

2009

**Kansas Strategic
Highway Safety Plan**

INTRODUCTION



Introduction

Why Plan?

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

By *coordinated*, we mean that many agencies staffed by people with a variety of skills take part – including engineers, planners, educators, persuaders, law enforcers, medical care providers.

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 outside of that system.

On average, 2,200 people die, or suffer disabling injuries in crashes, on those roads each year.

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

In the word “accidents,” there’s an insinuation that such events are unavoidable. They’re not.

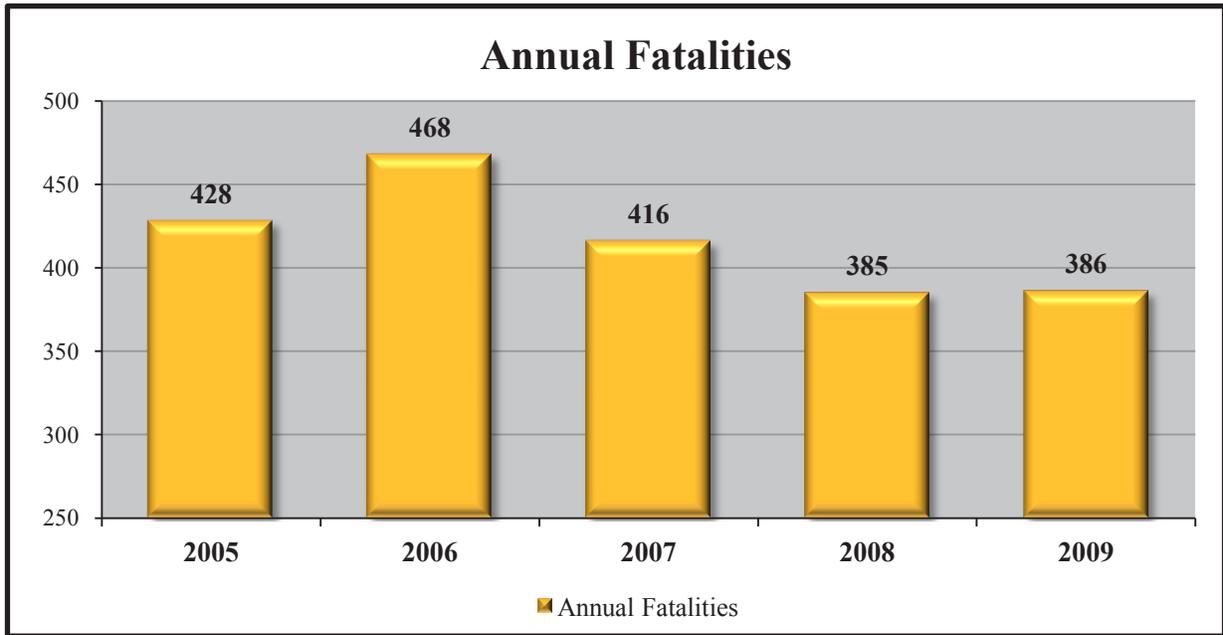
Their number can be – must be – reduced.

Traffic Crashes: Down but Not Out

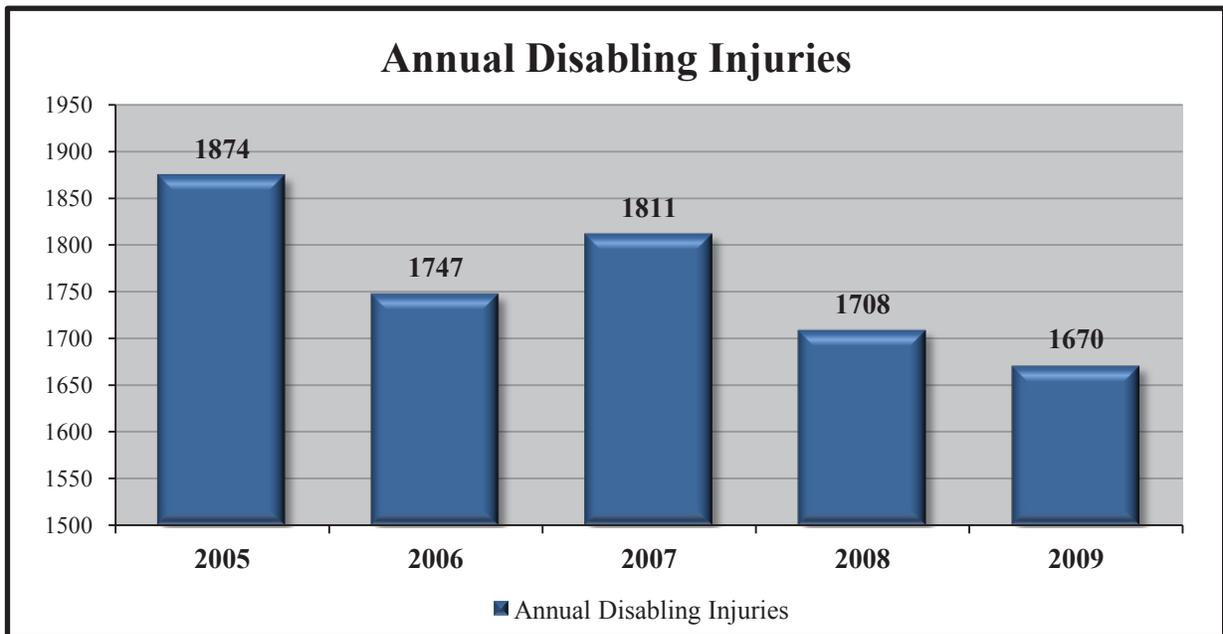
The number of fatal crashes has fallen in recent years, both in Kansas and the nation. The fatality *rate*, the number of fatalities per mile driven, has also dropped. Part of the credit for the decline belongs to highway departments. They’ve worked for decades to make roadways safer, installing rumble strips to keep drivers in their lanes and engineering shoulders and adjacent spaces for those who leave it. Part of the credit goes to vehicle manufacturers and their introduction of such advances as air bags, safety belts and anti-lock brakes. Finally, drivers themselves have taken more personal responsibility. More are buckling up and fewer are driving drunk.

Yet this stark fact remains: Between 2005 and 2009 in Kansas, 2,083 people took the last drive of their lives.

Highway safety begins with everyone, but ends with the driver.



On average, in Kansas, 417 people a year died in crashes between 2005 and 2009.



On average, 1,762 people a year suffered permanent or temporary disability in Kansas road crashes.

The effects of the nearly 2,200 people a year who were disabled 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, or 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, Gov. 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 Secretary of Transportation Deb Miller, Kansas Highway Patrol Col. William Seck 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 and formulated a three-year plan to implement recommendations related to 11 crash causes it had identified.

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.

- ❖ A booster seat bill became law in 2006. 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.
- ❖ In 2009, passage of a graduated driver's license law which may help reduce the risks for teenagers learning to drive.
- ❖ In 2010, the passage of a primary seat belt law allowed law enforcement officials to stop cars in which occupants aren't buckled up, without needing another cause to pull these vehicles over. Fortunately, the number of Kansans buckling up had already risen from 61 percent in 2001 to 82 percent in 2010.
- ❖ In 2010, a texting law made 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 1: 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 that fatalities would not exceed 400 in 2008 or 365 in 2010, that 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 the following:

- ❖ impaired driving because of alcohol or drugs,
- ❖ occupant protection (use of seatbelts and child safety seats),
- ❖ lane departure (crossing the center line or going off the shoulder),
- ❖ intersections,

- ❖ inexperienced/novice/teen drivers and
- ❖ 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. The reasons for this can’t be known, but one explanation may be that the strategies in that plan weren’t prioritized and their implementation wasn’t mapped out.

Three years later, a new planning process began.

SHSP 2: 2009

A newly constituted Kansas Executive Safety Council, or ESC, first met on May 14, 2009. It comprised 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, or KDOT, and Jim Hanni, of the Automobile Association of America, are co-chairs. A complete list of agencies and representatives can be found in the Process Chapter.

Transportation Secretary Miller attended the May meeting. She challenged the ESC to take charge of the new plan’s results and encouraged its participation in implementation. The ESC was to identify statewide goals and emphasis areas based on data and statistics; to recruit stakeholders to direct emphasis area teams and to serve on them; and to support implementation by the appropriate agencies of the strategies the teams developed.

At an ESC meeting on October 27, 2009, the SHSP mission, goal and vision were confirmed.

Mission

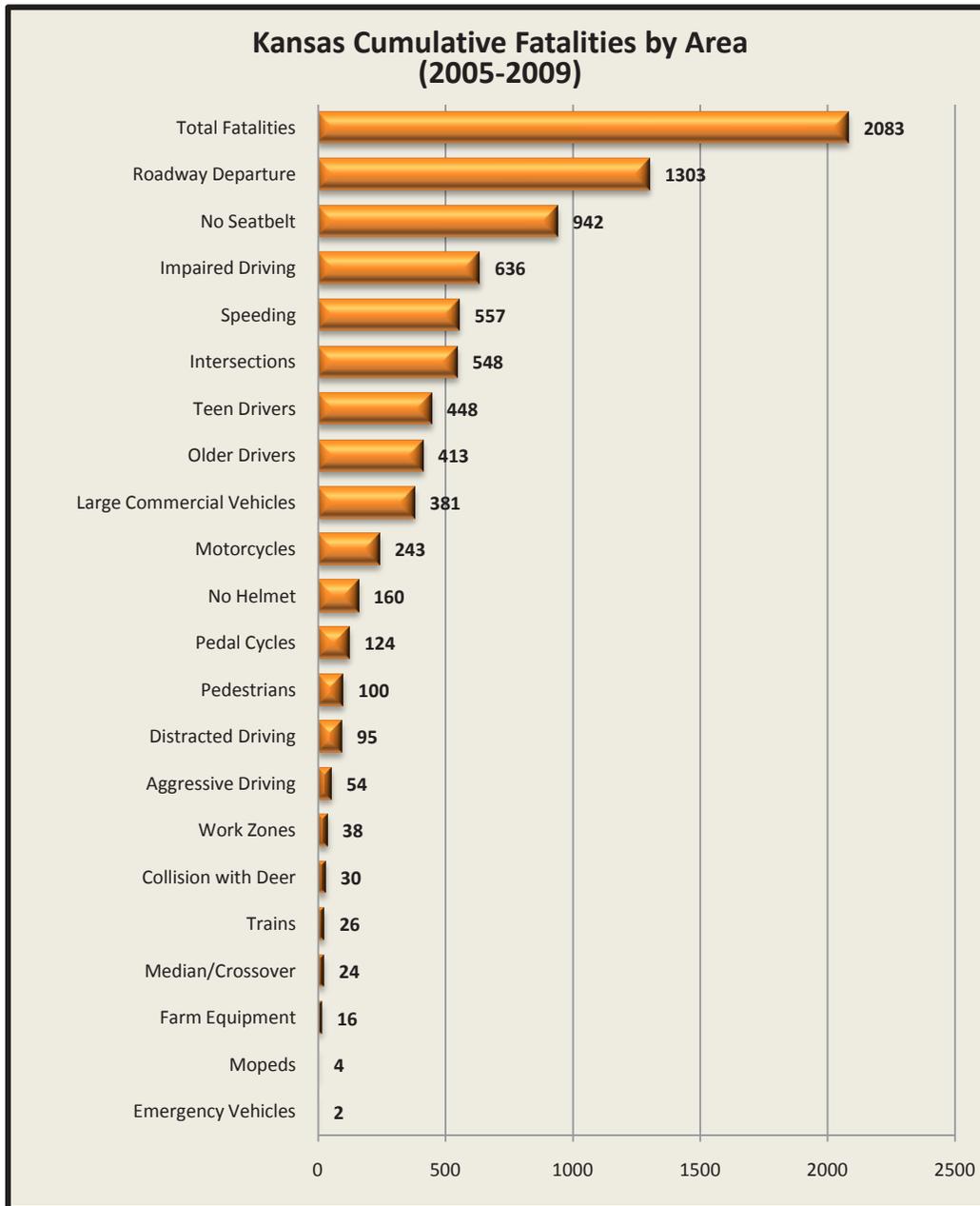
The mission of the Kansas SHSP is to drive strategic investments that reduce traveler casualties and the emotional and economic burdens of crashes, utilizing the 4E’s (education, enforcement, engineering and emergency medical services) in a collaborative process.

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

Strategic Investment

Kansas could make a wide range of investments in order to lessen fatalities and disabling injuries resulting from crashes. But the ESC chose to focus its investments. It decided to attend first to the variables most frequently involved in crashes that kill or disable drivers and passengers in Kansas. The chart below clarifies those variables.

- ❖ Roadway departure, such as when vehicles cross the centerline, was the leading cause of fatalities and disabling injuries from 2000 to 2009.
- ❖ Failure to use seatbelts was the second most frequent cause.
- ❖ Completing the list of the top five causes were these: drivers impaired by drugs or alcohol, speeding, and intersections



A variety of factors led to disabling injuries or fatalities in Kansas between 2005 and 2009. The total number of fatalities is less than the sum of the factors because crashes sometimes result from a combination. For example, a fatal crash at an intersection involving a teen driver who had failed to fasten her seatbelt would appear in three places on the chart.

The data led the ESC to designate three areas for attention and to appoint emphasis area teams to concentrate on each:

- ❖ Roadway Departure
- ❖ Occupant Protection
- ❖ Intersections

The ESC also focused on four other factors linked to serious crashes, designating them for attention as this document is updated.

- ❖ Impaired Driving
- ❖ Teen Drivers
- ❖ Large Commercial Vehicles
- ❖ Older Drivers

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 emphasis area teams with persons possessed of the requisite skills in the 4E’s. It also formed a support team to develop data that would support the work of the three teams. In addition the ESC is promoting the formation of regional safety coalitions statewide. These coalitions will be modeled after Destination Safe, a coalition in the Kansas City area (see Appendix D).

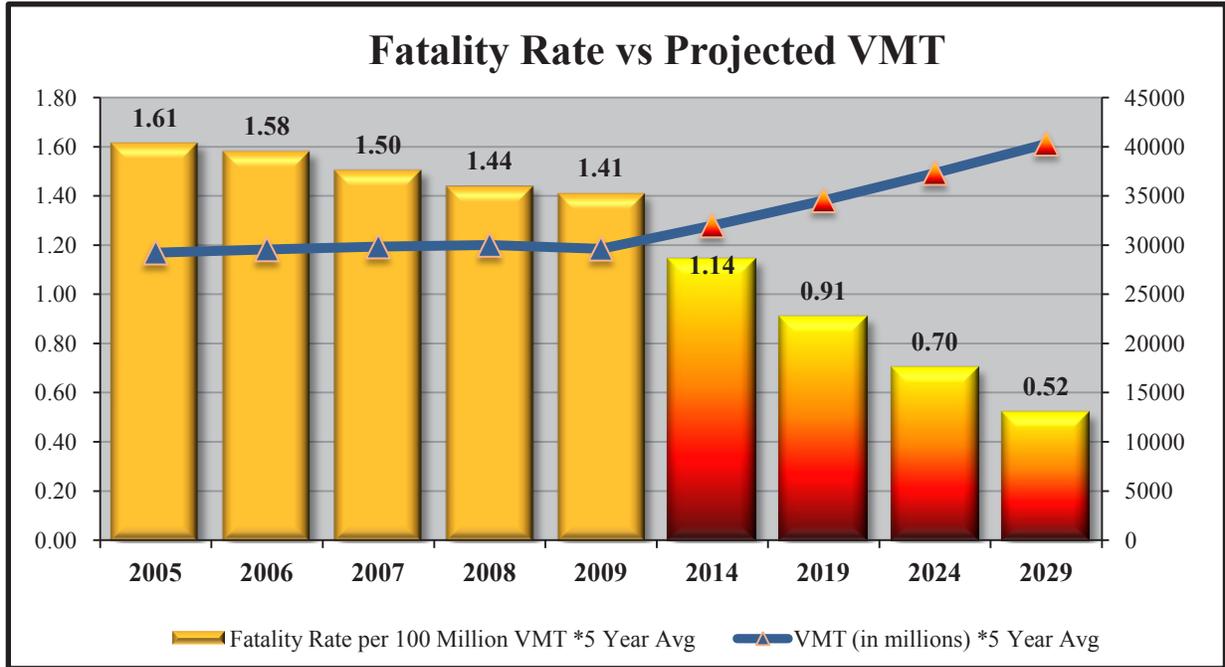
Besides the safety coalitions, Kansas has a number of organizations dedicated to research and training that can support SHSP implementation. A partial list of these organizations and description of their work appears in Appendix B.

Creating a safe transportation system can’t be purely a top-down or bottom-up proposition. Dialogue and partnering are mandatory, not elective. And given the unforeseeable shifts in future modes of transportation and energy sources, as well as other unknowns, it’s important to note that when we use the phrase “planning process,” the emphasis is on the second word as much as the first. This document will be available primarily on the Internet and updated periodically.

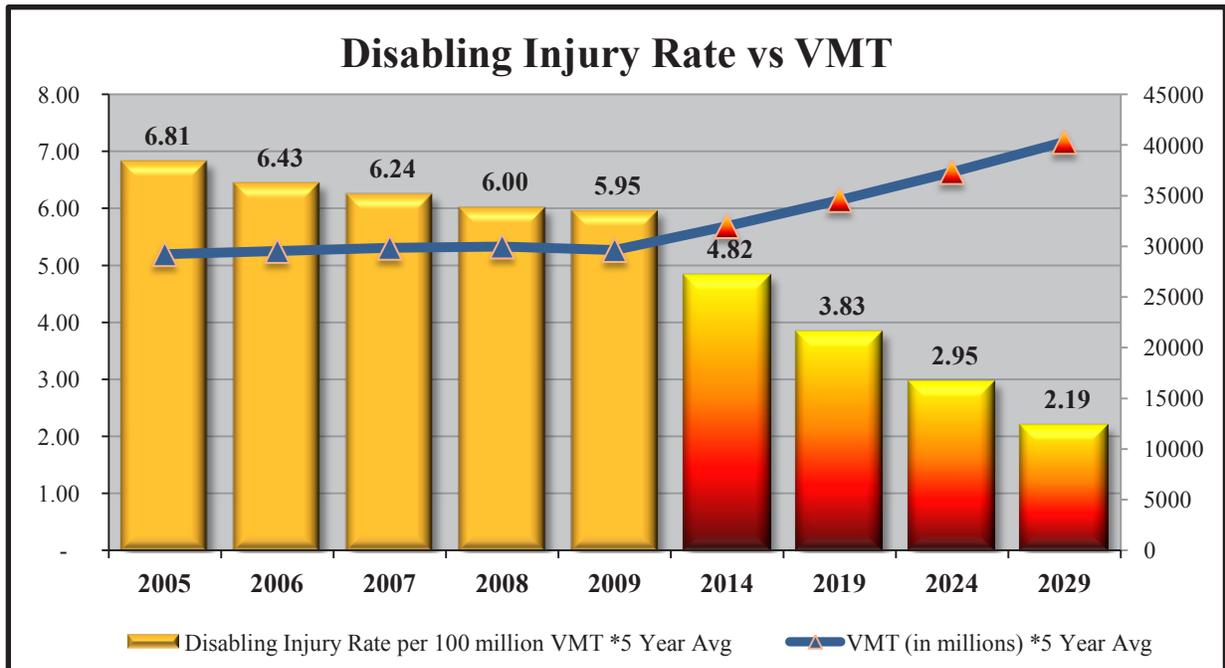
Goal: Cut Injuries and Deaths by Half

In October 2009, the ESC established this goal: to reduce fatalities and disabling injuries by half in 20 years (base period 2005 – 2009).

Cutting in half the five-year average of fatalities and injuries for 2005-2009 by 2025-2029 won’t be easy, given projected increases in traffic volume during the 20-year period. Those increases mean that for the goal to be met, the crash rate will have to be reduced by 63 percent, not 50 percent, during the 20 year period.



In 2009, the total of all miles driven within the state is estimated at just over 35 billion. If the vehicle miles traveled, or VMT, were unchanged over the next 20 years, cutting fatalities and disabling injuries in half would be a less daunting goal than it is given projected rises in VMT over that span.



