, but all partner agencies listed above. These activities can include—but are not limited to—research projects, policy changes, legislative initiatives and program direction. The strategies that follow in the chapters ahead clearly demonstrate this multi-agency, multi-disciplined approach to highway safety.



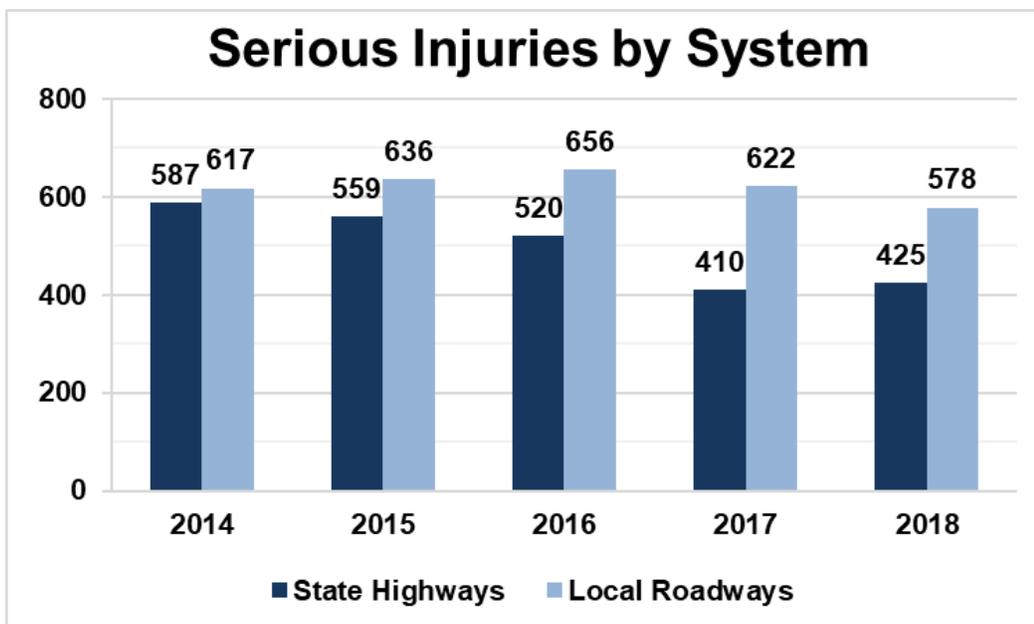
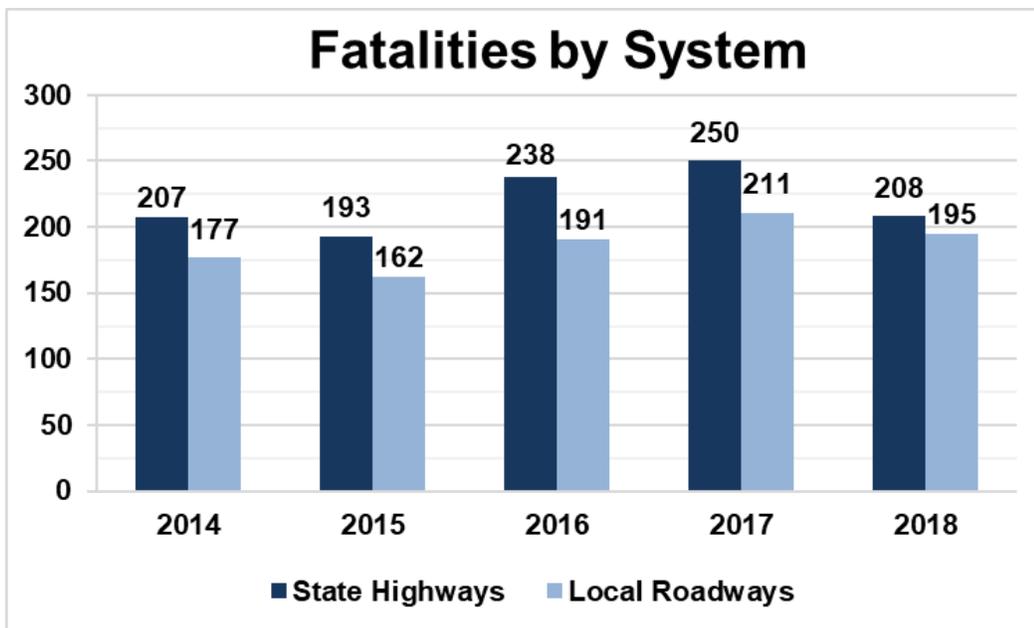
The Challenge of System Complexity

Some of the complexity of the roadway system in Kansas derives from sheer bulk—about 140,000 miles crisscross Kansas.

Moreover, streets, roads and highways are classified and managed according to their function and location in areas of greater or lesser population density.

Another complication derives from the large impact of the relatively few miles of state highway. Constituting a mere 7.4 percent of the 142,054 total miles in Kansas, they nevertheless carried 58 percent of all the state’s traffic in 2017. More crucially, they accounted for 45 percent of all the serious injuries and 54 percent of the fatalities between 2014 and 2018.

Yet if we were to focus attention largely on the state highway system, what would happen to crash totals on the 130,000 miles of non-state roads? A lack of focus on those roads would be shortsighted as they accounted for 46 percent of all fatalities and 55 percent of all serious injuries between 2014 and 2018.



The Management Challenge

Managing state highway safety may be easier than managing off-system safety. That's because the 10,000 miles of state highway have only two owners: KDOT and the Kansas Turnpike Authority. Statute enacted during the 2013 Kansas legislative session joins KDOT and KTA together in a partnership. The purpose of this partnership is to identify efficiencies that will ultimately lead to a safe, reliable and cost-effective transportation network. Moreover, the state highway system has extensive roadway and crash data that are easier to access than data on local roadways and the crash patterns on state highways are more predictable than those on local roads. Finally, the highway system's design sometimes requires expensive improvements, such as converting an intersection to an interchange or converting two-foot turf shoulders into full-width paved shoulders; at other times it lends itself to inexpensive improvements such as centerline rumble strips.



Managing safety off-system is more difficult given that more owners are managing many more miles of road. The ability to map crashes is more problematic, and roadway data, such as lane and shoulder width and traffic volume, are limited. Crash data are good but crash patterns are less predictable. Here, less expensive systemic improvements, like signing, pavement markings and rumble strips, may have an impact.

Finally, randomness makes management difficult on every kind of road and highway. Few serious crashes occur at the same location from one year to the next.

Complexities aside, we have no choice but to work both together and as individuals to reduce the number of crashes on our roads. We must also work at safety as individual drivers and passengers.

The Chapters Ahead

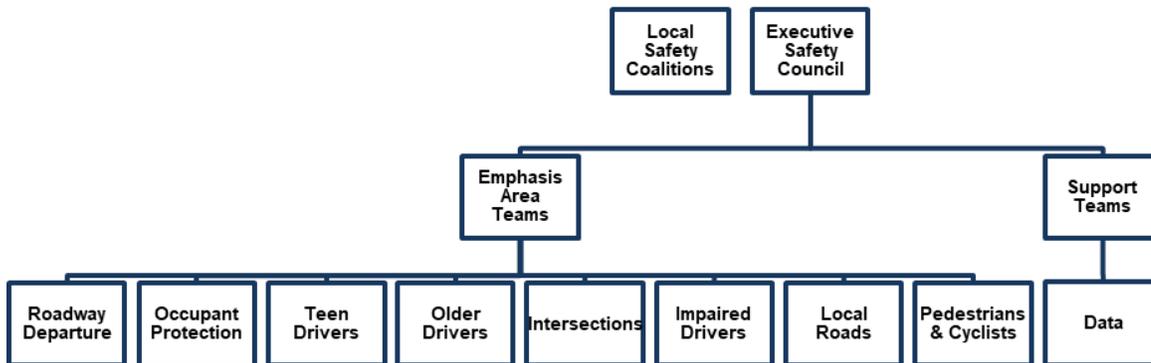
There is no shortage of ideas on how to address crashes. The challenge for each emphasis area team has been to identify realistic strategies for reducing crashes; prioritize those strategies; and implement those most likely to help us meet our goals by 2024. Discussion of the eight emphasis areas and data needs is presented separately in the chapters ahead.

Each chapter includes an introduction to the emphasis area, relevant data points and a performance measure. Next comes the important part: strategies to implement. Each team identified from three to seven strategies to work on over the next five years. Background information is included to add detail to the strategy. Appendix C includes information such as method of implementation, related program, associated costs, lead agency, target date, output and outcome.

The reasoned approach that informs this plan is important to its success. But success also depends on paying attention to the results that flow from it and on making adjustments as circumstances change. As the road opens before us, what we discover *in fact* will shape our journey.

Partners, Roles and Processes

As we developed this plan, we realized we were creating a process, too—one that will outlive the plan. Success depends on ongoing cooperation and communication among a variety of teams—local, regional and statewide—as they react to the changing world of surface transportation and anticipate its safety needs in a timely way.



Executive Safety Council

The Executive Safety Council (ESC) will tap the skills of many agencies to champion transportation safety on all public roads in Kansas by developing and maintaining the Strategic Highway Safety Plan (SHSP).

The ESC will:

- analyze data to identify statewide goals and emphasis areas
- recruit stakeholders for emphasis area teams
- direct the teams
- support strategy implementation by the appropriate agencies

The ESC currently includes representatives from the following organizations:

- AAA Kansas
- American Traffic Safety Services Association (ATSSA)
- Federal Highway Administration (FHWA)
- Federal Motor Carrier Safety Administration (FMCSA)
- Kansas Association of Chiefs of Police (KACP)
- Kansas Association of Counties (KAC)
- Kansas Board of Emergency Medical Services
- Kansas Department of Health and Environment (KDHE)
- Kansas Department of Revenue (KDOR)
- Kansas Department of Transportation (KDOT)
- Kansas Emergency Nurses Association
- Kansas Highway Patrol (KHP)
- Kansas Motor Carriers Association (KMCA)
- Kansas Traffic Safety Resource Office (KTSRO)
- Kansas Turnpike Authority (KTA)
- Mid-America Regional Council (MARC)
- National Highway Traffic Safety Administration (NHTSA)
- Stormont-Vail Trauma Services
- University of Kansas Transportation Center

The ESC meets four times a year. Agencies other than those listed may be invited to participate in meetings.

Emphasis Area Teams

Reporting to the ESC, the emphasis area teams will develop action plans, including safety-related programs and projects, to implement the SHSP.

The teams will:

- analyze data to select and prioritize strategies
- develop performance measures
- identify resources, including funding, legislation, staffing and lead agencies, to support programs and projects

These groups meet twice a year.

Emphasis Areas

Every crash touches many lives. Yet the ESC realized it couldn't focus equal attention on every potential source of crashes. Instead, it focused on those circumstances and conditions that kill or injure the largest numbers of drivers, passengers and vulnerable road users. The group queried a KDOT crash database to do so. The following table lists the areas considered for emphasis and groups them by category.

Potential Emphasis Areas	
Category	Area
Driver Behavior	Impaired Driving
	Distracted Driving
	Aggressive Driving
	Speeding
Preventive Measure	Seat Belts
	Helmets
Demographic	Teen Drivers
	Older Drivers
Crash Type	Intersections
	Roadway Departure
	Median/Crossover
	Collision with Deer
	Pedestrians
	Work Zones
Vehicle Type	Large Commercial Vehicles
	Motorcycles
	Trains
	Farm Equipment
	Emergency Vehicles
	Mopeds
	Bicycles

In the end, the ESC decided that emphasis area teams should focus on eight crash variables linked to large numbers of fatalities and serious injuries: impaired driving, intersections, local roads, older drivers, occupant protection, roadway departure, teen drivers and pedestrians and cyclists.

Support Teams

In addition to the emphasis area teams, a data support team reports to the ESC. This team meets twice a year.

Support teams function in the same way as the emphasis area teams—most importantly—by selecting strategies and identifying resources to support programs and projects. The difference is that the emphasis area teams will focus on specific crash variables, while the support teams supply them with data, educational resources and other tools. Two additional support teams that may be added during the life of this plan are education and emergency medical services.

Local Traffic Safety Coalitions

Traffic safety is everyone's responsibility. Not only law enforcement and government entities, but anyone who drives a motorized vehicle or rides in one. Or rides a motorcycle or bicycle. Or walks along the road or crosses the street. Everyone is responsible for traffic safety.

Because everyone is accountable, KDOT is promoting the establishment of traffic safety coalitions at the local level, either city-wide or county-wide. Traffic safety issues can be resolved in an efficient and timely manner when addressed at the community level as most members of the group will be familiar with the roads and neighborhoods. In addition, these members are more likely to take action because it's their own families and friends who will be safer when issues are resolved.

The coalitions will be organized based on local needs and interests and will promote communication among local transportation safety partners. The ultimate goal is for these local safety partners to drastically decrease the number of crashes in their communities. They will proactively identify traffic safety and driver behavior issues *before* a crash happens, find solutions and, most importantly, implement those solutions. Traffic safety and driver behavior issues can include, but are not limited to, older and teen drivers, seat belt usage, alcohol/drug impaired driving, pedestrians and cyclists, intersections, traffic control and construction zones.

A successful coalition is built around the 4E's of traffic safety: education, enforcement, engineering and emergency medical services. Coalition members can be law enforcement officers, healthcare providers, emergency medical responders, high school administrators, representatives from local governments, traffic engineers, public works officials, transportation safety advocates, local businesses and others with an interest in roadway safety. To help them decrease the number of crashes, the coalitions will:

- analyze crash data to identify goals and emphasis areas
- facilitate communication between local law enforcement officials and public works personnel
- recommend safety-related projects and programs to KDOT and others
- recommend systemic safety improvements that are eligible for High Risk Rural Roads Program funding or moneys from other sources
- promote timely and relevant safety training for 4E personnel at the local level

Destination Safe

Destination Safe is an excellent example of a local traffic safety coalition. It's administered by Mid-America Regional Council (MARC) and serves the Greater Kansas City region.

The coalition was founded in 2005 by Mid-America Regional Council, Kansas Department of Transportation (KDOT) and Missouri Department of Transportation (MODOT). Its mission is to reduce transportation-related fatalities and serious injuries. This effort unites federal, state, regional and local agencies to improve transportation system safety for 13 counties on both sides of the Kansas/Missouri border. These agencies represent a variety of professional sectors, including engineers, planners, law enforcement, health departments, trauma nurses, and other transportation safety advocates. The leadership team currently has 32 members.

The coalition's agenda is set by the Kansas City Regional Transportation Safety Blueprint. The Blueprint focuses on multiple transportation safety priorities and serves Greater Kansas City in the same way the Strategic Highway Safety Plan serves Kansas.

In Missouri, Destination Safe projects are funded by MODOT'S District 4. In Kansas, Destination Safe reviews and forwards recommendations to the KDOT Bureau of Transportation Safety and Technology for possible funding through the federal Section 402 program.

In 2007, Destination Safe won a Federal Highway Administration National Roadway Safety Award.

Revisions

The reality of change demands flexibility. Therefore, over the life of this five-year plan, the SHSP may be updated periodically under ESC guidance. For example, resources or direction may change in response to changes in state or federal transportation laws and funding.

Updates will consider the following factors:

- a review of fatal and serious injury crash data from the previous five calendar years
- progress on performance measures identified in the plan
- progress or roadblocks on strategies identified in the plan
- new ideas and influences
- input from local traffic safety coalitions and other partners in traffic safety

The five-year revision will consider the points above, as well as:

- a look at progress made and lessons learned from the previous five years
- a renewal of overall goals, emphasis areas, performance measures and strategies for the next five years





Chapter 2 Roadway Departure

According to the Federal Highway Administration (FHWA), a *roadway departure crash* is a “non-intersection event that occurs after a vehicle crosses an edge line or center line, or otherwise leaves the traveled way.”

These departures can be voluntary (during passing maneuvers, for example) or involuntary (due to distractions). Multiple-vehicle crashes may be either head-on or sideswipes involving vehicles moving in the same or opposite directions. Single vehicles may collide with a fixed object or roll over. Such crashes typically occur away from intersections, on shoulders, roadsides or medians.

One approach to reducing these crashes is prevention—keeping vehicles on the road and in their lanes. The other approach is forgiveness—implementing engineering and EMS solutions to reduce the severity of those incidents that do occur. We propose using both approaches.

The Roadway Departure Emphasis Area Team (EAT) has identified seven strategies to reduce the number and severity of roadway departure crashes in Kansas. A detailed action plan for each strategy will be developed with an emphasis on implementation and progress. Implementation will be via programs, projects, policy and research. And while this plan highlights only seven strategies, much work is being done by multiple agencies across the 4E’s to mitigate the impact of roadway departure.

Identifying strategies and means of implementation are only part of the challenge. Deciding where, and to what extent, to apply a strategy is also critical. For example, when considering an engineering solution, should we apply a low-cost strategy at 20 locations with a potential for crashes or apply a high-cost strategy at one location like the 20 that has a documented record of crashes?

A thorough understanding of the data related to roadway departure crashes is essential to answer these questions—and to the wise use of safety resources.

There is no shortage of ideas about achieving these goals using a 4E approach, including: *engineer* centerline rumble strips and keep the roadside clear of fixed objects; *enforce* impaired driving and distracted driver laws; *educate* drivers and passengers about seat belt use; and improve *emergency medical service* coordination to reduce the human cost of crashes. The challenge for the roadway departure team is to identify realistic strategies, prioritize them and promote implementation.

Rural Roadways

Of 142,054 miles of public roads in Kansas, 90 percent—127,794 miles—are rural. These rural roads represent over two-thirds of fatal crashes statewide, even though they carry less than half (47 percent) of all vehicle miles traveled. If the number of vehicle miles traveled on rural and urban roads is nearly equal, why do rural roadways experience more fatal crashes than urban roadways? Several factors contribute:

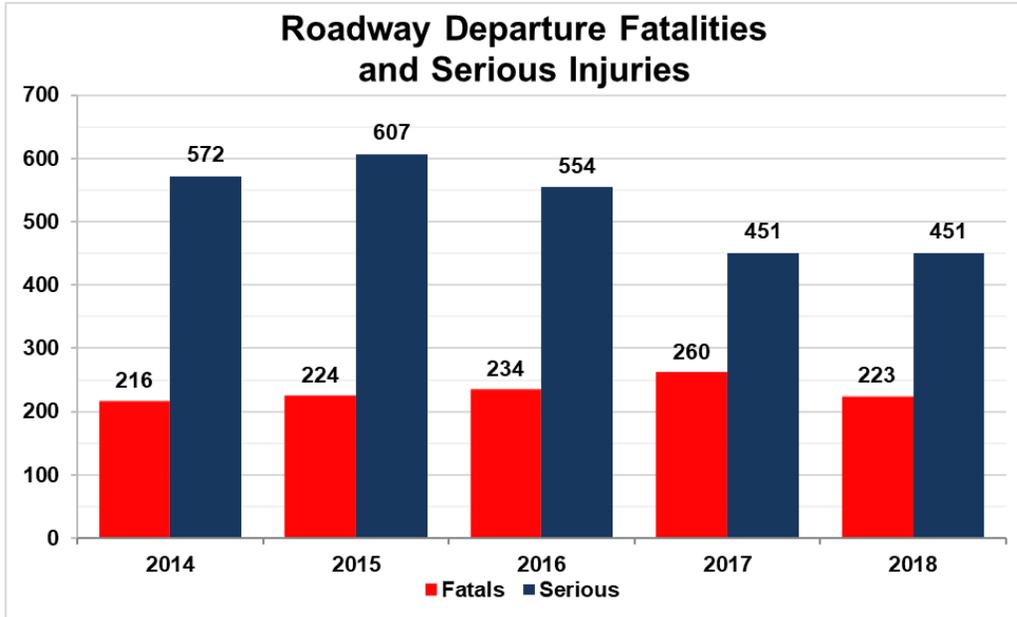
- Higher speeds: Less traffic and fewer intersections and driveways mean drivers are more comfortable traveling at a higher rate of speed. The posted speed limit reflects that reality.
- Discovery time: The length of time from when a crash occurs to when it is discovered and emergency services arrive has an impact on patient survival. This is especially true for single-vehicle crashes.
- EMS: It takes longer for emergency vehicles in general and ambulances in particular to reach the crash scene and longer to deliver the injured to the nearest hospital or trauma center.
- Health care resources: Depending upon the severity of the injury, a patient's needs may exceed the treatment capabilities of a rural health care facility.
- Engineering standards: Many of our rural local roads were designed and built long before the development of modern safety standards. Further, only about one-half the State Highway System has been designed based on modern methods.



Data Points

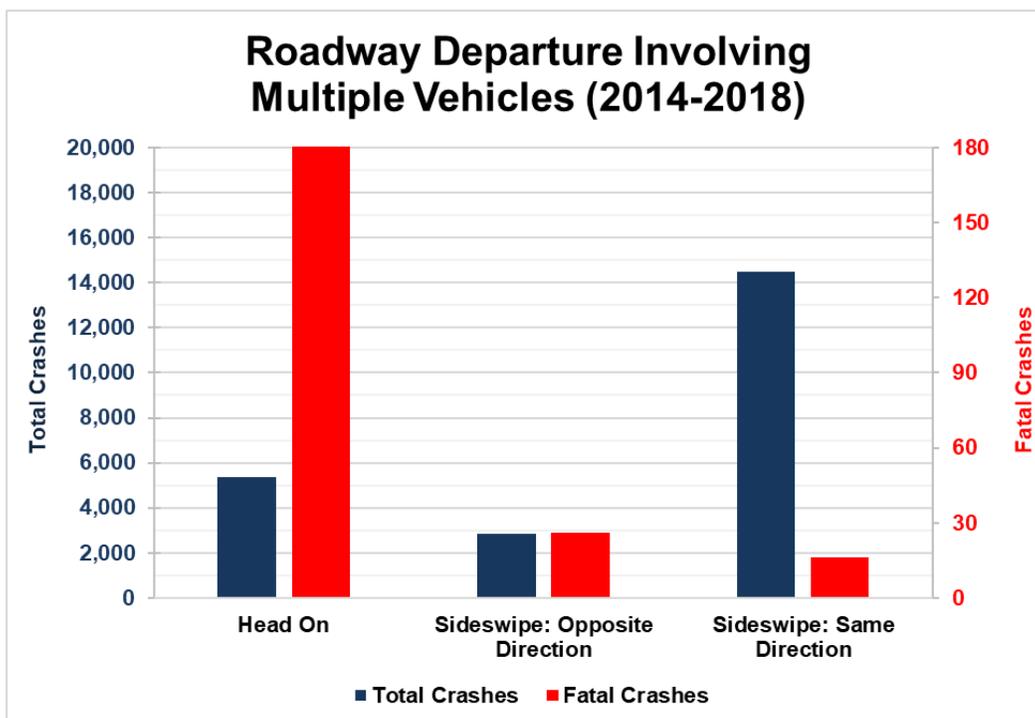
1. Roadway departure is the leading cause of serious injuries and deaths in Kansas.

Between 2014 and 2018, roadway departure was the first harmful event in 1,157 fatalities and 2,635 serious injuries, making it the number one source of danger to drivers and passengers in Kansas. During these years, such crashes accounted for about 30 percent of all those reported in Kansas and over half of those involving serious injuries or deaths. Compared with other crash causes, the impact of roadway departures on drivers and passengers is likely to be more severe.



2. Roadway departure events involving two or more vehicles are most commonly the result of same-direction sideswipes, but head-on collisions result in the highest number of fatalities.

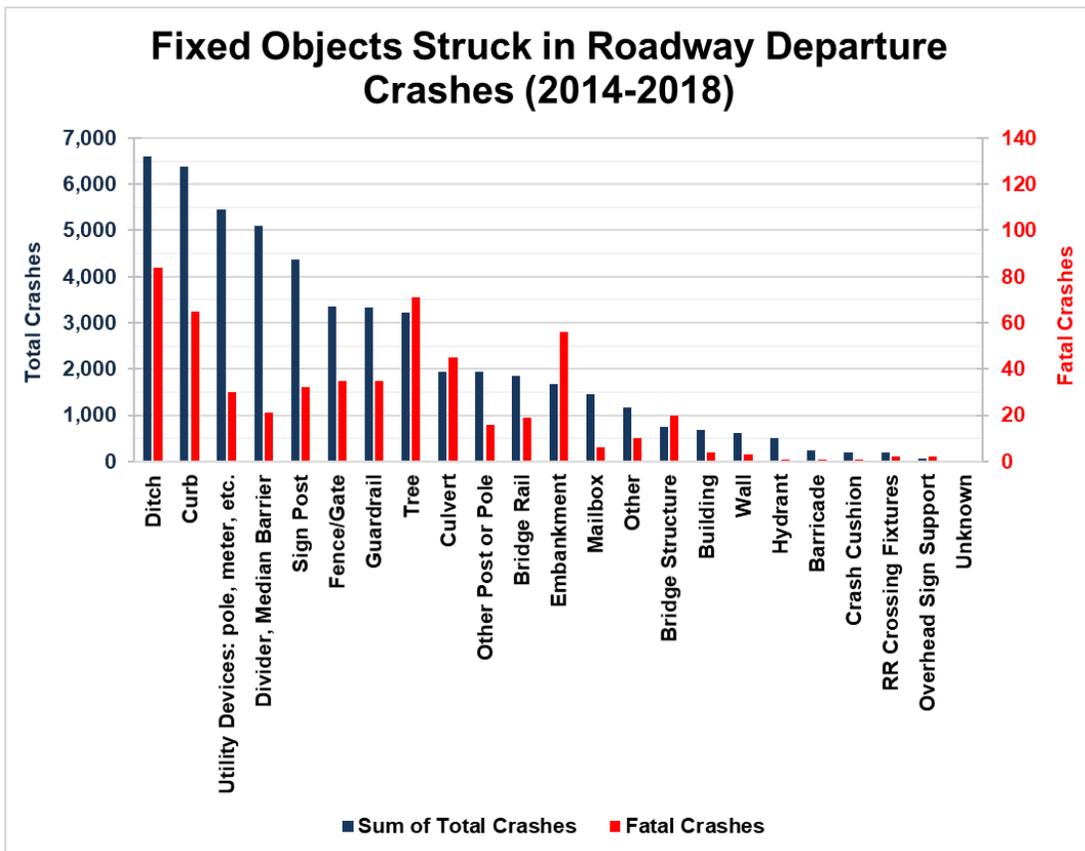
Roadway departure crashes include those resulting from lane departure, without leaving the roadway surface before the first harmful event. These lane departures can be both voluntary or involuntary. Such crashes are almost always multi-vehicle. While sideswipe crashes in the same direction make up most of these crashes, opposite direction in general and head-on in particular claim the most lives. Strategies focused on these crash types generally work toward prevention.