Vision: 0 Losses

The executive committee's vision is that a day will come when no life will be lost, no person disabled, in a traffic crash. In its words:

Vision Zero — Every One Matters

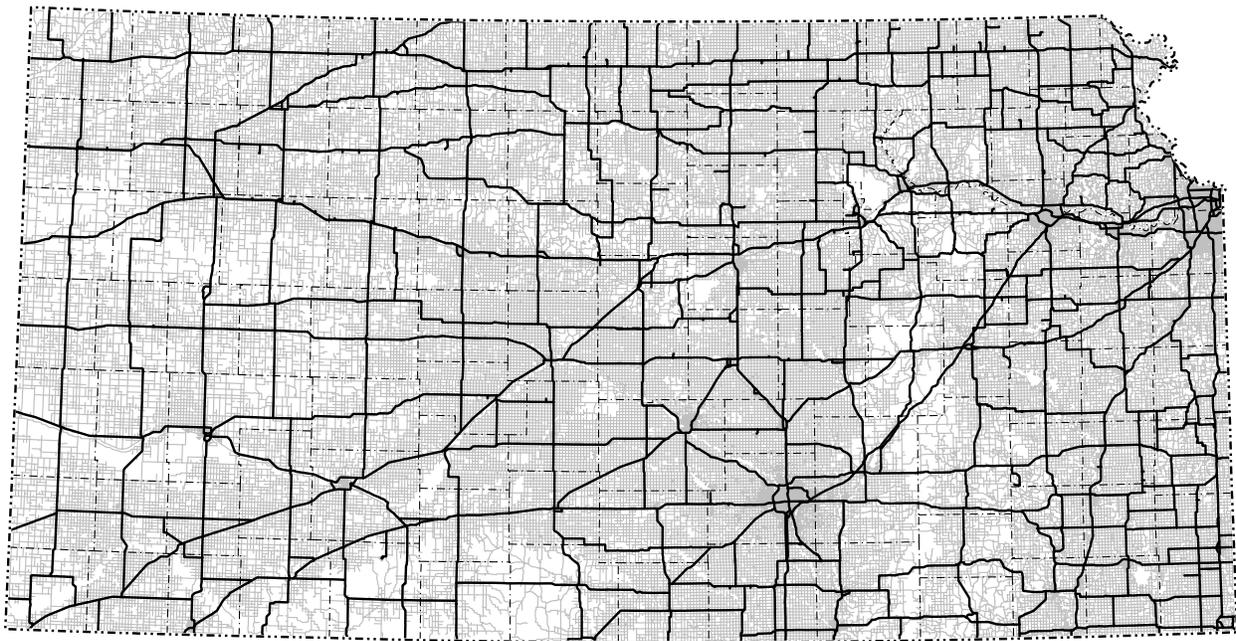
The Challenge of System Complexity

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

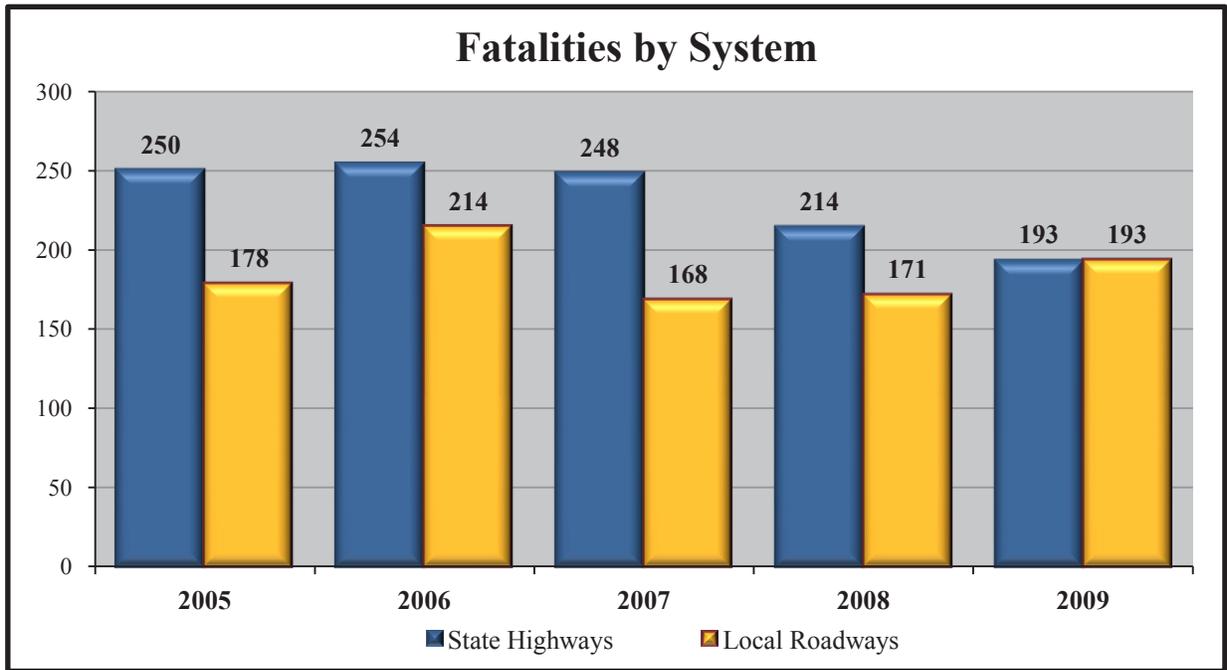
Moreover, there are streets, roads and highways classified and managed according to their function and their location in areas of greater or lesser population density. (For more details about this complexity, and about the contribution of various elements of the system to disabling and fatal crashes, see Appendix C.)

Another complication derives from the large impact of the relatively few miles of state highway. Constituting a mere 8 percent of the 140,000 total, they nevertheless carried 43 percent of all the state's traffic from 2005 to 2009. More crucially, they accounted for 49 percent of all the disabling injuries and 57 percent of the fatalities.

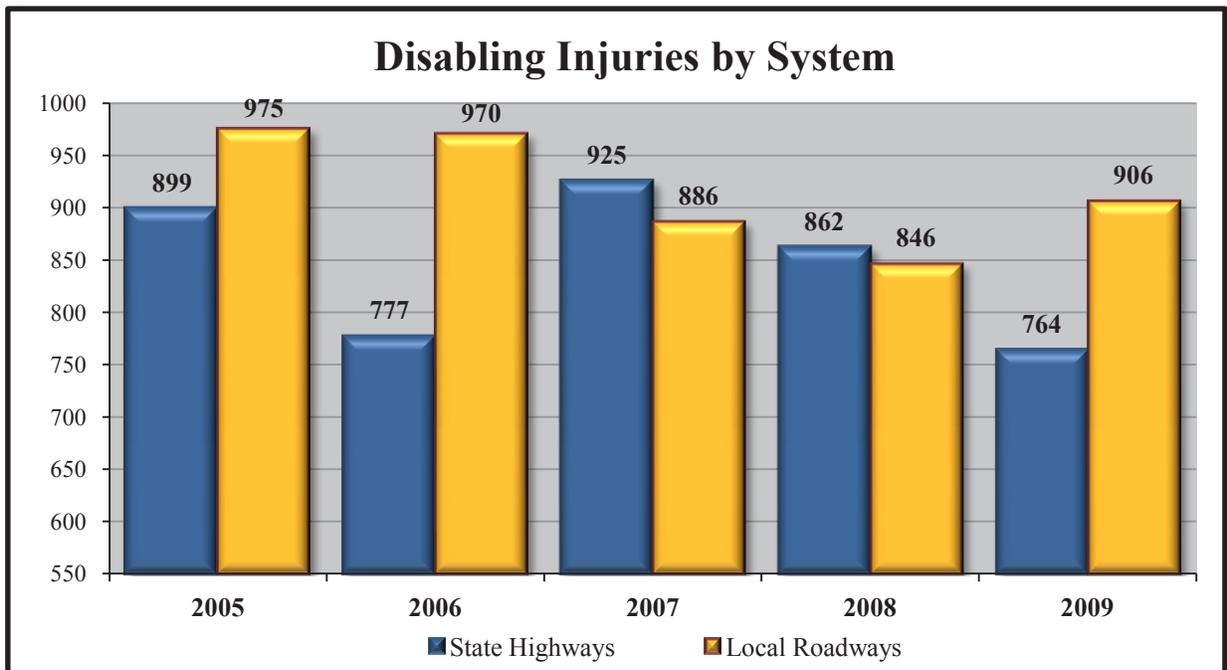
Yet if we were to focus attention largely on the state highway system, what would happen to crash totals on the 130,000 miles of non-state roads? A lack of focus on those roads – where 43 percent of all fatalities and 51 percent of all disabling injuries occur – would be shortsighted.



This map shows every rural public road in the state, including state highways, county highways, and township roads. City streets are not shown due to scale. If a picture is worth a thousand words, this one is worth about 140,000 miles.



These tables show the relative contributions of state highways and local roadways to disabling injuries and fatalities between 2005 and 2009.



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. 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 2 foot turf shoulders into full-width paved shoulders; at other times it lends itself to such inexpensive improvements as centerline rumble strips.

Managing safety off-system is more difficult given that there are more owners 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 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 the goal of halving the number of fatal and disabling crashes 20 years from now.

Discussion of the three emphasis areas – occupant protection, roadway departure and intersections – is presented separately in the chapters ahead.

Each chapter begins with an introduction to the emphasis area and relevant data. Next comes a statement of the desired outcome or outcomes in the emphasis area. Each outcome is supported by a strategy or strategies. "Current" strategies are now in place and will continue. "New" strategies are research-based innovations for which there is an action plan; these may be entirely new or revisions of current strategies. "Future" strategies are ideas we believe merit further consideration.

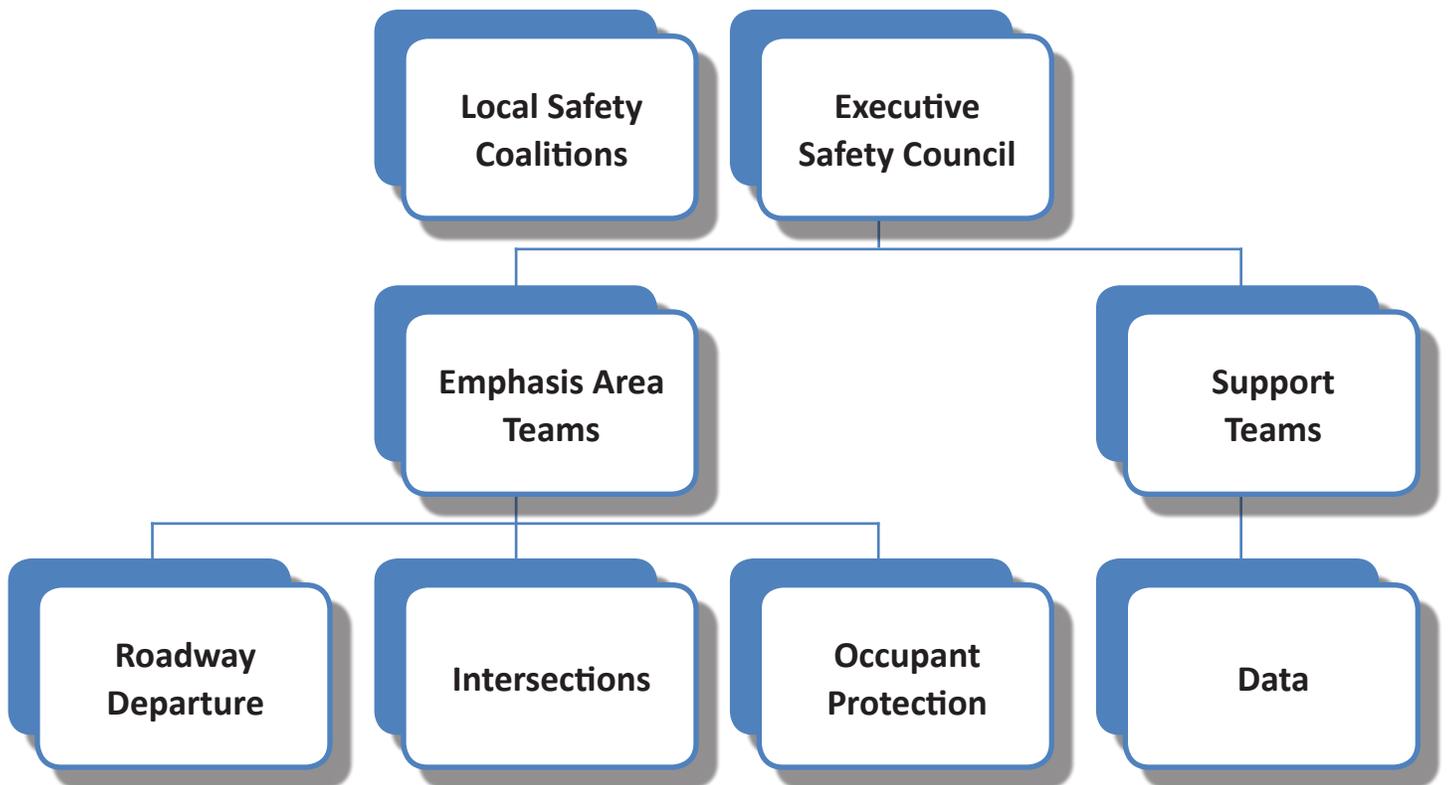
Within the discussions of strategies, readers will find reference to some or all of the following:

- ❖ background
- ❖ method of implementation: program, project, policy/practice, research, training or other
- ❖ costs
- ❖ performance measures
- ❖ lead agency and contact
- ❖ challenges
- ❖ target date

As mentioned earlier, a data support team has been formed to assist the emphasis area teams. The Data Support Chapter focuses on its work. Finally, in the chapter on “Partners Roles and Processes,” a flow chart shows the groups formed to help conceive and enact this plan, and the work of each is summarized. We anticipate future changes in this flow chart, including, for example, the addition of support teams focused on local roads and on education.

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.

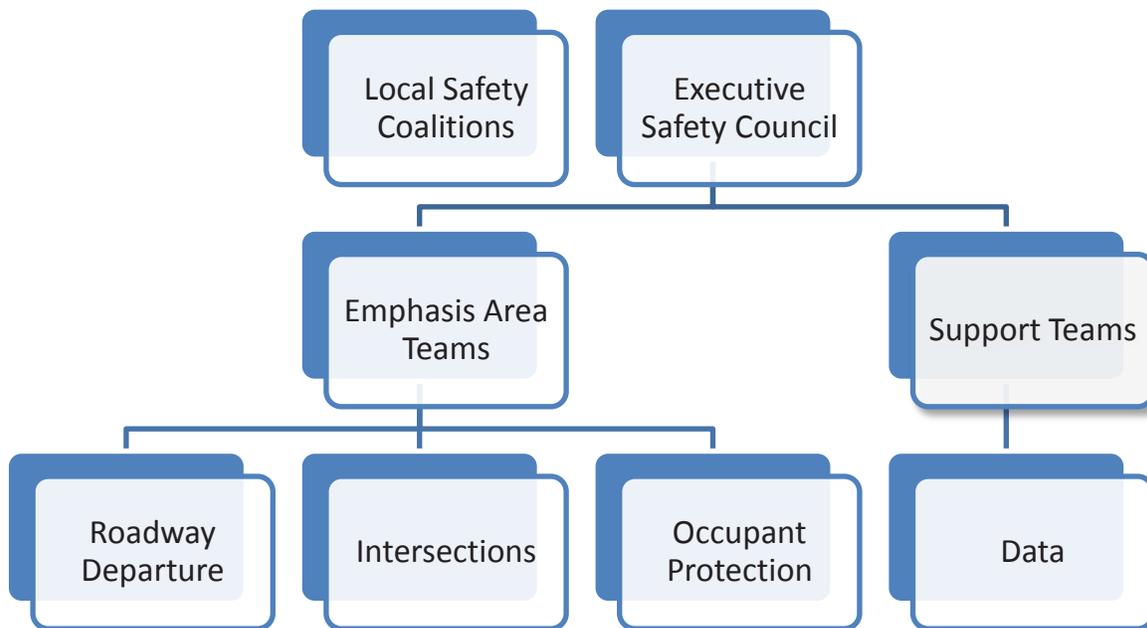
PARTNERS, ROLES AND PROCESSES



Partners, Roles and Processes

Overview

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. This chapter focuses on the role of the groups that appear in the flow chart below.



Executive Safety Council

The Executive Safety Council, or 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.

The ESC will

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

The ESC currently comprises 18 agencies and their representatives.

- ❖ Kansas Department of Transportation, Pete Bodyk and Mike Floberg
- ❖ Federal Highway Administration, Mike Bowen
- ❖ Kansas Association of Counties, Norm Bowers
- ❖ National Highway Traffic Safety Administration, Romell Cooks
- ❖ AAA Allied Group, Jim Hanni
- ❖ LTAP Center at the University of Kansas, Lisa Harris
- ❖ Stormont-Vail Trauma Services, Scott Harrison
- ❖ Mid America Regional Council, Mell Henderson
- ❖ Kansas Association of Chiefs of Police, Ed Klumpp
- ❖ Kansas Department of Revenue, Terry Mitchell
- ❖ The League of Kansas Municipalities, Don Moler
- ❖ Kansas Department of Health and Environment, Rosanne Rutkowski
- ❖ Kansas Legislature, Sen. Vicki Schmidt
- ❖ American Traffic Safety Services Association, Kevin Shelton
- ❖ Federal Motor Carrier Safety Administration, Max Strathman
- ❖ Kansas Motor Carriers Association, Tom Whitaker
- ❖ Kansas Emergency Nurses Association, Darlene Whitlock
- ❖ Kansas Highway Patrol, Art Wilburn

The ESC meets four times a year, generally on the second Thursday of February, May, August and November. 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

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

These groups will meet four times a year on dates agreed to by their members.

Emphasis Areas

Every crash touches many lives. Yet the ESC realized that it couldn't focus equal attention on every potential source of crashes. Instead, it focused on those circumstances and conditions that kill or disable the largest numbers of drivers and riders. It 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 Measures	Seat Belts
	Helmets
Demographic	Teen Drivers
	Older Drivers
Crash Types	Intersections
	Roadway Departure
	Median/Crossover
	Collision with Deer
	Pedestrians
	Work Zones
Vehicle Type	Large Commercial Vehicles
	Motorcycles
	Trains
	Farm Equipment
	Emergency Vehicles
	Mopeds
	Pedal Cycles

The ESC decided that emphasis area teams should focus on three crash variables linked to large numbers of fatalities and disabling injuries: roadway departure, occupant protection and intersections. In addition, the ESC designated four other areas for attention as this document is updated: impaired driving, teen drivers, large commercial vehicles and older drivers.

Support Teams

In addition to the emphasis area teams, several support teams will report to the ESC. A data support team has been established, and two other teams – focused on education and locally owned roads – will be added in the future.

The support teams will function in the same way as the emphasis area teams, selecting strategies, developing performance measures 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.

More detail about the work of the support teams appears in the emphasis area chapters. They will meet four times a year on dates agreed to by their members.

Regional/Local Safety Coalitions

Safety coalitions will be organized to represent the state's regions. They will promote communication among local transportation safety partners as they develop and implement regional traffic safety plans. One regional coalition, Destination Safe, has already been established (see Appendix D, Safety in Numbers.)

The regional coalitions will:

- ❖ analyze data to identify regional 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,
- ❖ administer a state-funded Traffic Safety Fund used to support the goals of local traffic safety plans,
- ❖ promote access by local decision makers to KDOT crash data to help in the identification of roads with high crash rates for possible safety improvements,
- ❖ recommend systemic safety improvements that are eligible for High Risk Rural Roads Program funding or moneys from other sources and
- ❖ promote timely and relevant safety training for 4E personnel at the local level.

Annual Revision

The reality of change demands flexibility. Therefore, the SHSP will be updated annually under ESC guidance. Resources may be reallocated in response to change, for example, in state or federal transportation laws and funding. The annual update should take into account the following factors:

- ❖ a review of fatal and disabling injury crash data in the KDOT database from the previous five calendar years,
- ❖ a report from each emphasis area team on the measurable results of the implementation of strategies,
- ❖ a report from each support team on the progress toward implementation of specific strategies and related performance measures and
- ❖ a report from each regional safety coalition on the impact of safety spending (if applicable) on local performance measures.

DATA SUPPORT

THE DATA TEAM

MARC

KANSAS DEPT. OF HEALTH AND ENVIRONMENT

**NATIONAL HIGHWAY TRAFFIC
SAFETY ADMINISTRATION**

KANSAS DEPT. OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

AAA ALLIED GROUP

Data

Introduction

Good crash data are the backbone of road safety management. According to the American Association of State Highway and Transportation Officials, or 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 and the Executive Safety Council, or 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 other emphasis area teams,
- ❖ assist ESC in identifying data gaps, collection and reporting weaknesses,
- ❖ assist in deciding whether a need exists for additional emphasis area teams and
- ❖ collect data from different agencies represented on the ESC.

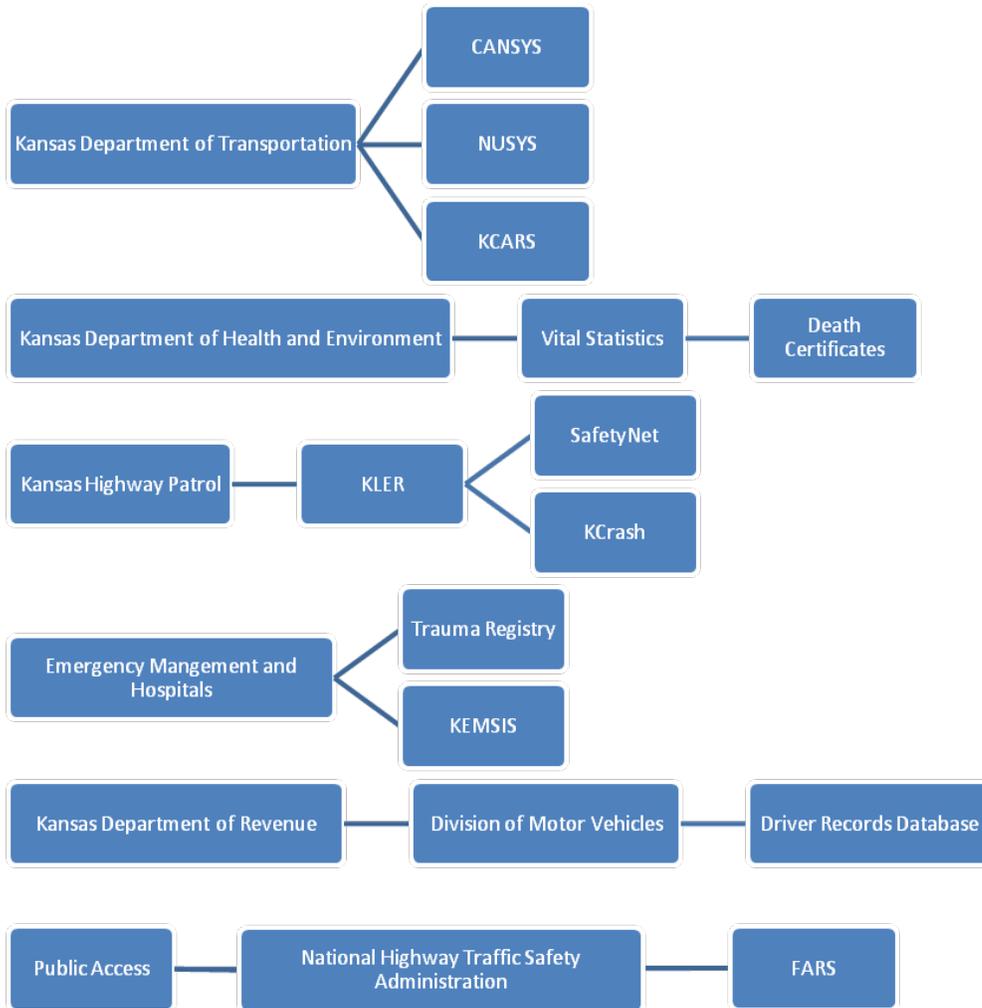
The data team was created not only to assist in the mining and presentation of data on behalf of other emphasis area teams but also to develop performance measures, outcomes and strategies specific to data collection, storage, analysis and reporting.

The team, which first met June 15, 2009, is represented by the following agencies:

- ❖ AAA Allied Group (AAA)
- ❖ Mid-America Regional Council (MARC)
- ❖ Federal Highway Administration (FHWA)
- ❖ National Highway Traffic Safety Administration (NHTSA)
- ❖ Kansas Department of Health and Environment (KDHE)
- ❖ Kansas Department of Transportation (KDOT)
- ❖ Wichita Area Metropolitan Planning Organization (WAMPO)

Data Collection and Storage

To address highway safety problems requires data of all sorts. There are roads of many kinds with twists and turns, rises and falls. There is an array of vehicles used by drivers young and old, drunk and sober, some with cell phones, some texting, some speeding, some fully attentive. Those who design, construct and maintain the infrastructure work to make it safe. Law enforcement works at managing those who use the infrastructure and emergency services – and are called on when crashes occur. So “crash data” include roadway geometrics, vehicles, drivers, injuries and fatalities, emergency management and more. Because of the complexity of data and the need to keep it secure, it is housed in databases maintained by various agencies. The graphic below reflects this.



Below are thumbnail sketches of these data sources.

❖ **CANSYS** - State Highway Network Data

This KDOT database contains information about the geometrics, condition and extent of the 10,000-plus miles of road in the state highway system, as well as a small percentage of off state system local roadways. It contains data on bridges, access permits and at-grade rail crossings and supports the work of various bureaus at KDOT, as well as of the FHWA and Kansas Legislature. CANSYS is maintained by the KDOT Geometric and Accident Data Unit, or GAD.

❖ **NUSYS** - Non-State Classified Network Data

This KDOT database contains information about roads classified as collector and above within the 40 areas in Kansas designated as urban by the U.S. Census Bureau. NUSYS is a central repository of geometric inventory information on off state system local roadways and is used to produce required federal reports. It provides answers to questions posed by the FHWA, Kansas Legislature, KDOT management and employees, and other state agencies. NUSYS is also maintained by GAD.

❖ **KCARS** - Kansas Crash & Analysis Reporting System

KCARS contains records of all reportable crashes in Kansas from 1990 to the present. The data in KCARS are provided to KDOT by law enforcement agencies. The data includes any field that is listed on the Kansas Motor Vehicle Accident Report and recorded by law enforcement. Like CANSYS and NUSYS, KCARS is maintained by GAD and provides answers to questions posed by the FHWA, Kansas Legislature, KDOT management and employees and other state agencies.

❖ **Vital Statistics** - Death Certificates

The Office of Vital Statistics within the KDHE supplies KDOT, at KDOT's request, with records that permit the coding of fatal crashes. The information helps researchers understand the cause and nature of injuries suffered in crashes, and the time that elapses between injury and death. To query vital statistic data go to: <http://kic.kdhe.state.ks.us/kic/death.html>

❖ **Driver Records**

The Driver Records database is hosted by the Kansas Department of Revenue Division of Motor Vehicles (DMV). It contains the records of all licensed drivers in Kansas. The file depends on many sources. For example, KDOT provides crash records to the database and the court system supplies adjudication information. At this writing, the DMV was revising the database. When the database is finished it will provide those interested in traffic safety with a more complete picture of specific drivers. It is anticipated that this information will improve public safety and maximize the impact of traffic-safety resources.

❖ **eCitations** - Statewide Electronic Traffic Citations Program

The Kansas Criminal Justice Information System (KCJIS) and the Kansas Traffic Records Coordinating Committee (TRCC) have identified the

Traditionally, traffic record data have been housed in isolated repositories. However, in June 2005, an interagency committee, the Traffic Records Coordinating Committee, or TRCC, began developing a statewide traffic records system. The statewide traffic records system will allow state and local agencies to access data by bringing together information that is now housed in KDOT, KDHE, the Kansas Department of Revenue, or KDOR, the Kansas Bureau of Investigation, or KBI and the Kansas Board of Emergency Medical Services, or KBEMS. The result will be a more complete picture of traffic safety in Kansas.

The data team would like to work with the TRCC to promote and expand use of:

- The Kansas Law Enforcement Reporting System, or KLER
- The Electronic Traffic Citation Program, or eCitations
- The Report and Police Impaired Drivers System, or RAPID

Each of these systems are discussed in more detail throughout the plan.

need for a design and plan for implementing a statewide electronic traffic citations program; commonly referred to as “eCitations”.

Electronic Traffic Citations, or eCitations, are the way of the future for the issuance of traffic citations, the storage of related information, and the dissemination to numerous authorized users. It contemplates a near-paperless, seamless process from the time of the traffic stop through court disposition of the traffic citation. Briefly, the law enforcement officer making the stop records information on the driver and the driver’s vehicle, either through a scanner or manually, into a laptop or handheld computer. Driver and vehicle information is uploaded (populated) into a citation form on the officer’s computer, either from information scanned from the barcodes and/or magnetic stripes on the driver’s license and vehicle registration or an external source such as the KDOT/KDMV, KBI, or NCIC. Time and location information can be imputed through the use of drop down menus, search words, or automatically populated from GPS or other location software. Officer and court information can be populated into the citation automatically from defaults pre-set by the officer at the start of the officer’s shift. This leaves only a few pieces of information to be entered by the officer, such as the violation(s), code number(s), and fine amount(s).

An eCitation system provides a multitude of benefits to each of the agencies identified above and to the public at large including decreasing the time of traffic stops and issuance of traffic tickets, increasing the accuracy of the data collected, eliminating the need for the LEAs, the Courts, and the Prosecutors’ offices to each enter the same citation data into their RMSs, and the automatic collection and analysis of data used to improve public safety and the roadways.

❖ **RAPID** - Report and Police Impaired Drivers

In 2009, the Kansas DUI Commission, a multi-disciplinary state commission tasked with studying driving under the influence (DUI), recommended the creation of a tracking system to consolidate access to an offender’s DUI history as well as modifications to existing systems to facilitate this tracking.

The goal of the system to Report and Police Impaired Drivers (RAPID), is to enhance available data sharing mechanisms and make improvements enabling a better and more efficient process for prosecutors, courts and law enforcement to prosecute and track DUI offenders from arrest through prosecution, sentencing, probation and monitoring. This system must leverage existing criminal history repositories at Kansas Bureau of Investigation (KBI), resources available in the Kansas Criminal Justice Information System (KCJIS), and other existing state repositories to deploy a secure web-based system for improving DUI prosecution in the state of Kansas.

❖ **KLER** - Kansas Law Enforcement Reporting System

The Kansas Highway Patrol (KHP) developed KLER, a field-based reporting system, which incorporates data from more than 15 reports, including KDOT crash forms, KBI incident forms and KDOR insurance forms. Law-enforcement officials use it to complete and view critical records on mobile laptop computers in their cars during traffic and crash stops. Eventually, KLER will include in its records a new statewide uniform traffic e-citation system. To learn more about the KLER System and its benefits, go to <http://portal.kstrs.org/Shared%20Pages/KLER.aspx>

The SHSP data support team would like to work with the TRCC in promoting and expanding use of KLER. The expansion would require additional training and education for law enforcement officers and administrators emphasizing the importance of electronic crash reporting.

❖ **SafetyNet** and **KCrash**

The KHP maintains SafetyNet and KCrash for federal reporting purposes and state use. KHP supplies data on inspections and collisions to SafetyNet. SafetyNet was developed, and is supported, by the Federal Motor Carrier Safety Administration (FMCSA). The KHP is the lead agency for state participation in the Motor Carrier Safety Assistance Program, which focuses on roadside inspections. The KHP is also required to document federally reportable collisions. There are three criteria for these: a fatality involving a commercial motor vehicle (CMV); an injury collision involving a CMV that requires immediate medical attention away from the scene; or a collision with a CMV resulting in disabling property damage to at least one unit.

The KCrash program has accelerated the filing of collision reports with FMCSA. It facilitates the electronic filing of SafetyNet reports, in place of paper forms. The KHP receives electronic copies of all collision reports involving a CMV to determine whether they meet federal reporting requirements. Paper copies of collision reports involving a CMV are converted to an electronic format by KDOT. KCrash screens all state highway system crash reports in order to populate the required SafetyNet fields before they are forwarded to FMCSA.

❖ **Observational Seat Belt Survey and Observational Distracted Driving Survey**

Every year, KDOT Traffic Safety section and its partners collect data across the state on seatbelt usage rates and driver distraction rates.

Methodology of Adult Survey - based on the federal guidelines in the Uniform Criteria manual. The Kansas survey is now performed at 544 sites on 3 different road types in 35 randomly selected counties which encompass 85% of the population of Kansas. The survey is conducted in June and July. The 2011 survey observed more than 65,000 drivers and passengers.

Methodology of Child Survey - based on the guidelines used in the adult survey. The Kansas survey is performed at 350 sites where children are transported (i.e. day cares, department stores, elementary and middle schools) in 20 randomly selected counties which encompass 85% of the population of Kansas. The survey is conducted in March, April and May. The 2011 survey observed more than 19,000 children.

View the survey results here: <http://www.ksdot.org/burTrafficSaf/safblt/safbltusag.asp>

❖ **Trauma Registry**

The trauma registry system is organized to facilitate a multidisciplinary response to those who suffer trauma related injuries during car crashes or other events. The trauma registry houses data on trauma patients from all Kansas hospitals. The data guide systemic improvements that reduce morbidity and mortality related to traumatic events. Registry data are used by emergency medical service personnel, hospital staff and the KDHE staff to identify injury trends, prioritize needs, and implement and evaluate prevention strategies. For more information on KDHE's Trauma Program go to: <http://www.kstrauma.org/>

❖ **KEMSIS - The Kansas EMS Information System**

KEMSIS is data system that captures the condition of patients and the treatments they receive before they arrive at a hospital. KEMSIS is a voluntary reporting system whose elements mirror those in the National Emergency Medical Service Information System dataset. Services utilize this information for quality improvements, equipment decisions, staffing adjustments, unit locations and treatment modalities. The system also provides an electronic patient care report for hospitals. As of June 2010, 55 emergency medical services and 23 hospitals were filing reports with KEMSIS. For more information, go to: http://www.ksbems.org/ems/?page_id=1603

❖ **FARS - Fatality Analysis Reporting System**



DATA SUPPORT

FARS is a database funded by the NHTSA and open to the public on its website. It contains records of all fatal crashes in Kansas. To be included in FARS, a crash must involve a motor vehicle traveling on a trafficway customarily open to the public and result in the death of a vehicle occupant, or of a non-motorist, within 30 days of the crash. The FARS file contains descriptions of each fatal crash reported. Each case has more than 150 coded data elements that characterize the crash, the vehicles and the people involved. To view fatality data, go to <http://www-fars.nhtsa.dot.gov/Main/index.aspx>

The Five Percent Solution

KDOT's approach to reduce the number of fatal or disabling crashes is to start by identifying those stretches of roadways that produce the highest incidence of them.

In 2005, federal legislation, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, or SAFETEA-LU, created the Highway Safety Improvement Program, or HSIP. Its goal was to raise public awareness of highway safety needs and challenges and reduce fatalities and serious injuries. HSIP required Kansas, starting in 2007, to submit an annual report describing no less than 5 percent of its highway system that, according to crash data, was in the greatest need of safety improvement.

2012 Kansas Transparency "5%" Report																																																									
Page 2 Page 3-5 Page 6-9	Non-State Rural Routes Segments Intersections	<table border="1"> <thead> <tr> <th>County</th> <th>City</th> <th>Route</th> <th>Start Location County Reference Post</th> <th>End Location County Reference Post</th> <th>Location Description</th> <th>Site Type</th> </tr> </thead> <tbody> <tr> <td>Barton</td> <td>Great Bend</td> <td>US Highway 56</td> <td>13.302</td> <td>13.81</td> <td>US 56 (10th St) From McKinley St to Washington St</td> <td>Urban Multilane undivided</td> </tr> <tr> <td>Bourbon</td> <td>Fort Scott</td> <td>US Highway 69</td> <td>9.787</td> <td>10.063</td> <td>US 69 (S Main St) From 23rd St to W 19th St</td> <td>Urban Multilane undivided</td> </tr> <tr> <td>Butler</td> <td>El Dorado</td> <td>Kansas Highway 254</td> <td>15.447</td> <td>15.562</td> <td>K254 (W Central Ave) From Haverhill Rd to Oil Hill Rd</td> <td>Urban Multilane undivided</td> </tr> <tr> <td>Douglas</td> <td>Lawrence</td> <td>Kansas Highway 10</td> <td>10.007</td> <td>12.763</td> <td>K 10 (E 23rd St) From US 59 (Iowa St) to E 1575 Rd</td> <td>Urban Multilane undivided</td> </tr> <tr> <td>Douglas</td> <td>Lawrence</td> <td>US Highway 40</td> <td>12.969</td> <td>16.361</td> <td>US 40 (W 6th St) From Folks Rd to Vermont St</td> <td>Urban Multilane undivided</td> </tr> <tr> <td>Douglas</td> <td>Lawrence</td> <td>US Highway 59</td> <td>12.646</td> <td>16.304</td> <td>US 59 (Iowa St) through Lawrence From South Junction of K10 to US 40 (W 6th St)</td> <td>Urban Multilane undivided</td> </tr> </tbody> </table>	County	City	Route	Start Location County Reference Post	End Location County Reference Post	Location Description	Site Type	Barton	Great Bend	US Highway 56	13.302	13.81	US 56 (10th St) From McKinley St to Washington St	Urban Multilane undivided	Bourbon	Fort Scott	US Highway 69	9.787	10.063	US 69 (S Main St) From 23rd St to W 19th St	Urban Multilane undivided	Butler	El Dorado	Kansas Highway 254	15.447	15.562	K254 (W Central Ave) From Haverhill Rd to Oil Hill Rd	Urban Multilane undivided	Douglas	Lawrence	Kansas Highway 10	10.007	12.763	K 10 (E 23rd St) From US 59 (Iowa St) to E 1575 Rd	Urban Multilane undivided	Douglas	Lawrence	US Highway 40	12.969	16.361	US 40 (W 6th St) From Folks Rd to Vermont St	Urban Multilane undivided	Douglas	Lawrence	US Highway 59	12.646	16.304	US 59 (Iowa St) through Lawrence From South Junction of K10 to US 40 (W 6th St)	Urban Multilane undivided	<small>Protection from Discovery and Admission into Evidence—Under 23 any purpose directly relating to this report shall not be subject to discovery, proceeding or considered for other purposes in any action for damages addressed in the reports.</small>					
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For KDOT, this Report is more than just a federal requirement, but a useful list of locations across the state that can lead to further traffic studies, road safety audits, and even projects. This list is posted annually on the FHWA's website and shared with relevant roadway owners.

For the state's most recent Five Percent Report, issued in 2012, KDOT divided the Report into three sections, each with its own methodology and results: non-state rural routes, segments, and intersections (rural intersections, urban intersection & ramp terminal intersections). The final list includes 16 rural county routes, 84 miles from the state highway system, and 60 intersections.

To view the 2012 Five Percent Report, go to

<http://safety.fhwa.dot.gov/hsip/fivepercent/>

Data Analysis

Two tools are particularly useful for analyzing the data found in state and federal databases.

❖ *SafetyAnalyst*: Network Screening Tool

KDOT and 20 other state transportation departments pooled funds to develop *SafetyAnalyst*, a software that can analyze safety data. KDOT and many of its peers are now in the process of implementing the software, which includes a network screening tool, diagnosis tool, countermeasure selection and evaluation tools, economic appraisal tool and priority ranking tool.

The Network Screening Tool identifies sites with potential for safety improvement. Network-screening algorithms are used to identify locations of the following types of sites with potential for safety improvement:

- Sites with higher-than-expected accident frequencies which may indicate the presence of safety concerns that are potentially correctable in a cost-effective manner, and
- Sites whose accident frequencies are not higher than expected, given the traffic volumes and other characteristics present at the site, but which nevertheless experience sufficient numbers of accidents that may potentially be improved in a cost-effective manner.

In addition, the network screening tool can identify sites with high accident severities and with high proportions of specific accident or collision types. The network screening algorithms focus on identifying spot locations and short roadway segments with potential for safety improvement, but also include the capability to identify extended route segments. Network screening and all other *SafetyAnalyst* algorithms can consider specific accident severity levels (fatalities and serious injuries, fatalities and all injuries, property-damage-only) or all severity levels combined.

At this time, *SafetyAnalyst* can only analyze safety data for the 10,000-plus miles in the state highway system.

❖ Local Roadway Analysis

This is a method for discovering stretches of road off the state highway system with high crash rates.

KCARS supplies the data, and KDOT uses an analytical method that's compatible with the data available. The method has allowed it to rank counties in terms of the number of crashes from 2007 to 2011 on the three rural functional classifications of road outside the state highway system.

Barriers to a fine-grained analysis of crashes on local roads come from incomplete or inconsistent data. Mapping a crash location requires one of two data points: a linear referencing system (LRS) location or a latitude and longitude. KDOT is responsible for 10,000 miles of state highway. The

state system's crash records include LRS data. Many of the 130,000 miles of local roads managed by individual cities, counties and townships lack locational data because they have neither county mile posts nor a geo-coded road inventory.

This results in analytical challenges.

- ❖ For the local roads that do not have a local referencing system, KDOT must assign each crash a latitude and longitude manually.
- ❖ Through the years, many off-system roads have accumulated multiple names. Different agencies and local residents refer to roads by different names. New roads are added every year, and it's a challenge to maintain a complete inventory.

Despite these barriers, KDOT is producing a list of potential sites for improvement for the annual Five Percent Report: <http://safety.fhwa.dot.gov/hsip/fivepercent/>

Goals and Strategies

The data support team has chosen five goals as the focus of its efforts. It seeks to

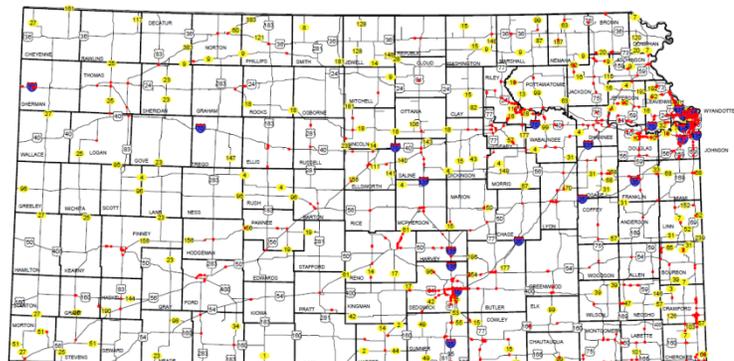
1. Coordinate the Data Needs of the Kansas Strategic Highway Safety Plan
2. Improve data analysis capability to better inform decision makers
3. Train those who create, input and utilize crash data
4. Map all crashes statewide using GIS tools
5. Systematic Reporting

The challenge is to identify the strategies that will have the greatest impact on improving the availability, accuracy, and efficiency of data and data analysis.

Goal 1: Coordinate the Data Needs of the Kansas Strategic Highway Safety Plan

New Strategy:

- ❖ Identify and analyze outstanding variables related to crashes that occur away from intersections and don't involve animals, using the Kansas 2010 Five Percent Report
 - ❖ Background: KDOT is required by SAFETEA-LU to report annually on the top five percent of state highway miles linked to fatal or serious injury crashes. When the reports from 2007 through 2010, each referencing 1,500 locations, were compared, about 700 locations recurred. Of these 700, 146 do not include an intersection. The crashes at those 146 locations may have resulted from roadway departure. Plans are to analyze those crashes to see whether that's true.
 - ❖ Method: research
 - ❖ Costs: none
 - ❖ Lead agency and contact: KDOT, Highway Safety Unit
 - ❖ Challenges: securing accurate and timely data
 - ❖ Target date: ongoing



Future Strategies:

- ❖ Link crash data to the trauma registry
- ❖ Pursue implementation of a Crash Outcome Data Evaluation System
- ❖ Develop a tool that helps local jurisdictions and regional safety coalitions to access and analyze crash data
- ❖ Develop a methodology to identify high-frequency crash corridors on local roadways

Goal 2: Improve data analysis capability to better inform decision makers

New Strategies:

- ❖ Create an intersection inventory to support crash analysis
 - ❖ Background: The FHWA defines an intersection as “a planned point of conflict in the roadway system.” A quarter of all crash fatalities in Kansas occur at intersections, but there is too little data on existing intersections. One problem is that there’s no identification system for individual intersections. Creating unique identifiers for intersections would allow better crash reporting and data collection.

The only intersections we have reliably identified and coded are system to system intersections, such as where one state highway intersects another. GIS allows the mapping of intersections, but that information can’t be integrated with other data without a linear referencing system. Such data gaps impede our ability to analyze intersection crashes.

GAD has begun identifying and collecting data about specific intersections, using KDOT’s video-log. The goal is to identify and characterize all intersections in terms of more than 25 data elements, including the type of traffic control present at the intersection, the number of legs, directions of travel and pavement type.
 - ❖ Method: project
 - ❖ Costs: additional staff
 - ❖ Lead agency and contact: KDOT, GAD Unit
 - ❖ Challenges: ensuring additional staff
 - ❖ Target date: fall 2013

- ❖ Create a horizontal curve inventory to support crash analysis
 - ❖ Background: According to the FHWA, horizontal curves are those that change the alignment or direction of the road (as opposed to vertical curves, which change the slope). More than 25 percent of fatal crashes are associated with a horizontal curve, and the vast majority of these crashes involve roadway departure. The average crash rate for horizontal curves is about three times that of other types of highway segments.

However, available data on existing curves is not thorough. As with intersections, the problem is that there’s no identification system for individual curves. Creating unique identifiers for curves would allow better crash reporting. Once curves are identified in this way, data can be collected.