3. Besides ditches, tree strikes are the leading cause of fixed object fatalities.

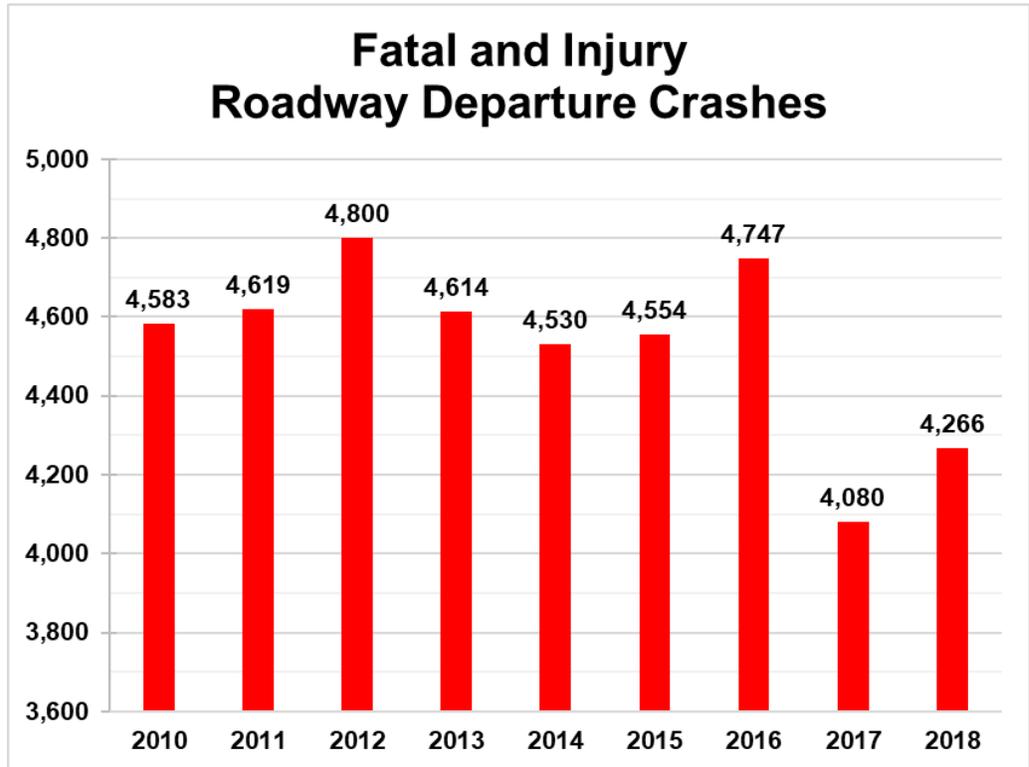
Between 2014 and 2018 there were 51,120 crashes where the first or most harmful event involved striking a fixed object, such as a ditch, tree or culvert. Of these, 559 resulted in at least one fatality. Strategies focused on these crash types generally work toward forgiveness. Fixed objects that should be expected along the road, such as ditches and signposts, are engineered to reduce severity when struck. Other fixed objects may be removed (such as trees), relocated (such as utilities), or shielded (such as bridge piers) by engineered fixed objects (such as guardrail) to also reduce severity.



Performance Measure

Roadway departure crashes held steady until 2017.

Since 2010—the year the most recent Kansas crash reporting form was used by all agencies statewide—we have averaged 4,532 fatal and injury roadway departure crashes per year (based on first harmful event). We hope the 2017 and 2018 numbers are the beginning of a positive trend and not an anomaly in the data. It may reflect an increasing number of vehicles having lane-departure warning systems. Couple this with the strategies outlined below, our target is to be at or below 3,650 fatal and injury crashes by 2024, or an average of 10 per day.



Strategies

1. Develop and implement a safety corridor program.

Several states have developed successful safety corridor programs. This approach begins by identifying highway corridors with safety issues, including but not limited to high crash frequencies or rates, then using a 4E approach (engineering, enforcement, education and emergency medical services) to identify treatments and strategies to improve corridor safety.

Law Enforcement

High-visibility enforcement campaigns have been used to deter aggressive driving and speeding. In the high-visibility enforcement model, law enforcement targets selected high-crash or high-violation geographical areas using either expanded regular patrols or designated aggressive driving patrols. This model is based on the same principles as high-visibility seat belt and alcohol-impaired-driving enforcement—to convince the public that speeding and aggressive driving actions are likely to be detected and that offenders will be arrested and punished.

In the high-visibility enforcement model, officers focus on drivers who commit common aggressive driving actions such as speeding and following too closely. Enforcement is publicized widely. The strategy is very similar to saturation patrols directed at alcohol-impaired drivers. Because speeding and aggressive driving are moving violations, officers cannot use checkpoints. Rather, they must observe driving behavior on the road.

Several studies have credited high-visibility enforcement campaigns with reducing crashes, speeding and other violations.

2. Implement the FHWA's EDC5-Reducing Rural Roadway Departure initiative.

According to the FHWA, "Systemic application of proven safety countermeasures on rural roads helps keep vehicles in the travel lane and reduce the incidence and severity of roadway departure crashes." In Kansas, roadway departure crashes represent about 60 percent of all fatal crashes, with over two-thirds of these in rural areas. Substantial improvements on these roads can be difficult to make due to the size of the network. Further, these roads are often owned by local agencies with limited resources and technical expertise in safety analysis. This initiative includes a list of over a dozen recommended countermeasures. Each will be evaluated and where appropriate implemented in Kansas on both state highways and locally-owned roads.

3. Promote systemic low-cost countermeasures for reducing crashes at horizontal curves.

Horizontal curves represent nearly one in three fatal roadway departure crashes. This program may include targeted improvements, such as high-friction surface treatment, at curves with a pattern of correctable crashes, and lower-cost systemic improvements, such as enhanced signing and delineation, at multiple curves identified based on common risk factors.



4. Create and deliver education campaigns that target factors in roadway departure crashes.

Roadway departure crashes, like all crashes, begin with four contributing factors: the driver, the vehicle, the road and the environment. Nationwide, driver-related factors contribute to over 90 percent of all crashes. These include contributing circumstances such as inattention, drowsy driving and too fast for conditions. This strategy will identify outstanding factors associated with drivers in roadway departure crashes and develop related educational materials to positively influence driver behavior on both state highways and locally-owned roads.

5. Provide local roadway safety training and resources through LTAP and direct technical assistance from LTAP's Local Field Liaison Program.

The State Highway System represents less than 8 percent of all public roads in the state. The remaining 92 percent are owned by cities, counties and townships, each with varying degree of expertise in matters related to roadway safety. The Local Technical Assistance Program administered by the University of Kansas Transportation Center provides training, technical resources and now direct contact through liaisons to these local jurisdictions.

6. Update and implement a new rumble strip policy.

KDOT's rumble strip policy was last updated in 2007. At the time, centerline rumble strips (CLRS) were added to the policy. Since then, nearly 2,000 miles of CLRS have been installed. A study conducted by Kansas State University evaluated the impact of CLRS in Kansas and found cross-over crashes were reduced by 67 percent! Shoulder rumble strips also save lives by reducing the potential for run-off-road crashes. For each, expansion of use and method of delivery will be considered in the new policy.

7. Identify and add safety enhancements to pavement preservation projects.

Although difficult to quantify, surface condition is an important component of highway safety. Wet roads and icy roads are captured in crash data, but potholes, broken pavement, and washboards (on gravel roads) are not. Annually, KDOT works to resurface around 1,200 centerline miles of state highways through the Pavement Preservation Program. While the program is driven exclusively by surface condition, these projects provide opportunity to identify and construct safety features such as rock wedge or narrow paved shoulders, tapered pavement edge, rumble strips, fixed-object removal and roadside safety hardware improvements.

Reference Appendix C for Roadway Departure action plan.



Chapter 3 Occupant Protection

Buckling up is the most effective protection during a car crash. The National Highway Traffic Safety Administration (NHTSA) estimates that lap/shoulder seat belts, when used correctly, reduce the risk of fatal injuries to front-seat passenger car occupants by 45 percent and moderate-to-critical injuries by 50 percent.

For light-truck occupants, the protection is even better: seat belts reduce the risk of fatal injury by 60 percent and moderate-to-critical injury by 65 percent.

Kansas has two seat belt laws which cover occupants in all passenger vehicles (cars, vans, pickup trucks and SUVs), plus federal regulations which require seat belt use in commercial vehicles.

The Safety Belt Use Act (KSA 8-2501) requires all occupants ages 14 and older to “have a safety belt properly fastened” when a car is in motion. The Child Passenger Safety Act (KSA 8-1343) requires drivers to provide for the protection of children younger than age 14 by properly using child passenger safety restraints or seat belts.

Kansas relies on two annual observational surveys to determine seat belt use in vehicles. The observational survey, which is required by the National Highway Traffic Safety Administration (NHTSA), is conducted each summer and focuses on passenger vehicle drivers and front-seat outboard-position passengers. Data released by KDOT in 2019 showed 85 percent of front seat occupants were using seat belts, a sizable increase from 77 percent in 2009.

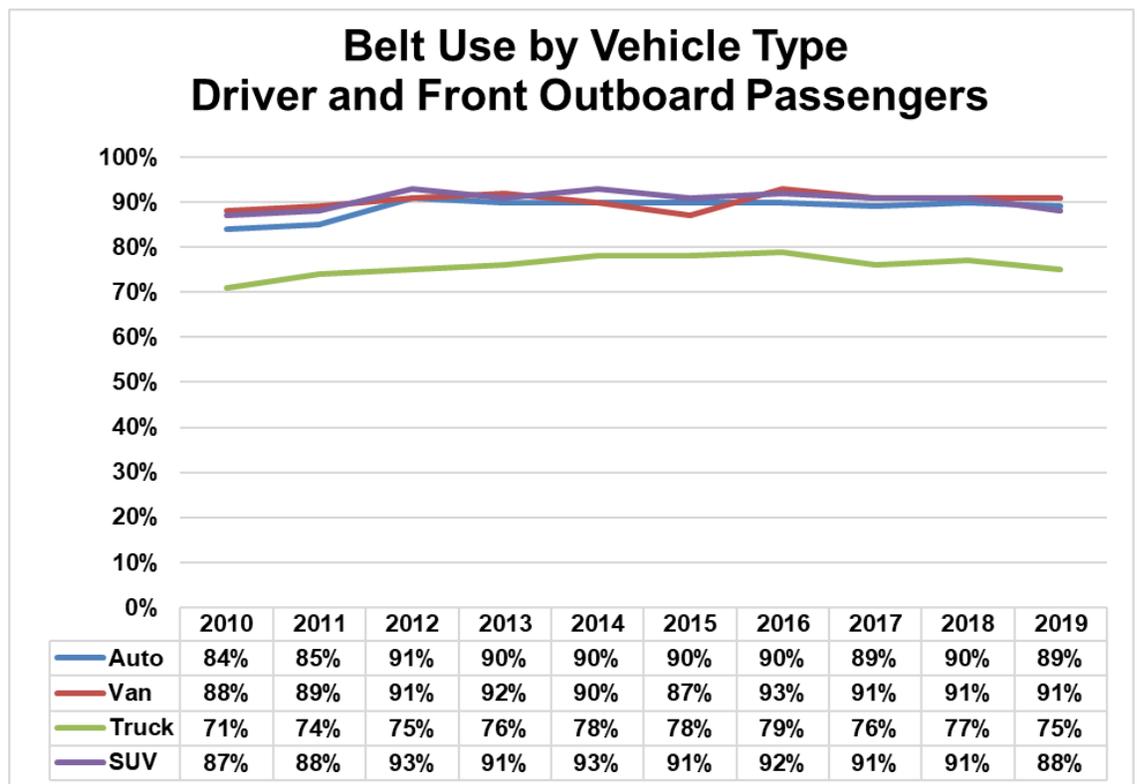
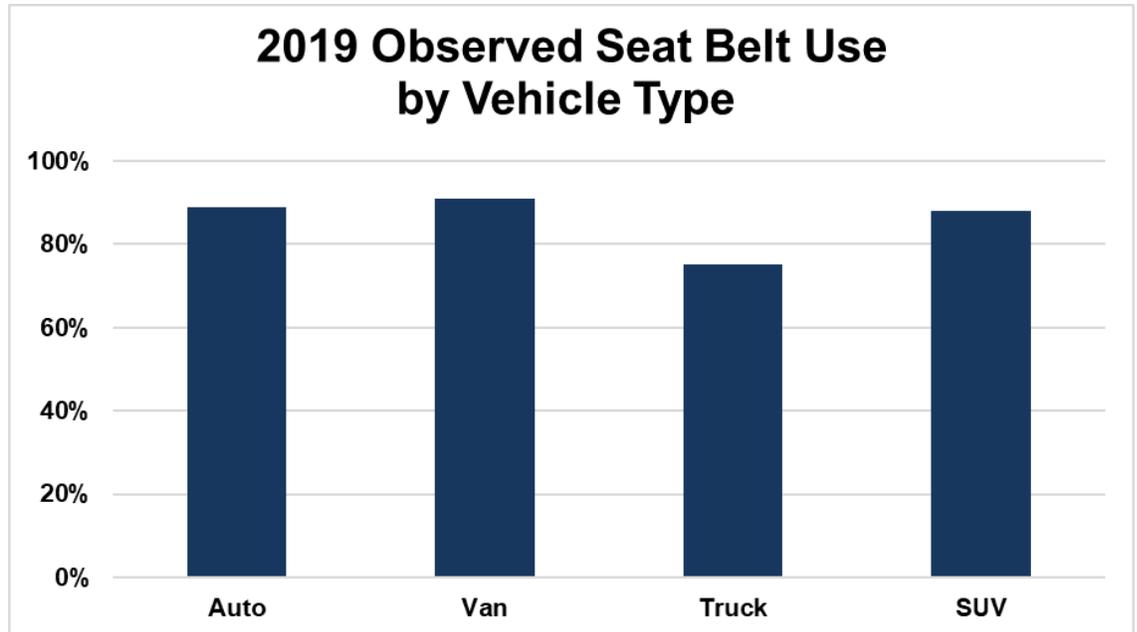
The child survey, which is not required by NHTSA, is conducted in early spring and focuses on children younger than age 18. In 2019, the observation rate for children ages 0-17 was 91 percent, up from 75 percent in 2009.

The outcome sought by the Occupant Protection Emphasis Area Team is the implementation of the SHSP strategies. Some efforts will be statewide; others will target specific demographics or geographic areas with low rates of seat belt use.

Data Point

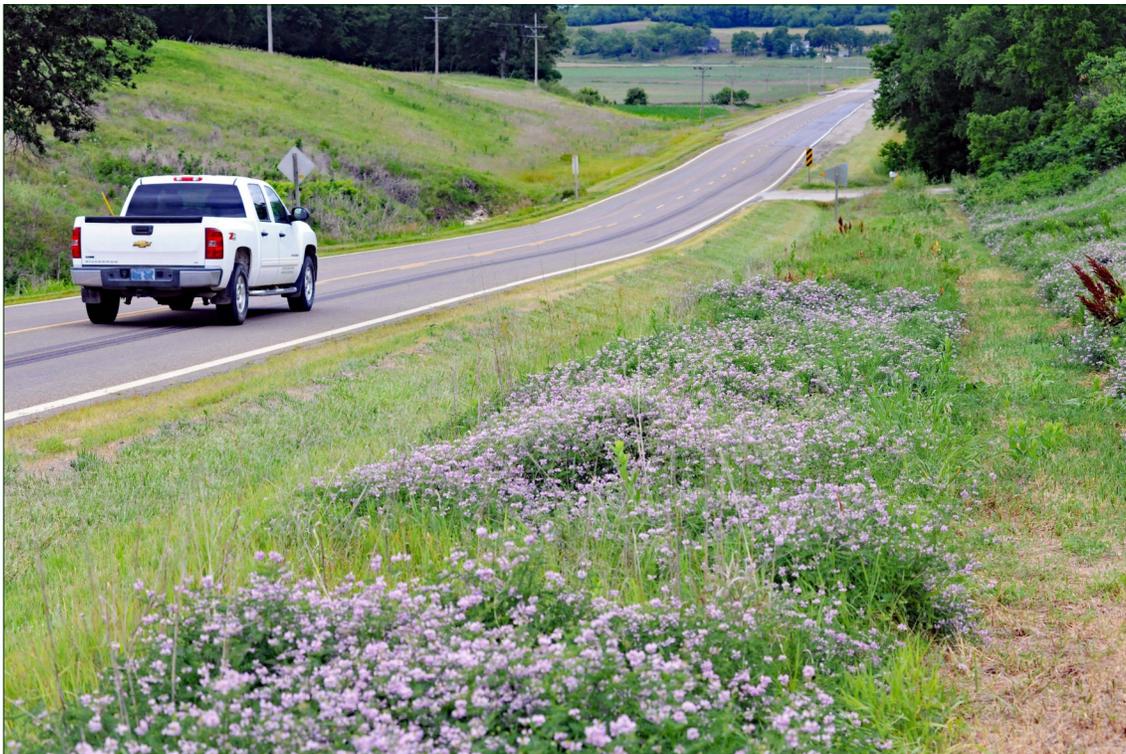
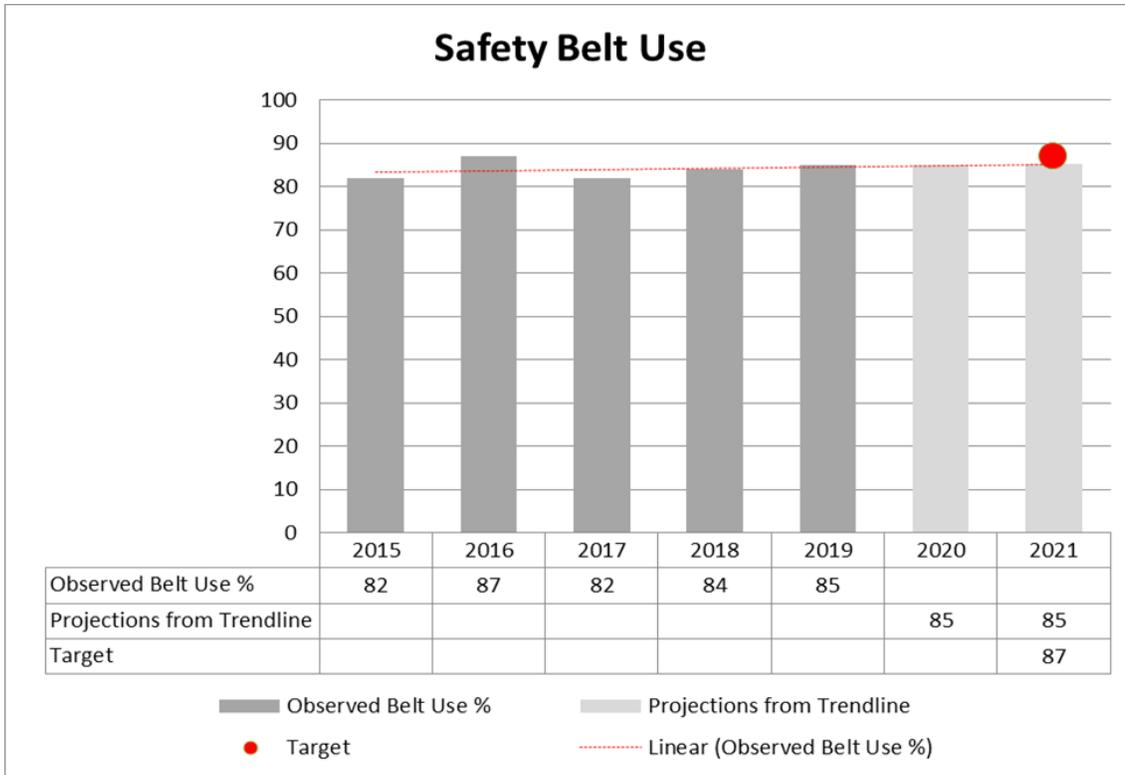
1. The highest risk-takers: pick-up truck occupants.

Not wearing seat belts is most prevalent among drivers and passengers of pick-up trucks. Although belt use rates among all vehicle types have increased since 2002, belt use in trucks has consistently been observed to be between 12 to 15 percentage points lower than other vehicle types.



Performance Measure

The Occupant Protection Emphasis Area Team seeks to reduce vehicle fatalities and serious injuries from 2019-2024 by increasing the use of safety restraints. The target is to achieve an observed belt use rate of 90 percent by 2024, with an interim target of 87 percent in 2021. Statistics support that an increase of proper belt use should result in a decrease in the number of fatalities.



Strategies

1. Create a targeted media campaign directed toward pickup drivers.

Statistics show that seat belt use is lowest among occupants in pickup trucks and in rural settings. The media contractor should develop materials targeting pickup drivers and their influencers.

2. Provide funding and other forms of support for law enforcement efforts to uphold occupant protection laws.

Law enforcement officers are more likely to enforce occupant protection laws if they are trained in the importance of using safety restraints at every stage of life. Often, agencies operate on tight budgets with low manpower, so funding is needed for overtime enforcement, training and equipment purchases.

3. Collaborate with state and local partners, including employers, to promote seat belt usage through education and incentive programs.

Many partners are needed to effectively reach the public with our seat belt message. A consistent message is most desirable and can only be achieved through these partnerships.

4. Enhance existing primary seat belt law to include all seating positions, increase fines and assess court costs.

States with strong laws consistently show higher seat belt use and lower fatality rates.

5. Analyze existing and new data sources to define and support the prioritization of strategies.

Strong and ongoing data analysis is an essential component of any occupant protection program to ensure time and resources are being utilized effectively.

Reference Appendix C for Occupant Protection action plan.



Chapter 4 Impaired Driving

Impaired driving consists of driving under the influence of alcohol, drugs or any other mind altering chemical, or any combination of the drugs whether legal or illegal. The Impaired Driving Emphasis Area Team focuses on educational and enforcement efforts for alcohol and drugs and provides guiding principles for both educational and enforcement efforts. With the recent legalization of marijuana in bordering states resulting in easy access, marijuana has become the most concerning impairing substance in Kansas.

To combat being under the influence of marijuana while driving, Kansas has led the country in studying roadside oral fluid instrument testing by law enforcement officers.

In addition, new marketing messages about “driving high” have been played in all forms of media outlets.

Roadside testing technology is now currently available to test for the presence of illegal drugs in a driver’s system. The Kansas Legislature made changes in 2019 to facilitate roadside oral fluids preliminary testing by law enforcement.

The final phase for total implementation of roadside testing is to provide the instruments to law enforcement and authorize them to use in all suspected impaired driving cases. Twelve roadside oral fluids testing instruments have been approved for purchase for the Kansas Highway Patrol who is instituting a program to provide field testing across Kansas by partnering with local law enforcement agencies.

Kansas forensic crime labs were not equipped to test oral fluids so KDOT has purchased two scientific instruments with a third purchase in the works. This will allow Kansas crime labs to test oral fluids at the necessary evidentiary level to provide levels and types of drugs in the driver’s system.

Finally, focusing on the aftercare of anyone arrested on driving under the influence offenses, ignition interlock, which monitors alcohol only, has been statistically shown to reduce recidivism of driving



under the influence offenses. These are proven effective with DID cases because most people who are driving under the influence of drugs are statistically simultaneously under the influence of alcohol.

The Impaired Driving Team works diligently to address many issues, and its efforts are not limited to the few highlighted in this Strategic Highway Safety Plan. The issues listed here will be major focus areas for the next five years.

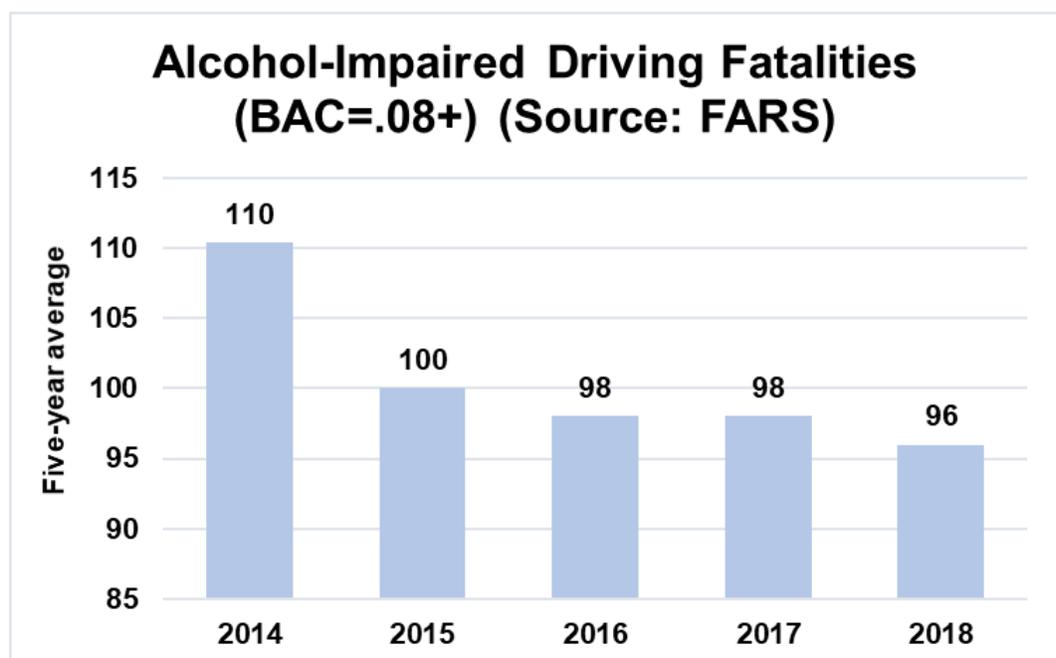
Data Points

1. Data provides problem identification for DUI related crashes. Both locational data and fatality date are useful to determine where to concentrate efforts and provide countermeasures that work.

According to the 2018 Fatality Analysis Reporting System (FARS) final data, pickup truck drivers had the largest percent decrease in alcohol-impaired drivers involved in fatal crashes from 2016 to 2017, dropping 4.8 percent. SUV drivers involved in fatal alcohol-impaired-driving crashes had the largest percent increase of 5.5 percent among other passenger vehicles. Alcohol-impaired drivers of large trucks involved in fatal crashes had the largest percent increase of 61.1 percent but note that the percentage is based on much smaller numbers than other vehicle types.

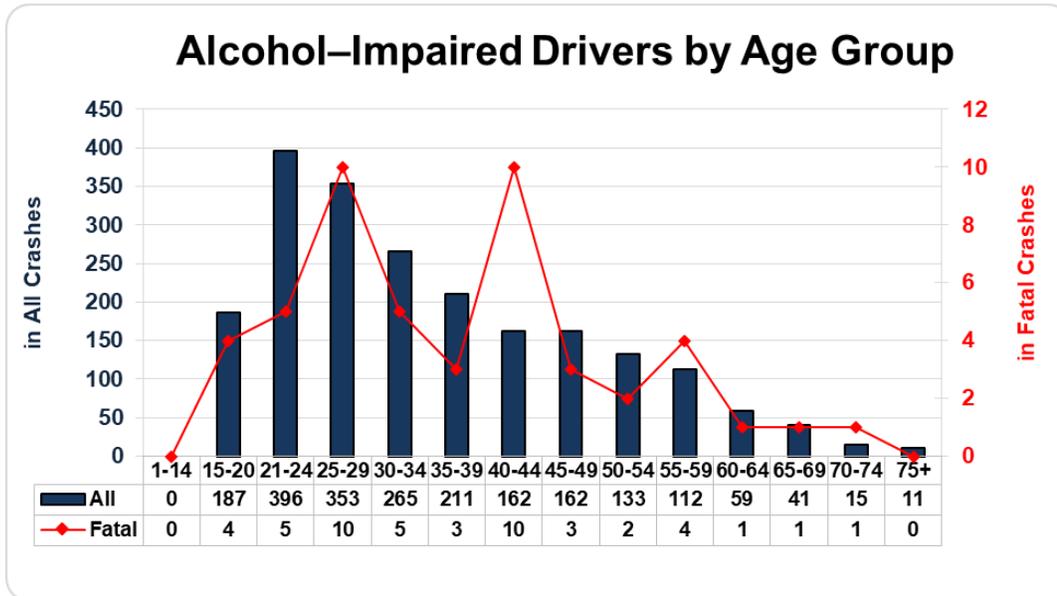
2. Alcohol is involved in more than one in five fatal crashes.

In 2018, Kansas had a total of 403 fatalities with 88 alcohol-impaired driving fatalities, or 22 percent of all fatalities. While the alcohol-impaired fatalities were down from a total of 104 in 2017, the percentage of fatalities remained consistent at 22 percent of all fatalities.



3. Alcohol-involvement by age group peaks in the early 20s.

Not surprisingly, drivers in the age category 21-24 are involved in more alcohol-involved crashes than any other age group. At this age, alcohol is legal to purchase and consume while neuroscience indicates the brain is not yet fully developed, leading to a higher propensity for risk-taking.



Performance Measure

Statistics will tell us two in five Kansans are involved in or affected by an alcohol-related crash at some point in their lives. The emotional and economic tolls these preventable crashes take on society are immeasurable. But performance measures can be tracked and measured, thus better outcomes can be achieved.

To reduce the significant and overwhelming impact these crashes have on society and reduce the victimization that is caused by impaired drivers, the Impaired Driving Emphasis Area Team is committed to reducing alcohol related fatalities by 1 percent lower than the 2018 five-year average of 96, or not more than an average of 95 fatalities in 2024.

Strategies

1. Institute legally permissible roadside oral fluids testing program for drug impaired driving.

The initial Kansas study demonstrating the reliability of roadside oral fluids was completed with lead agency Sedgwick County Criminal Forensics Laboratory. The study demonstrated the field-testing instrument's high degree of accuracy with validations done at two independent laboratories. A high level of confidence now exists to accurately measure drugs present in the body. To use oral fluids, the Kansas Legislature had to modify statutes in 2019 to authorize testing of oral fluids for driving under the influence statutes. That was completed and became law July 1, 2019. Select law enforcement agencies will use the instrument to ensure policies, procedures and protocols are appropriate for successful prosecution. Model policies will be available to law enforcement agencies to adopt to ensure the program is legally acceptable.

2. Equip Kansas forensic crime labs to test oral fluids to allow for courtroom evidence.

Current Kansas statutes allow oral fluids for preliminary testing only. This is what officers use to establish probable cause for the arrest. The next step is to allow oral fluids to be entered as evidence into the court proceedings. To provide this, Kansas labs need instruments capable of testing oral fluids for evidentiary submissions. KDOT has purchased instruments for Johnson County Sheriff and the Kansas Bureau of Investigation who are currently certifying lab instrument for oral fluids. Sedgwick Forensic Crime Lab is working with KDOT to secure a contract for the purchase of the lab instrument. Once these crime labs are certified for oral fluids, the Kansas Legislature must amend current state law to allow oral fluids to be used as evidence in court.

3. Institute a state-wide enforcement unit with Kansas Highway Patrol for offender compliance enforcement of ignition interlock devices (IID).

Monitoring those convicted of DUI offenses is key to reducing recidivism of DUI-related arrests. Studies show a significant reduction of repeat DUI arrests for those who have IIDs installed vs. those who do not. Studies also show a 15 percent reduction in fatality crashes related to alcohol in states requiring IIDs. Kansas has led the nation in IID requirements including requiring IIDs for first time offenders. Per capita, Kansas has the second most IIDs deployed in the nation. The weak link is enforcement of IID requirements. Some offenders are illegally circumventing the IIDs or getting "curbside service" where a sober person blows for them. Some offenders are never getting an IID installed. To address offender compliance issues, KDOT and KHP have teamed up to provide two full time troopers to train Kansas law enforcement on IID violations. KDOT will fund two positions and necessary equipment for five years beginning in 2019. The troopers' primary focus in the first three years is training; last two years will be enforcement driven to increase compliance with IID requirements.

Reference Appendix C for Impaired Driving action plan.



Chapter 5 Older Drivers

The National Highway Traffic Safety Administration (NHTSA) defines the older driver as age 65 and older. In *Countermeasures That Work*, NHTSA provides older driver characteristics. The document outlines physical and mental abilities, driving behaviors, and crash risks that change as drivers age. Hearing, muscle tone, reaction time, and vision all decline. Cognitive capabilities can diminish. Fragility increases, and injuries take longer to heal. Medications may cause drowsiness or otherwise affect driving. All these factors can contribute to a decline in driving ability.

Countermeasures That Work also states that older drivers practice some safe driving behaviors. They are less likely than younger people to drive after drinking or using recreational drugs. They recognize and avoid driving in situations in which they feel uncomfortable, such as at night, on high-speed roads, or in unfamiliar situations. Older drivers rarely drive aggressively or speed, although they may drive more slowly than prevailing traffic, which can be risky.

One more fact about the 65+ age group must be addressed, and it adds urgency to the timeliness of implementing safety measures for older drivers.

The Silver Tsunami has hit Kansas. And it will continue to flood the state for several years.

The “tsunami” is the enormous number of Baby Boomers flowing into the older driver segment. The Boomer generation spans birth years 1946 to 1964, hence the oldest members turned 65 in 2011—and an estimated 10,000 Americans turn 65 every single day. These Boomers are joining an older driver segment that already contains more than 50 million born in the Silent Generation (1928 to 1945) and the Greatest Generation (before 1928).

In Kansas, 533,000 people are age 65 or older in 2020, and approximately 90 percent hold a driver’s license. By 2024, the 65+ population will be 587,317. The last of the Boomers will turn 65 in 2029. At that point, the Kansas population age 65+ is projected to be 668,980. (Population projections provided by Wichita State University’s Center for Economic Development and Business Research.)

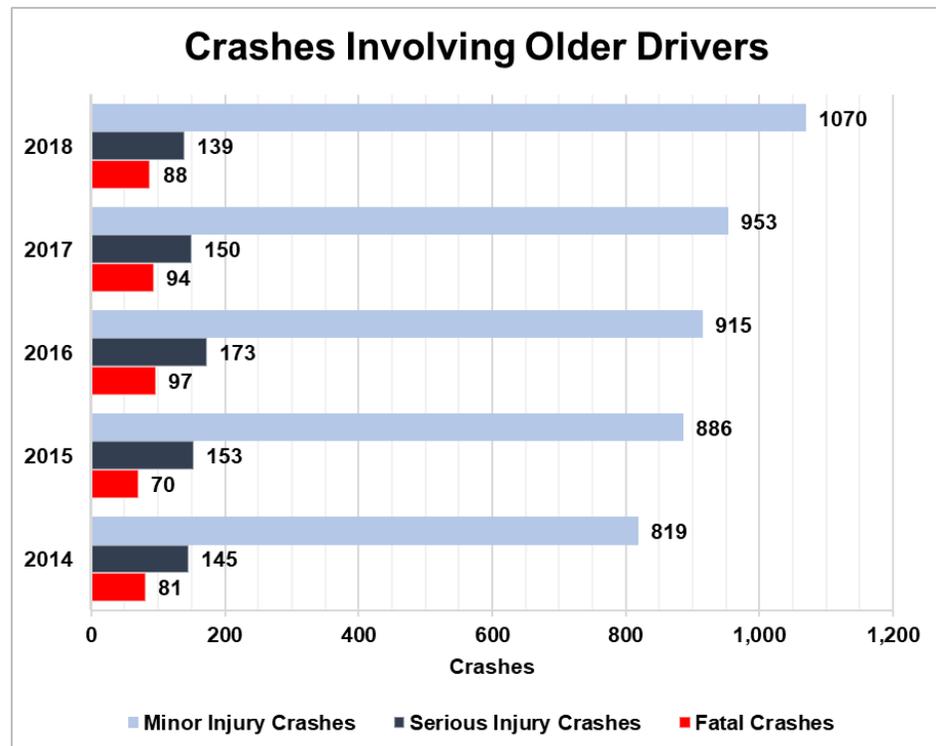
According to AAA, seniors are outliving their driving years by an average of seven to 10 years. This news combined with the massive influx of Kansans rapidly moving into the 65+ age group requires the Older Driver Emphasis Area Team to quickly implement its strategies for older driver safety.



Data Points

1. Crashes involving older drivers are on the rise in Kansas.

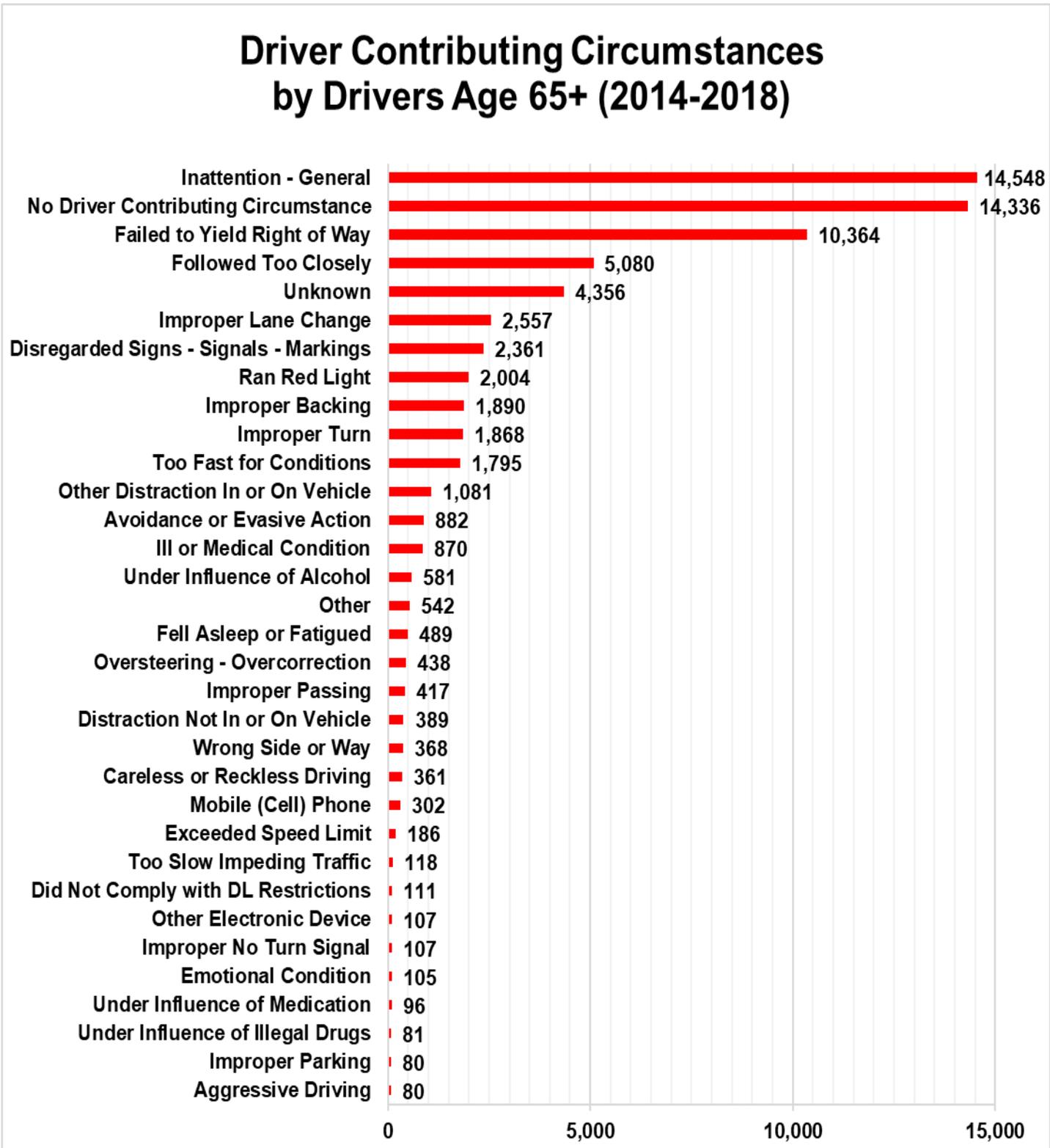
Since 2009, total crashes involving an older driver have increased by 39 percent. (Total number of crashes in 2009 was 7,998; the total in 2018 was 11,088.) The number of people killed or who suffered minor injuries in a crash involving an older driver has also increased. These are crashes in which an older driver was involved. The older driver may not have been the cause of the crash and the older driver may not have died. However, at least one of the drivers was age 65 or older. *Note:* crashes coded as “possible injury” or “property damage only” in the Kansas Motor Vehicle Crash Report are not included in this graph.



2. Diminished spatial awareness is often a factor in crashes involving older drivers.

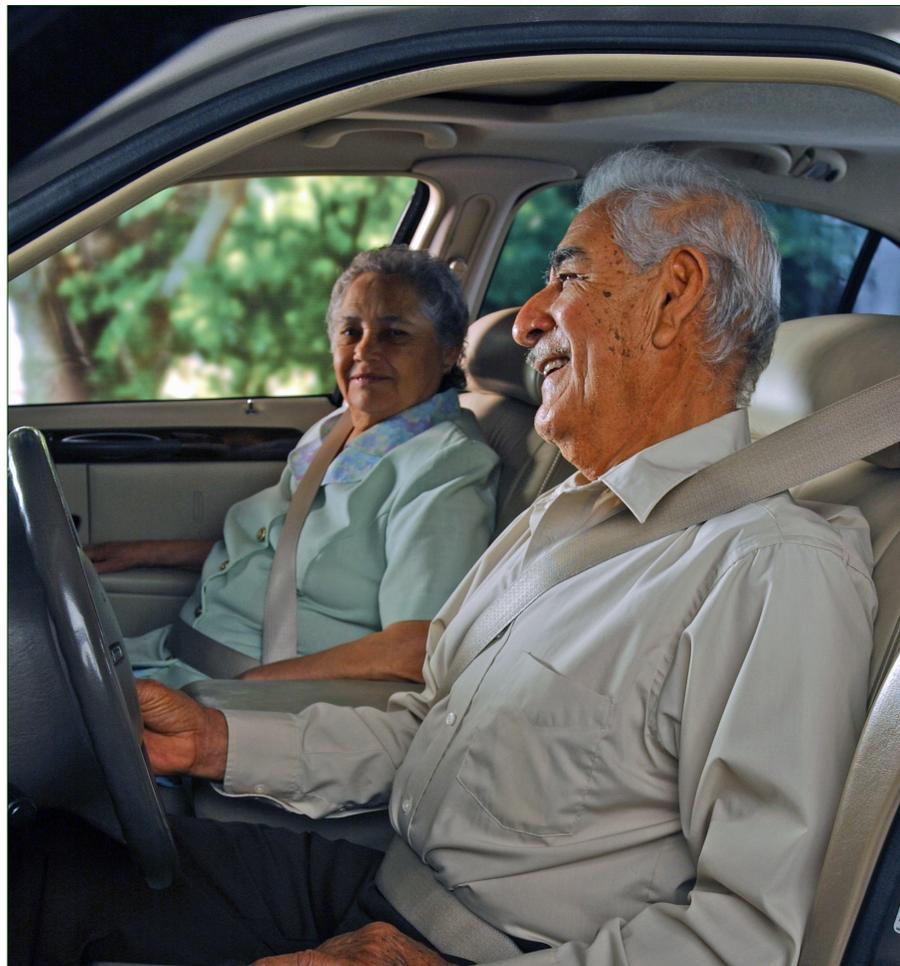
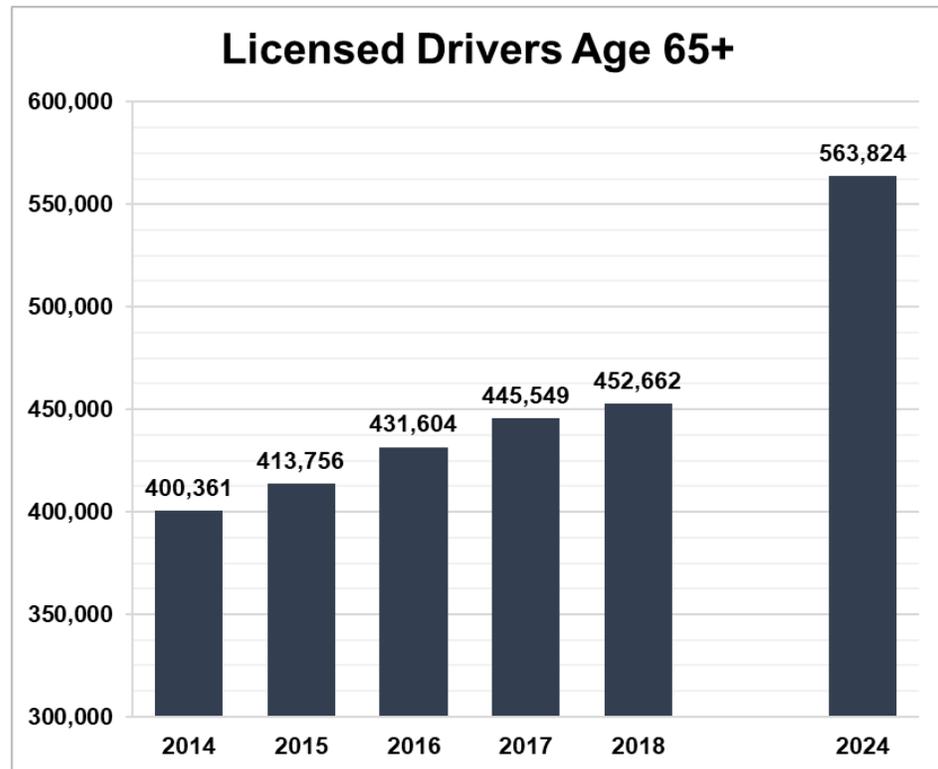
Between 2014 and 2018, a total of 51,564 crashes included an older driver. Three of the top six driver contributing circumstances in these crashes could be the result of diminished spatial awareness in the older driver. "Failed to yield right of way," "followed too closely," and "improper lane change" all involve judging distance, a skill that often declines as people age. On another note, in 14,336 crashes, none of the contributing circumstances were attributed to the older driver.

About the graph: each crash could have multiple contributing circumstances. For example, one crash could involve a driver with a medical condition who failed to yield right of way and ran a red light. This crash would be coded with three contributing circumstances.



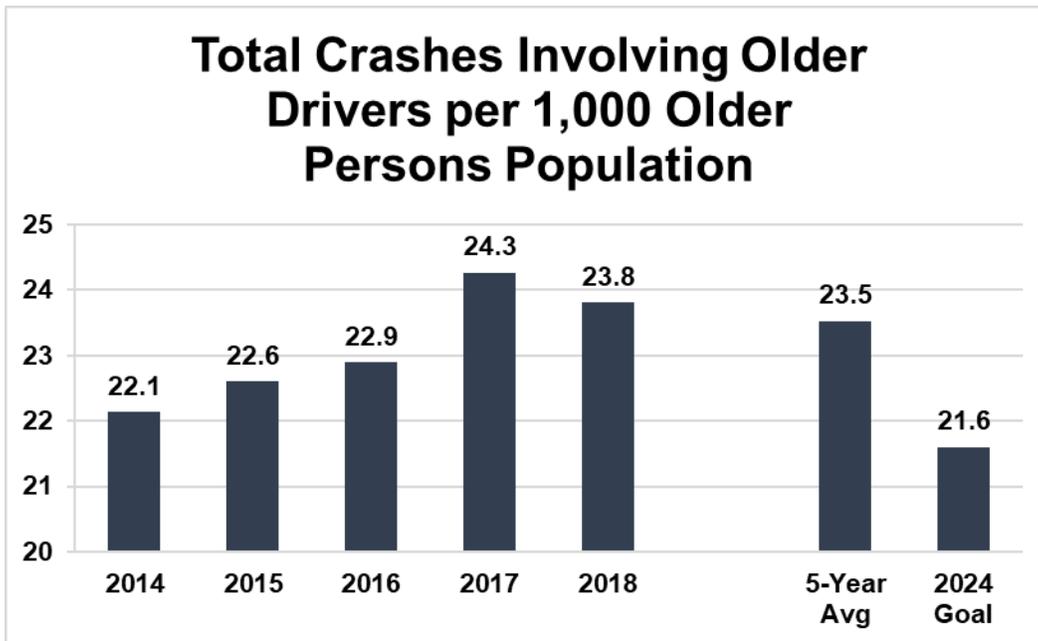
3. Number of Kansas drivers age 65+ is increasing rapidly.

The number of older Kansans holding driver's licenses has been increasing over the last five years and will continue to rise through 2024.



Performance Measure

Between 2014 and 2018, Kansas averaged 23.5 total crashes involving an older driver for every 1,000 older persons in the population. Total crashes include any crash reportable to the state, from property damage only to fatal. (In comparison, all drivers of any age were involved in crashes at a rate of 21.6 during that same period.) While the rate over these five years has remained relatively close to the five-year average, the number of total crashes involving older drivers has increased from 9,406 in 2014 to 11,088 in 2018. This is explained by the increase in population of older persons, from 416,000 in 2014 to 461,000 in 2018. Wichita State University’s Center for Economic Development and Business Research projects the population of older persons will reach 587,317 in 2024 and 668,980 by 2029! For this reason—and although it would be ideal—targeting a reduction in crashes is not realistic. What is realistic, however, is targeting a reduction in the rate at which older drivers are involved in crashes. If the rate is reduced from 23.5 to 21.6 by 2024, the projected reduction in crashes in that same year will be 1,116. (From 13,802 with a rate of 23.5 to 12,686 with a rate of 21.6.)



CarFit

CarFit is an educational program that provides a quick, comprehensive review of how well older drivers and their vehicles work together. The program, which was developed by AAA, AARP and the American Occupational Therapy Association, also provides information and materials on community-specific resources that could enhance driving safety and increase mobility.

Ill-fitting vehicles can make driving uncomfortable and unsafe. Today’s vehicles have many safety features that offer enhanced restraint and protection, yet many drivers are unaware of those features or how to best use them. CarFit helps older drivers explore vehicle adjustment and develop strategies to achieve the safest fit to improve comfort, control and confidence behind the wheel.



At CarFit checks, trained CarFit Technicians ask the drivers several simple questions and complete a 12-point checklist. The entire process takes about 20 minutes, and the driver leaves with recommended car adjustments and adaptations, a list of local resources and greater peace of mind.

The CarFit program could make a lifesaving difference. For more information, visit ktsro.org/carfit.

Strategies

1. Partner with and provide educational materials about older drivers to stakeholders, including senior centers, law enforcement agencies, Kansas legislature, city and county governments, Chamber of Commerce groups, and the state's Area Agencies on Aging.

Educate about the social, medical, physical, and cognitive issues that older drivers may encounter. Include self-assessment tools so seniors can learn to self-identify when they can no longer drive. Promote AAA's Roadwise Driver and AARP's Smart Driver.

2. Educate members of the medical community about how physical and cognitive issues facing older drivers can affect their driving ability.

Audience includes physicians, advanced practice providers (physician assistants, nurse practitioners), nurses, pharmacists, and occupational and physical therapists. Include information about how certain medications can interact with each other and impair the driver. Include information from the Older Drivers chapter in NHTSA's *Countermeasures That Work*.

3. Promote CarFit as an important training opportunity.

CarFit is an educational program that provides a quick, yet comprehensive review of how well older drivers and their vehicles work together. The program, which was developed by AAA, AARP and the American Occupational Therapy Association, also provides information and materials on community-specific resources that could enhance driving safety and increase mobility.

4. Establish Mobility Managers at locations throughout the state to work with regional transit agencies to cooperatively meet the longer-distance travel needs of transit-dependent populations, including older drivers.

Kansas currently has three active Mobility Managers with others in development for 2020-2022. The goal is to eventually have a network of Mobility Managers that works to improve transportation services in communities and works collectively on state-wide public transportation issues, including transportation options for seniors who no longer drive.

5. Conduct training for older drivers on how to access and use the public transit system as a transportation option.

Mobility Managers and other traffic safety advocates can distribute free training materials to new public transportation users. Materials include the Flint Hills aTa Bus training video, Kansas Rides (ksrides.org) and the Kansas Rural Transit Assistance Program (kutc.ku.edu/rtap/map).

6. Establish mandatory physician and law enforcement reporting for drivers of any age who no longer have the necessary physical or mental capacity to effectively operate a motor vehicle.

Physicians, advanced practice providers (physician assistants, nurse practitioners), and law enforcement officers will be required to report drivers to the Division of Vehicles if they have been diagnosed with conditions that may affect driving ability. Statute will also require more frequent in-person renewal of licensing for drivers age 75 and older.

Reference Appendix C for Older Drivers action plan.