All the curves to be identified are part of the state highway system. Data collected include curve location, length, advisory speed (if present) and radius. GIS allows the mapping of curves, but the mapping of curves can’t be integrated with other data without a linear referencing system. Such data gaps impede the ability to analyze crashes at curves.
 - ❖ Method: project
 - ❖ Costs: additional staff

- ❖ Lead agency and contact: KDOT, GAD Unit
- ❖ Challenges: ensuring additional staff
- ❖ Target Date: fall 2013

- ❖ Use SafetyAnalyst to couple data analysis with engineering solutions
 - ❖ Background: In addition to SafetyAnalyst's ability to scan the highway system for crash "hot spots" through the Network Screening Tool, SafetyAnalyst, using statistical techniques, can perform detailed crash analysis recommend possible engineering countermeasures for specific locations.
KDOT has begun to use SafetyAnalyst 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: software
 - ❖ Costs: annual license fees
 - ❖ Lead agency and contact: KDOT, Highway Safety Unit
 - ❖ Challenges: importing, processing and calibrating Kansas crash, roadway and traffic volume data for SafetyAnalyst use
 - ❖ Target date: ongoing

Future Strategies:

- ❖ Educate transportation professionals about the Highway Safety Manual published by AASHTO
To view more information about the Highway Safety Manual, go to
<http://safety.fhwa.dot.gov/hsm/factsheet/factsheet.pdf>

Goal 3: Train those who create, input and utilize crash data

Current Strategies:

- ❖ Continue to provide training to law enforcement on the use and importance of the crash reporting form
 - ❖ KDOT's Geometric and Accident Data (GAD) Unit is currently working on:
 - continued enhancements to the Accident Coding Manual
 - continued ad hoc (personal) consultation via phone and email
 - continued communication via Facebook and Twitter concerning accident coding
 - development of a training video
 - continued communication through the quarterly newsletter:
<http://www.ksdot.org/burtransplan/prodinfo/lawinfo.asp>

- ❖ Continue to provide training for officials in local government so they can understand and use crash data in their safety-related decision making [See more information in the Local Roads Support Chapter]

- ❖ Continue to promote electronic reporting of crash reports at city and county level
 - ❖ Approximately 60,000 crash reports are processed annually, with 50% submitted in paper form and 50% submitted electronically. Paper reports, however, require 85% of the resources with electronic requiring 15% of the resources. There are approximately 500 law enforcement agencies in the state, yet at this time only 101 agencies submit reports electronically. While this does not represent 50% of the agencies it is close to being 50% of the reports sent to KDOT.

The TRS estimates the paper reports at \$7.25/record and electronic reports at \$1.50/record. This means that each electronic submission saves the State of Kansas \$5.75. With approximately 30,000 crash reports still being submitted in paper-form each year, the savings for the state and taxpayers are significant.

Parties interested in becoming KLER users or wishing further details are encouraged to contact the following: ***KHP IT Helpdesk*** at
1-877-317-4597

Future Strategies:

- ❖ If additional funding were to become available, KDOT would like to offer live training to law enforcement around the state

Goal 4: Map all crashes statewide using GIS tools

Current Strategies:

- ❖ Complete geo-coding (assignment of latitude and longitude) of crashes on local roads
 - ❖ Background: The GAD Unit at KDOT has been working to geo-code and geo-locate all crashes in Kansas. While CANSYS is able to support the geo-location of crashes on state highways, another method is being developed to geo-code crashes located on non-state highways and locally administered roads. The geo-coding of crashes relies on information provided by crash reports. Unfortunately, at this time, longitude and latitude are not initially captured in crash reports and must be inferred or found indirectly.

At the time this chapter was being written, the geo-coding of crash data for 2004, 2006, 2007 and 2008 was complete. Geo-coding must still be completed for 2005 and 2009 to-date.

Goal 5: Systematic Reporting

Current Strategies:

- ❖ Create and post Quarterly Dashboard Report
 - ❖ Background: The quarterly Dashboard Report contains year-to-date preliminary (not officially closed out) fatality data for the following quarters:

Quarter One: January 1st through March 31st

Quarter Two: January 1st through June 30th

Quarter Three: January 1st through September 30th

Quarter Four (Annual Report): January 1st through December 31st

The annual Dashboard Report contains annual preliminary fatality data from January 1st through December 31st. The Report can also be generated ad-hoc as requested by the Executive Safety Council (ESC).

The Report presents either quarterly or annual fatality counts compared to the previous year. These figures are then further broken down statewide and at the district level by the emphasis areas outlined in the SHSP or as requested by the ESC.

Dashboard Reports can be viewed here:

<http://www.ksdot.org/burTrafficSaf/reports/kshs.asp>

Education

Introduction

Roadway engineering and driver behavior both affect crash statistics – so both are addressed in the Kansas Strategic Highway Safety Plan, or SHSP. The SHSP will drive the highway and traffic safety activities of the Kansas Department of Transportation, and through it, we hope to influence our member agencies and the public at large. Our goal is to reduce fatalities by at least half over 20 years. If the goal is met, the five-year average of 417 fatalities a year between 2005 and 2009 would fall to 208 or fewer between 2025 and 2029.

The SHSP works within the frame of the “4E’s” of highway (that is, all roadways) safety: engineering, enforcement, emergency medical services and education. Within this broad frame, each of the emphasis area teams, or EATs, will focus on a particular problem, risk or threat associated with roadway safety: roadway departure, occupant protection, intersections, impaired driving, teen drivers, older drivers and large commercial vehicles. The EATs will ponder, for example, how to communicate to those opposed to centerline rumble strips that those grooves in the pavement actually save lives, how to convince a 28-year-old rural Kansan to wear a seat belt in his pick-up truck and how to teach parents the proper use of a booster seat. Education will be crucial to success.

The education support team was therefore convened to coordinate and support the educational efforts required to help the SHSP succeed. Creation of this team followed the convening of two other teams to support the EATs, one to provide the groups with information (the data support team) and another to help coordinate efforts on locally owned roads (the local roads team).

The education team will identify the tools, networks and platforms that will help other teams distribute their messages, conduct their training and share their resources. Potential roles include developing a system by which to distribute messages and facilitating public outreach, education and marketing campaigns.

The team, which first met Jan. 23, 2012, is represented by the following agencies:

- ◆ Kansas Traffic Safety Resource Office (KTSRO)
- ◆ Kansas Highway Patrol (KHP)
- ◆ KU Transportation Center
- ◆ Kansas Department of Aging & Disability Services
- ◆ Kansas Department of Health and Environment (KDHE)
- ◆ Safe Kids Kansas
- ◆ Kansas Emergency Nurses Association (KENA)
- ◆ Boys & Girls Clubs of Topeka
- ◆ Kansas Department of Transportation (KDOT)

Some of the new strategies discussed below—specifically, a tiered communications network, a user-friendly website “hub” for traffic safety information and a safety calendar—will serve several purposes such as: the dissemination of research on behavioral and engineering approaches to reducing traffic fatalities; publicizing of engineering successes; educating drivers about new traffic laws; providing resources to locals; and promoting public involvement of Kansans with an interest in safety

KANSAS Traffic Safety Resource OFFICE

The Kansas Traffic Safety Resource Office, or KTSRO, is the educational arm of the Kansas Department of Transportation Traffic Safety Section.

The mission of KTSRO is to provide public information and education to protect Kansans from avoidable injury or death on Kansas roadways. Together with many partners, KTSRO focuses on measures dealing with novice drivers, increasing seat belt use, preventing drunken driving and underage drinking and raising motorcycle safety awareness. KTSRO is an extension of KDOT providing their resources, materials and traffic safety information through a physical office located at 2930 SW Wanamaker Drive, Topeka, KS, (800-416-2522) and on the web at www.ktsro.org.

Educating Drivers: A Lifetime Course

To define the word “educate,” dictionaries often mention schooling, training, instruction. But to make good driving decisions, new drivers need education from many sources, including parents, law enforcement officials and more experienced peers and siblings. Driving decisions may be based on law (specifying, say, who needs to wear a seatbelt or the steps to get a driver’s license) or technique (such as how to drive through a roundabout).

Driving decisions also may be affected by more informal sources – such as the repeated retelling, within a community, of a story or stories. Or it may be shaped by more novel approaches, such as that taken by Crawford County (see “A Seatbelt-Use Program Goes Viral”). Yet for the most part, in the realm of driving, the word “education” refers to systemic efforts to positively influence people’s behavior through educational campaigns and programs. In general, the most effective public education strategies are those tied to a specific activity.

For Every Safety Restraint, There Is a Season

A newborn's arrival into a family is a great teaching moment – among other things, about the use of safety restraints.

KDOT conducts observational safety belt usage surveys annually. In 2011, children – from newborns to age 4 – were observed to be properly restrained 97 percent of the time. In part, that's because hospitals educate new parents about the use of car seats before sending a newborn home.

Unfortunately, this figure drops to 77 percent for kids between ages 5 and 9. It's just harder to reach parents when the child is transitioning from a car seat to a booster seat or later from booster seat to seat belt.

At that point, parents need to learn booster seats work by raising a child up so the lap and shoulder belt are positioned safely. Their use reduces the risk of injury by 58 percent.

Knowing this, the Occupant Protection EAT has a strategy: It's promoting curricula such Booster to Belts and Safety Break! The education team will advise the Occupant Protection EAT on ways to implement these strategies.

A Seatbelt-Use Program Goes Viral

Getting teenagers to use seatbelts is tough. One Kansas county got more kids to buckle up by getting them involved in creating a program and by using sugar rather than vinegar to change their behavior.

In 2008, when law enforcement officers visited every school in Crawford County and gave safety talks there, county teens had one of the state's lowest compliance rates for seatbelt use. But by the end of the 2008-2009 school year, the average increase in seatbelt use there was 16.3 percent.

Today, in more than a third of all Kansas counties, at least one school uses the program, which is described in detail below.

Representatives from the Crawford County sheriff's office, Kansas Highway Patrol and Kansas Department of Transportation based their pilot program on two assumptions. The first: If students are involved in creating the program, they'll be more invested in its success. The second: Both the threat of consequences and the offer of rewards work best when you're trying to change behavior.

Students became creators when they were asked to nominate different names and slogans for the program. In the end, Seat Belts Are for Everyone, or SAFE, won the most votes. Students also designed a pledge card, which recognized each of the six Crawford County schools participating in the program.

Law enforcement officials would visit schools, address students, then follow up with enforcement of seat belt laws, typically for a week following their visit.

Meanwhile, various agencies or offices were approached for contributions to fund rewards to teenagers who signed pledge cards promising to use seat belts. Students could sign the cards each month to be eligible for a drawing.

Of the 1,875 students in the county, an additional 306 – or 16.3 percent – were using seatbelts by the end of the school year. Today, there are SAFE programs operating in 38 Kansas counties. For more details, go [here](#) to learn more.

Educators who seek to have an impact need to keep the following questions in mind as they design programs.

- ◆ Who is your primary target audience?
- ◆ How do you reach this audience through all the background "noise"?
- ◆ If there are several audiences, what's the best medium for reaching each one?
- ◆ How do you measure your impact?
- ◆ There are many messengers. Who is the best for communicating yours?
- ◆ There are many messages. What's yours?
- ◆ How are changes in communications media affecting education?

How we answer these questions will determine the communication strategies we select and the messages we dispatch.

Goals and Strategies

The Education Support Team has set three goals. It seeks to

1. Reach drivers and those who influence them (police and lawmakers, for example) by developing a communications infrastructure
2. Maintain a statewide traffic safety hub of information, training and resources
3. Support partners in traffic safety

Goal 1: Reach drivers and those who influence them by developing a communications infrastructure

Current strategies:

- ◆ Utilize social media like Facebook and Twitter to draw people to the [KTSRO website](#).
- ◆ Reach more audiences with our message.
 - ◆ Background: We use social media because teenagers and the young are an important audience to reach. The question now is prioritizing other audiences for messaging.

New strategy:

- ◆ Develop a tiered network of organizations and individuals to deliver messages to the target audiences
 - ◆ Background: Messages delivered to the wrong audiences fall on deaf ears. KDOT public affairs managers and KHP public resource officers work hard to develop and maintain regional networks. But the audience for news of an engineering approach to prevent vehicles from leaving the roadway may be much different from an audience that needs to hear that car seats are safer than laps for children. We want to make certain that our message, whatever its form – news release, web link or public service spot – reaches its target audience. The network route a message takes will depend on the EAT that develops it; the media best suited to its distribution; and the target audience, such as, for example, the trauma community. We will specify audiences, identify partner agencies and create networks as needed to implement education strategies that emerge from the EATs.
 - ◆ Method: project
 - ◆ Costs: none
 - ◆ Lead agency and contact: KDOT, Traffic Safety Section
 - ◆ Challenges: accepting the limits of our reach
 - ◆ Target date: ongoing

Future strategy:

- ◆ Meet with media representatives to brainstorm about media and messages that will give us access to our target audiences.

KDOT's Voice in Kansas

Send only meaningful information.

Don't waste words.

KDOT observes those rules to deliver its messages effectively to – and through – media.

Statewide messages typically come from KDOT headquarters in Topeka.

Regional messages originate from six district offices, each with its own public affairs manager, or PAM.

Questions?

For phone numbers, click [here](#) and search for the words “public affairs director” and “public affairs manager.”

Goal 2: Maintain a statewide traffic safety hub of information, training and resources

New strategies:

- ◆ Create a domain and website, to be called [Safekan](#), as the central repository for safety information.
 - ◆ Background: Websites facilitate public outreach. A Safekan website, frequently updated and user-friendly, will be the portal for all Kansas traffic and roadway safety information, beginning with this SHSP. The “Kansas Driving: Safe. Not Sorry” road kit is an example of the kind of information that could be made available on the site. Designed by KDOT to assist partners in making safe driving presentations, the kit contains brochures, pamphlets and videos. After an update, these could be provided online.
 - ◆ Method: project
 - ◆ Costs: TBD
 - ◆ Performance measure: site visits
 - ◆ Lead agency and contact: KDOT, Bureau of Traffic Safety & Technology
 - ◆ Challenges: securing funding to maintain a site and steering traffic to it
 - ◆ Target date: 2013



- ◆ Create an electronic safety [calendar](#) that helps safety partners keep track of such scheduled safety activities as campaigns and trainings.
 - ◆ Background: The National Highway Traffic Safety Administration has a communications calendar for traffic safety advocates. The Local Technical Assistance Program has a training calendar for local public works agencies. The American Trauma Society celebrates Trauma Awareness Month in May; the 2012 campaign was “Decide to Drive: Arrive Alive.” KDOT promotes “Put the Brakes on Fatalities Day.” With many agencies scheduling traffic and roadway safety activities, a single calendar available to everyone would help both those planning and participating in activities. It would also help minimize redundancy in events, better coordinate messaging, and better align the communication and education activities of all the EATs.
 - ◆ Method: project
 - ◆ Costs: TBD
 - ◆ Performance measure: periodic surveys of agencies to evaluate its usefulness
 - ◆ Lead agency and contact: Kansas Traffic Safety Resource Office
 - ◆ Challenges: securing input from partner agencies to keep the calendar current
 - ◆ Target date: 2013

Goal 3: Support partners in traffic safety

New strategy:

- ◆ Develop a checklist tool for the EATs to use when implementing their education strategies.
 - ◆ Background: Sometimes the hardest part about launching an initiative is knowing where to begin. A checklist tool developed by the education team will give practitioners guidance about how to design an education strategy.
 - ◆ Method: project
 - ◆ Costs: TBD
 - ◆ Lead agency and contact: Kansas Traffic Safety Resource Office
 - ◆ Challenges: anticipating the different needs of each EAT
 - ◆ *Target date:* 2013

Kansas Department of Transportation

Strategic Highway Safety Plan

Intersections



Introduction

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). There are five types of intersections, two with traffic lights, three without.

- ❖ Signalized
 - Pre-Timed Traffic Signals
 - Traffic-actuated Signals

- ❖ Unsignalized
 - 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

Given the FHWA definition of an intersection above, it is important to point out what is not counted as an intersection crash. The meeting of a private driveway with a public road won't be treated as an intersection although we recognize the value of well-designed access, especially near intersections. Kansas averages about eight fatal crashes per year at driveways and parking lot accesses. Another type of crash that will not be treated as an intersection crash is those that occur at grade-separated interchanges (where roads cross at different levels) such as merge areas and ramps. Therefore, the only crashes reported here will be those that occur where two or more public roads cross at the same level, or be directly related to those crashes.

The purpose of the Intersections Emphasis Area Team, or EAT, is to develop data-driven action plans that reduce the potential for and severity of intersection crashes. The plan establishes performance measures and goals and proposes implementation strategies. These strategies are based on the 4E's of traffic safety: engineering, education, enforcement and emergency medical services. The Intersections EAT will help implement the Strategic Highway Safety Plan, or SHSP, by recommending safety-related programs and projects. These programs and projects may include low-cost safety improvements deployed systemically, high-cost safety improvements deployed via safety programs or projects, policy changes, and research initiatives. The Intersections EAT first met October 14, 2009 and was represented by the following agencies:

- ❖ Mid-American Regional Council (MARC)
- ❖ City of Overland Park Planning and Development
- ❖ Shawnee County Public Works
- ❖ City of Manhattan Public Works
- ❖ City of Topeka Police Department
- ❖ Federal Highway Administration (FHWA)
- ❖ Kansas Department of Transportation (KDOT)



Intersections

There is no shortage of strategies available to the highway safety practitioner. Our original SHSP, drafted in 2006, included a long list of potential strategies, but it did not prioritize them or plan for their implementation. In drafting the current plan, we have focused on implementation questions that will lead to more tangible outcomes. Examples of these questions are as follows:

- ❖ How can this plan shape existing safety programs, including funding levels and project selection?
- ❖ What tools can KDOT provide local jurisdictions with the jurisdiction wants to submit potential safety projects?
- ❖ How can this plan influence large-scale reconstruction projects?
- ❖ How can this plan shape legislative agendas?

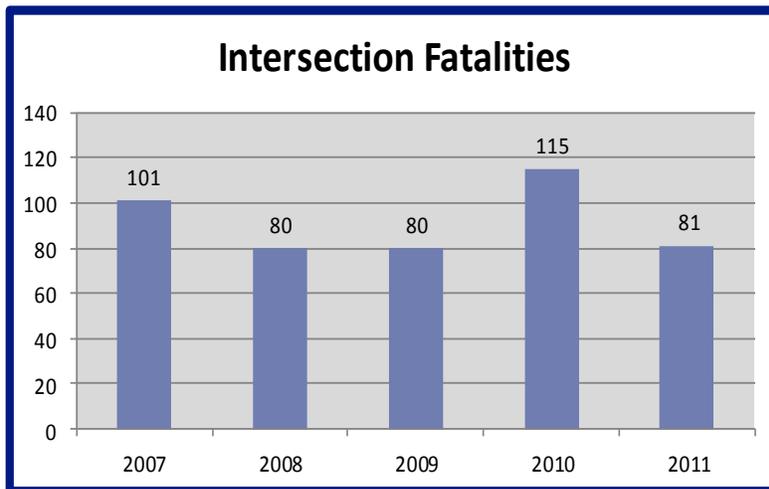
If we answer these questions correctly, the discovery of the findings will be an important step towards diminished numbers of fatal and serious-injury crashes. For instance, if we as a state reduce intersection-related fatalities by half from 2010 - 2029, over 500 lives will be saved during that period.

Analyzing intersection-crash data is essential to answering these questions. With input from the Data Support Team, the Intersections EAT will be able to select and prioritize strategies and make recommendations based on the problems the data will reveal.

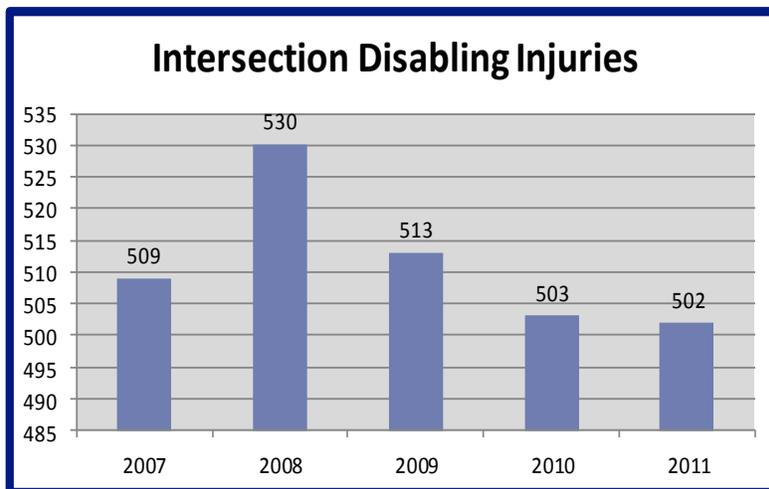
Data Points

1. One in four Kansas crash fatalities happens at an intersection

Intersection-related fatalities represent roughly 23 percent of all crash fatalities in Kansas. Between 2007 and 2011 there were 457 fatalities and 2,557 disabling injuries at intersections. In that span, intersection crashes accounted for 30 percent of serious-injury crashes statewide and 30 percent of all crashes.



Increases and decreases in intersection fatalities tend to parallel the pattern of fatalities overall.