Chapter 6 Intersections

The mission of the Intersections Emphasis Area Team (EAT) is to develop data-driven action plans that reduce the potential for, and severity of, intersection and intersection-related crashes. The plan establishes specific strategies in support of the mission as well as an intersection performance measure focused on the next five years (2020 to 2024). These strategies are based on the 4E's of traffic safety: education, enforcement, engineering and emergency medical services. The Intersections EAT will help implement the Strategic Highway Safety Plan (SHSP) by recommending safety-related programs and projects. These programs and projects may include low-cost safety improvements, high-cost safety improvements, policy changes and research initiatives.

The Federal Highway Administration (FHWA) defines an intersection as "a planned point of conflict in the roadway system." In this plan, we define an intersection as two or more public roads crossing at grade (or at the same level, versus an interchange where one road passes over the other). There are many types of intersections included within three different categories: Signalized, Unsignalized and Alternative.

Signalized – Traditional

- pre-timed traffic signals
- traffic-actuated signals
- traffic-adaptive signals

Unsignalized – Traditional

- uncontrolled (no stop or yield signs and no assignment of right-of-way)
- controlled (stop or yield signs assign right-of-way and may include flashing beacons)
- roundabouts

Alternative – Non-Traditional (could be signalized or unsignalized)

- restricted crossing U-turn
- median U-turn
- continuous flow intersection
- quadrant roadway intersection
- split intersection

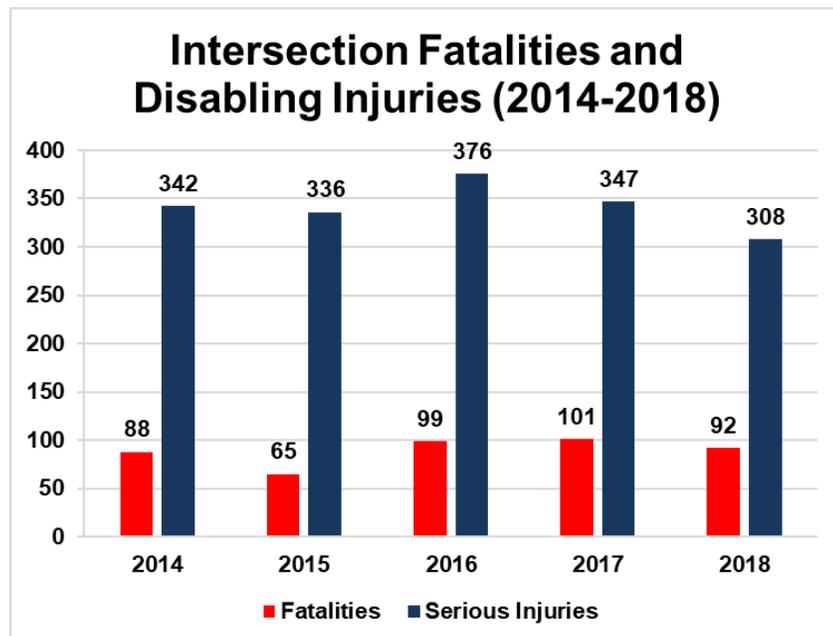
Given the FHWA definition of an intersection, it is important to point out what is not counted as an intersection crash. The meeting of a private driveway with a public road will not be treated as an intersection although we recognize the value of well-designed access, especially near intersections. Other crashes that will not be treated as intersection crashes are those that occur at grade-separated interchanges (where roads cross at different levels), such as merge areas and ramps. Therefore, the only crashes reported in this chapter will be those that occur where two or more public roads cross at the same level or are directly related to those crashes.



Data Points

1. Almost one in four Kansas crash fatalities happens at an intersection.

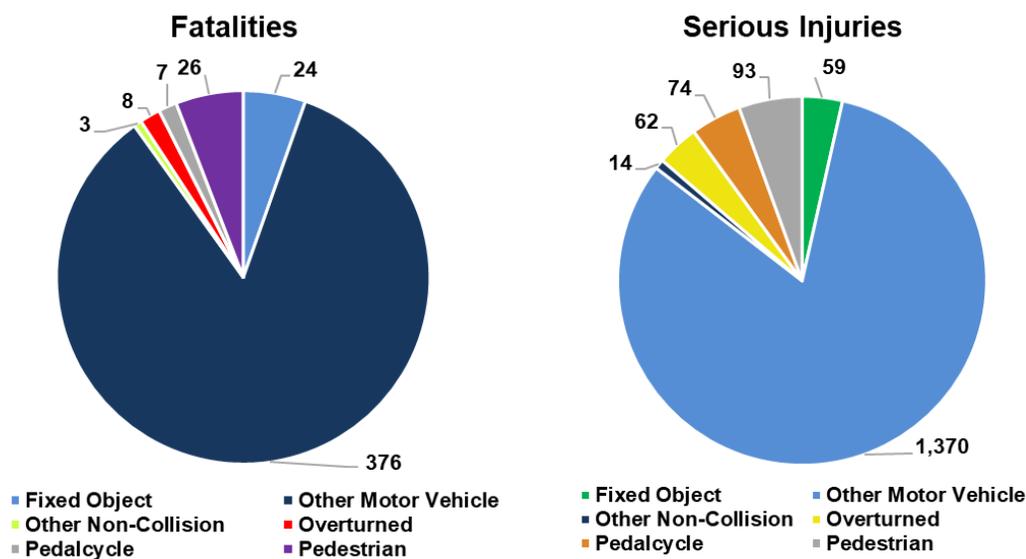
Intersection-related fatalities represent roughly 21 percent of all crash fatalities in Kansas. Between 2014 and 2018, 445 fatalities and 1,709 serious injuries occurred at intersections. In that span, intersection crashes accounted for 30 percent of serious-injury crashes statewide and 31 percent of all crashes. Increases and decreases in intersection fatalities and serious injuries tend to parallel the pattern of fatalities and serious injuries overall.



2. The most likely crash: collisions between vehicles.

More than 80 percent of intersection crashes are collisions between motor vehicles. Rear-end and angle/side impact crashes are the most common types. The data indicates that our focus should be on reducing the potential for these conflicts. Reducing angle crashes begins with good engineering, but also depends on drivers' recognition of intersection type and law enforcement. Rear-end crashes along signalized corridors can be reduced by such means as timed signals and turn lanes. Between 2014 and 2018, collisions between motor vehicles accounted for 84 percent of the fatalities and 82 percent of the serious injuries at intersections. Of these, 76 percent were angle collisions (left-turn and right-angle), 15 percent rear-end.

Intersection Crashes by Accident Class (2014-2018)

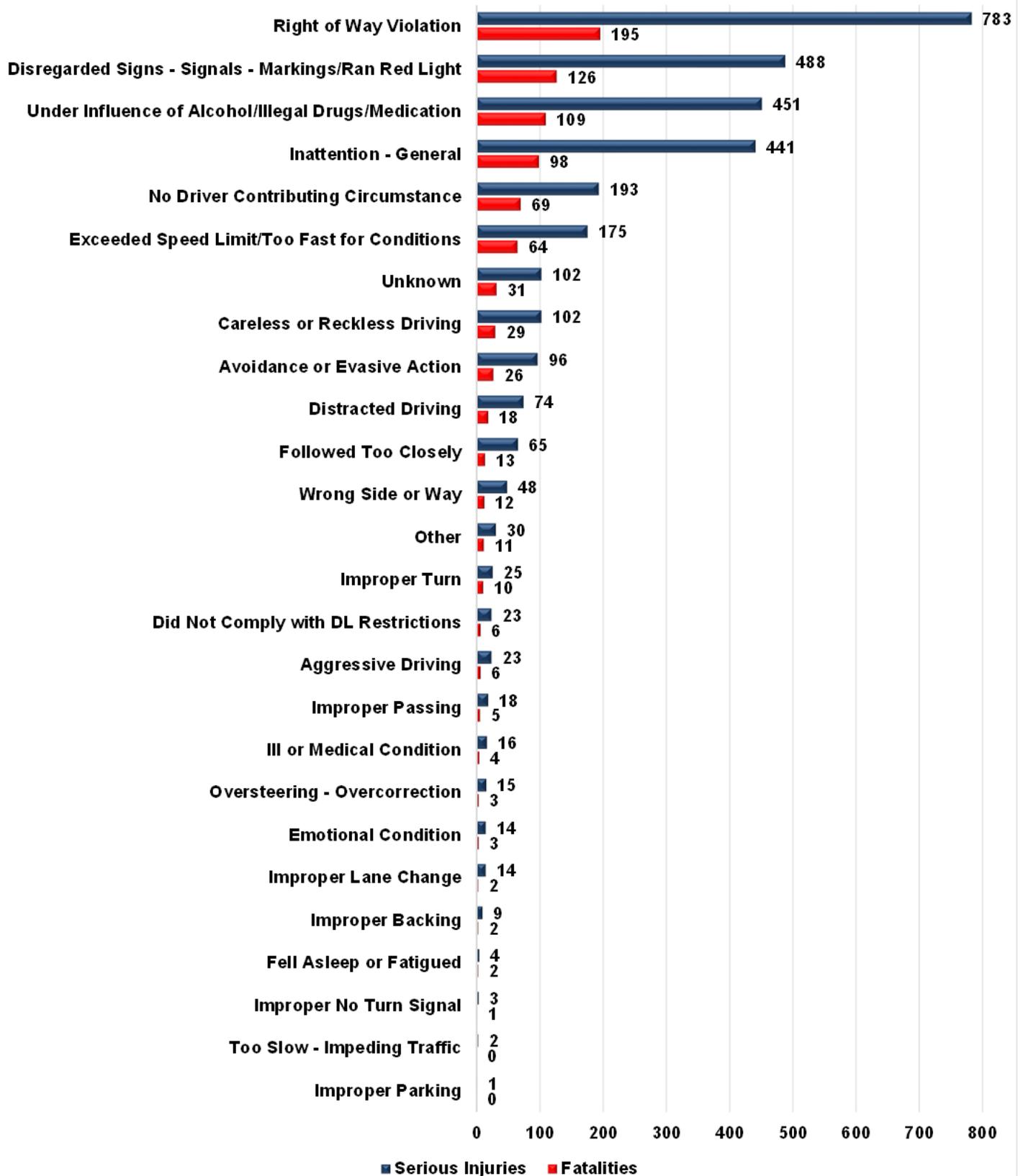


3. The contribution of driver behavior to intersection collisions.

Most intersection fatalities are the result of a collision between two vehicles and most of those collisions are identified as angle/side impact. Given this information, it's not surprising that "failure to yield right-of-way" and "disregarded traffic signs, signals or markings" represent two of the top three factors involved in collisions. Use of handheld communication devices inside and outside of vehicles has skyrocketed within the last decade. Given this trend, it's not surprising that "inattention/distracted driving" is noted as the fourth largest contributor to intersection crashes. The remaining factor in the top four, "driving while impaired by alcohol or drugs," is all too familiar. Additional information regarding this category of fatalities/serious injuries can be found in the impaired driving chapter of this plan.

In most intersection fatalities, at least one of the drivers involved makes a poor decision. Intersections are a planned point of conflict in the roadway system. Each intersection has a number of potential conflict points. A standard four-legged intersection has 32 conflict points—32 opportunities for a driver to make a mistake. Roundabouts, by comparison, have only eight. Engineering, as well as enforcement, education and emergency medical services can only go so far. In the end the success of this plan depends largely on the drivers.

Intersection Fatalities and Serious Injuries by Driver Contributing Circumstances (2014-2018)



94 percent of crashes nationwide are the result of driver error.



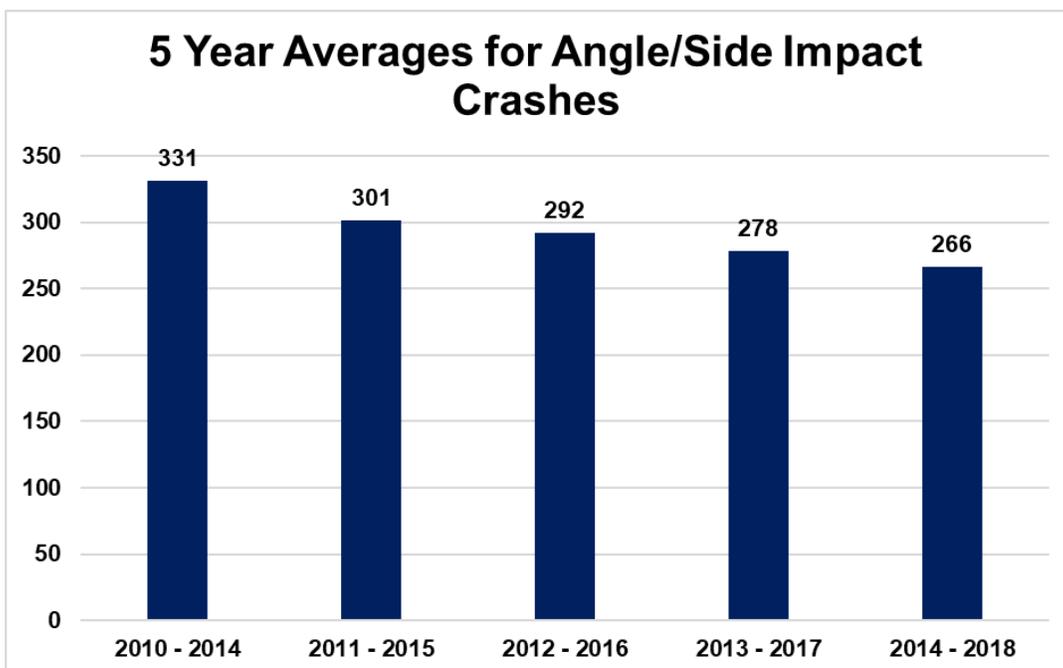
Research from the National Highway Transportation Safety Administration (NHTSA) reveals that most crashes are caused by driver error. The critical reason, which is the last event in the crash causal chain, was assigned to the driver in 94 percent ($\pm 2.2\%$) of the crashes. In about 2 percent ($\pm 0.7\%$) of the crashes, the critical reason was assigned to a vehicle component's failure or degradation, and in 2 percent ($\pm 1.3\%$) of crashes, it was attributed to the environment (slick roads, weather, etc.). Among an estimated 2,046,000 drivers who were assigned critical reasons, recognition errors accounted for about 41 percent ($\pm 2.1\%$), decision errors 33 percent ($\pm 3.7\%$), and performance errors 11 percent ($\pm 2.7\%$) of the crashes.

Source: "Critical Reasons for Crashes Investigated in the National Motor Vehicle Crash Causation Survey," USDOT, NHTSA, *Traffic Safety Facts, DOT HS 812 115, February 2015.*

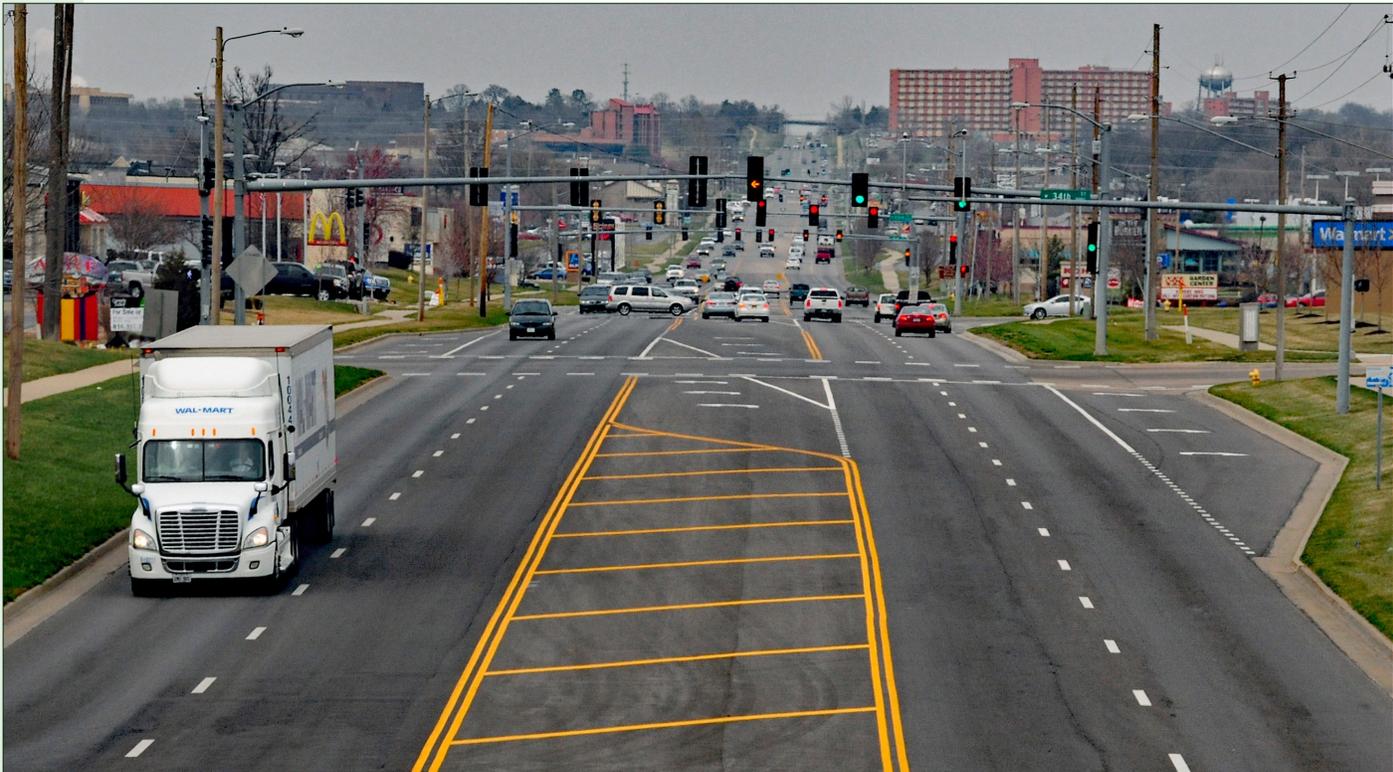
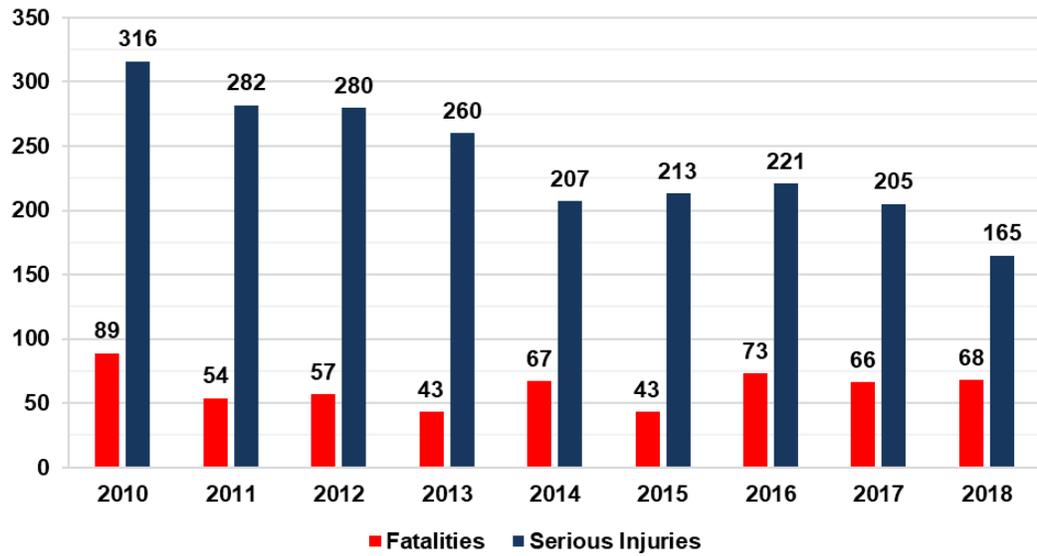
Performance Measure

For the 2010-2018 timeframe, the total number of fatal and serious injury intersection angle/side impact crashes has decreased from 405 in 2010 to 233 in 2018. As can be noted in the second graph, occasional spikes up and down are not representative of the trend over time. To soften the impact of those annual spikes, the Intersection EAT has chosen to focus on five-year averages.

In reviewing the crash data for the five-year period 2014–2018, the angle/side impact is the "first harmful event" in 84 percent of fatality crashes and 74 percent of serious injury crashes at intersections. As a result, and accounting for the 40 percent increase in serious injuries recorded in 2019 due largely to the change in definition, our performance measure is to reduce the five-year average of intersection-related angle/side impact fatal and serious injury crashes by 24 crashes for each of the next five years: from a baseline of 349 to 229 in 2024. Of all the data points that are tracked on crash reports, this is the primary one that our selected strategies can address.



Intersection Angle/Side Impact Crashes (2010-2018)



Strategies

1. Promote strategic enforcement at intersections with safety issues.

Work with local law enforcement to identify and target intersections in their area with a risk of serious crashes and identify resources to provide targeted enforcement and public outreach.

2. Promote systemic low-cost countermeasures for reducing crashes at *traffic signal-controlled intersections*.

This can be accomplished with policy and standard changes, as well as projects that include reflective back plates, countdown timers, APS push buttons, lead pedestrian interval, consistent yellow and all-red timings, improved geometry, improved vehicle detection and improved signal phasing/timing plans.

3. Continue promoting low-cost countermeasures for reducing crashes at stop sign controlled intersections.

This strategy can be implemented with policy and standard changes, as well as projects that include fluorescent yellow advanced warning signs, additional stop and advanced warning signing, advanced intersection identification signing, clearing vegetation within sight triangles, and installing ITS devices at rural high-speed approach intersections to improve conspicuity of opposing traffic.

4. Continue promoting countermeasures at stop sign controlled intersections that are focused on *speed differential management*.

Speed differential accounts for the flow of traffic along a road. The goal in road design and traffic control is uniformity of speed. Vehicles slower (or faster) than the average speed cause friction and increase the potential for conflicts. This strategy will seek to improve intersection sight-distance, replace bypass lanes with dedicated left and right-turn lanes, implement traffic calming measures at intersections or along corridors, and add auxiliary turn lanes to move slower speed traffic out of the higher speed traffic lanes.

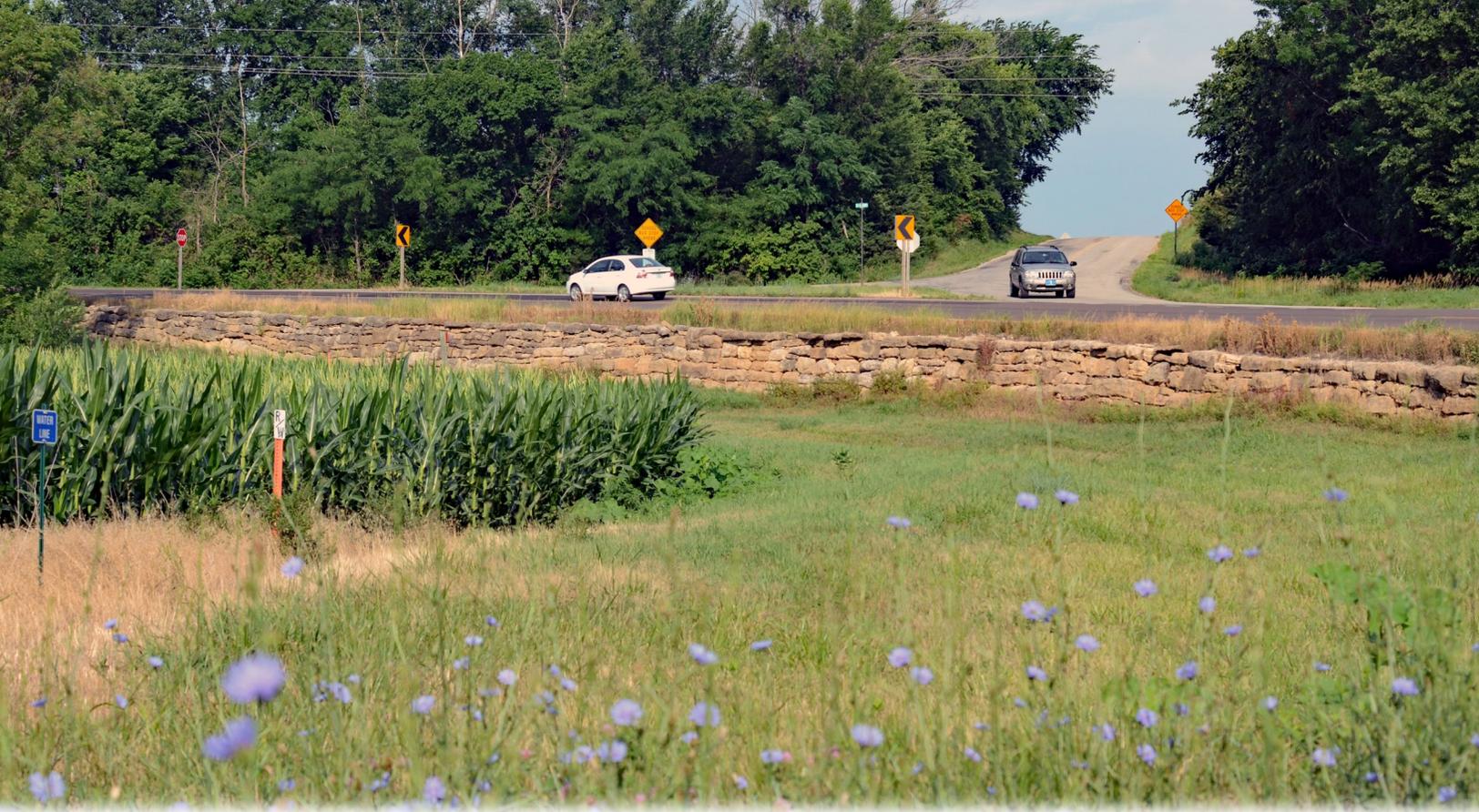
5. Promote construction of traditional and alternative intersection types which reduce the number of conflict points.

This strategy can be implemented with right-in/right-out, three-quarter access (right-in/right-out/left-in), modern roundabouts, displaced left-turn, median U-turn (MUT), restricted crossing U-turn (RCUT), diverging diamond interchanges (DDI) and quadrant roadway.

6. Develop education material for new intersection types and new traffic control devices relevant to intersections.

When roundabouts were introduced in Kansas, educating the traveling public of this new and innovative intersection type was essential to their acceptance. As Kansas continues to introduce new intersection designs—from the diverging diamond to the RCUT—education will continue to be a critical step. Further, innovative traffic control devices continue to be approved for use on public roads. These include, but are not limited to, the flashing yellow arrow, leading pedestrian interval, rectangular rapid flashing beacon (RRFD), and hybrid pedestrian sign. And while traffic control devices are designed to be intuitive, at some point education is required to learn that an octagon means stop and a flashing yellow left-turn signal means turns permitted but yield to other pedestrians and vehicles within the intersection.

Reference Appendix C for Intersections action plan.



Chapter 7 Local Roads

The majority of public roads in Kansas—92.6 percent—are owned by cities, counties and townships. Traffic on these roads, which comprise 131,670 centerline miles of road, accounts for about 42 percent of the total vehicle miles traveled in Kansas. The most recently available crash data show that between 2014 and 2018, 46 percent of fatalities and 55 percent of disabling injuries occurred on roads owned by local public authorities.

Addressing safety on local roads involves different considerations than on state and interstate highways.

Many roads owned by local governments were not built to modern operational and safety standards. Local governments generally have less access to professional engineers and to dedicated funding to address safety problems. There are different stakeholders for safety—including local elected officials, school officials, and public works and law enforcement agencies. There are varying levels of awareness about local safety problems and how to best address them. To reduce crashes at the local level, we need strategies to address local realities and needs.

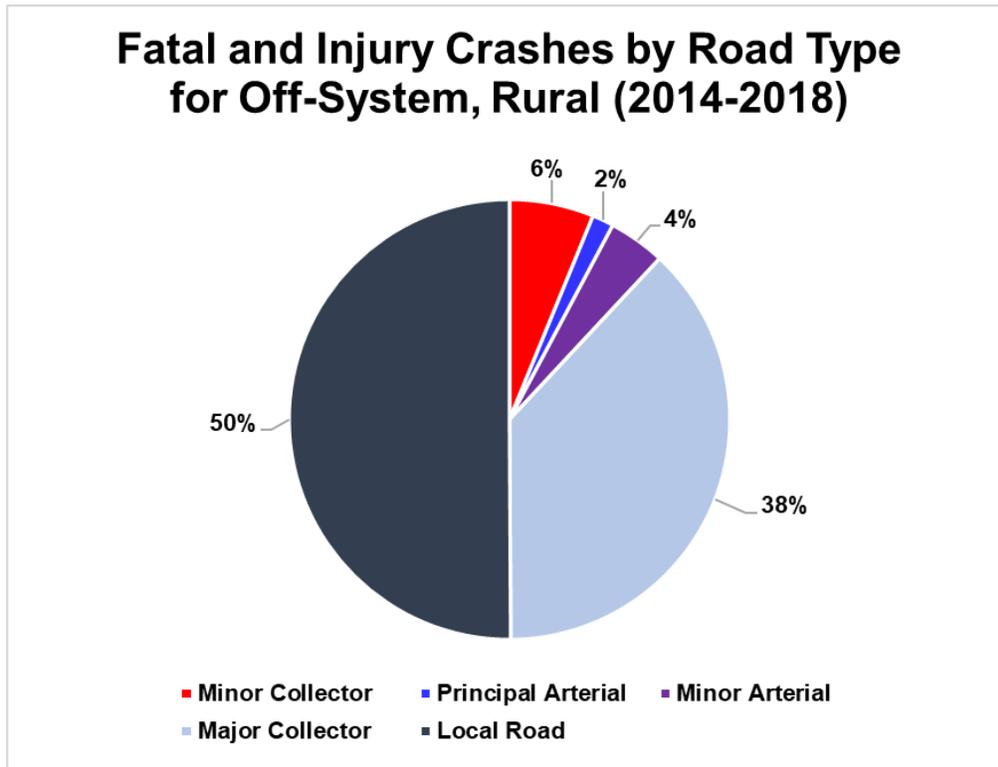
For the purpose of this chapter, a local road is defined as any public road not maintained by the state and not part of the State Highway System. Strategies in this chapter focus on reducing fatal and serious-injury crashes on rural major collectors, which is the classification of road in Kansas that carries the most traffic in rural areas. The Local Roads Emphasis Area Team is focusing on rural areas because other emphasis area teams, notably the Intersections and Pedestrians & Cyclists teams, contain strategies that address crashes in more urban environments.

The surface types for major collectors in Kansas are both paved and unpaved, including some with brick surfaces. The team has identified strategies that address roadway departure crashes, safety training needed at the local level, and education for how to drive with better safety on unpaved roads.

Data Points

1. Large percentage of crashes are on locally-owned rural major collectors.

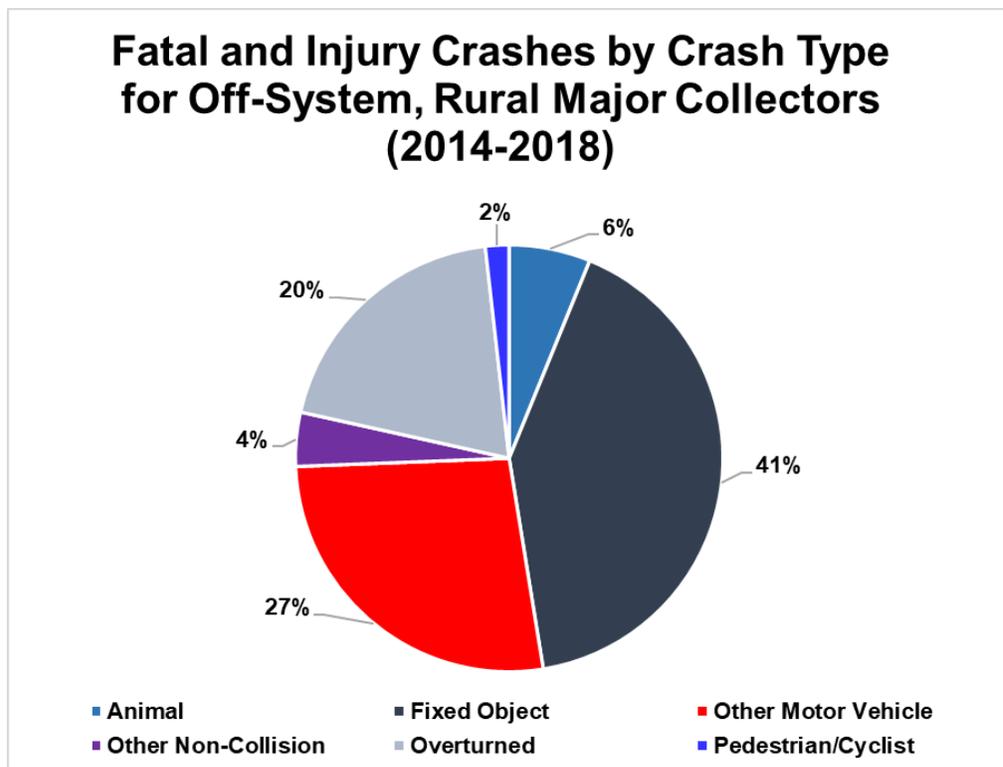
Although there is a larger percentage of fatal and serious injury crashes on roadways classified as local roads, the number of miles of rural major collectors is significantly smaller and carries a larger portion of the total traffic so a more significant reduction in total fatal and serious injury crashes can be obtained by focusing on locally owned rural major collectors. However, since most roadways classified as local roads are surfaced with gravel and account for about half of all fatal and serious injury crashes on the locally owned system, two strategies focus on gravel roads.





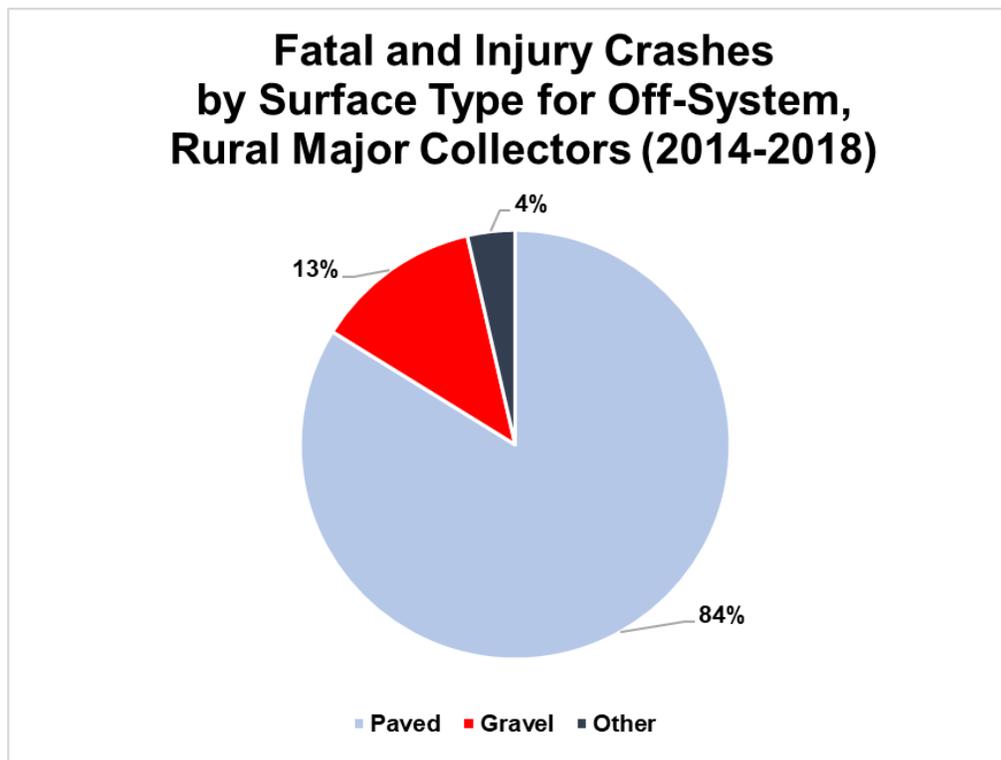
2. Run-off-road represents a large percentage of crashes on locally-owned rural major collectors.

Nearly half the reported crashes on locally-owned roads classified as rural major collectors involve a fixed object, which includes anything from a ditch to a tree, and implies a run-off-road event. The overturned crash type is also a run-off-road event. This crash type is the focus of most Local Road Safety Plans (LRSP) which includes a prioritized list of projects for high-risk rural road funding. Reducing or mitigating run-off-road crashes is also an emphasis in training provided to local agencies.



3. The majority of crashes on locally-owned rural major collectors happen on paved surfaces.

Between 2014 and 2018, 84 percent of crashes on locally-owned roads classified as rural major collectors happened on a paved surface, including blacktop/asphalt or concrete. For this reason, a large portion of this plan focuses on paved rural county highways. However, this graph only shows crashes for rural major collectors, where nearly 2,700 crashes happened on an unpaved surface—thousands more (many unreported) happen on unpaved rural minor collectors and local roads. For this reason, two strategies have a gravel road emphasis.



Performance Measure

To reach a fatal and serious injury crash rate of 35 crashes per 100 million vehicle miles traveled (VMT) for rural major collectors by 2024.



Strategies

1. Complete up to 20 County Local Road Safety Plans (LRSP) per year until all Kansas counties have a plan.

Local Road Safety Plans provide a framework for identifying, analyzing and prioritizing roadway safety improvements. Stakeholders are engaged, crash types and risks are identified, countermeasures are recommended, and priorities are identified.

2. Prioritize projects identified in LRSPs for HSIP/HRRR funding.

Once a project is identified in a county's LRSP, the county may apply for Highway Safety Improvement Program (HSIP) funding through the High-Risk Rural Roads (HRRR) program. Priority should be given to these projects during the selection process.

3. Provide local roadway safety training and technical assistance.

Due to changes in personnel or simply the need for updated information, many local agencies would benefit from training in the most efficient use of their time and resources to maintain and improve safety along their roadways. This training will be provided through Local Technical Assistance Program (LTAP) courses, LTAP's Local Liaison position(s), and resources available through Federal Highway's EDC-5 Rural Roadway Departures initiative.

4. Promote the Traffic Engineering Assistance Program (TEAP).

The TEAP program helps cities and counties without a traffic engineering staff. Studies are performed by consultants and recommendations are made for improvements such as speed limits, updated or improved signing, addition of turn lanes, etc.

5. Identify strategies to improve safety on gravel roads.

A variety of resources exist for safety improvements to paved roads (rumble strips, pavement markings, etc.). With over 50 percent of nonstate rural major collectors being unpaved, it is important to provide approaches to improve safety along these roadways as well.

6. Address driver behavior on the locally owned road system through educational efforts.

Although general educational efforts exist for topics such as impaired driving or seatbelt usage, and these campaigns benefit drivers on local roads, there are also topics that are unique to local roads. These may include driving on gravel roads, recovery strategies after leaving a roadway, and appropriate decision-making without the types of signing and marking on the state system.

Reference Appendix C for Local Roads action plan.



Chapter 8 Teen Drivers

Drivers age 14 to 19 present one of the highest crash risks when compared with other age groups. Eighteen percent of all Kansas crashes in 2018 involved a teen driver, a proportion three times higher than would be expected for a group that comprises about 5 percent of Kansas drivers.

Responding to this is challenging. Teen drivers are confronted by two fixed realities which are unique to their age group: a lack of experience with the actual processes and rules of driving while concurrently experiencing an extended period of uneven brain development. As regards this latter point, the last area of the brain to mature is that which governs judgment and decision-making, and its full maturity is not reached until age 24—well after the age for full licensure. Because this area—the prefrontal cortex—is lagging behind, teens tend to rely on the more developed emotional center of their brains—the amygdala—for thinking and decision-making tasks. Thrill-seeking and risk-taking are common manifestations of this.

Laid alongside this overreliance on emotionally-influenced judgment is the fact that during these formative years teens are at their highest natural levels of physical strength, coordination and fine motor skills. The confluence of these developmental factors overlaid against a teen's inexperience behind the wheel can easily impart an inflated self-assessment of his or her driving capabilities.

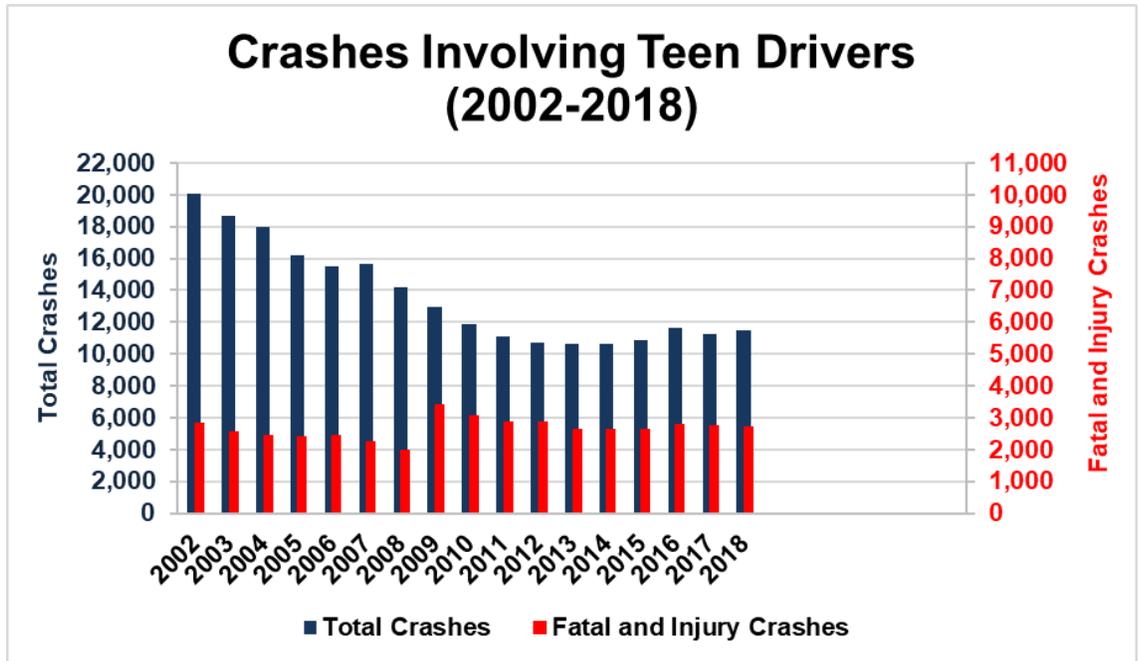
Given these realities, it is clear that short of extreme limitations on their access to vehicle or roadway, teen drivers will continue to be overrepresented in crash statistics.

While teen drivers age 14 to 19 represent only 5 percent of Kansas' licensed drivers, they were involved in 18 percent of all crashes and 15 percent of fatal crashes in 2018.

Strategies to further reduce crashes involving teen drivers must continue to confront the realities of inexperience and immaturity. In Kansas such strategies are in play and yielding encouraging results.

Data Points

1. Since 2002, teen crashes in Kansas have dropped nearly 43 percent. In 2002, the number of 14 to 19 years old involved in crashes was 20,029 compared to 2018, which recorded 11,470 teen crashes.

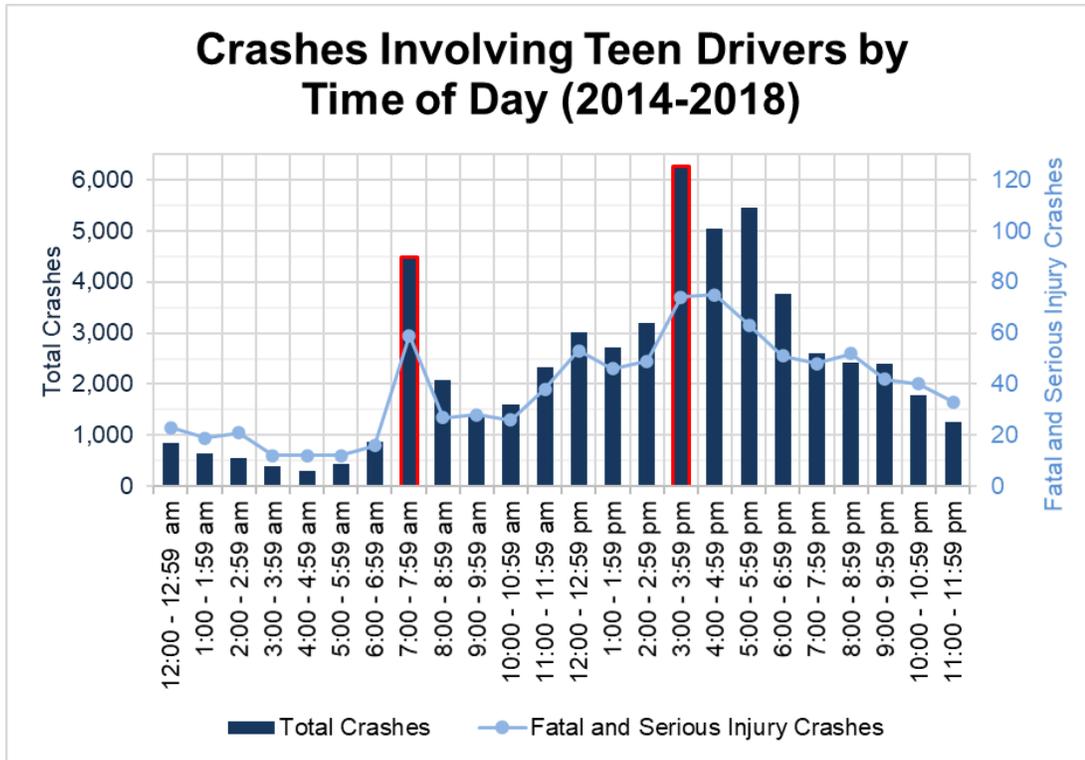


2. In differing combinations, driver behavior, timing, location and infrastructure can all affect crash likelihood and severity.

The following table lists the most common factors known to be associated with crash rates. Note that in all but one category (light conditions) teen drivers are implicated at a higher level than the driving public in general. More than one factor can contribute to a single crash.

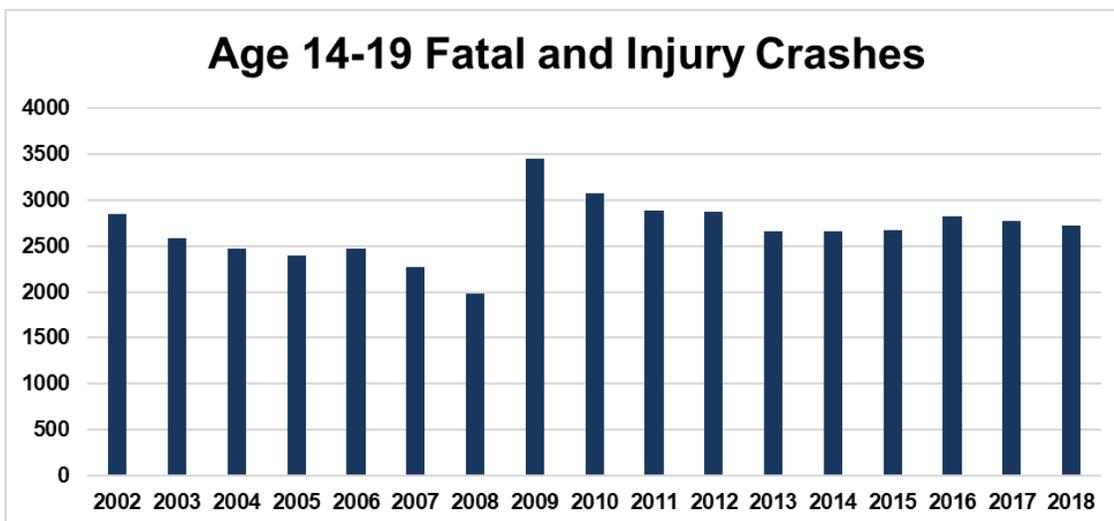
Percent of Fatal and Serious Injury Crashes (2014-2018)	
Category	Involving Teen Drivers (All Drivers)
Intersections	35% (28%)
Speeding	23% (18%)
Following Too Closely	4% (4%)
Involving Another Motor Vehicle	55% (43%)
Rear-end Collisions	11% (10%)
Local Roadways	66% (56%)
Dark/Light Condition	31% (34%)
Rural	54% (52%)
Distracted Driving	31% (27%)

3. Teen crashes are most likely to occur before and after the school day and through early evening.



Performance Measure

The rate at which teen drivers are involved in fatal or injury crashes has been dropping since 2009. In 2009, Kansas recorded 3,441 fatal and injury crashes. Factors such as teen access to safer vehicles and increased belt use over this period will assist in working toward this projected rate; however, factors such as increased marijuana consumption will work against it. And of course, it is expected successful implementation of the strategies that follow will contribute to a decreasing rate. For these reasons, the 2024 goal of this five-year plan is to be at or below 2,500 fatal and injury crashes for teen drivers.



Strategies

1. Continue to monitor teen driving laws that are in place, advocate for initiatives that will strengthen or expand existing laws, and work against attempts to alter them in ways that weaken them.

Foremost, here, is the protection and perhaps enhancement of Kansas' Graduated Driver License (GDL) law which went into effect January 1, 2010. As noted in the NHTSA publication, *A Highway Safety Countermeasure Guide for State Highway Safety Offices (Ninth Edition), 2017*, "graduated driver licensing addresses *both the inexperience and the immaturity* of young drivers. GDL provides a structure in which beginning drivers gain substantial driving experience in less-risky situations. GDL raises the minimum age of full licensure and helps parents manage their teenage drivers." It specifically addresses the first three areas of concern bulleted above: *nighttime driving, teen passengers, and cell phone use.*

2. Expand the SAFE program (Seatbelts Are For Everyone) across Kansas.

The SAFE program launched in six Crawford County high schools at the beginning of the 2008-2009 school year. The brainchild of KDOT law enforcement liaison David Corp, the program has grown to more than 160 high schools in almost 70 counties. More than 3,000 students participate every year, during which time it is estimated that their comprehensive program of safety messaging to peers reaches 81,000. Covered are the necessity to buckle up, cell phone distractions, impaired driving and unsafe speed among others. The Kansas Traffic Safety Resource Office (KTSRO) is responsible for oversight of the program. While safety restraint usage is still its top priority, SAFE student activists reach out to their peers on a full range of safe driving topics throughout the school year.

3. Continue to utilize annual high visibility statewide high school and middle school neighborhood safety restraint enforcement campaigns by local and state law enforcement agencies.

As many as 90 agencies participate in the highly-publicized one-week fall middle school and two-week spring high school campaign. These voluntary campaigns engage law enforcement across the state for one-week enforcement waves during the periods just before and after the school day and in the neighborhood around each school.

4. Continue to facilitate a conference for teens and teen traffic safety advocates geared to improving novice and inexperienced drivers and improve traffic safety.

By 2017, youth attendance at the Kansas Transportation Conference (TSC) had grown to the point where it was decided that, while youth would still be invited to attend TSC, its impact would be greater if they were to have their own two-day TSC type experience. Registration is limited to 200 students, most of whom represent SAFE programs. While geared to younger safety activists, the conference is every bit as professional as the TSC, with expert presenters and opportunities to develop advocacy skills, network and engage law enforcement professionals in positive environment.

5. Continue to support Alcoholic Beverage Control and other law enforcement efforts to reduce underage drinking and driving.

The Department of Revenue's Division of Alcoholic Beverage Control, utilizing a grant from KDOT, conducts underage drinking actions at concerts, festivals and other events across the state. All enforcement is on overtime and federally funded. Additionally, KDOT has partnered with the Overland Park Police Department and DCCCA to provide overtime funding targeting underage drinking enforcement. KDOT also maintains two dedicated phone lines to and from Kansas Highway Patrol Central Dispatch for citizens to anonymously report underage drinking activities in progress or planned.

6. Promote the initiation of teen road safety audits.

This strategy complements the SAFE programming. A road safety audit of school locale by student members of SAFE programs will mesh well with existing student-led activities, such as the two observational seat belt surveys performed annually by the students.

Reference Appendix C for Teen Drivers action plan.



Chapter 9 Pedestrians & Cyclists

Walking and riding a bike are essential forms of transportation for many Kansans and our visitors. As walking and biking have become increasingly popular forms of transportation and recreation throughout the state, Kansas has experienced an increase in crashes involving pedestrians and cyclists resulting in fatalities or serious injuries.

For this document, pedestrians and cyclists are a combined group of road users called “non-motorists” and can be referred to as “non-motorized.” Non-motorist crashes are defined as crashes involving at least one motor vehicle involving at least one person who was classified as a pedestrian or a cyclist.

When evaluating crashes involving a pedestrian, it is important to know how a pedestrian is defined. The definition of pedestrian is inclusive of anyone on foot and/or using a wheelchair or personal mobility device.