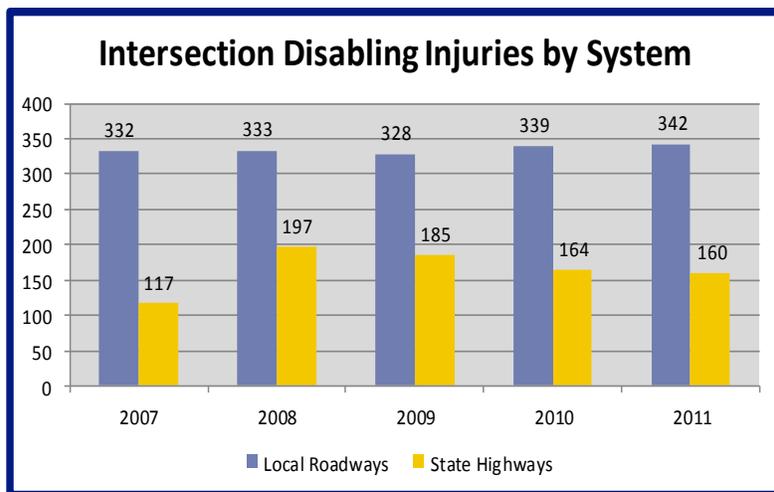
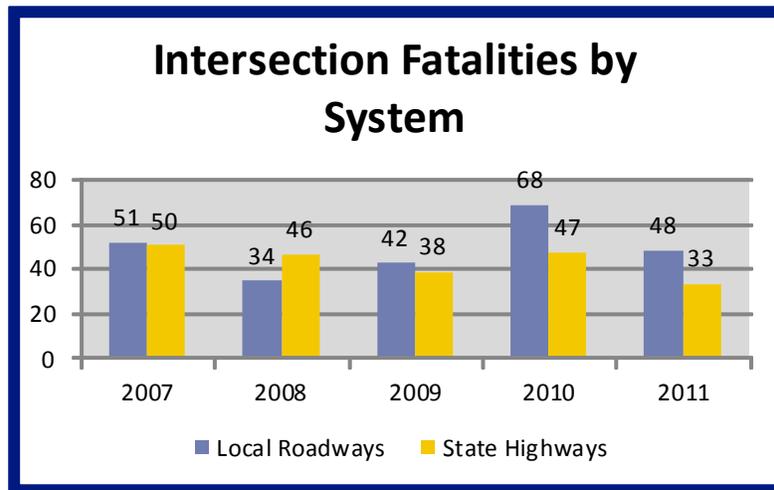


With the exception of 2008, intersection disabling injuries were relatively steady.

2. Controlled access reduces the potential for crashes

Between 2007 and 2009, 47 percent of intersection fatalities, compared to 52 percent of all fatalities, occurred on state highways. During the same time period, 35 percent of intersection-related disabling injuries, compared to 48 percent of all disabling injuries, occurred on state highways. It's likely that controlled-access policy along state highways save lives and prevent more serious injuries from happening. Interstates are made safer by having no intersections. On the contrary, locally-owned roads, particularly in urban areas, have more intersections with more conflict points and consequently a higher share of intersection crashes.

Intersection fatalities have not shown a predictable pattern in recent years.



On local roads, disabling injuries resulting from intersection crashes have held steady in recent years. On state highways, there's been a decline in such injuries.

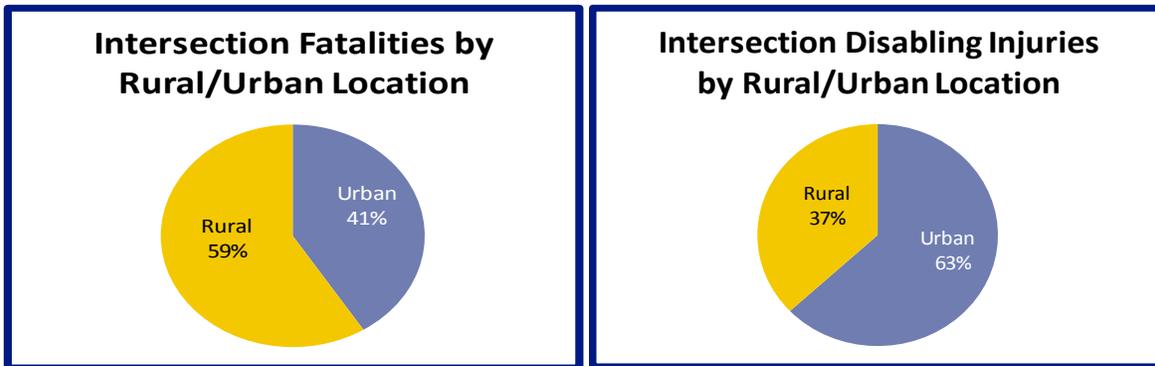
3. Crashes at rural intersections are more likely to be severe

Of the 140,609 miles of public roads in the state, 91 percent are located in rural Kansas. By that measure, it's not surprising that there are more deaths caused by crashes on rural roads than on urban roads. Crashes at rural intersections account for 59 percent of all intersection fatalities.

By another measure, though, the high fatality percentage in rural Kansas is a surprise. Less than half of all vehicle miles traveled in Kansas -- 49 percent -- are on rural roads. With vehicle miles traveled on rural and urban roads nearly equal, why do intersection crashes on rural roads result more often in fatalities or serious injuries?

Three factors play a role.

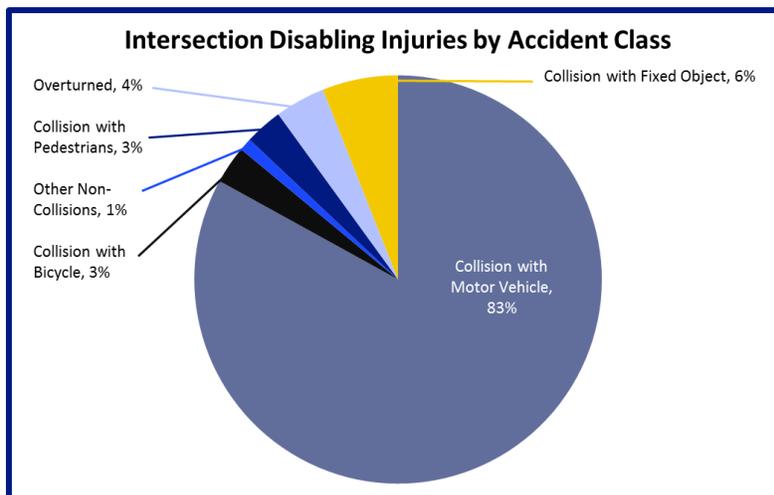
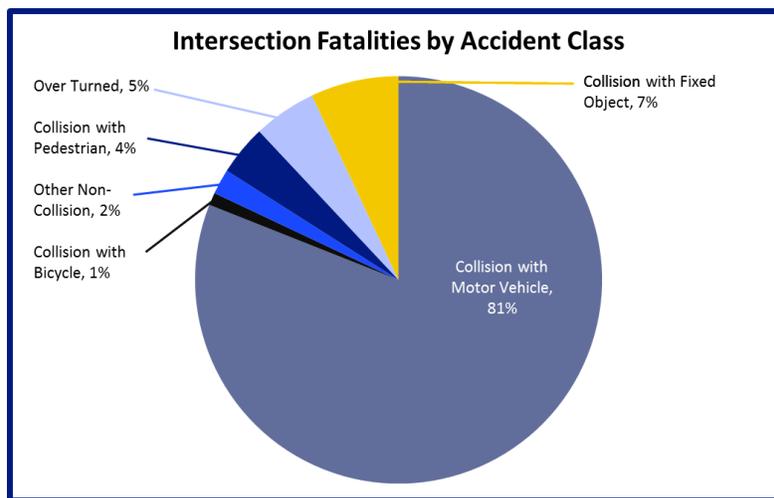
- ❖ **Higher speeds:** Less traffic, intersections and driveways mean that drivers are more comfortable traveling at high speeds.
- ❖ **EMS:** It takes longer for emergency vehicles in general and ambulances in particular to reach crash scenes and to deliver the injured to hospitals or trauma centers.
- ❖ **Health care facilities:** Patient needs may exceed the care capacity of rural health care facilities.



Serious injuries in a rural area are more likely to result in death compared to those sustaining the same type of injury in an urban area. Rural areas of the state experience fewer intersection disabling injuries compared to the urban areas. However, 59 percent of intersection fatalities occur in the rural areas. The challenges of health care in rural areas may help explain this difference. There are often longer discovery times after a crash, greater EMS response times, longer travel distances to a hospital and fewer hospital resources (e.g., trauma surgeons, emergency physicians, sophisticated diagnostic radiology, and blood bank reserves).

4. The most likely accident: collisions between vehicles

More than 80 percent of intersection crashes are collisions between vehicles. Rear-end and angle crashes are the most common types. The data indicate that our focus should be on reducing the potential for these conflicts. Reducing angle crashes begins with good engineering, but also depends on drivers' knowing who has the right of way – and enforcement of laws governing that. Reducing rear-end crashes requires managing traffic congestion by such means as timed signals and turn-lanes.



Accident Class	Fatalities	Disabling Injuries
Collision with motor vehicle	395	2117
Overturned/rollover	139	390
Collision with fixed object	29	164
Collision with pedestrian	14	96
Collision with parked motor vehicle	4	12
Collision with bicycle	3	77

Between 2007 and 2011, collisions between motor vehicles accounted for 81 percent of the fatalities and 83 percent of the disabling injuries at intersections. Of these, 75 percent were angle collisions (left-turn and right-angle), 16 percent rear-end.

5. A new crash reporting form enables detailed analysis

In 2009, a new crash reporting form allowed the collection of more detailed data about intersection types. Roundabouts, four ways, five ways, T's and Y's, for example, were assigned different numbers for coding purposes. Before 2009, the only information collected about intersections where crashes had occurred concerned traffic control measures such as signals, stop signs and yield signs. The causes and mitigation of intersection collisions will be analyzed in greater detail as additional data accrues.

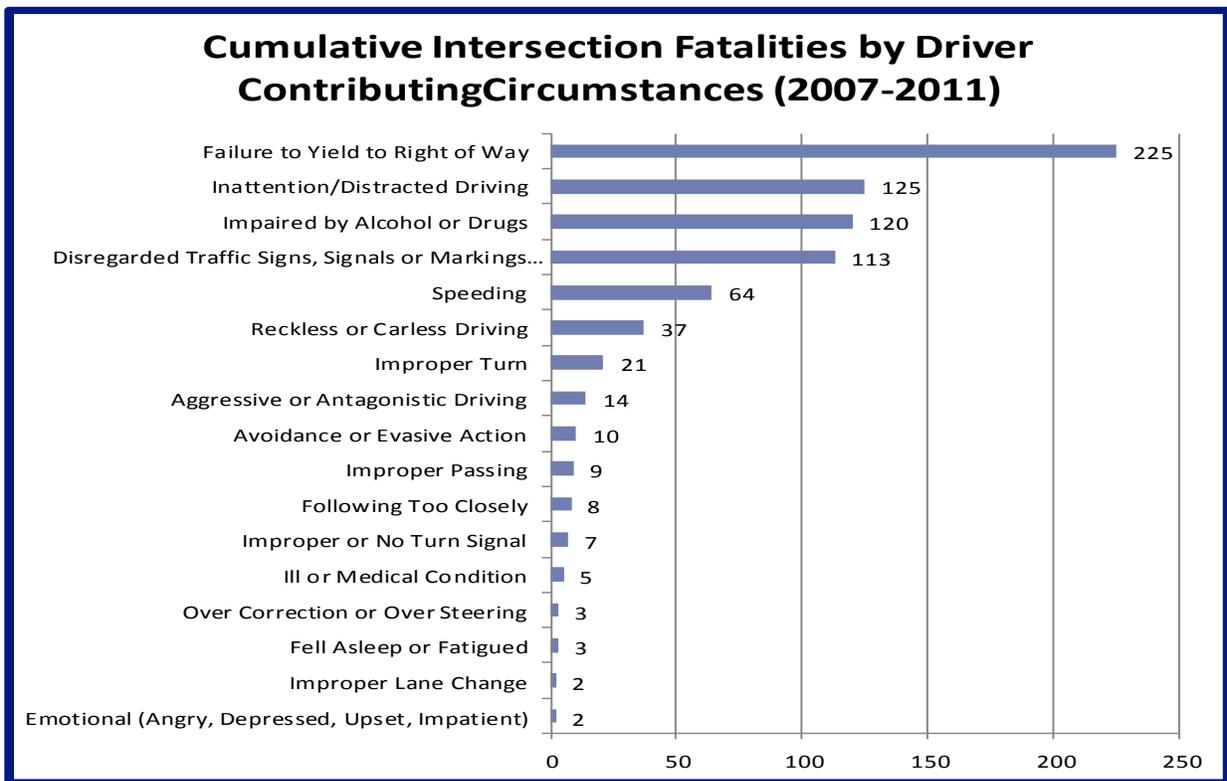
TRAFFIC CONTROLS			
	(On / At Road) O/A		
	Type Present	OK/NF	
00 None	1	1	1
01 Officer, flagger	2	2	2
02 Traffic signal	3	3	3
03 Stop sign	4	4	4
04 Flasher	5	5	5
05 Yield sign			
06 RR gates / signal			
07 RR crossing signs			
08 No passing zone			
09 Center/Edge lines			
10 Warning signs			
11 School zone signs			
12 Parking lines			
88 Other: _____			
99 Unknown			

ACC. LOCATION (of 1st Harmful Event)
<u>ON ROADWAY:</u> (within travel lanes)
11 Non-intersection
12 Intersection +
13 Intersection-related +
14 Access to Parking lot/Drwy
15 Interchange Area +
16 On Crossover
17 Toll Plaza
<u>OFF ROADWAY:</u>
20 Shoulder
21 Roadside (not shoulder)
22 Median
23 Parking lot or Rest area
88 Other: _____
99 Unknown
+INTERSECTION TYPE
01 Four-way intersection
02 Five-way or more
03 T - intersection
04 Y - intersection
05 L - intersection
06 Roundabout (See Manual for Definitions)
07 Traffic Circle (See Manual for Definitions)
08 Part of an interchange
99 Unknown

The crash reporting form introduced in 2009 lists more options under “Traffic Controls” and “Accident Location” and adds a new category: “Intersection Type.”

6. 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 occur between vehicles moving at 90 degree angles to each other. 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 four factors involved in collisions. Cell phone usage inside and outside of vehicles has skyrocketed within the last decade. Given this trend, it is not surprising that inattention/distracted driving" is noted as the second 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 driver chapter of this plan.

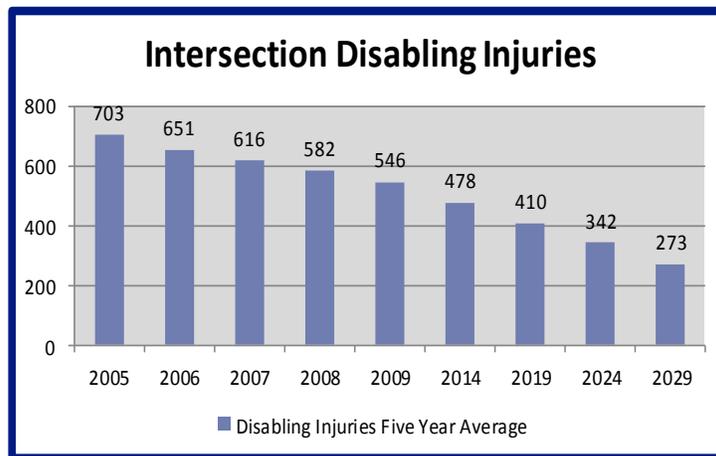
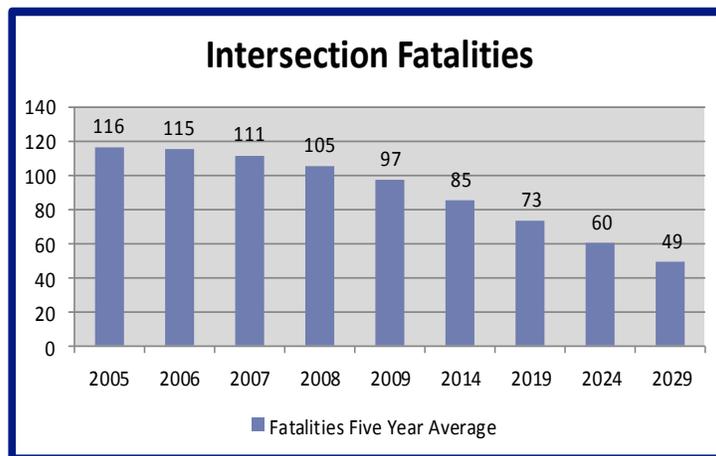


Increased police presence could reduce many of the driver behaviors that lead to Intersection fatalities.

Performance Measures

Consistent with the overall SHSP goal, the Intersections EAT aims to halve intersection fatalities and serious injuries within 20 years. Focusing on serious injuries as well as fatalities makes sense, since serious injury crashes are often an indicator of potential fatal crashes. For the five-year period 2005 through 2009, Kansas averaged 97 intersection and intersection-related fatalities and 546 disabling injuries per year. In order to meet our goal, we must, on average, reduce fatalities during the 2025 to 2029 period by an average of at least 49 per year, and disabling injuries by at least 273 per year.

The SHSP is a key tool in accelerating the trend toward decreased intersection collisions seen in recent years. Interim goals will help us measure our progress. The Intersections EAT chose to use a straight-line projection to set interim goals – that is, to consistently reduce intersection fatalities by two or three a year. A straight line projection was made because the EAT felt most of the “simple” fixes have already been applied statewide. These include strategies such as all-red time intervals between green signals, 12” signal lenses, back-plates on signal housing, mast-arms that put signals over the lanes, and dilemma-zone protection for signalized intersections and pavement markings such as turn-arrows and stop lines. The next figure shows our interim five-year goals, in terms of fatalities, represented here by blue bars



Goals and Strategies

To reduce serious injury and fatal crashes at intersections on all public roads statewide, the Intersections EAT developed the following list of intermediate goals.

1. Create and manage data-driven safety programs that make the best use of safety dollars.
2. Make use of available traffic records, crash data and roadway data to identify projects designed to make intersections safer.
3. Experiment with innovative engineering countermeasures.
4. Promote proven engineering countermeasures.
5. Use law enforcement to encourage good behavior.
6. Promote education campaigns that focus on the factors most often linked to intersection crashes.

Some techniques for reducing intersection collisions cost little or nothing. Examples of little or no cost countermeasures include timing traffic light changes so that for a brief interval all signals show red, allowing an intersection to clear before right-of-way is reassigned. Other measures, such as the construction of roundabouts to reduce conflict points and lower vehicle speeds, are more expensive. The challenge for the Intersections EAT is to identify, prioritize and implement realistic strategies.

Goal 1: Create and manage data-driven safety programs that make the best use of safety dollars.

Current Strategies:

- ❖ Maintain sign retro-reflectivity (visibility when lighted by headlights) on state highways by replacing sign sheeting at scheduled intervals.
- ❖ Promote good access management near intersections through a corridor management policy.
- ❖ Perform improvements of crash-prone intersections under the support of a federal Highway Safety Improvement Program (HSIP) initiative designed to make intersections safer.
 - Background: Kansas has benefited from its involvement with the HSIP program, and its predecessors, since the 1970s. Intersection crashes have declined and the partnership has created strong working relationships between KDOT traffic engineers and city public works staffs. Typical projects include converting stop signs to traffic signals, replacing pedestal-mounted signals with overhead signals, installing traffic-actuated signals, constructing roundabouts and constructing turn lanes.

New Strategy:

- ❖ Recommend new distribution of Highway Safety Improvement Program, or HSIP, funding based on Kansas crash statistics. See *Roadway Departure chapter for action plan*.

Goal 2: Make use of available traffic records, crash data and roadway data to identify projects designed to make intersections safer.

Current Strategies:

- ❖ Promote the Traffic Engineering Assistance Program (TEAP) to assist with traffic studies on locally owned roads,
- ❖ Complete geo-coding—the assignment of latitude and longitude— of crashes on local roads.

New Strategies:

- ❖ Develop a method to project the expected number of crashes based on intersection types and traffic volumes in order to identify intersections with the potential for improvement.
 - Background: KDOT wants to utilize safety performance functions (SPF) and crash modification factors (CMF) as the basis for determining low-cost, system wide improvements and high-cost projects at specific sites. Both SPF and CMF are key elements of the Highway Safety Manual published in 2010 by the American Association of State Highway and Transportation Officials. KDOT is currently using a software tool called Safety Analyst to analyze crash, volume and roadway data. Safety Analyst was developed by the FHWA in cooperation with a number of states, including Kansas. Using this software will support a more sophisticated analysis of the Kansas highway system. KDOT will also develop an application that helps local jurisdictions predict crash frequencies at different types of
 - Method: research
 - Costs: \$50,000 per year (estimated)
 - Lead agency and contract: KDOT, Traffic Safety Section
 - Challenges: reliability of the data
 - Target date: begin integration into planning process in 2014
- ❖ Create an intersection inventory to aid crash analysis. *See Data Support for action plan.*

Future Strategies

- ❖ Identify and analyze recurring variables related to intersection crashes.
- ❖ Facilitate access by local jurisdictions to KDOT crash data.
- ❖ Improve the quality and consistency of crash reporting by law enforcement.
- ❖ Establish a grading system for intersections to rank them based on safety.

Goal 3: Experiment with innovative engineering countermeasures.

Current Strategies:

- ❖ Experiment with innovative intelligent transportation systems (ITS) applications
 - Background: KDOT has experimented with warning signs that are activated for traffic that has the right of way when a vehicle is detected on a side street
- ❖ Review policy on left-turn lanes vs. bypass lanes at rural high-speed intersections.

New Strategies:

- ❖ Promote research into experimental low-cost countermeasures.
 - Background: Specific countermeasures are often described as experimental, tried or proven. The effort here will be to promote research on experimental strategies that leads to proof of their viability. This will be accomplished by working through state programs like KTRAN and federal programs like the National Highway Cooperative Research Program. This strategy will also require working with organizations like the Local Transportation Assistance Program (LTAP) at the University of Kansas (KU) and the American Public Works Association to stimulate local participation.
 - Method: research
 - Costs: \$100,000 per year (estimated)
 - Lead agency and contact: KDOT, Traffic Safety Section
 - Challenges: finding locations for build-to-evaluate countermeasures
 - Target date: 2014

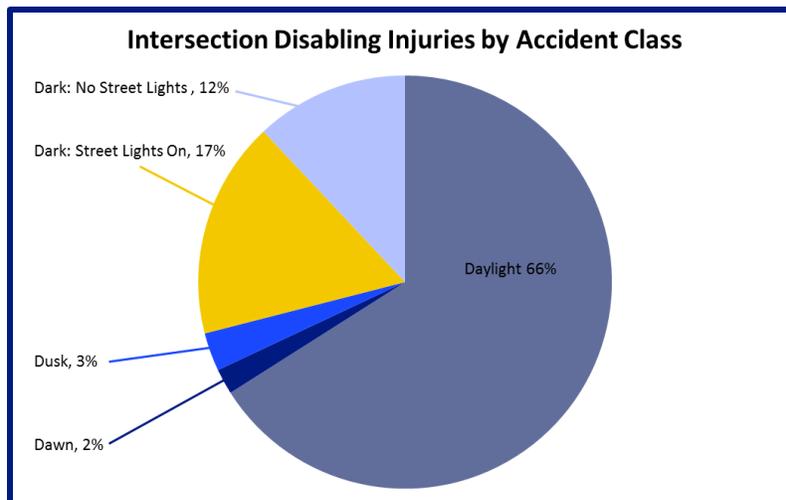
Future Strategies:

- ❖ Consider experimenting with rural intersection collision avoidance systems
 - Background: This system is currently being tried in some other Midwestern states. Based on vehicle detection on major thoroughfares, it determines safe distances between vehicles in traffic and informs side street drivers when to proceed

Goal 4: Promote proven engineering countermeasures.