Everyone is a pedestrian. Whether you travel by car, take public transit or ride a bike, all trips usually begin and end with you as a pedestrian.

While occupants of motor vehicles benefit from built-in safety enhancements and advancements in roadway safety and technology, non-motorists remain extremely vulnerable to death and serious injury in a collision. Protecting non-motorists by reducing the frequency and severity of crashes is a primary safety emphasis of the 2020-2024 Kansas Strategic Highway Safety Plan.

The Pedestrians & Cyclists Emphasis Area Team has identified four strategies to reduce the frequency and severity of crashes involving non-motorists.

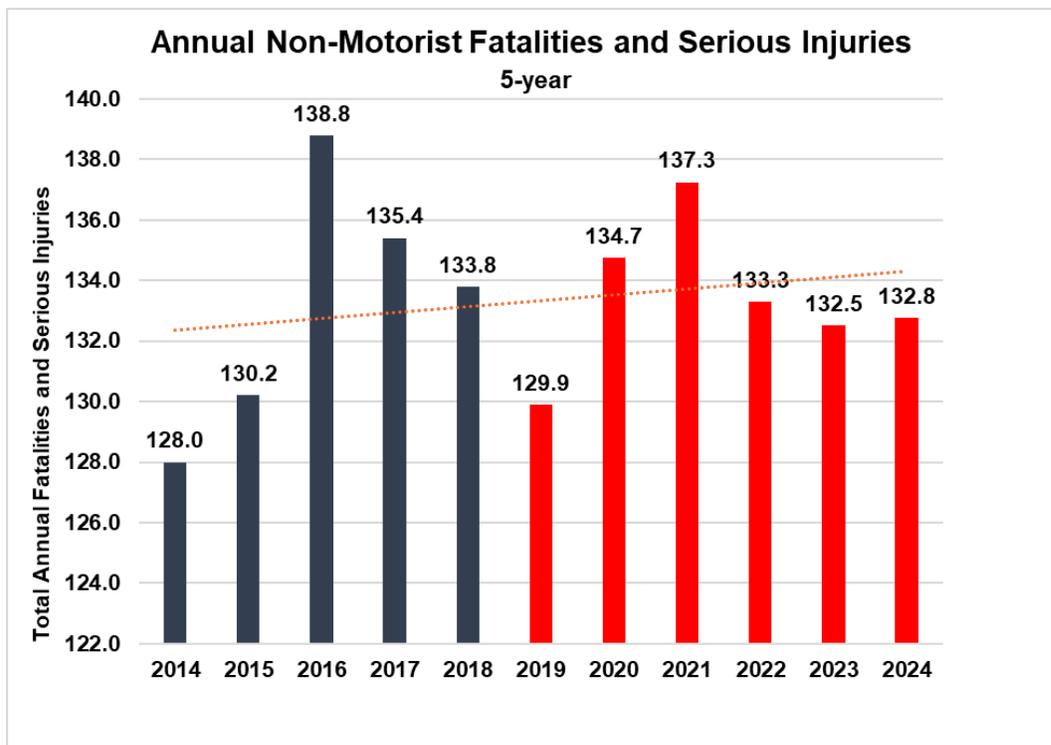


Data Points

1. Non-motorist fatalities and serious injuries are expected to increase in Kansas.

From 2014 to 2018, Kansas experienced an increase in non-motorists involved in fatal and serious injury crashes. Over this time period, the number of non-motorists involved in fatal and serious injury crashes increased from 128 to 134, an increase of 4.7 percent. Over the same 2014-2018 time period, the number of all occupants of motor vehicles involved in fatal and serious injury crashes decreased from 1,777 to 1,395, a decrease of 21.5 percent.

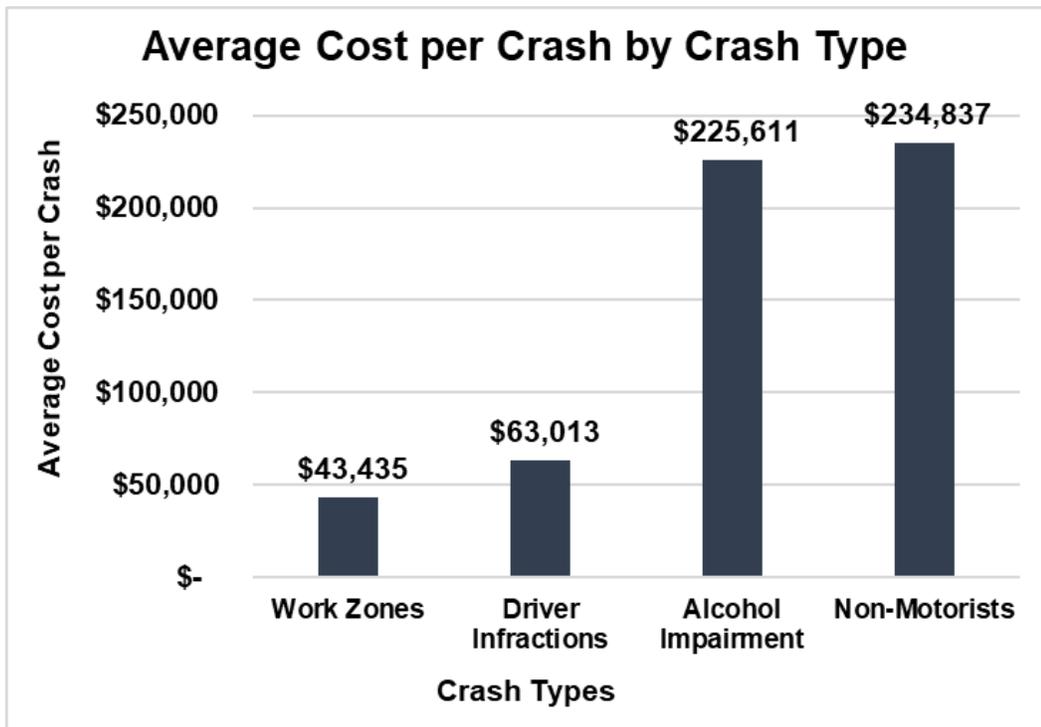
Based on data and trend line shown in the chart below, and without any intervention, Kansas can expect to see an annual average of approximately 133 non-motorists involved in fatal or serious injury crashes until the year 2024.



2. Annual costs associated with non-motorized crashes are expected to increase in Kansas.

From 2014 to 2018, Kansas experienced an increase in costs associated with all non-motorized crashes. During this time period, the annual cost of non-motorized crashes increased from \$195.4 million to \$268.2 million, an increase of 37.2 percent.

The chart below displays an average cost per single crash by crash type in Kansas. This chart reveals that a single crash involving a non-motorist is more costly to the state of Kansas when compared to other "crash types" such as Work Zones, Driver Infractions and Alcohol Impairment. Prioritizing investments to reduce the frequency and severity of crashes involving non-motorists could save lives, prevent serious injuries, and have significant cost-saving benefits to the state of Kansas.

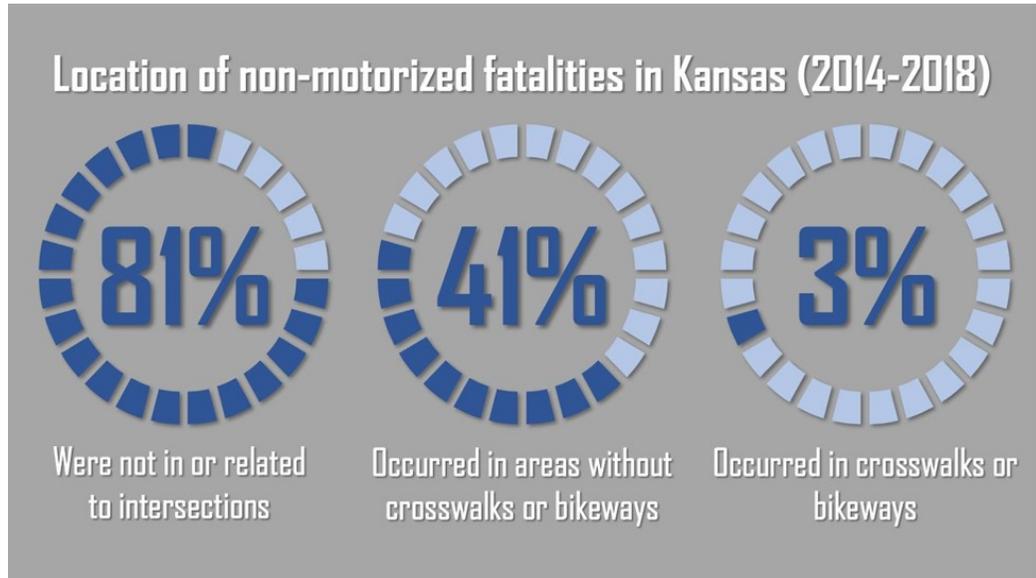


Note: Due to limited data for all crash types, the chart above displays the average cost per crash by crash type using the four most recent years of available data for each crash type shown. Crash "costs" is a general valuation of the tangible (e.g. medical bills, lost wages) and intangible (e.g. physical pain, emotional pain, or quality-adjusted life years) consequences of crashes in monetary terms. The higher the average crash cost, the higher the incidence of serious injuries and fatalities.



3. Many non-motorist fatalities occur in locations without appropriate infrastructure.

From 2014 to 2018, police crash reports documented a large percentage of non-motorized fatalities that occurred in locations away from intersections and in areas without crosswalks or bikeways. During the same time period, police crash reports also documented a small percentage of non-motorized fatalities occurred in crosswalks and bikeways. While the data illustrate access to appropriate non-motorist infrastructure can minimize risk, it also shows that the available infrastructure does not prevent fatal crashes.



Performance Measure

In Kansas, non-motorists form a disproportionate percentage of the state's total traffic fatalities and serious injuries at 9 percent from 2014-2018. A goal of the Pedestrians & Cyclists EAT is to reduce the number of non-motorized fatalities and serious injuries while continuing to encourage the growth of non-motorized transportation throughout the state. The Pedestrians & Cyclists EAT will track annual non-motorized fatalities and serious injuries to determine if the four strategies have an impact on non-motorized safety.

Target: By 2024, non-motorist fatalities and serious injuries will be 1 percent less than the projected 133, a goal to achieve not more than 132.



Strategies

1. Improve non-motorized data collection and analysis.

Engage in collaborative efforts that support the collection of non-motorized traffic data (crash, count/volume, roadway characteristics and conditions, and other relevant data). This data will be used to identify transportation and safety needs for non-motorists and to select the appropriate improvements to make conditions safer and more comfortable for all road users.

2. Identify and promote the use of best practices when planning and designing transportation facilities for non-motorized modes of transportation.

Share and promote new programs and design resources for non-motorized transportation to provide guidance and best practices that address pedestrian and bicycle safety issues.

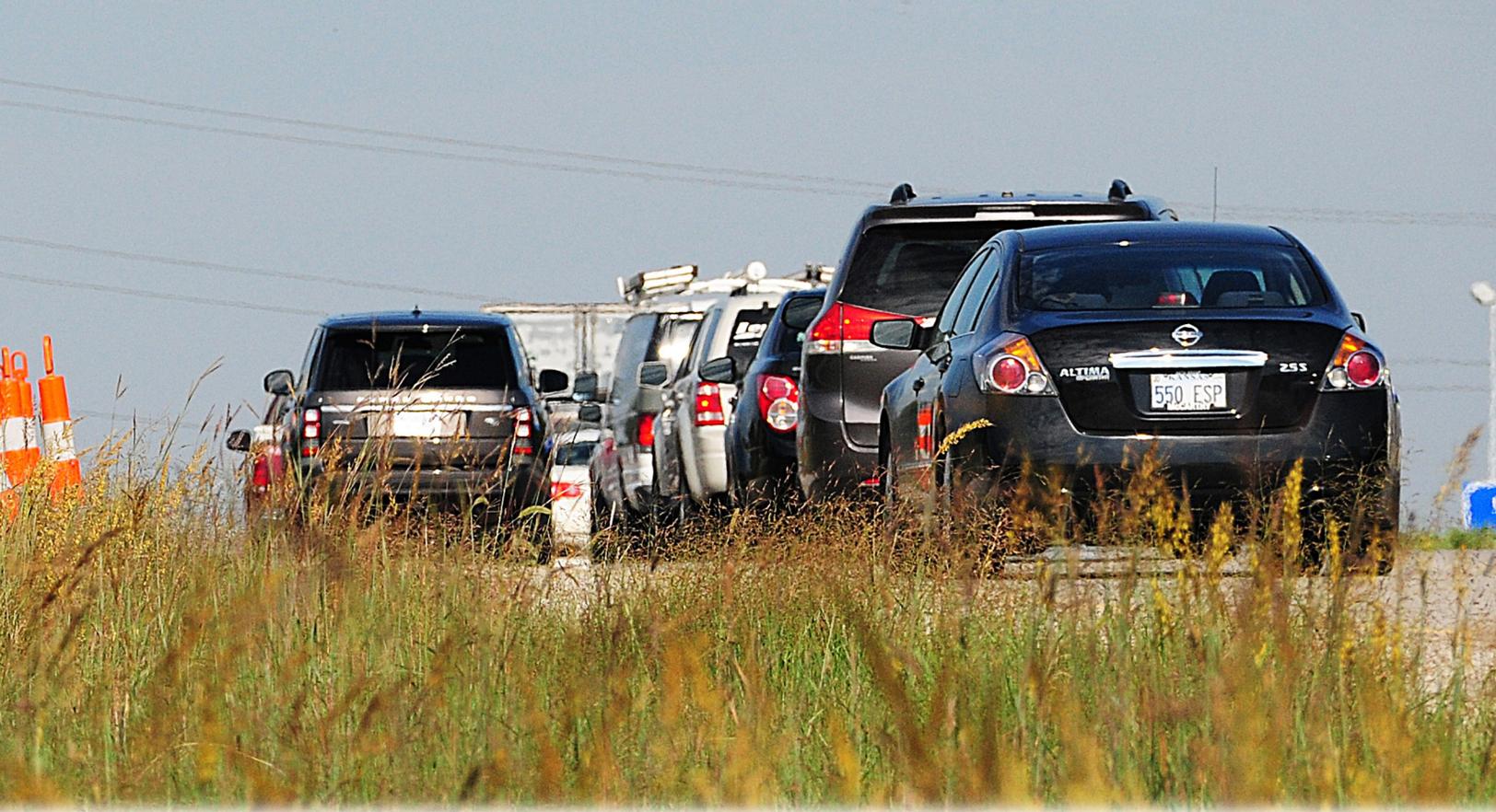
3. Improve network connectivity and operation of pedestrian and bicycle facilities.

Implementing and promoting infrastructure treatments with proven safety countermeasures that emphasize the safety of non-motorists at high-risk locations can reduce all crashes and lower fatality and serious injury rates for non-motorists.

4. Improve public awareness of non-motorized road users.

Effective outreach and education strategies can be simple and low-cost ways to distribute information to the public on a regular basis.

Reference Appendix C for Pedestrians & Cyclists action plan.



Chapter 10 Data Support

Reliable crash data are the backbone of road safety management. According to the American Association of State Highway and Transportation Officials (AASHTO) strategic highway safety plans should improve data collection and, as a result, decision making.

The data support team will provide the emphasis area teams (EAT) and the Executive Safety Council (ESC) with the data required to craft an information-based Strategic Highway Safety Plan. The data team will:

- gather and present data to the ESC
- collect and organize data at the request of the other emphasis area teams
- assist the ESC in identifying data gaps, collection and reporting weaknesses
- assist in deciding whether a need exists for additional emphasis area teams
- collect data from different agencies represented on the ESC

The data team was created not only to assist in the mining and presentation of data on behalf of other emphasis area teams but also to develop outcomes and strategies specific to data collection, storage, analysis and reporting.

Strategies

1. Promote web-based mapping tool for local jurisdictions, traffic safety coalitions, and others to access and view crash data.

KDOT is a central location for crash data and analysis that many groups utilize to fulfill their data needs. Web-based mapping tools, both off-the-shelf and custom-built are available for others to use to visualize and analyze crash information. This strategy will promote, facilitate, and improve these tools by and for safety partners across the state.

2. Link crash data to the trauma registry (to improve serious injury data).

All states were required to adopt a uniform definition of serious injury in motor-vehicle crashes by April 15, 2019. Kansas adopted this national definition effective January 1, 2019. This change will improve consistent reporting, both within Kansas and nationally. Linking injury severities in crash reports with actual outcomes in the trauma registry will further improve the reliability of serious injury data.

3. Collect and inventory roadway data to support crash analysis, project analysis and application of policies.

The safety management process is incomplete without robust roadway inventory data, including features such as lane and shoulder width, and assets such as signs and guardrail. The FHWA recognizes this such that they have required states to collect fundamental data elements based on the Model Inventory of Roadway Elements (MIRE) by September 30, 2026. Information collected will support intersection analysis, application of Performance Based Practical Design, and implementation of policies such as longitudinal rumble strips. Projects under this strategy could include building an intersection inventory on the State Highway System made up of more than 25 data elements and the use of mobile lidar or similar technology.

4. Use safety management process tools such as Safety Analyst to couple data analysis with engineering solutions.

In addition to its ability to scan the highway system for crash “hot spots” through the Network Screening Tool, Safety Analyst can use statistical techniques to perform detailed crash analysis and recommend possible engineering countermeasures for specific locations. Safety Analyst can be used to:

- View detailed site analysis summarizing crash patterns and overrepresented crash variables
- View diagnoses that recommend engineering countermeasures
- Suggest cost/benefit appraisals of proposed countermeasures
- Suggest project prioritization

5. Revise official Kansas Motor Vehicle Crash Report form based on the Model Minimum Uniform Crash Criteria (MMUCC).

MMUCC is the national standard in coding all motor-vehicle crashes. The Crash Data Unit at KDOT will be revising the Kansas Motor Vehicle Crash Report form in the next five years and will be working closely with the law enforcement agencies to improve the flow of the form.

6. Replace the Traffic Records System (TRS) and the KCARS crash database with a new portal and database.

The current portal and database for processing, storing, and using crash data are outdated and lacks the ability to upgrade for better efficiencies. The Traffic Safety Section in combination with the Crash Data Unit is in the works to completely replace the TRS portal and KCARS database with a new system. This system is suspected to improve crash coding from officers, increase the speed of availability of crash data, improve internal processing, and to allow law enforcement to submit crash data electronically.

7. Create processes to monitor changes in roadway data sources

The geocoding of crashes and reference of roadway data to crashes depends on the state having the roadway information from NextGen 911 road centerlines and municipal boundaries, and KDOT having the roadway in the Khub linear-referencing system (LRS). This strategy will involve development of an interface between Khub data and NextGen 911 data, so that when new local roads are built KDOT has the road inventory in the LRS in a timely manner, and when KDOT reconstructs highways, the new location information is available to NG911 for incorporation into their data in a timely manner.

8. Interface Crash Data with Khub.

Khub is the official HPMS system with all public roads linear referencing system (LRS). Crashes must be referenced to the LRS by RouteID and Measure/Milepost, so that the data can be compared to traffic, roadway geometrics (such as curves, grades, lane configurations, shoulders), features (cable barriers, signs, traffic controls) or classifications (jurisdictions, functional class). The LRS is a key tool in preparing data for crash safety analysis and key performance indicator reporting.

Reference Appendix C for Data Support action plan.

Appendix A

Policies, Programs, Personnel, Achievements

Road safety requires the skills of engineers, public relations specialists, trainers, law enforcement officers and emergency medical personnel, among others. Many strategies for making travel safer were identified in the first as well as the current Strategic Highway Safety Plan, by the Driving Force Task Force and in other initiatives. Please note, although many of the strategies are complete, some are part of on-going efforts as well. These strategies/results are described below.

Roadway Departure

- KDOT increased the standard width of the white edge-line on all state highways from four inches to six inches in 2005.
- KDOT implemented a new centerline rumble strip policy in 2007.
- KDOT developed a policy on the use of cable median barriers in 2009.
- KDOT maintains sign retro-reflectivity (visibility when lighted by headlights) on state highways by replacing sign sheeting at scheduled intervals based on anticipated service life.
- KDOT upgrades pavement markings based on the routine collections of retro-reflectivity data under support of the federal Highway Safety Improvement Program (HSIP).
- Researched the potential impact of expanded use of centerline rumble strips.
- KDOT has and continues to improve highway shoulders under highway programs such as Comprehensive Highway Program, Comprehensive Transportation Program, and now T-Works.
- Installs rock-wedge shoulders.
- Utilizes a tapered pavement edge where appropriate and promotes its use to county agencies.
- Installs shoulder rumble strips based on policy.
- Created a program that funds the removal of fixed objects on locally-owned roads.
- Continues application of the most current Roadside Design Guide in highway design.
- Continues media campaigns highlighting the danger of impaired or distracted driving.
- Promotes educational campaigns to let people know the likelihood of unbelted drivers and passengers being thrown from a vehicle in a rollover—and their survival rate.
- Supports defensive driving training.
- Conducts road safety audits on locally-owned roads.

Occupant Protection

- KDOT has sponsored Bucks for Buckles since 2005.
- KDOT continues a three-year renewable grant to fund the Buckle Up program, providing child safety seats, training and other support to enhance child passenger safety.
- KDOT sponsored an Occupant Protection Safety Assessment in 2003, 2013, 2016 and 2019.
- A primary seat belt law passed in 2010.
- Utilizes KDOT staff and its safety partners to gain grassroots support, testify before the Kansas Legislature and provide information to the media on the benefits of strong safety restraint laws.
- KDOT continues the annual Click It or Ticket (CIOT) media/enforcement campaign.
- Researched methods for retaining and recertifying law enforcement personnel trained in child passenger safety.
- Supports continuing education opportunities for CPS Technicians and their instructors.
- Continues to promote employer “buckle-up” programs.
- Expanding use of non-traditional media (social networking sites, internet, games) to promote CIOT message.
- Continues to promote occupant protection message at event venues, such as universities,

Sporting KC, Country Stampede and Johnson County Parks & Recreation.

- Continues to expand the Seatbelts Are For Everyone (SAFE) program statewide.
- Provides funding support for a Kansas representative on the National CPS Board.
- Promotes curricula such as Boosters to Belts, Safety Breaks and CPS for daycare providers.
- Surveyed attitudes about and knowledge of seat belt laws annually and used the results in public education efforts.
- Reaches out to school resource officers and school nurses to provide seat belt education and information to students.
- Develops partnerships with the medical and faith communities to promote occupant protection strategies to senior citizens and minority group members.
- Continues to support Safe Kids Kansas by providing funding for supplies at check-up events, education regarding children in and around cars, and by partnering through traditional and social media efforts.
- Continues presentations on occupant protection at the KDOT Transportation Safety Conference, Special Traffic Enforcement Program luncheons, and trainings for new recruits at Kansas Law Enforcement Training Center (KLETC).
- Provides signage for law enforcement agencies to promote buckling up while on the job.
- Requires all agencies that receive KDOT grants to have an enforceable seat belt usage policy.
- Provides grants to pay for equipment and overtime related to conducting seat belt enforcement activities.
- Promotes AAA Community Traffic Safety Awards for the exceptional enforcement of occupant protection laws.
- Trains prosecutors and judges on occupant protection laws.
- Continues program to enforce nighttime seat belt use.
- Continues support for local child passenger safety inspection stations and provision of safety seats for low-income families.
- Continues observational surveys conforming to NHTSA standards.
- Increases enforcement efforts in counties with low rates of seat belt use.
- Provides occupant protection education within minority groups where seat belt use is low.
- Uses billboards/gas pump toppers or other outdoor/non-traditional advertising to communicate messages in parts of Kansas with low rates of seat belt use.
- Amended KSA 8-2503 to allow for primary enforcement in all seating positions for ages 14-17.
- Amended KSA 8-2504 to raise fine for adult violation (ages 18+) to \$30 and ages 14-17 to \$60.
- Enacted law to establish seat belt safety fund.

Impaired Driving

- Operation Impact was launched in the Kansas City area in 1990 and in Wichita in 2010.
- Kansas Highway Patrol (KHP) executes Roving Aggressive Violation Enforcement (RAVE) saturation patrols on high priority corridors statewide.
- A Kansas Impaired Driving Assessment conference was held in 2006 with several results:
 - Drivers with blood alcohol levels of 0.15 or greater now face heavier penalties.
 - A DUI advisory board, which meets quarterly, was created.
 - A traffic safety resource prosecutor was hired to conduct training statewide and to provide prosecutors with information to assist them in cases involving driving under the influence of alcohol.
- The Kansas DUI Commission, a multi-disciplinary state commission, was sanctioned by the Kansas legislature to conduct a two-year study (2009-10) of driving under the influence in Kansas.
- The KHP – Breath Alcohol Unit (BAU) and Kansas Traffic Safety Resource Prosecutor (KTSRP) offers numerous training opportunities related to DUI detection and enforcement.
- The Kansas Law Enforcement Training Center includes DUI detection and enforcement as part of their standard curriculum.
- KDOT funds impaired driving deterrence initiatives that include Special Traffic Enforcement Program (STEP), Impaired Driving Deterrence Program (IDDP), RAVE and the 1-866-Must B 21 program.
- KDOT has provided federal grant money to Kansas Department of Health and Environment (KDHE) and the Kansas Bureau of Investigation (KBI) for the purchase of instruments used to establish

impairment in suspected impaired drivers.

- Advocacy groups such as Mothers Against Drunk Driving (MADD) and the DUI Victims center deliver educational messages against impaired driving.
- Law enforcement relies on trained hospitals and EMS personnel to assist in the gathering of blood evidence used in the prosecution of many DUI cases.
- Media campaigns are promoted highlighting the danger of impaired or distracted driving.
- DUI law includes provisions to enable prosecutors to charge offenders with Aggravated Battery DUI in DUI cases involving serious or great bodily harm to others.
- The KTSRP and KHP – BAU offer various trainings across the state designed for prosecutors.

Older Driver

- The first Kansas Senior Driving Summit was held in March 2014 to educate and communicate with strategic partners.
- Kansas Traffic Safety Resource Office (KTSRO) conducts training to increase the number of CarFit coordinators and technicians, and promotes events statewide.

Many standards practices in the application of traffic control devices account for the visual needs of the older driver, including the use of high reflectivity sign and pavement markings on the State Highway System. At traffic signals, the use of the all-red clearance interval, protected left-turn phase, signal head backplates and 12-inch signal lenses are designed to aid older drivers.

Intersections

- Kansas remains a national leader in the promotion and use of roundabouts.
- KDOT continues to manage a longstanding program related to the intersection of highways and railroad lines.
- KDOT maintains sign retro-reflectivity (visibility when lighted by headlights) on state highways by replacing sign sheeting at scheduled intervals.
- KDOT promotes good access management near intersections through a corridor management policy.
- KDOT performs improvements of crash-prone intersections under support of the federal Highway Safety Improvement Program (HSIP).
- The Traffic Engineering Assistance Program (TEAP) is available to assist with traffic studies on locally owned roads.
- KDOT experimented with innovative intelligent transportation systems (ITS) applications at intersections.
- KDOT completed road safety assessments on all 10,000 miles of the State Highway System.
- KDOT provides street lighting at higher-volume intersections and interchanges under support of the federal HSIP.
- Some intersection approaches have been realigned to reduce or eliminate intersection skew.
- Traffic signals continue to be modernized with:
 - dilemma-zone protection
 - clearance interval (yellow and all-red) optimization
 - traffic signal coordination along urban corridors
- Flashing solar-powered beacons are used on intersection warning and stop signs where recommended.
- Transverse rumble strips are installed across the stop approach lanes in rural areas where recommended.
- Public works and law enforcement officials are provided with training and educational materials through Kansas *Local Technical Assistance Program (LTAP)* at University of Kansas and the Traffic Assistance Services for Kansas program at Kansas State University.
- Since 1998 the 10,000 miles of road in the state highway system have been reviewed or studied, county by county, either by a traffic engineer or by an engineering associate supervised by an engineer from the Kansas Department of Transportation Traffic Engineering Section.

Local Roads

- KDOT provides practical road safety assessments on county highway corridors.
- LTAP provides traditional road safety audits at trouble spots.

- KDOT assists Local Public Authorities (LPA) when applying for funding and takes advantage of flexibilities to maximize federal participation.
- Packages solutions with data through programs such as TEAP.
- LTAP provides safety education through publications, technical assistance and face-to-face training.
- The Kansas Association of Counties (KAC) provides technical assistance.
- Kansas LTAP and KAC provide training for front-line workers, supervisors and executives through the Kansas Roads Scholar program.
- K-State and KU promote engineering-related safety topics through the Traffic Assistance Services for Kansas (TASK) program.
- KDOT provides funding for local law enforcement to attend training in the latest techniques of traffic enforcement.
- Supports KDOT's Law Enforcement Liaison (LEL) program.
- KDOT awards grants to participating Kansas law enforcement agencies to increase education and enforcement efforts directed at compliance with Kansas seat belt, child passenger safety and impaired driving laws through the Special Traffic Enforcement Program (STEP).
- KDOT purchases and distributes equipment to STEP agencies that promote and participate in traffic safety enforcement efforts.
- Supports Operation Impact in Wichita and Kansas City regions.
- KDOT promotes systemic low-cost safety improvements in KDOT's High Risk Rural Roads Program, including: roadway departure; signing, pavement marking, and rumble strips; and horizontal curves.
- KDOT continues the Federal Fund Exchange Program that allows local agencies to exchange federal funds for state funds on projects including, but not limited to, safety improvements.

Teen Drivers

- In 2009, the Crawford County sheriff and KDOT initiated Seatbelts Are For Everyone (SAFE), a program to promote seatbelt use among high school students. Other partners include the six Kansas trauma councils, AAA of Kansas/Missouri and State Farm Insurance, as well as numerous local organizations and businesses.
- The Kansas Highway Patrol (KHP) and the Kansas Motor Carriers Association (KMCA) promote Teens in Trucks, a program aimed at teaching new drivers about the dangers of driving near large commercial motor vehicles and how to minimize crash risks.
- Stormont-Vail Health Care Trauma Services continues to conduct presentations to high schools on roadway safety.
- The KHP uses its "Convincer" and "Rollover" in programs reaching teen drivers.
- Think First targets teens using speakers who have suffered consequences from poor decisions.
- The Kansas Traffic Safety Resource Office (KTSRO) developed a Teen Driver Tool Kit.
- The American Automobile Association (AAA) has a Dare to Prepare pre-permit program for young teens and parents.
- Safe Kids has a Countdown 2 Drive program that helps families build passenger agreements.
- KDOT contributed funding to research that used in-car cameras to understand the behaviors of young drivers.
- Schools install signs at their parking lot exits carrying such safety messages as *Buckle Up*.
- KDOT established reduced speed zones near rural high schools at peak traffic hours.
- Law enforcement often focuses on routes to and from high schools.
- The Kansas Graduated Driver's License law passed in 2009.

Commercial Motor Vehicles (Future EAT)

- KHP, with the support of KMCA and funding from Federal Motor Carrier Safety Administration (FMCSA), implemented the Trucks on Patrol for Safety program which aims to reduce commercial vehicle crashes caused by others who are driving unsafely in proximity to those vehicles.
- KHP and FMCSA implemented Compliance, Safety, and Accountability 2010, a data driven system to identify motor carriers for a safety review.
- KHP conducted 52,458 commercial vehicle and bus safety inspections in federal fiscal year 2010, which are designed to remove unsafe vehicles from highways and collect data on carrier safety.

Data

- More than 140 law enforcement agencies are now utilizing the Kansas Law Enforcement Reporting Tool developed by the KHP to complete and electronically submit crash reports to KDOT.
- KDOT continues to train law enforcement on the use and importance of the crash reporting form.
- Continues to provide training for officials in local government so they can understand and use crash data in their safety-related decision making.
- The Traffic Records Coordinating Committee continues to promote electronic reporting of crash reports at city and county level.
- KDOT creates and posts a Quarterly Dashboard Report based on the SHSP. An Annual Dashboard Report contains annual preliminary fatality data from January 1 through December 31.

Emergency Medical Services (Future Support Team)

- Kansas was one of three states chosen by the National Highway Traffic Safety Administration to participate in a trauma and emergency medical services data evaluation project in 2010.
- Regional trauma councils promote motor vehicle safety in each of the trauma regions.
- The Kansas Emergency Nurses Association provides various injury prevention activities in each of its emergency departments.
- Law enforcement relies on trained hospitals and EMS personnel to assist in the gathering of blood evidence used in the prosecution of many DUI cases.

Education

- KDOT Traffic Safety Section utilizes federal funds to promote safety programs in Kansas and to raise public awareness about safety issues on Kansas roadways, including seat belt and child safety seat use, impaired and distracted driving, motorcycle, pedestrian and bicycle safety.
- The Traffic Assistance Services for Kansas program trains public employees charged with traffic safety responsibilities.
- The Kansas Rural Transit Assistance Program (RTAP) provides defensive driving/emergency procedures training to about 600 transit agency employees annually.
- KHP visits motor carriers new to the interstate motor carrier industry and safety requirements.
- Groups such as MADD and the DUI Victim's Center deliver an educational message against impaired driving.
- KTSRO and KTSRP offer educational programs for both law enforcement and the public at large.
- Utilizes social media like Facebook and Twitter to draw people to ktsro.org.
- Created an electronic safety calendar that helps safety partners keep track of such scheduled safety activities as campaigns and trainings.
- Publicly recognizes champions of safety to raise the profile of traffic safety:
 - Transportation Safety Recognition Awards (People Saving People Awards and Hero Awards) are presented at the annual Transportation Safety Conference.
 - The AAA Foundation annually recognizes outstanding law enforcement agencies with their Community Traffic Safety Awards.

Personnel and Restructuring

- In 2005 KDOT created a new position, state highway safety engineer, to administer development of the first Strategic Highway Safety Plan.
- In 2008 KDOT provided funding for a traffic safety resource prosecutor to assist prosecuting attorneys in litigating DUI-related violations.
- In 2008 KDOT combined the bureaus of Traffic Safety and of Traffic Engineering and its Intelligent Transportation System program to form a new Bureau of Transportation Safety and Technology.
- In 2008 KDOT created a new position of state highway safety analyst to assist the state highway safety engineer and others in making strategic, data-based investment decisions.
- In 2015 KDOT moved the Crash Data Unit to the Bureau of Transportation Safety and Technology to fully incorporate this unit into the Traffic Safety program.
- In 2015 KDOT provided funding for a second traffic safety resource prosecutor.

Appendix B

Safety Support Groups: Recordkeeping, Education, Research

The Traffic Records Coordinating Committee (TRCC) provides an avenue to promote sharing of relevant traffic safety data. The TRCC has representatives from many state and local entities all striving to break down the silos of information currently in existence. eCitation, a TRCC project, secures a non-public web data entry portal within the KBI network in which authorized users can manually enter citation information to be housed in the eCitation Data Repository. It also allows local law enforcement and courts to electronically submit citation information. GIS Mapping Integration, another TRCC project, is an efficient method to display crash location to an internet audience within the context of a map. The Report and Police Impaired Drivers System was developed under the guidance of TRCC to address deficiencies related to Driving Under the Influence charges and prosecutions.

The Kansas Local Technical Assistance Program (LTAP) at the University of Kansas is part of a national program that provides services to improve the safety and operating efficiency of local roads and bridges. In the area of safety, both roadway and worker safety are emphasized. Road field personnel, public works officials and local elected officials are LTAP's primary audiences. Kansas LTAP provides training for about 500 persons a year; houses a library of training videos and publications; publishes an electronic newsletter; and maintains a website. LTAP safety-related courses focus on roadway safety assessment, traffic-impact studies, low-cost safety improvements and safety effects of geometric design features on two-lane rural roads. LTAP partners with the Kansas County Highway Association and the Kansas Chapter of the American Public Works Association on safety training activities through the Kansas Road Scholar certificate program and other safety-related efforts. Kansas LTAP has a safety associate on staff to help local agencies with safety issues and to coordinate LTAP's equipment loan program for traffic safety equipment.

For 70 years, the **AAA Foundation for Traffic Safety** has been true to its mission to prevent traffic deaths and injuries by conducting research into their causes and by educating the public about strategies to prevent crashes and reduce injuries when they do occur. Initially emphasizing projects related to safety patrols and driver education, today the Foundation has expanded its scope of work and has long been recognized as a leader in traffic safety, with a focus on four research priorities: driver behavior and performance; emerging technologies; roadway systems and drivers; and vulnerable road users.

Appendix C

Action Plans

Roadway Departure

Strategy 1: Develop and implement a safety corridor program.

Several states have developed successful safety corridor programs. This approach begins by identifying highway corridors with safety issues, including but not limited to high crash frequencies or rates, then using a 4E approach (engineering, enforcement, education and emergency medical services) to identify treatments and strategies to improve corridor safety.

- Method of implementation: program
- Program: Strategic Safety Initiative
- Cost: \$20,000 per year for signing (costs for treatments and strategies will be covered by other strategies in the SHSP)
- Lead agency: KDOT, Traffic Safety Section
- Target date: first corridor signed by end of CY 2021
- Output: three statewide at any one time
- Outcome: measurable crash reduction on selected safety corridors

Strategy 2: Implement the FHWA's EDC5-Reducing Rural Roadway Departure initiative.

According to the FHWA, "Systemic application of proven safety countermeasures on rural roads helps keep vehicles in the travel lane and reduce the incidence and severity of roadway departure crashes." In Kansas, roadway departure crashes represent about 60 percent of all fatal crashes, with over two-thirds of these in rural areas. Substantial improvements on these roads can be difficult to make due to the size of the network. Further, these roads are often owned by local agencies with limited resources and technical expertise in safety analysis. This initiative includes a list of over a dozen recommended countermeasures. Each will be evaluated and where appropriate implemented in Kansas on both state highways and locally-owned roads.

- Method of implementation: committee
- Program: NA
- Cost: none
- Lead agency: KDOT, Traffic Safety Section
- Target date: initiate committee in 2020 and meet semi-annually
- Output: new policies, practices, standards, and processes that institutionalize substantive safety
- Outcome: measurable reduction of statewide rural roadway departure crashes

Strategy 3: Promote systemic low-cost countermeasures for reducing crashes at horizontal curves.

Horizontal curves represent nearly one in three fatal roadway departure crashes. This program may include targeted improvements, such as high-friction surface treatment, at curves with a pattern of correctable crashes, and lower-cost systemic improvements, such as enhanced signing and delineation, at multiple curves identified based on common risk factors.

- Method of implementation: program
- Program: Strategic Safety Initiative
- Cost: \$1 million per year (of \$10 million annual program)
- Lead agency: KDOT, Traffic Engineering Section
- Target date: 2021
- Output: number of horizontal curves improved
- Outcome: measurable crash reduction at horizontal curves on SHS

Strategy 4: Create and deliver education campaigns that target factors in roadway departure crashes.

Roadway departure crashes, like all crashes, begin with four contributing factors: the driver, the vehicle,

the road and the environment. Nationwide, driver-related factors contribute to over 90 percent of all crashes. These include contributing circumstances such as inattention, drowsy driving and too fast for conditions. This strategy will identify outstanding factors associated with drivers in roadway departure crashes and develop related educational materials to positively influence driver behavior on both state highways and locally-owned roads.

- Method of implementation: project
- Program: NHTSA 402
- Cost: \$100,000
- Lead agency: KDOT, Traffic Safety Section
- Target date: 2022
- Output: specific campaigns
- Outcome: better drivers

Strategy 5: Provide local roadway safety training and resources through LTAP and direct technical assistance from LTAP’s Local Field Liaison Program.

The State Highway System represents less than 8 percent of all public roads in the state. The remaining 92 percent are owned by cities, counties and townships, each with varying degree of expertise in matters related to roadway safety. The Local Technical Assistance Program administered by the University of Kansas Transportation Center provides training, technical resources and now direct contact through liaisons to these local jurisdictions.

- Method of implementation: training
- Program: Kansas Local Technical Assistance Program (LTAP)
- Cost: \$390,000 per year
- Lead agency: University of Kansas Transportation Center
- Target date: ongoing
- Output: number of courses and total trained, number of local agencies assisted by LTAP Local Field Liaisons, number of agencies accessing LTAP communications and resources
- Outcome: more knowledgeable safety professionals at the city, county, and township level; more resources for local decision makers who invest in safety

Strategy 6: Update and implement a new rumble strip policy.

KDOT’s rumble strip policy was last updated in 2007. At the time, centerline rumble strips (CLRS) were added to the policy. Since then, nearly 2,000 miles of CLRS have been installed. A study conducted by Kansas State University evaluated the impact of CLRS in Kansas and found cross-over crashes were reduced by 67 percent! Shoulder rumble strips also save lives by reducing the potential for run-off-road crashes. For each, expansion of use and method of delivery will be considered in the new policy.

- Method of implementation: policy
- Program: NA
- Cost: none
- Lead agency: KDOT, Traffic Safety Section and Bureau of Construction & Materials
- Target date: September 1, 2020
- Output: new policy and resulting proportionality of eligible highways
- Outcome: reduction of head-on, side-swipe opposite crashes, and run-off-road crashes on SHS

Strategy 7: Identify and add safety enhancements to pavement preservation projects.

Although difficult to quantify, surface condition is an important component of highway safety. Wet roads and icy roads are captured in crash data, but potholes, broken pavement, and washboards (on gravel roads) are not. Annually, KDOT works to resurface around 1,200 centerline miles of state highways through the Pavement Preservation Program. While the program is driven exclusively by surface condition, these projects provide opportunity to identify and construct safety features such as rock wedge or narrow paved shoulders, tapered pavement edge, rumble strips, fixed-object removal and roadside safety hardware improvements.

- Method of implementation: program
- Program: 1R
- Cost: \$10 million per year
- Lead agency: KDOT Traffic Safety Section and Bureau of Construction & Materials
- Target date: FY21 program and continuing annually
- Output: centerline miles addressed
- Outcome: measurable crash reduction on selected project corridors

Occupant Protection

Strategy 1: Create a targeted media campaign directed toward pickup drivers.

Statistics show that seat belt use is lowest among occupants in pickup trucks and in rural settings. The media contractor should develop materials targeting pickup drivers and their influencers.

- Method of implementation: communications/outreach
- Program: Highway Safety Plan
- Cost: \$50,000
- Lead agency: KDOT Traffic Safety Section
- Target date: Spring 2020
- Output: new advertising and educational materials
- Outcome: increased seat belt usage, reduction of unbelted injuries and fatalities among pickup drivers and their occupants

Strategy 2: Provide funding and other forms of support for law enforcement efforts to uphold occupant protection laws.

Law enforcement officers are more likely to enforce occupant protection laws if they are trained in the importance of using safety restraints at every stage of life. Often, agencies operate on tight budgets with low manpower, so funding is needed for overtime enforcement, training and equipment purchases.

- Method of implementation: program/training
- Program: Highway Safety Plan
- Cost: \$1,000,000 annually
- Lead agency: KDOT Traffic Safety Section
- Target date: ongoing
- Output: training and overtime enforcement by law enforcement agencies
- Outcome: enforcement of occupant protection laws

Strategy 3: Collaborate with state and local partners, including employers, to promote seat belt usage through education and incentive programs.

Many partners are needed to effectively reach the public with our seat belt message. A consistent message is most desirable and can only be achieved through these partnerships.

- Method of implementation: outreach
- Program: Highway Safety Plan
- Cost: minimal
- Lead agency: Kansas Traffic Safety Resource Office
- Target date: ongoing
- Output: comprehensive seat belt usage program
- Outcome: increased seat belt usage, reduction of unbelted injuries and fatalities

Strategy 4: Enhance existing primary seat belt law to include all seating positions, increase fines and assess court costs.

States with strong laws consistently show higher seat belt use and lower fatality rates.

- Method of implementation: legislation
- Program: NA
- Cost: minimal
- Lead agencies: AAA of Kansas, Buckle Up Education Coalition
- Target date: by end of 2022 legislative session
- Output: stronger occupant protection laws
- Outcome: increased belt usage in all seating positions; reduction of unbelted injuries and fatalities

Strategy 5: Analyze existing and new data sources to define and support the prioritization of strategies.

Strong and ongoing data analysis is an essential component of any occupant protection program to ensure time and resources are being utilized effectively.

- Method of implementation: data/outreach
- Program: Highway Safety Plan
- Cost: \$300,000 annually
- Lead agency: KDOT Traffic Safety Section
- Target date: ongoing
- Output: Occupant Protection Surveys, OP data and analysis
- Outcome: informed decision-making process for outreach programs

Impaired Driving

Strategy 1: Institute legally permissible roadside oral fluids testing program for drug impaired driving.

The initial Kansas study demonstrating the reliability of roadside oral fluids was completed with lead agency Sedgwick County Criminal Forensics Laboratory. The study demonstrated the field-testing instrument's high degree of accuracy with validations done at two independent laboratories. A high level of confidence now exists to accurately measure drugs present in the body. To use oral fluids, the Kansas Legislature had to modify statutes in 2019 to authorize testing of oral fluids for driving under the influence statutes. That was completed and became law July 1, 2019. Select law enforcement agencies will use the instrument to ensure policies, procedures and protocols are appropriate for successful prosecution. Model policies will be available to law enforcement agencies to adopt to ensure the program is legally acceptable.

- Method of implementation: policy
- Program: NHTSA 405b Alcohol Funds
- Cost: \$60,000
- Lead agency: Kansas Highway Patrol Breath Alcohol Unit
- Target date: FFY 2021
- Output: 12 instruments distributed statewide; each assigned agency to test 10 individuals per month for total of 1,440 field tests
- Outcome: All Kansas law enforcement agencies will be able to purchase and use a legally acceptable field test for drugs or intoxicants other than alcohol. This will remove impaired drivers from the roads, provide general deterrence, and reduce crashes and fatalities related to alcohol.

Strategy 2: Equip Kansas forensic crime labs to test oral fluids to allow for courtroom evidence.

Current Kansas statutes allow oral fluids for preliminary testing only. This is what officers use to establish probable cause for the arrest. The next step is to allow oral fluids to be entered as evidence into the court proceedings. To provide this, Kansas labs need instruments capable of testing oral fluids for evidentiary submissions. KDOT has purchased instruments for Johnson County Sheriff and the Kansas Bureau of Investigation who are currently certifying lab instrument for oral fluids. Sedgwick Forensic Crime Lab is working with KDOT to secure a contract for the purchase of the lab instrument. Once these crime labs are certified for oral fluids, the Kansas Legislature must amend current state law to allow oral fluids to be used as evidence in court.

- Method of implementation: purchase
- Program: NHTSA 405b Alcohol Funds
- Cost: \$500,000
- Lead agencies: KDOT, Sedgwick County Forensics Crime Lab
- Target date: FFY 2021
- Output: test 20 oral fluid tests each month
- Outcome: With the purchase of this lab instrument, successful prosecutions will result and thereby put an instrument in the hands of law enforcement officers that can provide immediate results of impaired substances. This will remove impaired drivers from the roads, provide general deterrence, and reduce crashes and fatalities related to alcohol.

Strategy 3: Institute a state-wide enforcement unit with Kansas Highway Patrol for offender compliance enforcement of Ignition Interlock Devices (IID).

Monitoring those convicted of DUI offenses is key to reducing recidivism of DUI-related arrests. Studies show a significant reduction of repeat DUI arrests for those who have IIDs installed vs. those who do not. Studies also show a 15 percent reduction in fatality crashes related to alcohol in states requiring IIDs. Kansas has led the nation in IID requirements including requiring IIDs for first time offenders. Per capita, Kansas has the second most IIDs deployed in the nation. The weak link is enforcement of IID requirements. Some offenders are illegally circumventing the IIDs or getting "curbside service" where a sober person blows for them. Some offenders are never getting an IID installed. To address offender compliance issues, KDOT and KHP have teamed up to provide two full time troopers to train Kansas law enforcement on IID violations. KDOT will fund two positions and necessary equipment for five years beginning in 2019. The troopers' primary focus in the first three years is training; last two years will be enforcement driven to increase compliance with IID requirements.

- Method of implementation: grant
- Program: KDOT NHTSA program
- Cost: \$250,000 annually for five consecutive years

- Lead agencies: KHP, KDOT
- Target date: program will begin October 1, 2020, and end September 30, 2025
- Output: training to 500 certified law enforcement officers each year for a total of training 2,500 officers
- Outcome: It is projected law enforcement will uncover 500 offender violations per year for a total of 2,500 violations in the five-year period. This will remove impaired drivers from the roads, provide general deterrence, and reduce crashes and fatalities related to alcohol.

Older Drivers

Strategy 1: Partner with and provide educational materials about older drivers to stakeholders, including senior centers, law enforcement agencies, Kansas legislature, city and county governments, Chamber of Commerce groups, and the state's Area Agencies on Aging.

Educate about the social, medical, physical, and cognitive issues that older drivers may encounter. Include self-assessment tools so seniors can learn to self-identify when they can no longer drive. Promote AAA's Roadwise Driver and AARP's Smart Driver.

- Method of implementation: outreach
- Program: Highway Safety Plan
- Cost: \$5,000 or less annually
- Lead agency: KDOT Traffic Safety Section
- Target date: ongoing
- Output: educational materials
- Outcome: increased awareness of cognitive and physical issues affecting the driving skills of people age 65+

Strategy 2: Educate members of the medical community about how physical and cognitive issues facing older drivers can affect their driving ability.

Audience includes physicians, physician assistants, nurses, pharmacists, and occupational and physical therapists. Include information about how certain medications can interact with each other and impair the driver. Include information from the Older Drivers chapter in NHTSA's *Countermeasures That Work*.

- Method of implementation: training
- Program: Highway Safety Plan
- Cost: \$5,000 or less annually
- Lead agency: KDOT Traffic Safety Section
- Target date: 2024
- Output: five educational workshops annually
- Outcome: increased awareness within the medical community of cognitive and physical issues affecting the driving skills of people age 65+

Strategy 3: Promote CarFit as an important training opportunity.

CarFit is an educational program that provides a quick, yet comprehensive review of how well older drivers and their vehicles work together. The program, which was developed by AAA, AARP and the American Occupational Therapy Association, also provides information and materials on community-specific resources that could enhance driving safety and increase mobility.

- Method of implementation: outreach
- Program: Highway Safety Plan
- Cost: minimal
- Lead agency: KTSRO
- Target date: ongoing
- Output: marketing materials and techniques
- Outcome: increased recognition of CarFit program among drivers age 65+

Strategy 4: Establish Mobility Managers at locations throughout the state to work with regional transit agencies to cooperatively meet the longer-distance travel needs of transit-dependent populations, including older drivers.

Kansas currently has three active Mobility Managers with others in development for 2020-2022. The goal is to eventually have a network of Mobility Managers that works to improve transportation services in communities and works collectively on state-wide public transportation issues, including transportation options for seniors who no longer drive.

- Method of implementation: outreach

- Program: Regional Transit Business Model
- Cost: approximately \$100,000 per Mobility Manager annually
- Lead agency: KDOT Office of Public Transit
- Target date: 2021
- Output: Mobility Manager in each Coordinated Transit District
- Outcome: additional transit resource that can identify gaps in transportation for transit dependent populations and train individuals on how to properly gain access to transportation via transit

Strategy 5: Conduct training for older drivers on how to access and use the public transit system as a transportation option.

Mobility Managers and other traffic safety advocates can distribute free training materials to new public transportation users. Materials include the Flint Hills aTa Bus training video, Kansas Rides (ksrides.org) and the Kansas Rural Transit Assistance Program (kutc.ku.edu/rtap).

- Method of implementation: training
- Program: KDOT Public Transit Programs
- Cost: \$5,000 annually
- Lead agency: KDOT Office of Public Transit
- Target date: ongoing
- Output: training materials
- Outcome: distribution of training materials that will lead to more knowledgeable transit users and assist the transit dependent population in accessing transportation

Strategy 6: Establish mandatory physician reporting for drivers of any age who no longer have the necessary physical or mental capacity to effectively operate a motor vehicle.

Doctors will be required to report their patients to the Division of Vehicles. Statute will also require more frequent in-person renewal of licensing for drivers age 75 and older.

- Method of implementation: legislation
- Program: NA
- Cost: none
- Lead agency: TBD
- Target date: 2022
- Output: physicians are required by law to report unsafe drivers of any age to the Division of Vehicles
- Outcome: fewer people driving who do not have the physical or mental capacity to effectively operate a motor vehicle

Intersections

Strategy 1: Promote strategic enforcement at intersections with safety issues.

Work with local law enforcement to identify and target intersections in their area with a risk of serious crashes and identify resources to provide targeted enforcement and public outreach.