Current Strategies:

- ❖ Promote and construct roundabouts.
- ❖ Promote and conduct road safety audits and assessments.
- ❖ Provide street lighting at higher-volume intersections and interchanges.



Nearly a third of all intersection fatalities occur between dusk and dawn, despite decreased traffic volume during those hours.

- ❖ Provide left-turn and right-turn lanes at intersections.
- ❖ Realign intersection approaches to reduce or eliminate intersection skew.
- ❖ Install dilemma-zone protection at signalized intersections.
- ❖ Optimize clearance intervals, including the all-red and yellow.
- ❖ Coordinate traffic signals along urban corridors.
- ❖ Install flashing solar-powered beacons on intersection warning and stop signs where appropriate.
- ❖ Install transverse rumble strips across the stop approach lanes in rural areas where appropriate.

Future Strategies:

- ❖ Promote advance street name signs at intersections.
- ❖ Simplify the configuration of low traffic-volume, two-way, stop-controlled intersections.
- ❖ Encourage signal pre-emption that gives right-of-way to emergency vehicles.

Goal 5: Use law enforcement to encourage good driver behavior.

New Strategy:

- ❖ Develop a program to fund targeted enforcement programs at high-crash intersections.
 - Background: Speeding contributed to at least 64 fatalities between 2007 and 2011. Disregard of signs, signals or markings contributed to at least 113 fatalities during this time period. It's widely recognized that the presence of law enforcement improves driver behavior. The motorist is more likely to drive at a reasonable speed, drive defensively, and obey signs, signals and markings when a law enforcement officer is within sight. Less well-known is that enforcement of traffic laws appears to reduce crime rates overall. The retention of strong traffic enforcement units within law enforcement agencies, therefore, may be a benefit at many levels. We recommend the creation of a program (and the promotion of existing programs) that fund overtime law enforcement at specific intersections and the development of lines of communication between law enforcement and public works employees about "hot spots."
 - Method: program
 - Costs: TBD
 - Lead agency and contact: KDOT, Traffic Safety Section
 - Challenges: identify high-crash intersections and prioritizing those that receive increased attention if demand exceeds funding.
 - Target date: FY 2014

Future Strategies:

- ❖ Use the media to promote awareness of the link between vigorous traffic-law enforcement and reduced crime.
- ❖ Encourage law-enforcement agencies to concentrate more resources on traffic law enforcement.



Intersections

Goal 6: Promote education campaigns

Current Strategies:

- ❖ Provide public works and law enforcement officials with training and educational materials through LTAP at KU and the Traffic Assistance Services for Kansas program at K-State.
- ❖ Promote media campaigns highlighting the danger of impaired or distracted driving.

Future Strategies:

- ❖ Develop guidelines and procedures for consultants, state engineers and local engineers to complete traffic studies and intersection crash analyses.

Kansas Department of Transportation

Strategic Highway Safety Plan

Local Roads



Introduction

The Kansas State Highway System is highly visible to those traveling long distances across the state but represents only a fraction of all the miles of public roads in the state. Of 140,752 miles of highways and streets, only 7.3 percent are part of the highway system. The Kansas Turnpike Authority oversees another 0.2 percent. The remaining 92.5 percent of public roads – 130,170 centerline miles – are owned by cities, counties and townships. Traffic on these roads account for about 43 percent of the total vehicle miles traveled in Kansas, and crash data show that between 2005 and 2009 45 percent of fatalities and 52 percent of disabling injuries occurred on roads owned by local public authorities. Clearly, if we are to achieve our overall goal of halving fatalities and serious injuries by 2029, locally owned roads must be included as a significant part of the plan. The Local Roads Support Team, or LRST, was formed to identify and coordinate strategies aimed at saving lives on local roads.

In helping to fashion the Strategic Highway Safety Plan, support teams like the LRST function in the same way as emphasis area teams: They identify overall goals, select specific strategies and create action plans to implement those strategies. The difference is that the emphasis area teams focus on specific crash variables (such as seat belt use, driving while impaired and intersections) while support teams (such as education, data and local roads) address issues relevant to the SHSP as a whole.

Why have a dedicated local roads chapter? Because addressing safety on local roads involves different considerations than on state 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, 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.

The LRST, driven by its mission of reducing by half fatal and serious injury crashes on locally owned roads by 2029 by reference to the 4 E's of roadway safety – engineering, enforcement, education and emergency medical services – committed itself to:

- ❖ Promoting the SHSP to local governments,
- ❖ Communicating with emphasis area teams to make sure they address local roads,
- ❖ Identifying goals and strategies that may not be specific to an emphasis area but are important to reducing crashes on local roads,
- ❖ Keeping abreast of new developments in local road safety, and
- ❖ Assisting fund managers to distribute their local safety funds on the basis of local safety priorities.



Local Roads

Many programs aimed at saving lives on local roads are already in place. Some of the more significant follow:

- ❖ Training and Technical Assistance
 - Traffic Assistance Service for Kansas, or TASK, a partnership of Kansas State University and the University of Kansas
 - Kansas Local Technical Assistance Program, or LTAP, at the University of Kansas
 - Traffic Engineering Assistance Program, or TEAP, through the Kansas Department of Transportation's, or KDOT's, Bureau of Local Projects
 - Road safety audits by KDOT and Kansas LTAP
 - Technical assistance provided by the Kansas County Road Engineer at the Kansas Association of Counties
 - Drug recognition expert training and certification through the International Association of Chiefs of Police
- ❖ Funding for Engineering Improvements
 - High Risk Rural Roads Program, managed by KDOT's Bureau of Local Projects
 - Intersection Safety Program, managed by KDOT's Bureau of Transportation Safety & Technology
 - Railway-Highway Grade Crossing Program, managed by KDOT's Bureau of Design
 - Safe Routes to School, managed by KDOT's Bureau of Transportation Planning
 - Federal Fund Exchange Program, managed by KDOT's Bureau of Local Projects. This program allows local agencies to exchange federal funds for state funds on projects including, but not limited to, safety improvements.
- ❖ Partnering and Education
 - Destination Safe, a regional safety coalition administered by the Mid-America Regional Council
 - Seatbelts Are for Everyone, or SAFE, managed by the Kansas Traffic Safety Resource Office
 - National Highway Transportation Safety Administration-funded Highway Safety Program
 - AAA training for older drivers

Many programs are already in place, yet the rates of serious and fatal crashes on local roads indicate that there is more that needs to be done. The team decided to focus individually on three of the 4Es: engineering, enforcement, and EMS, with the fourth E, education, woven into each discussion. The discussions will ultimately result in strategies to dramatically reduce fatal and serious injury crashes on local roads. For each of the three discussions, a survey was sent asking team members to identify who is responsible for decision-making affecting that E on local roads, what safety resources and programs already exist for that E, what gaps exist, and what the data suggests for strategies for reducing crashes.

As the team worked through these discussions some dominant themes emerged:

- ❖ Spending federal dollars is more cumbersome and less efficient than spending state dollars. Project delivery, productivity and flexibility improve when the locals handle the projects themselves.
- ❖ When spending safety dollars the primary emphasis should shift to low-cost systemic safety improvements, with a secondary emphasis on higher-cost infrastructure projects at high-crash—or black spot—locations.
- ❖ Access to data is important to locals, but so is training to use the data to effectively reduce crashes.
- ❖ Single-vehicle crashes are more common on local roads than on state highways. In the event of a serious crash on a low-volume road, discovery, reporting, and EMS response could be compromised.
- ❖ There is a decline in interest among law enforcement personnel in enforcing traffic laws.

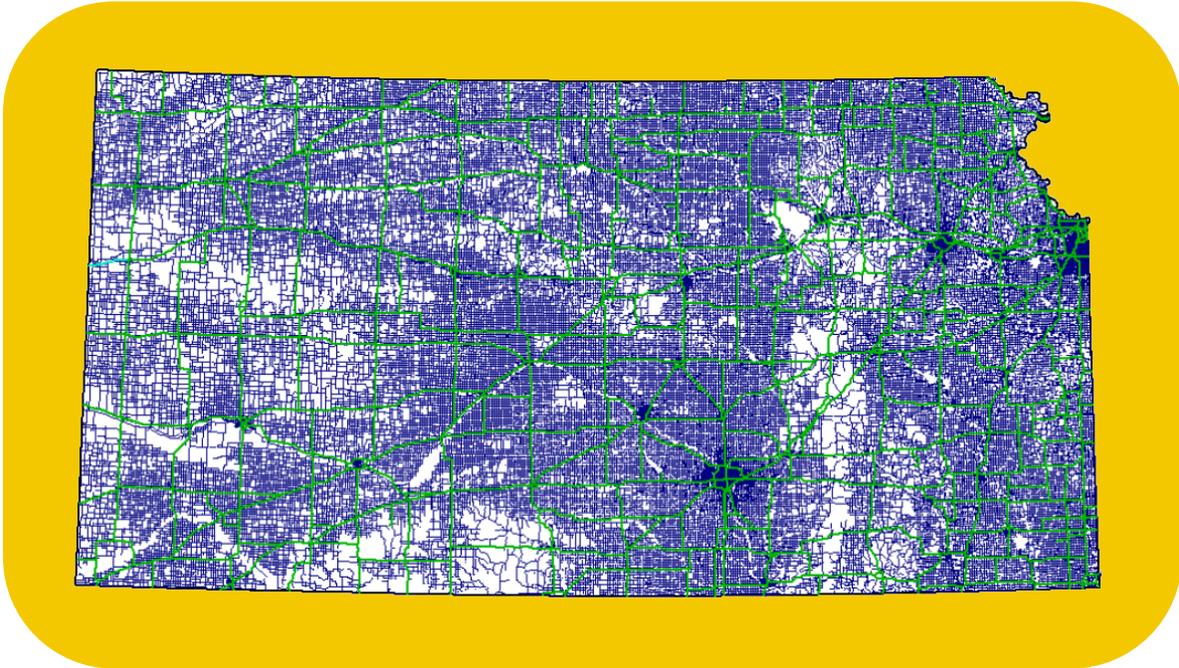
The Local Roads Support Team first met April 24, 2012. These agencies were represented.

- ❖ Kansas Department of Transportation (KDOT)
- ❖ Lawrence-Douglas County Metropolitan Planning Organization
- ❖ American Public Works Association (APWA)
- ❖ Kansas State Department of Education (KSDE)
- ❖ City of Topeka Traffic Engineering
- ❖ Kansas Local Technical Assistance Program (LTAP)
- ❖ Kansas Association of Counties (KAC)
- ❖ Federal Highway Administration (FHWA)
- ❖ Lyon County Sheriff's Department
- ❖ Barton County Engineering
- ❖ Sedgwick County Traffic Engineering
- ❖ Kansas Board of Emergency Medical Services
- ❖ Kansas Department of Health and Environment (KDHE)

A thorough understanding of the data and research related to local road crashes is essential to the wise expenditure of our safety dollars. With input from the Data Support Team, the LRST will have the tools to assist local agencies when managing safety investments. The following are data the team considered when developing their strategies.

Data Points

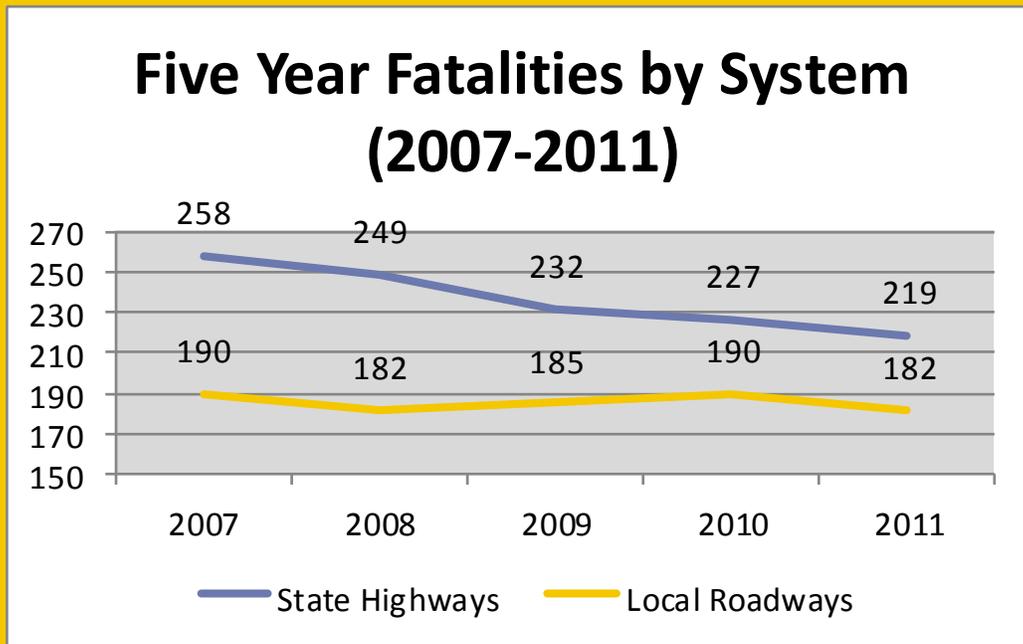
For the purpose of this chapter, a local road is defined as any public road not maintained by the state and not part of the State Highway System (such as K-10, US-54, and I-70.) Local roads represent 92 percent of all roads in Kansas and carry 43 percent of all traffic. To put these numbers in perspective, the state image below shows local roads in blue and the State Highway System in green.



The data presented in the charts below represents the roads shown above in blue—it does not include the State Highway System. The data indicates that what is happening on local roads is often different than what occurs on state highways. Some of the data points to strategies addressed in other chapters of this plan, such as seat belts and teen drivers; other data points to goals and strategies detailed below. Additional data specific to local roadways is presented in other chapters of the plan.

1. Local roads are not benefiting from the statewide reduction in fatalities

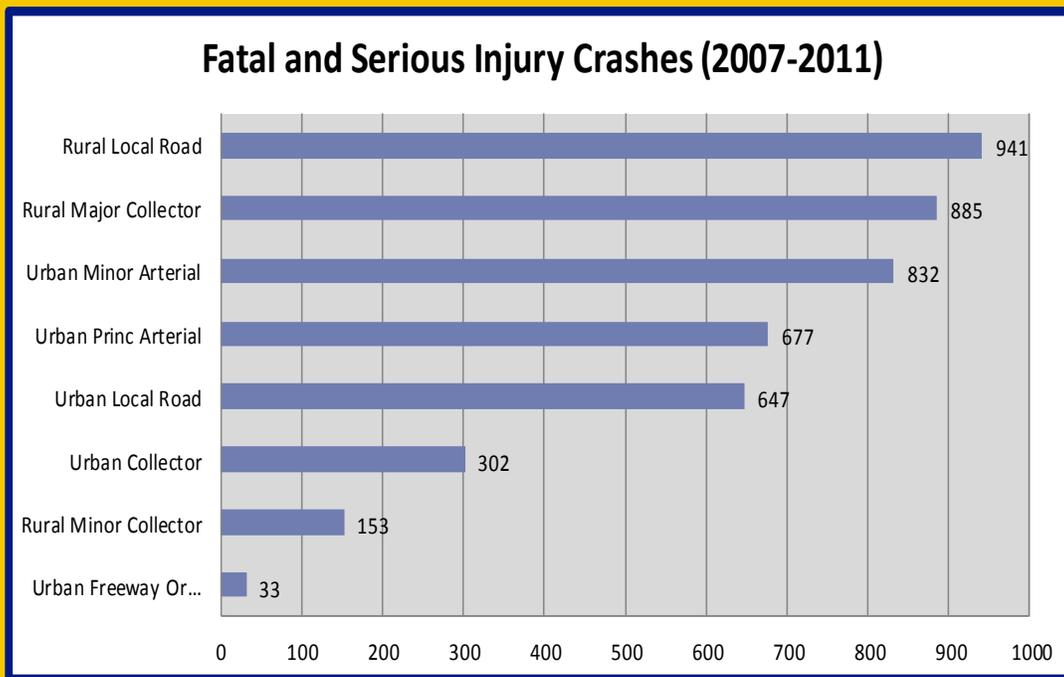
Fatalities in Kansas have been trending downward for the past decade. However, most of the reduction is found on state highways and not local roads. Based on five-year averages, in 2007 local roads represented 42 percent of all fatalities; by 2011 that share increased to 45 percent. Over this four-year period, the five-year average for state highway fatalities decreased by 15 percent; for local roads it only decreased by 4 percent.



Exposure (i.e. traffic volume) does not explain these trends. Between 2007 and 2011, the vehicle-miles of travel, or VMT, on state highways decreased by less than one percent while the VMT on local roads decreased by less than two percent.

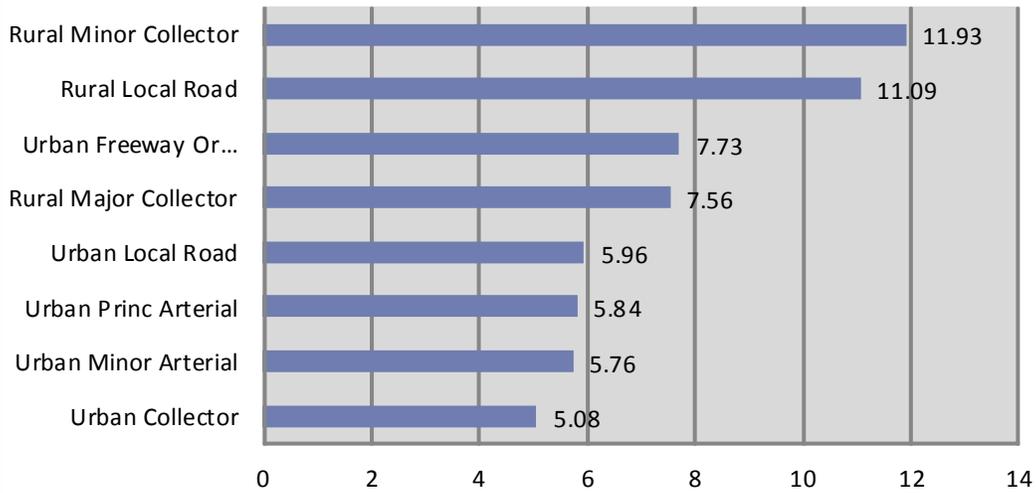
2. Rural local and rural major/minor collectors have high rates of fatal and severe injury crashes despite low traffic volumes.

About two percent of all crashes on locally-owned roads involve a fatal or serious injury. There are three levels of injury severity: possible, non-incapacitating, and disabling/incapacitating. Only the latter is considered serious injury. Most fatal and serious injury crashes occur on roads classified as rural local roads and major collectors. However, when traffic volumes are factored in, rural minor collectors have the highest crash rate. (Note: Information on the functional classifications used in the tables below can be found in Appendix C. Cities with a population less than 5,000 are classified as rural, while some rural areas on the edge of large cities may be classified as urban.)



Urban crashes account for 73 percent of all local road crashes but only 56 percent of fatal and serious injury crashes, and 35 percent of fatal crashes.

Fatal and Serious Injury Crashes (2007-2011)

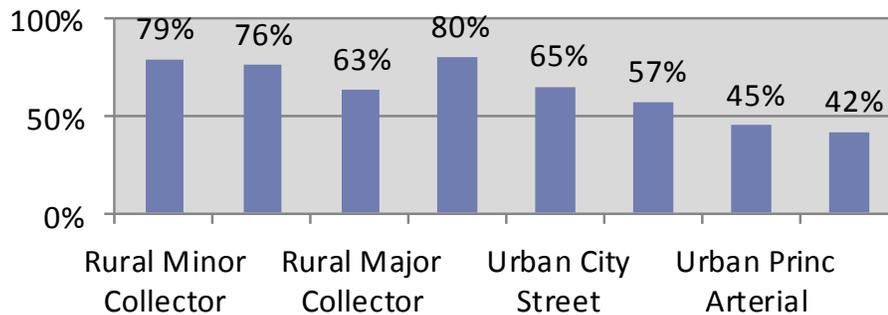


Two-thirds of all the miles driven on local roads occur in urban areas.

3. Low seatbelt use on rural roads.

People in fatal and serious injury crashes on local roads are less likely to be wearing a seatbelt than those on the State Highway System. For all roads, 55 percent of fatality victims were not wearing a seatbelt; for local roads this number increases to 65 percent; and for *rural* local roads this number further increases to 70 percent (348 unbelted fatal occupants out of 494.) Similarly, for all roads 34 percent of serious injury victims were not wearing seatbelts compared to 37 percent for local roads and 50 percent for *rural* local roads (739 unbelted seriously injured occupants out of 1467.) See the chapter Occupant Protection Emphasis Area for strategies to increase seatbelt compliance.

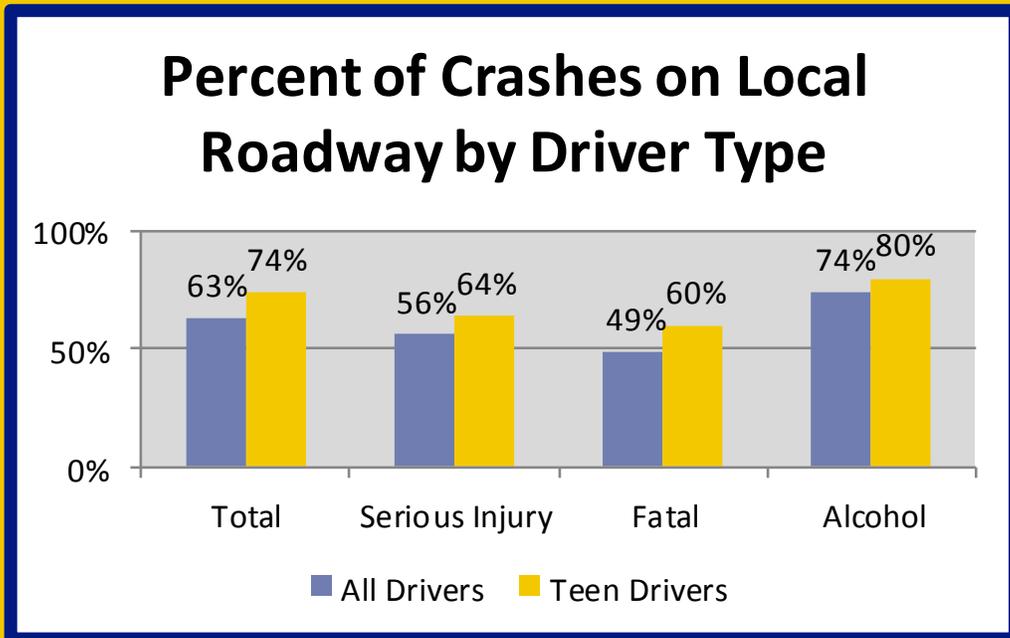
Local Unbelted Fatalities by Functional Classification (2007-2011)



Local traffic and rural traffic are both indicators of low seatbelt use. For example, 79 percent of fatalities where a seatbelt was available (i.e. non-motorcycle, bicycle, pedestrian) on rural minor collectors were NOT wearing a seatbelt.

4. Inexperienced drivers are over-represented in local road crashes.

Seventy-four percent of all teen crashes (i.e. crashes that involve at least one driver from age 14 to 19) occur on local roads, including 60 percent of fatal crashes, 64 percent of serious injury crashes, and 80 percent of impaired teen driver crashes. Of the fatal crashes involving teen drivers, 71 percent occurred on *rural* local roads. The graph below compares teen drivers to the population as a whole. See the chapter Teen Drivers Emphasis Area for strategies to address inexperienced drivers.



Of the 127 teens killed in local traffic crashes between 2007 and 2011, 74 percent were NOT wearing a seatbelt. Teens are more likely to wear their seatbelts while driving/riding on urban local roads. This may be due to the primary seatbelt law for teens and greater likelihood of meeting a police officer in town than in the country.

5. Single-vehicle crashes.

Seventy-seven percent of all crashes on rural locally-owned roads do not involve multiple vehicles; that is, they are single-vehicle crashes—typically run-off-the road. This is much higher than the 47 percent on all roadways and the 56 percent on state highways. This creates problems because a lone driver or occupant may not be able to call for help. In addition, since rural areas carry much less traffic and have much lighter patrolling, a crash is less likely to be reported by another driver or law enforcement. Although EMS issues are critical to safety on local roads, the strategies discussed are considered relevant to all roads. See the chapter EMS Support for strategies to address emergency response and the chapter Roadway Departure Emphasis Area for strategies to address run-off-the road crashes.

The “Golden Hour”

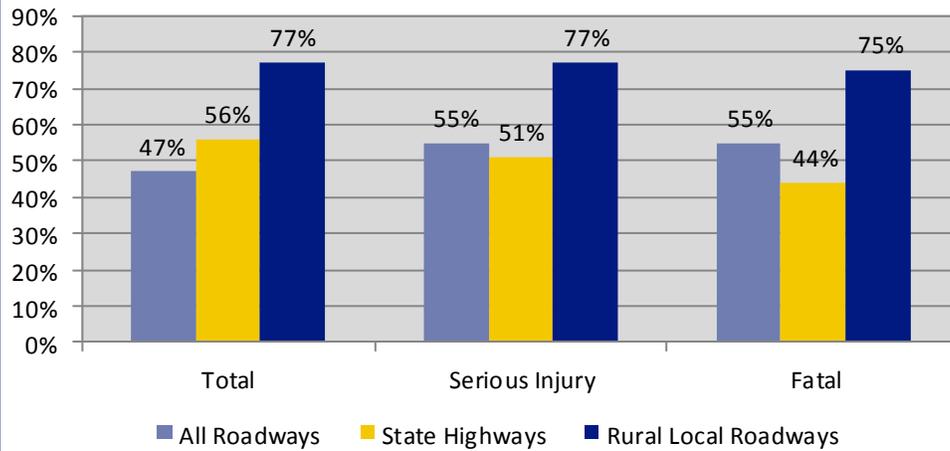
In general, the time to deliver patients to definitive care consists of the six time intervals:

1. Time between crash occurrence and EMS notification,
2. Response time for EMS personnel to be notified and depart the station (i.e., chute time)
3. Travel time to the crash scene by EMS
4. On-scene EMS rescue time
5. Transport time to a hospital or trauma center
6. Emergency department resuscitation time

The best chance for survival following a traumatic injury occurs when the injured person is seen and treated within an hour of the event, known as the “Golden Hour”. However, the average elapsed time for several of these time intervals typically is longer in rural areas than in urban areas.

National Average: Approximately 30 percent of the rural fatal crashes exceeded the golden hour, while only about 8 percent of the urban fatal crashes exceeded it. (NHTSA Study 2004)

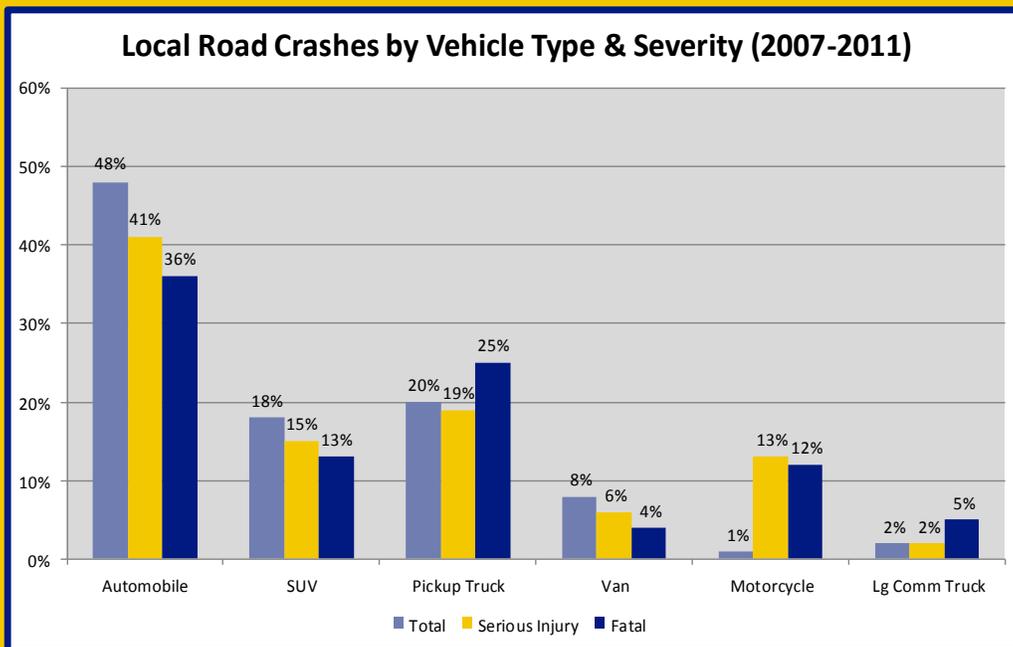
Percent of Single Vehicle by Severity (2007-2011)



According to a 2004 study by NHTSA, approximately 30 percent of the rural fatal crashes exceeded the "golden hour", while only about 8 percent of the urban fatal crashes exceeded it.

6. The percent of pick-up trucks and motorcycles increase with crash severity.

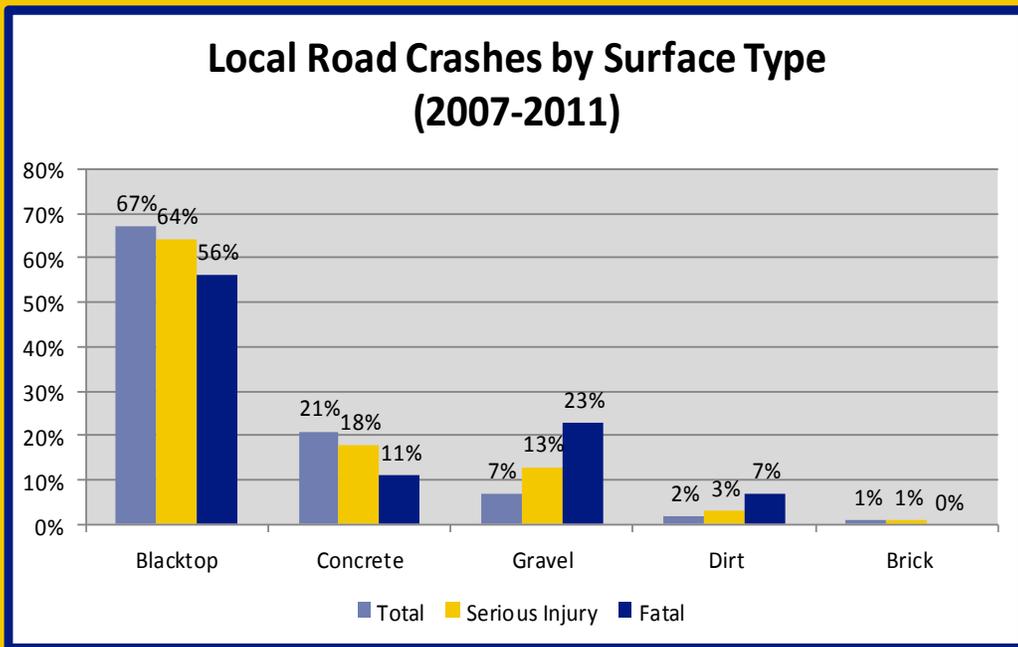
There is an increase in the frequency of pick-up trucks involved in local road crashes as the severity increases, accounting for 20 percent of all local road crashes, 19 percent of all local road serious injuries, and 25 percent of all local road fatalities. Motorcycles represent only one percent of crashes on local roads, but about one in eight fatal and serious injury crashes. Finding the right message to reach the typical driver of pickups and motorcycles is a serious challenge for those in behavioral safety.



While the numbers are much lower, large trucks show a pattern similar to pickup trucks and motorcycles.

7. Unpaved roads are over-represented in local road fatalities.

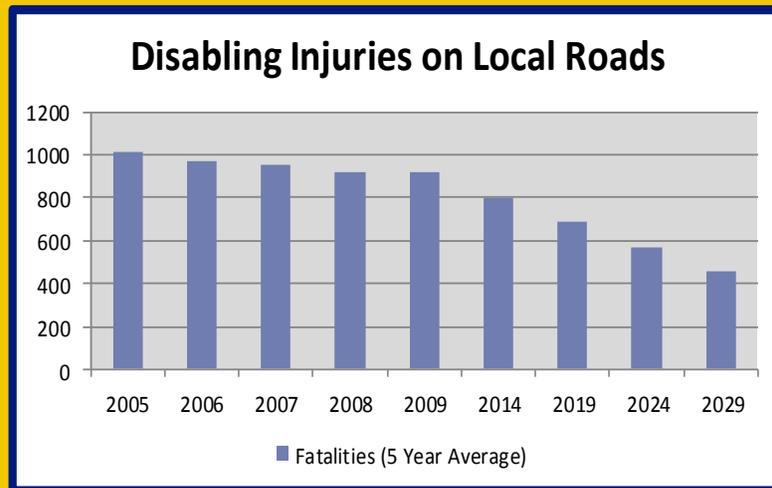
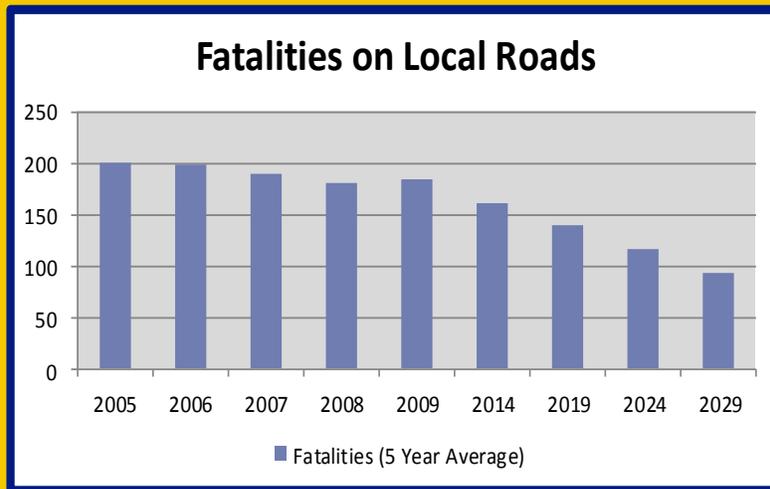
There is an increase in the frequency of gravel road surfaces in local road crashes as the severity increases, making up: 7 percent of all local road crashes, 13 percent of all local road serious injuries, and 23 percent of all local road fatalities. There is a similar increase on dirt roads, making up: 2 percent of all local road crashes, 3 percent of all local road serious injuries, and 7 percent of all local road fatalities.



As severity increases, the percent share of paved roads (blacktop and concrete) decreases; this trend reverses for unpaved roads (gravel and dirt.) This could be due to a variety of factors; most notably unpaved roads typically have less “forgiving” roadsides than paved roads.

Performance Measures

Consistent with our plan’s overall goal, the Local Roads Support Team seeks to halve fatalities and serious injuries on local roads within 20 years. In the five years between 2005 and 2009, Kansas averaged 185 fatalities and 915 disabling injuries on local roads annually. Therefore, our target performance measure for the effectiveness of our goals and strategies to reduce crashes is to average fewer than 93 fatalities and 458 disabling injuries during the years 2025 to 2029.



Reaching these goals will be slightly easier should VMTs on local roads continue to decrease over the next 20 years, or more difficult should VMTs increase. Projecting VMTs on local roads—especially rural—is difficult due to changing demographics and shifting population distributions.

Goals and Strategies

While there are many safety issues on local roads that could be addressed with goals and strategies in this chapter, the LRST chose those that had the best potential to significantly reduce the number of fatal and serious injury crashes on local roads. The LRST has chose the following goals.

1. Make access to federal and state safety dollars for roads and streets less cumbersome for local agencies by identifying and acting on opportunities to improve efficiencies
2. Maximize benefit from available funds by tying funding to the greatest needs, as indicated by crash data and crash research.
3. Improve local public authority, or LPA, access to crash data
4. Catalyze multi-disciplinary collaboration and cooperation on safety at local and regional levels to reduce crashes on the local system
5. Train and otherwise assist LPAs in developing safety programs and identifying low-cost strategies
6. Emphasize to the law enforcement community the important role of law enforcement to improve safety on local roads

These goals and strategies are in addition to those of the other SHSP emphasis area and support teams that include local roads.

Goal 1: Make access to federal and state safety dollars for roads and streets less cumbersome for local agencies by identifying and acting on opportunities to improve efficiencies

Current strategies:

- ❖ Continue 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.
- ❖ Allow local agencies to submit applications for funding at any time in the year.

New strategies:

- ❖ Take advantage of all flexibilities to maximize federal participation on projects.
 - Background: Staff and budget at local agencies are often stretched thin. Typically, on federally funded local projects, the federal share is 90 percent of the costs of construction and inspection and the local agency picks up the remaining 10 percent. However, the local agency is often responsible for 100 percent of the cost of design, utility adjustments and right-of-way acquisition. The result is that many times a 90/10 project may turn into one where the costs are borne equally by the local agency and federal funds when the total project cost is considered. This strategy aims to simplify the application process for funds, lower the local match where possible, and allow more work phases in funding eligibility while striking a balance that ensures local ownership of project outcomes.
 - Method: policy
 - Costs: potentially fewer high-cost, spot improvement projects could result, as more dollars will need to be programmed on projects where the local agency requests funding of additional work phases.
 - Lead agency and contact: KDOT, Bureau of Local Projects
 - Challenges: changing established ways of doing business in KDOT and local governments
 - Target date: ongoing

❖ Consider alternatives to minimize construction engineering costs on city and county federal aid safety projects.

- Background: Local federal aid projects usually employ consultants to perform the construction engineering. Fees are based on hourly rates, and in some cases have exceeded 40% of construction costs. Construction engineering fees subtract from funds that can be used for construction. Possible alternatives are to reduce working days, or have local agency staff monitor the project when non-critical construction is underway.
- Method: policy
- Costs: current system assures compliance
- Lead agency and contact: KDOT, Bureau of Local Projects
- Challenges: finding alternatives that satisfy KDOT as well as federal regulations
- Target date: FY 2014

Future strategy:

- ❖ Consider eliminating federal-aid safety programs and move committed dollars to a state program, similar to the federal-fund exchange program.



Local Roads

Goal 2: Maximize benefit from available funds by tying funding to the greatest needs, as indicated by crash data and crash research.

Current strategy:

- ❖ Promote systemic low-cost safety improvements in KDOT's High Risk Rural Roads Program.
 - Background: This programmatic approach is based on FHWA's former High Risk Rural Roads Program and uses state-wide crash data to address roadway departure crashes on rural roads functionally classified as a rural major or minor collector or rural local road. The most common non-state highway fatality crash type involves a vehicle leaving the roadway and striking a fixed object. Approved strategies include tree removal, headwall removal, and culvert extension. This approach allows use of federal funds without the need for site-specific data for each project location.

New strategy:

- ❖ Expand the systemic low cost safety improvement program KDOT's High Risk Rural Roads program
 - Background: A paradigm shift is occurring in the world of highway safety spending, from doing large projects at a few "hot spot" sites to doing smaller projects at numerous locations. To meet our objective requires both approaches. We can't ignore the high-crash spot in need of serious improvements (installing traffic signals, for example, where stop signs alone aren't working). Nor can we ignore common crash causes that can be addressed before a crash occurs, such as removing a tree too close to the road. This strategy will allow KDOT, in consultation with local officials to further develop a list of eligible countermeasures that don't require site-specific crash data and to identify means of implementation, including on-call contractors. Should funding requests exceed the money available, a project selection methodology would be created. Suggested countermeasures include signing retro-reflectivity, pavement markings, clearing for sight distance, street lighting, advance street name signs, signal timing studies, curve signing and longitudinal rumble strips.
 - Method: program
 - Costs: funds allocated from the HSIP
 - Lead agency and contact: KDOT, Bureau of Local Projects
 - Challenges: scoring and ranking projects if applications exceed available funds
 - Target date: FY 2014

Goal 3: Improve local public authority, or LPA, access to crash data.

New strategies:

- ❖ Create an online form that LPAs can use to request crash data.
 - Background: Most crashes on city streets and county roads are reported by local police officers and sheriff's deputies. These reports are submitted to the state for record-keeping, and unless local road agencies maintain their own databases or are able to obtain crash reports from their local law enforcement agencies, they need to contact the state to request the data. KDOT provides crash locations and data to LPAs upon request. The current process isn't difficult, but it can be improved upon. This strategy will be similar to the [online form agencies use to order blank accident reporting forms](#).
 - Method: project
 - Costs: none
 - Lead agency and contact: KDOT, Geometric and Accident Data Unit, or GAD
 - Challenges: ensuring LPAs know about this new tool and increasing the workload of the GAD Unit
 - Target date: April 2014

- ❖ Improve local access to geo-coded crash maps through an automated process.
 - Background: A new strategy in the Data Support plan is to geo-code all crashes on locally-owned roads. The next obvious step is making these maps available to local agencies. One option is to use the existing platform developed by the Kansas Data Access and Support Center.
 - Method: project
 - Costs: TBD
 - Lead agency and contact: KDOT, Geometric and Accident Data Unit, or GAD
 - Challenges: ensuring LPAs know about this new tool
 - Target date: April 2014

Future strategy:

- ❖ Create an interactive website that LPAs can access.
 - Background: Sound decisions require accurate information, and sound safety decisions require accurate crash information that is easily available. This strategy will create an online portal that will allow LPAs (and the general public) to pull their own crash data.

Goal 4: Catalyze multi-disciplinary collaboration and cooperation on safety at local and regional levels to reduce crashes on the local system.

Current strategies:

- ❖ Support regional safety coalitions in metropolitan Kansas City and Wichita.
- ❖ Publicly recognize champions of safety in order to raise the profile of traffic safety.
 - Background: A highlight of the annual Kansas Transportation Safety Conference is the People Saving People awards that recognize individuals who have championed traffic safety in their communities. Also, the AAA Foundation annually recognizes outstanding law enforcement agencies with their Community Traffic Safety Awards.

New strategies:

- ❖ Promote regular meetings of local personnel representing such interests as public works, law enforcement, EMS and trauma centers to review crash records and develop solutions.
 - Background: Silo . . . stovepipe . . . box. Terms like these describe a tendency to isolate from others when trying to solve a problem. The SHSP process encourages a multidisciplinary approach to reducing fatal and serious injury crashes. Such partnering at least fosters communication and, preferably, action-based outcomes. Packaged crash data, analysis, and best practices could be provided to spur discussion.
 - Method: program
 - Costs: staff time
 - Lead agency and contact: KDOT, Bureau of Transportation Safety and Technology
 - Challenges: breaking down barriers among agencies, identifying a local safety champion or lead agency
 - Target date: as soon as practical
- ❖ Pilot regional or local safety coalitions.
 - Background: The Kansas SHSP addresses safety at the statewide level. As such, emphasis areas are selected based on statewide data. However, statewide data is not necessarily representative of local or regional data. Local safety coalitions will identify issues that could be unique to their area and develop strategic plans to reduce fatal and serious injury crashes. See Appendix D, "Safety in Numbers", for an example.
 - Method: program
 - Costs: seed money to plant interest
 - Lead agency and contact: KDOT, Bureau of Transportation Safety and Technology
 - Challenges: encouraging voluntary participation from individuals and groups, identifying a regional safety champion and administrative support
 - Target date: pilot a new coalition in 2014

❖ Pilot local road safety plans.