- Method of implementation: project
- Program: Highway Safety Plan
- Cost: TBD
- Lead agency: KDOT Traffic Safety Section in cooperation with local law enforcement
- Target date: begin in 2022
- Output: top 50 signalized and unsignalized intersections will be identified
- Outcome: extra enforcement will have immediate effect on the system

Strategy 2: Promote systemic low-cost countermeasures for reducing crashes at traffic signal-controlled intersections.

This can be accomplished with policy and standard changes, as well as projects that include reflective back plates, countdown timers, APS push buttons, lead pedestrian interval, consistent yellow and all-red timings, improved geometry, improved vehicle detection and improved signal phasing/timing plans.

- Method of implementation: policy and program
- Program: NA
- Cost: none
- Lead agency: KDOT Traffic Engineering Section
- Target date: begin in 2021
- Output: review of top 50 signalized intersections

- Outcome: reduction of angle crashes. Crash rates will be compared three years into the program for comparison purposes.

Strategy 3: Continue promoting low-cost countermeasures for reducing crashes at stop sign controlled intersections.

This strategy can be implemented with policy and standard changes, as well as projects that include fluorescent yellow advanced warning signs, additional stop and advanced warning signing, advanced intersection identification signing, clearing vegetation within sight triangles, and installing ITS devices at rural high-speed approach intersections to improve conspicuity of opposing traffic.

- Method of implementation: policy and program
- Program: NA
- Cost: none
- Lead agency: KDOT Traffic Engineering Section
- Target date: begin in 2021
- Output: review of top 50 unsignalized intersections
- Outcome: reduction of angle crashes. Crash rates will be compared three years into the program for comparison purposes.

Strategy 4: Continue promoting countermeasures at stop sign controlled intersections that are focused on speed differential management.

Speed differential accounts for the flow of traffic along a road. The goal in road design and traffic control is uniformity of speed. Vehicles slower (or faster) than the average speed cause friction and increase the potential for conflicts. This strategy will seek to improve intersection sight-distance, replace bypass lanes with dedicated left and right-turn lanes, implement traffic calming measures at intersections or along corridors, and add auxiliary turn lanes to move slower speed traffic out of the higher speed traffic lanes.

- Method of implementation: project
- Program: Strategic Safety Initiative Program
- Cost: \$500,000
- Lead agency: KDOT Traffic Engineering Section
- Target date: built by 2024
- Output: this and additional construction projects
- Outcome: after crash analyses

Strategy 5: Promote construction of traditional and alternative intersection types which reduce the number of conflict points.

This strategy can be implemented with right-in/right-out, three-quarter access (right-in/right-out/left-in), modern roundabouts, displaced left-turn, median U-turn (MUT), restricted crossing U-turn (RCUT), diverging diamond interchanges (DDI) and quadrant roadway.

Action Item 5.1

- Method of implementation: project
- Program: HSIP
- Cost: \$10,000,000
- Lead agency: KDOT
- Target date: built by 2024
- Output: innovative expressway intersection
- Outcome: after crash analysis and additional proposed projects statewide

Action Item 5.2

- Method of implementation: education
- Program: Highway Safety Plan
- Cost: \$10,000 annually
- Lead agency: KDOT Bureau of Transportation Safety & Technology
- Target date: first publication in 2022
- Output: handouts to assist local governmental agencies
- Outcome: improved collaboration between KDOT, university transportation technology transfer centers and local agencies.

Strategy 6: Develop education material for new intersection types and new traffic control devices relevant to intersections.

When roundabouts were introduced in Kansas, educating the traveling public of this new and innovative intersection type was essential to their acceptance. As Kansas continues to introduce new intersection

designs—from the diverging diamond to the RCUT—education will continue to be a critical step. Further, innovative traffic control devices continue to be approved for use on public roads. These include, but are not limited to, the flashing yellow arrow, leading pedestrian interval, rectangular rapid flashing beacon (RRFD), and hybrid pedestrian sign. And while traffic control devices are designed to be intuitive, at some point education is required to learn that an octagon means stop and a flashing yellow left-turn signal means turns permitted but yield to other pedestrians and vehicles within the intersection.

- Method of implementation: education
- Program: Highway Safety Plan
- Cost: \$20,000 annually
- Lead agencies: KUTC, KTSRO
- Target date: first publication in 2022
- Output: handouts to assist local governmental agencies
- Outcome: improved collaboration between KDOT, university transportation technology transfer centers and local agencies

Local Roads

Strategy 1: Complete up to 20 County Local Road Safety Plans (LRSP) per year until all Kansas counties have a plan.

Local Road Safety Plans provide a framework for identifying, analyzing and prioritizing roadway safety improvements. Stakeholders are engaged, crash types and risks are identified, countermeasures are recommended, and priorities are identified.

- Method of implementation: program
- Program: High Risk Rural Roads (HRRR)
- Cost: \$5,500,000 (\$50,000 to \$55,000 per plan)
- Lead agency: KDOT Bureau of Local Projects in partnership with each county
- Target date: estimated 2023 (but will continue until complete)
- Output: provide list of priority safety projects for each county for their consideration
- Outcome: local education on safety issues in each county, and ownership of list of prioritized projects for when funding is available; eligibility for future HRRR funding

Strategy 2: Prioritize projects identified in LRSPs for HSIP/HRRR funding.

Once a project is identified in a county's LRSP, the county may apply for Highway Safety Improvement Program (HSIP) funding through the High-Risk Rural Roads (HRRR) program. Priority should be given to these projects during the selection process.

- Method of implementation: program
- Program: HSIP (HRRR)
- Cost: \$3,500,000 to \$5,000,000 annually
- Lead agency: KDOT Bureau of Local Projects in partnership with counties
- Target date: ongoing
- Output: safety improvements across the system
- Outcome: safety funds are awarded to projects having the greatest impact to safety first

Strategy 3: Provide local roadway safety training and technical assistance.

Due to changes in personnel or simply the need for updated information, many local agencies would benefit from training in the most efficient use of their time and resources to maintain and improve safety along their roadways. This training will be provided through Local Technical Assistance Program (LTAP) courses, LTAP's Local Liaison position(s), and resources available through Federal Highway's EDC-5 Rural Roadway Departures initiative.

- Method of implementation: technology transfer
- Program: SP&R
- Cost: \$600,000 annually
- Lead agency: LTAP
- Target date: ongoing
- Output: training and technical assistance opportunities for Local Roadway Officials
- Outcome: Local Roadway Officials gain knowledge in Roadway and Roadside Safety and are better able to recognize and solve safety issues that arise

Strategy 4: Promote the Traffic Engineering Assistance Program (TEAP).

The TEAP program helps cities and counties without a traffic engineering staff. Studies are performed by consultants and recommendations are made for improvements such as speed limits, updated or

improved signing, addition of turn lanes, etc.

- Method of implementation: program
- Program: HSIP
- Cost: \$200,000 annually
- Lead agency: KDOT
- Target date: ongoing
- Output: engineering studies to address perceived safety issues for LPAs on locally owned facilities, focusing on major collectors
- Outcome: local education on safety concerns, basis for eligibility for funding from other safety programs

Strategy 5: Identify strategies to improve safety on gravel roads.

A variety of resources exist for safety improvements to paved roads (rumble strips, pavement markings, etc.). With over 50 percent of nonstate rural major collectors being unpaved, it is important to provide approaches to improve safety along these roadways as well.

- Method of implementation: task force
- Program: NA
- Cost: none
- Lead agency: LTAP
- Target date: 2024
- Output: specific action items that will improve safety on gravel roads
- Outcome: increased safety on gravel roads

Strategy 6: Address driver behavior on the locally owned road system through educational efforts.

Although general educational efforts exist for topics such as impaired driving or seatbelt usage, and these campaigns benefit drivers on local roads, there are also topics that are unique to local roads. These may include driving on gravel roads, recovery strategies after leaving a roadway, and appropriate decision-making without the types of signing and marking on the state system.

- Method of implementation: education
- Program: NHSTA Section 402
- Cost: TBD
- Lead agencies: KDOT, LTAP
- Target date: 2024
- Output: increased driver education
- Outcome: increased safety on the locally owned road system

Teen Drivers

Strategy 1: Continue to monitor teen driving laws that are in place, advocate for initiatives that will strengthen or expand existing laws, and work against attempts to alter them in ways that weaken them.

Foremost, here, is the protection and perhaps enhancement of Kansas' Graduated Driver License (GDL) law which went into effect January 1, 2010. As noted in the NHTSA publication, *A Highway Safety Countermeasure Guide for State Highway Safety Offices (Ninth Edition), 2017*, "graduated driver licensing addresses *both the inexperience and the immaturity* of young drivers. GDL provides a structure in which beginning drivers gain substantial driving experience in less-risky situations. GDL raises the minimum age of full licensure and helps parents manage their teenage drivers." It specifically addresses the first three areas of concern bulleted above: *nighttime driving, teen passengers, and cell phone use.*

- Method of implementation: legislation
- Program: NA
- Cost: none
- Lead agency: KDOT, Traffic Safety Section
- Target date: ongoing
- Output: better educated young and inexperienced drivers
- Outcome: reduction in crashes and fatalities

Strategy 2: Expand the SAFE program (Seatbelts Are For Everyone) across Kansas.

The SAFE program launched in six Crawford County high schools at the beginning of the 2008-2009 school year. The brainchild of KDOT law enforcement liaison David Corp, the program has grown to more than 160 high schools in almost 70 counties. More than 3,000 students participate every year,

during which time it is estimated that their comprehensive program of safety messaging to peers reaches 81,000. Covered are the necessity to buckle up, cell phone distractions, impaired driving and unsafe speed among others. The Kansas Traffic Safety Resource Office (KTSRO) is responsible for oversight of the program. While safety restraint usage is still its top priority, SAFE student activists reach out to their peers on a full range of safe driving topics throughout the school year.

- Method of implementation: project
- Program: Seatbelt Safety Fund (State dollars)
- Cost: \$350,000 annually
- Lead agencies: KDOT, Kansas Traffic Safety Resource Office (KTSRO)
- Target date: annual
- Output: increased seat belt use and increased awareness of traffic safety
- Outcome: reduction in crashes, injuries, suspected serious injuries and fatalities

Strategy 3: Continue to utilize annual high visibility statewide high school and middle school neighborhood safety restraint enforcement campaigns by local and state law enforcement agencies.

As many as 90 agencies participate in the highly-publicized one-week fall middle school and two-week spring high school campaign. These voluntary campaigns engage law enforcement across the state for one-week enforcement waves during the periods just before and after the school day and in the neighborhood around each school.

- Method of implementation: enforcement
- Program: no cost to state, law enforcement voluntary enforcement
- Cost: none
- Lead agency: KDOT, Traffic Safety Section
- Target date: annual
- Output: increased seat belt use and increased awareness of traffic safety
- Outcome: reduction in crashes, injuries, suspected serious injuries and fatalities

Strategy 4: Continue to facilitate a conference for teens and teen traffic safety advocates geared to improving novice and inexperienced drivers and improve traffic safety.

By 2017, youth attendance at the Kansas Transportation Conference (TSC) had grown to the point where it was decided that, while youth would still be invited to attend TSC, its impact would be greater if they were to have their own two-day TSC type experience. Registration is limited to 200 students, most of whom represent SAFE programs. While geared to younger safety activists, the conference is every bit as professional as the TSC, with expert presenters and opportunities to develop advocacy skills, network and engage law enforcement professionals in positive environment.

- Method of implementation: project
- Program: Seatbelt Safety Fund (State dollars)
- Cost: \$125,000 annually
- Lead agencies: KDOT, Kansas Traffic Safety Resource Office (KTSRO)
- Target date: annual
- Output: increased seat belt use and increased awareness of traffic safety
- Outcome: reduction in crashes, injuries, suspected serious injuries and fatalities

Strategy 5: Continue to support Alcoholic Beverage Control and other law enforcement efforts to reduce underage drinking and driving.

The Department of Revenue's Division of Alcoholic Beverage Control, utilizing a grant from KDOT, conducts underage drinking actions at concerts, festivals and other events across the state. All enforcement is on overtime and federally funded. Additionally, KDOT has partnered with the Overland Park Police Department and DCCCA to provide overtime funding targeting underage drinking enforcement. KDOT also maintains two dedicated phone lines to and from Kansas Highway Patrol Central Dispatch for citizens to anonymously report underage drinking activities in progress or planned.

- Method of implementation: project
- Program: National Highway Traffic Safety Administration (NHTSA), Federally funded
- Cost: \$70,000 annually
- Lead agencies: KDOT, Kansas Department of Revenue, Alcoholic Beverage Control
- Target date: annual
- Output: decrease underage drinking and impaired driving in teens.
- Outcome: reduction in crashes, injuries, suspected serious injuries and fatalities

Strategy 6: Promote the initiation of teen road safety audits.

This strategy complements the SAFE programming. A road safety audit of school locale by student members of SAFE programs will mesh well with existing student-led activities, such as the two observational seat belt surveys performed annually by the students.

- Method of implementation: project
- Program: Seatbelt Safety Fund (State dollars)
- Cost: \$20,000 annually
- Lead agency: KDOT, Traffic Safety Section
- Target date: annual
- Output: increase awareness of roadway characteristics and the importance of data
- Outcome: reduction in crashes, injuries, suspected serious injuries and fatalities and promotion of the field of civil engineering

Pedestrians & Cyclists

Strategy 1: Improve non-motorized data collection and analysis.

Engage in collaborative efforts that support the collection of non-motorized traffic data (crash, count/volume, roadway characteristics and conditions, and other relevant data). This data will be used to identify transportation and safety needs for non-motorists and to select the appropriate improvements to make conditions safer and more comfortable for all road users.

Issue 1.1: Data from crash reports can be limited and insufficient to accurately determine events that lead to crashes.

Action Item 1.1.1: Develop and utilize crash-analysis methodology.

- Method of implementation: administrative
- Program: KDOT's Bicycle & Pedestrian Program
- Cost: none
- Lead agency: KDOT Bureau of Transportation Planning
- Target date: December 2021
- Output: Crash Analysis report and Active Transportation Priority Tool
- Outcome: A step-by-step methodology for prioritizing improvements to existing roadways that lack adequate pedestrian and bicycle facilities.

Issue 1.2: Lack of user data to effectively respond to increased demand for non-motorized facilities.

Action Item 1.2.1: Develop State non-motorized counting program.

- Method of implementation: program
- Program: HSIP
- Cost: \$200,000
- counting equipment, parts and supplies, software and installation training, data storage and analysis
- Lead agency: KDOT Bureau of Transportation Planning
- Target date: September 30, 2021
- Output: Purchase counting equipment and technologies capable of capturing pedestrian and bicycle activity and develop a State Pedestrian & Bicycle Counting Program.
- Outcome: Improved count and data collection and analysis technologies for pedestrian and bicycle modes will help prioritize and guide investment decisions.

Strategy 2: Identify and promote the use of best practices when planning and designing transportation facilities for non-motorized modes of transportation.

Share and promote new programs and design resources for non-motorized transportation to provide guidance and best practices that address pedestrian and bicycle safety issues.

Issue 2.1: Resources that promote safe accommodations for non-motorized modes of transportation are currently a low priority or not considered during the planning and design processes.

Action Item 2.1.1: Continue participating in FHWA's STEP Program (Safe Transportation for Every Pedestrian).

- Method of implementation: program
- Program: FHWA's Every Day Counts (EDC) program – Safe Transportation for Every Pedestrian (STEP)
- Cost: \$10,000
- Lead agency: KDOT Bureau of Transportation Planning
- Target date: January 1, 2021
- Output: Develop, produce, and implement KDOT STEP Program materials and training opportunities.

- Outcome: Policy and guidance focusing on pedestrian safety and improved institutional knowledge of innovative best practices for proven safety countermeasures that specifically address pedestrian safety.

Action Item 2.1.2: Develop a program that supports temporary traffic demonstrations.

- Method of implementation: program
- Program: HSIP
- Cost: \$200,000 or less annually
- Lead agency: KDOT Division of Planning & Development
- Target date: September 30, 2021
- Output: Develop and implement a new safety program that supports the purchase and use of temporary traffic control devices and equipment that demonstrate (short-term) the real-world impact of traffic safety countermeasures.
- Outcome: Access to public participation elements (user data, traffic data, public feedback, etc.) related to proposed safety infrastructure, prior to long-term investments.

Action Item 2.1.3: Adoption/approval of new policy and guidance that promote and incorporate modern pedestrian and bicycle transportation facility design.

- Method of implementation: administrative
- Program: KDOT Bicycle & Pedestrian Program
- Cost: none
- Lead agency: KDOT Comprehensive Transportation Planning Unit
- Target date: January 1, 2022
- Output: Recommend policy and guidance documents that promote the inclusion and safety of pedestrians and bicyclists in transportation projects.
- Outcome: Allow design flexibility to provide safe accommodations for non-motorists in transportation projects.

Issue 2.2: The legislative process is complex, making it difficult to find and follow laws (existing or proposed) that may have an impact on non-motorized transportation.

Action Item 2.2.1: Establish a policy-focused Work Group.

- Method of implementation: administrative
- Program: KDOT Bicycle & Pedestrian Program
- Cost: none
- Lead agency: KDOT Comprehensive Transportation Planning Unit
- Target date: January 1, 2022
- Output: Monitor and track legislation to inform and educate partners and stakeholders.
- Outcome: State and local laws that support non-motorized transportation and protect vulnerable road-users.

Issue 2.3: Kansas does not have a statewide “Complete Streets” policy, program, or guiding document.

Action Item 2.3.1: Develop “Complete Streets” policy, program, and guidance that covers transportation projects across the state.

- Method of implementation: administrative
- Program: KDOT Bicycle & Pedestrian Program
- Cost: none
- Lead agency: KDOT Comprehensive Transportation Planning Unit
- Target date: January 1, 2022
- Output: New policy and guidance that directs transportation planners and engineers to routinely design and operate the entire right-of-way to enable safe access for all road users.
- Outcome: Every transportation project will make the street network better and safer for all road users—pedestrians, bicyclists, transit riders, and motorists.

Strategy 3: Improve network connectivity and operation of pedestrian and bicycle facilities.

Implementing and promoting infrastructure treatments with proven safety countermeasures that emphasize the safety of non-motorists at high-risk locations can reduce all crashes and lower fatality and serious injury rates for non-motorists.

Issue 3.1: A large portion of non-motorized fatalities and serious injuries occur in locations without appropriate infrastructure.

Action Item 3.1.1: Invest in construction projects that promote proven safety countermeasures for non-motorized road users.

- Method of implementation: program
- Program: HSIP, State General Funds
- Cost: \$2,000,000 or more annually

- Lead agency: KDOT
- Target date: January 1, 2022
- Output: Construct non-motorized transportation facilities.
- Outcome: Provide appropriate facilities for non-motorized road users.

Issue 3.2: Local agencies and communities lack the support and resources required to assess their transportation network to determine their pedestrian and bicycle needs.

Action Item 3.2.1: Develop local training program for community-led Road Safety Audits (RSA).

- Method of implementation: program
- Program: Local RSA Training Program
- Cost: \$15,000 annually
- Lead agencies: KDOT, LTAP
- Target date: January 1, 2022
- Output: Provide training for communities to conduct their own RSAs.
- Outcome: Community-led roadway safety assessments that identify their safety concerns and infrastructure needs.

Strategy 4: Improve public awareness of non-motorized road users.

Effective outreach and education strategies can be simple and low-cost ways to distribute information to the public on a regular basis.

Issue 4.1: Public awareness of safe and legal non-motorized transportation is critical to a safe transportation system.

Action Item 4.1.1: Develop a statewide safety campaign for pedestrians and cyclists

- Method of implementation: administrative
- Program: Highway Safety Plan
- Cost: \$30,000 or less annually
- Lead agency: KDOT Division of Planning & Development, KDOT Division of Communications
- Target date: September 30, 2021
- Output: Develop and implement statewide campaign strategy and marketing plan for pedestrian and cyclist safety.
- Outcome: Increased public awareness on non-motorized safety issues.

Issue 4.2: Educational programs and resources pertaining to non-motorized transportation issues are limited.

Action Item 4.2.1: Expand existing training programs to improve education and outreach regarding non-motorized transportation safety issues.

- Method of implementation: program
- Program: NHTSA 402
- Cost: \$50,000 or less annually
- Lead agencies: KDOT Comprehensive Transportation Planning Unit, KDHE Bureau of Health Promotion
- Target date: September 30, 2021
- Output: Provide educational training programs that focus on traffic safety for non-motorized road users.
- Outcome: Increased education and outreach on safety practices for non-motorized transportation.

Data Support

Strategy 1: Promote web-based mapping tool for local jurisdictions, traffic safety coalitions, and others to access and view crash data.

KDOT is a central location for crash data and analysis that many groups utilize to fulfill their data needs. Web-based mapping tools, both off-the-shelf and custom-built are available for others to use to visualize and analyze crash information. This strategy will promote, facilitate, and improve these tools by and for safety partners across the state.

- Method of implementation: communication
- Program: NA
- Cost: none
- Lead agency: KDOT Bureau of Transportation Planning, Bureau of Transportation Safety & Technology
- Target date: 2021

- Output: easier access to crash data visualization and analysis
- Outcome: better informed safety partners at local level

Strategy 2: Link crash data to the trauma registry (to improve serious injury data).

All states were required to adopt a uniform definition of serious injury in motor-vehicle crashes by April 15, 2019. Kansas adopted this national definition effective January 1, 2019. This change will improve consistent reporting, both within Kansas and nationally. Linking injury severities in crash reports with actual outcomes in the trauma registry will further improve the reliability of serious injury data.

- Method of implementation: partnership
- Program: NA
- Cost: none
- Lead agency: Kansas Department of Health & Environment
- Target date: 2022
- Output: clinical outcome to validate serious injuries from crash reports
- Outcome: improved accuracy of serious injury data, facilitating safety performance measures and the safety management process

Strategy 3: Collect and inventory roadway data to support crash analysis, project analysis, and application of policies.

The safety management process is incomplete without robust roadway inventory data, including features such as lane and shoulder width, and assets such as signs and guardrail. The FHWA recognizes this such that they have required states to collect fundamental data elements based on the Model Inventory of Roadway Elements (MIRE) by September 30, 2026. Information collected will support intersection analysis, application of Performance Based Practical Design, and implementation of policies such as longitudinal rumble strips. Projects under this strategy could include building an intersection inventory on the State Highway System made up of more than 25 data elements, and the use of mobile lidar or similar technology.

- Method of implementation: project
- Program: National Highway Traffic Safety Administration (NHTSA), State Traffic Records Enhancement Fund
- Cost: \$1,058,233
- Lead agency: KDOT Bureau of Transportation Planning, Bureau of Transportation Safety & Technology
- Target date: 2021
- Output: improved accuracy and completion of roadway inventory data
- Outcome: better decision-making when determining where and how to spend limited safety funding

Strategy 4: Use safety management process tools such as Safety Analyst to couple data analysis with engineering solutions.

In addition to its ability to scan the highway system for crash “hot spots” through the Network Screening Tool, Safety Analyst can use statistical techniques to perform detailed crash analysis and recommend possible engineering countermeasures for specific locations. Safety Analyst can be used to:
View detailed site analysis summarizing crash patterns and overrepresented crash variables
View diagnoses that recommend engineering countermeasures
Suggest cost/benefit appraisals of proposed countermeasures
Suggest project prioritization

- Method of implementation: purchase
- Program: operating budget
- Cost: \$35,000 annually
- Lead agency: KDOT, Traffic Safety Section
- Target date: annual
- Output: application of best available safety science to State Highway System
- Outcome: identification of projects with highest potential for safety improvements

Strategy 5: Revise official Kansas Motor Vehicle Crash Report form based on the Model Minimum Uniform Crash Criteria (MMUCC).

MMUCC is the national standard in coding all motor-vehicle crashes. The Crash Data Unit at KDOT will be revising the Kansas Motor Vehicle Crash Report form in the next five years and will be working closely with the law enforcement agencies to improve the flow of the form.

- Method of implementation: project

- Program: NHTSA
- Cost: \$10,000
- Lead agency: KDOT Traffic Safety Section
- Target date: for use beginning January 1, 2024
- Output: new crash report form for use by law enforcement
- Outcome: compliance with the Model Minimum Uniform Crash Criteria (MMUCC) fulfilling crash data element needs

Strategy 6: Replace the Traffic Records System (TRS) and the KCARS crash database with a new portal and database.

The current portal and database for processing, storing, and using crash data are outdated and lacks the ability to upgrade for better efficiencies. The Traffic Safety Section in combination with the Crash Data Unit is in the works to completely replace the TRS portal and KCARS database with a new system. This system is suspected to improve crash coding from officers, increase the speed of availability of crash data, improve internal processing, and to allow law enforcement to submit crash data electronically.

- Method of implementation: project
- Program: NHTSA
- Cost: \$500,000
- Lead agency: KDOT Traffic Safety Section
- Target date: January 1, 2022
- Output: new crash portal, integrated query tools, database, integrated training, and coding guidance
- Outcome: increased electronic crash reporting, improved coding, accurate, complete timely information, and simplified data output; ability to connect to other systems

Strategy 7: Create processes to monitor changes in roadway data sources

The geocoding of crashes and reference of roadway data to crashes depends on the state having the roadway information from NextGen 911 road centerlines and municipal boundaries, and KDOT having the roadway in the Khub linear-referencing system (LRS). This strategy will involve development of an interface between Khub data and NextGen 911 data, so that when new local roads are built KDOT has the road inventory in the LRS in a timely manner, and when KDOT reconstructs highways, the new location information is available to NG911 for incorporation into their data in a timely manner.

- Method of implementation: project
- Program: TBD
- Cost: \$100,000 (portion of)
- Lead agency: KDOT Bureau of Transportation Planning
- Target date: development beginning of 2021 and then ongoing
- Output: accurate HPMS and certified mileage
- Outcome: ability to locate crashes on every road; no underreporting leads to full share of federal funding

Strategy 8: Interface Crash Data with Khub

Khub is the official HPMS system with all public roads linear referencing system (LRS). Crashes must be referenced to the LRS by RouteID and Measure/Milepost, so that the data can be compared to traffic, roadway geometrics (such as curves, grades, lane configurations, shoulders), features (cable barriers, signs, traffic controls) or classifications (jurisdictions, functional class). The LRS is a key tool in preparing data for crash safety analysis and key performance indicator reporting.

- Method of implementation: project
- Program: NA
- Cost: none
- Lead agency: KDOT Bureau of Transportation Planning
- Target date: July 2021
- Output: data for safety management software and tools
- Outcome: improved reporting and analysis