- Background: Many states have developed local road safety plans to advance safety on locally-owned major and minor collectors. In fall 2013 a delegation from Kansas attended a peer exchange to learn from the experiences of Minnesota and others. Local road safety plans assist LPAs to select and prioritize projects that will have the biggest impact on safety based on the crash types and high-risk roadway characteristics in their jurisdiction. Because of the random nature of crashes—in particular on lower-volume local roads—these plans place emphasis on low-cost systemic improvements; that is, the approach is proactive rather than reactive.
- Method: program
- Costs: Minnesota spent on average \$45,000 per county
- Lead agency and contact: KDOT, Bureau of Local Projects
- Challenges: staff to administer new program, funds to implement plans, roadway and crash data, and low number of county engineers
- Target date: pilot a local road safety plan in 2014

Future strategy:

- ❖ Add roadway safety to local coalitions that already exist for areas such as health and transportation.

Goal 5: Train and otherwise assist LPAs in developing safety programs and identifying low-cost strategies

Current strategies:

- ❖ Provide road safety audits through KDOT and LTAP.
- ❖ Provide assistance to LPAs in applying for funding.
- ❖ Package solutions with data through programs such as TEAP.
- ❖ Provide safety education through publications, technical assistance and face-to-face training. (See Appendix B for a description of the Kansas LTAP.)
- ❖ Provide technical assistance through the Kansas Association of Counties.
- ❖ Provide training for front-line workers, supervisors and executives through the Kansas Road Scholar Program.
- ❖ Promote engineering-related safety topics through TASK.
- ❖ Inform LPAs of issues pertaining to local road approaches to state highways as part of the county-wide road safety assessments performed on the State Highway System by KDOT.

New strategies:

- ❖ Design a course that addresses analyses and solutions based on local roadway crash data and proven research on effective systemic improvements.
 - Background: The cliché “jack of all trades and master of none” applies to most local public works staffs. Few cities, and even fewer counties, have the benefit of, for example, a full-time traffic engineer. Nevertheless, the agency that owns a road and is responsible for its maintenance is principally responsible as well for its safety. Training is a key. It should be basic, relevant and brief.
 - Method: project
 - Costs: TBD
 - Lead agency and contact: Kansas LTAP
 - Challenges: competing priorities for training, developing and promoting the course
 - Target date: 2014

- ❖ Initiate lower-cost road safety audits on rural county highways and urban city streets.
 - Background: A road safety audit, or RSA, is a formal safety performance examination of an existing road or intersection by an independent, multidisciplinary assessment team. KDOT has hired engineering consultants to conduct a few RSAs as part of the HRRRP. The goal of this strategy is to scale back the scope and reporting requirements of RSAs for corridors to minimize costs while maintaining the greatest benefit: identifying recommendations that when implemented will reduce crashes. One target is to identify low-cost safety improvements (e.g., tree removal for roadside safety or to remove sight line obstructions) that could be implemented by the local agency within existing budget constraints. This is in addition to more traditional “project” type improvements. A side benefit of this approach is that local officials will become more attuned to how to look at their facilities with safety in mind and also to become familiar with a toolbox of options for achieving practical safety improvements.
 - Method: program
 - Costs: staff time
 - Lead agency and contact: KDOT, Bureau of Local Projects
 - Challenges: finding knowledgeable personnel willing to commit their time
 - Target date: begin in summer 2013

Future strategies:

- ❖ Start a Safety Circuit Rider program.
 - Background: Other states have developed similar programs that use crash data and crash research to locate actual and potential high crash sites along roadways and assist LPAs in finding low cost roadway solutions.
- ❖ Develop tools to train elected officials on the importance of local road safety plans and funding safety improvements.

Enforcement

Kansas cities, counties and townships oversee more than 130,000 miles of state road. That means that halving fatalities and serious injuries in the next 20 years will take lots of help from local partners – law enforcement in particular.

A short survey of police officials from Butler, Lyon, Johnson, Crawford and Stafford counties turned up several barriers to success in reducing crash numbers, including having too few officers and too little crash data.

John Koelsch, chief deputy at the Lyon County Sheriff's Office, who conducted the survey, noted that "law enforcement almost always has fewer personnel than needed to concentrate on traffic-related matters."

Three of the other four officers agreed, citing the problem, in their words, of a lack of "manpower," "people" or "extra officers to patrol."

The fourth said that a lack of personnel is less important than "motivation and permission to do traffic enforcement."

To reduce crashes on local roads also requires, according to Koelsch, "crash data easily accessed . . . in a timely matter."

The data could include, for example, the day of the week and time of day, along with such contributing factors as road and weather conditions, ages of drivers, impairment by alcohol or drugs, speed of vehicles and presence of hazards at crash "hot spots."

Those areas could then be worked more than others "when deputies have time," said Crawford County Sheriff Sandy Horton, "but to be honest with you, to work traffic for this office is a luxury, as we are so busy responding to other calls."

KDOT is working to set up an accessible database that will contain such information linked to the location of accidents established by use of GPS technology.

Other needs mentioned included updated equipment (to replace aging radar, for example), as well as training related to impaired driving, both within the academies and on the job.

Some grant money is available to help law enforcement reduce crashes on local roads – the KDOT Special Traffic Enforcement Program is one source – but budget constraints at all levels of government restrict access to funds.

One of those surveyed, Dave Corp, now retired from service with the highway patrol, mentioned the importance to officers of feeling supported by judges and prosecutors when they do make arrests. "Officers do not want to write tickets if some judge or prosecutor . . . dismisses them," he said. "That sends a message to the officer."

Goal 6: Emphasize to the law enforcement community the important role of law enforcement to improve safety on local roads

Current strategies:

- ❖ Provide funding for local law enforcement to attend training in the latest techniques of traffic enforcement thru KDOT.
- ❖ Support KDOT's Law Enforcement Liaison (LEL) program.
 - Background: KDOT utilizes three LELs to promote occupant protection/impaired driving issues as well as maintain/enhance a good working relationship between KDOT and the nearly 450 diverse local law enforcement agencies within the State.
- ❖ Award grants to participating Kansas law enforcement agencies to increase education and enforcement efforts directed at compliance with Kansas safety belt, child passenger safety, and impaired driving laws through the Special Traffic Enforcement Program, or STEP.
- ❖ Purchase and distribute equipment to STEP agencies that promote and participate in traffic safety enforcement efforts.
- ❖ Support Operation Impact in Wichita and Kansas City regions.
 - Background: Operation Impact is a multi-agency initiative to address traffic safety on specific corridors. Education, awareness, and enforcement are typical priorities of each operation.
- ❖ Encourage partnerships between local media and law enforcement agencies.

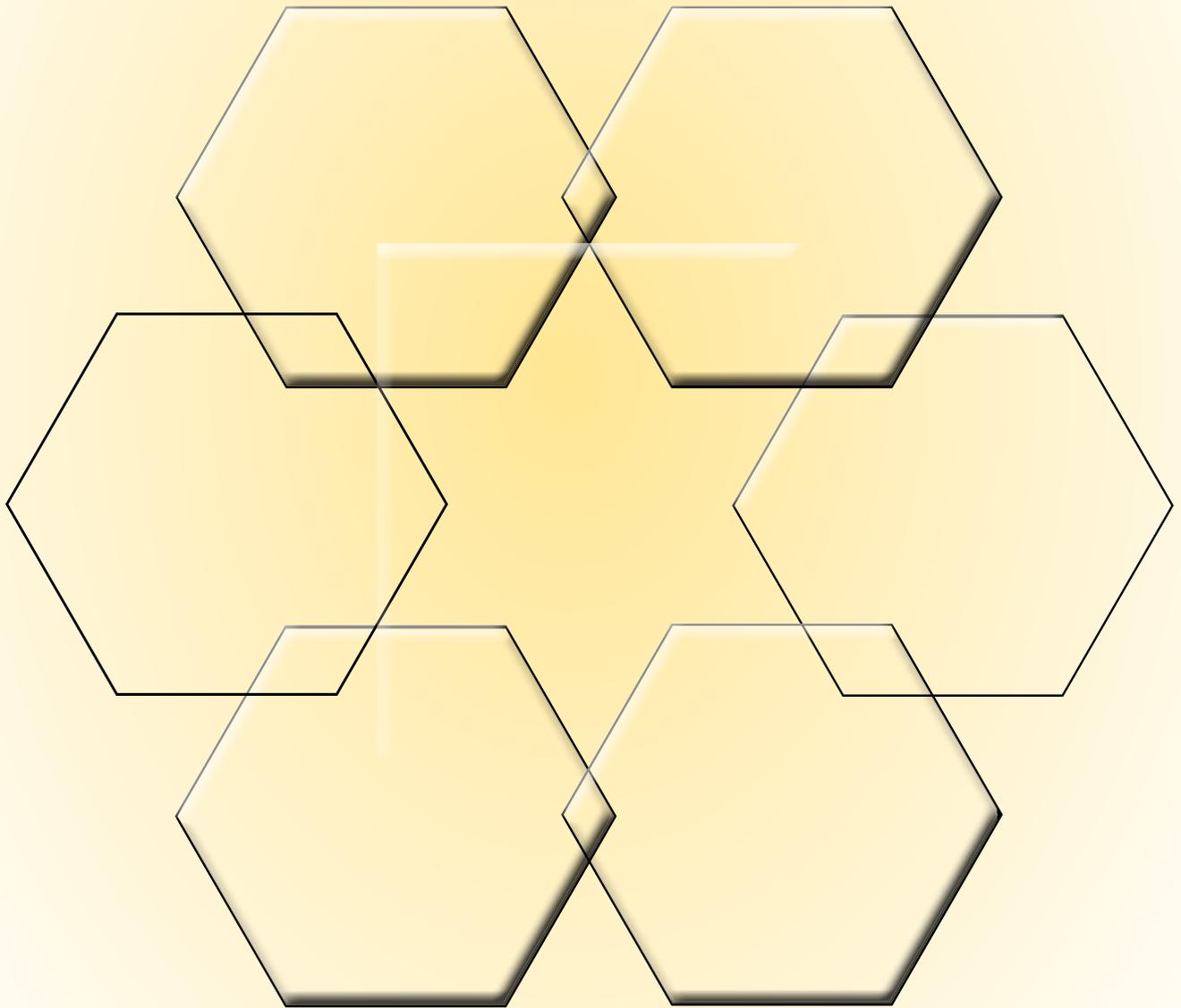
New strategy:

- ❖ Promote the importance of traffic enforcement to the law enforcement community.
 - Background: There appears to be a decline in interest among law enforcement personnel in enforcing traffic laws. Traffic enforcement allows direct contact and a great chance to educate drivers. On local roads especially, there is sometimes a reluctance to arrest or ticket a "local", who may also be a neighbor. Regardless, traffic laws are written for a reason and law enforcement needs to enforce them. Delivering analyzed crash data is one way to initiate this conversation.
 - Method: practice
 - Costs: none
 - Lead agency and contact: KDOT, Bureau of Transportation Safety & Technology, Law Enforcement Liaisons
 - Challenges: competing with other law enforcement units
 - Target date: beginning 2014

Future strategies:

- ❖ Provide training to law enforcement on such topics as traffic laws, distracted driving and the importance of writing tickets for infractions that result in crashes.
- ❖ Create incentives for law enforcement agencies to participate in traffic safety campaigns by tying safety grants to enforcement activities.
- ❖ Identify local road corridors that based on crash data would benefit from enhanced enforcement activities.

OCCUPANT PROTECTION



Occupant Protection

Introduction

Buckling up – or being buckled in – is the most effective protection during a car crash. The simple truth is that the great majority of people ejected from a motor vehicle die. The U.S. Department of Transportation’s National Highway Traffic Safety Administration, or NHTSA, estimates that lap/shoulder seat belts, used correctly, reduce fatal injuries to front-seat passenger car occupants by 45 percent and moderate-to-critical injuries by 50 percent. See [2006 Motor Vehicle Protection--Facts](#) for details.

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

The greatest benefit, though, is for infants under age 1. Child safety seats reduce their fatalities by 71 percent. For toddlers ages 1 to 4 in passenger cars, the reduction is 54 percent. For infants and toddlers in light trucks, the reductions are 58 percent and 59 percent, respectively.

Kansas law requires children under age 4 to ride in these seats. When children reach the weight or height limits of their infant-only seat, they should be changed to a convertible seat and remain rear-facing until they reach the weight or height limits of that seat. At that point, they should be placed in a forward-facing seat and secured by a full harness until they reach the weight or height limits of that seat. Children ages 4 to 8 must be in a child safety seat or booster seat until they weigh more than 80 pounds or are taller than 4’9”; at that point a seat belt is mandatory. Children ages 8 to 13 must wear a seat belt. All passengers and drivers 14 or older are required to use seat belts.

Data released by KDOT in 2010 showed that four in five front seat occupants were using seat belts, an increase of about 5 percent from the year before. We remain concerned, however, about the vulnerability of the one in five who still don’t buckle up. The good news in child passenger safety is that a majority of parents buckle up their children in car seats, booster seats, or seat belts. However, according to NHTSA, approximately 3 out of 4 car seats are not used properly, which is a tremendous risk when traveling.

The purpose of the occupant protection emphasis area team is to develop data-driven action plans that encourage drivers and passengers to wear seat belts at all times. Data in this chapter apply only to vehicles covered under Kansas seat belt laws; this would exclude, for example, data related to bicycles and motorcycles.

The occupant protection team is developing performance measures, setting objectives, selecting strategies and identifying resources needed, including funding, legislation, staff and lead agencies. Implementing the strategies will require various combinations of the 4E’s: engineering, education, enforcement and emergency management.

The outcome sought by the occupant protection emphasis area team is the implementation of the SHSP through safety-related programs and projects. Implementation may depend on policy changes, media attention, education and awareness campaigns, enforcement mobilization and programs aimed at low seat-belt-use groups. Some efforts will be statewide; others will target geographic areas with low rates of seat belt use.



OCCUPANT PROTECTION

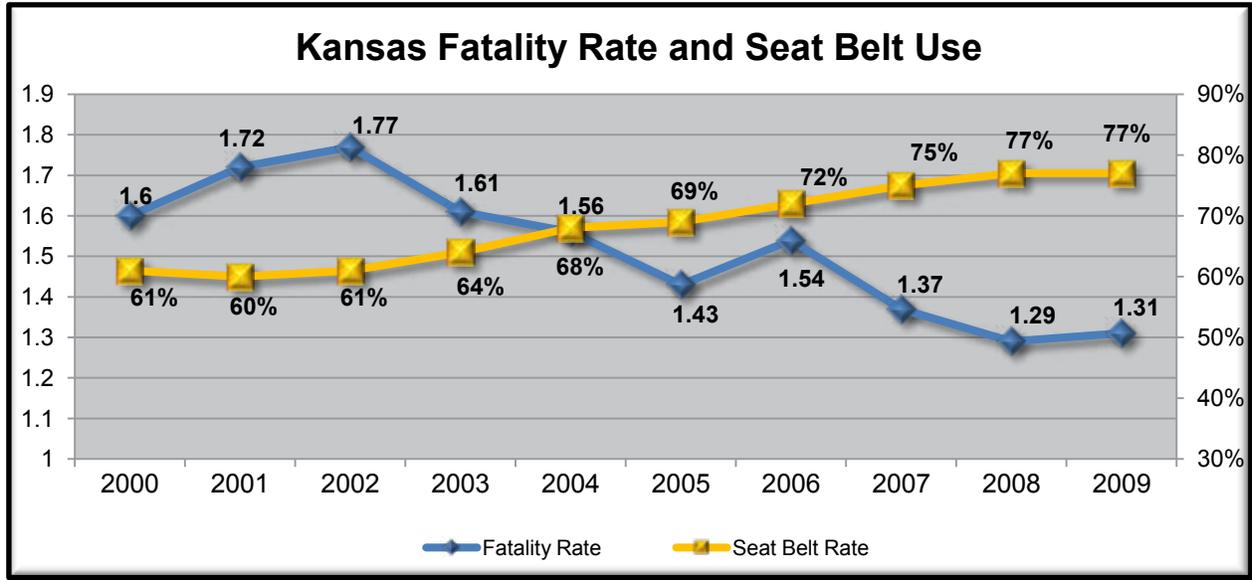
Members of the emphasis area team, representing the following groups, first met on September 18, 2009:

- ❖ Kansas Department of Transportation (KDOT)
- ❖ National Highway Traffic Safety Administration (NHTSA)
- ❖ Kansas Highway Patrol (KHP)
- ❖ Kansas Department of Health and Environment (KDHE)
- ❖ AAA of Kansas
- ❖ Mid-America Regional Council (MARC)
- ❖ Safe Kids Kansas
- ❖ Kansas Traffic Safety Resource Office (KTSRO)
- ❖ Parsons Brinckerhoff

Data Points

1. Buckle them in, then buckle up. Save lives.

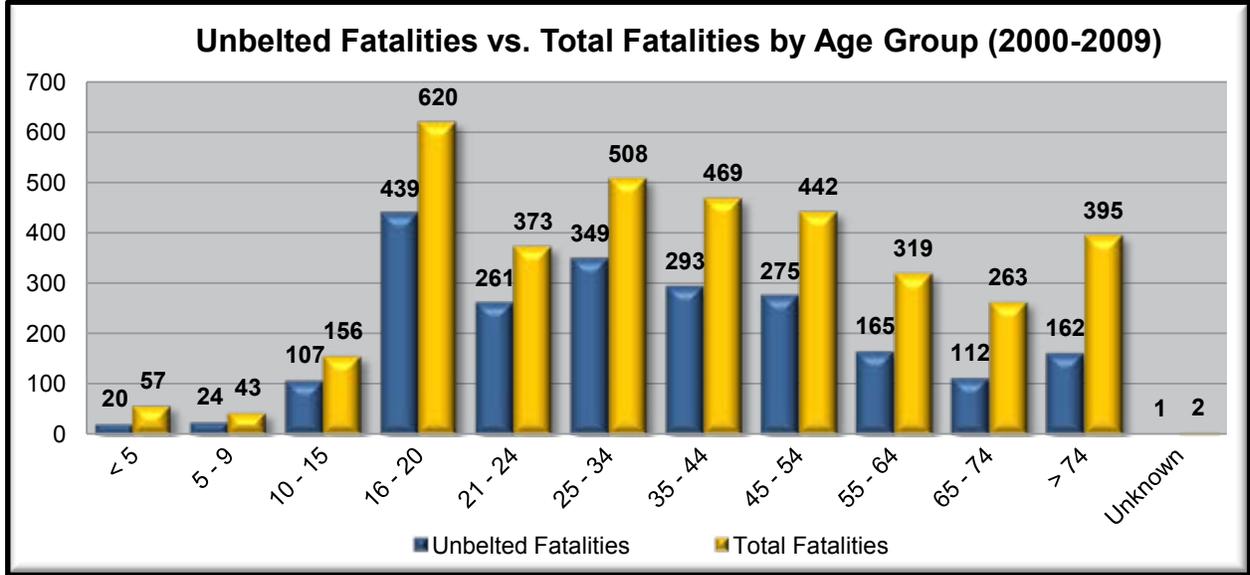
In crashes, fatalities fall when drivers and riders buckle up. Of every 10 adults who died in Kansas crashes from 2004 to 2009, 60 to 70 percent (depending on the year) weren't wearing seatbelts.



In the latest reporting year, there were 1.31 fatalities for every 100 million vehicle miles traveled. As the rate of seat belt use increases, fatalities fall.

2. At highest risk: the young.

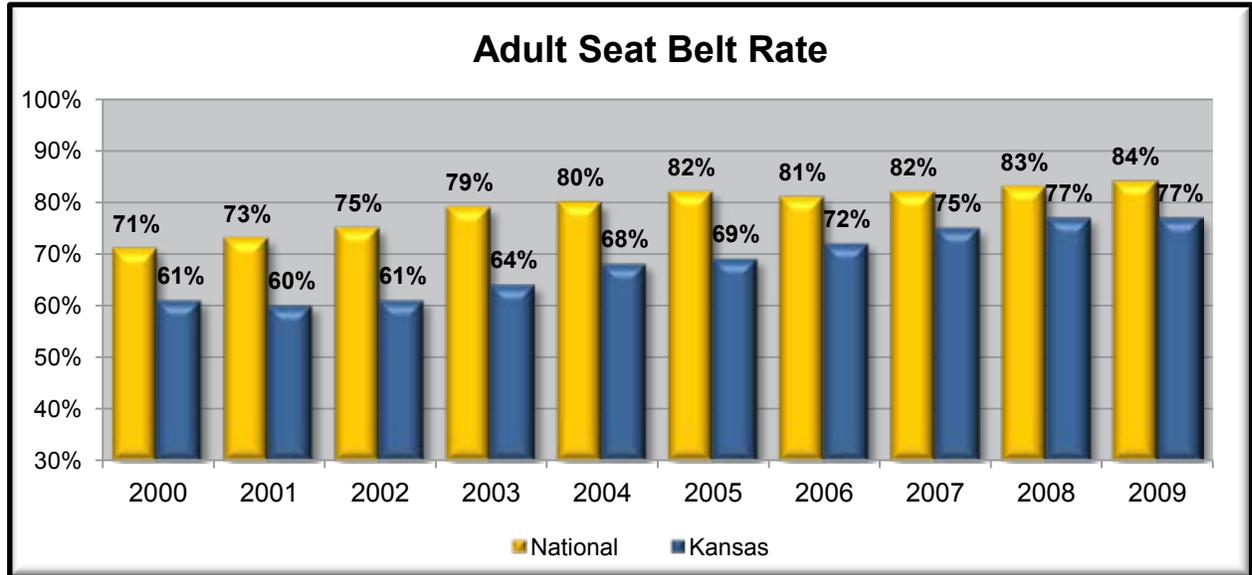
Not wearing seat belts is especially hazardous for riders and drivers under age 35.



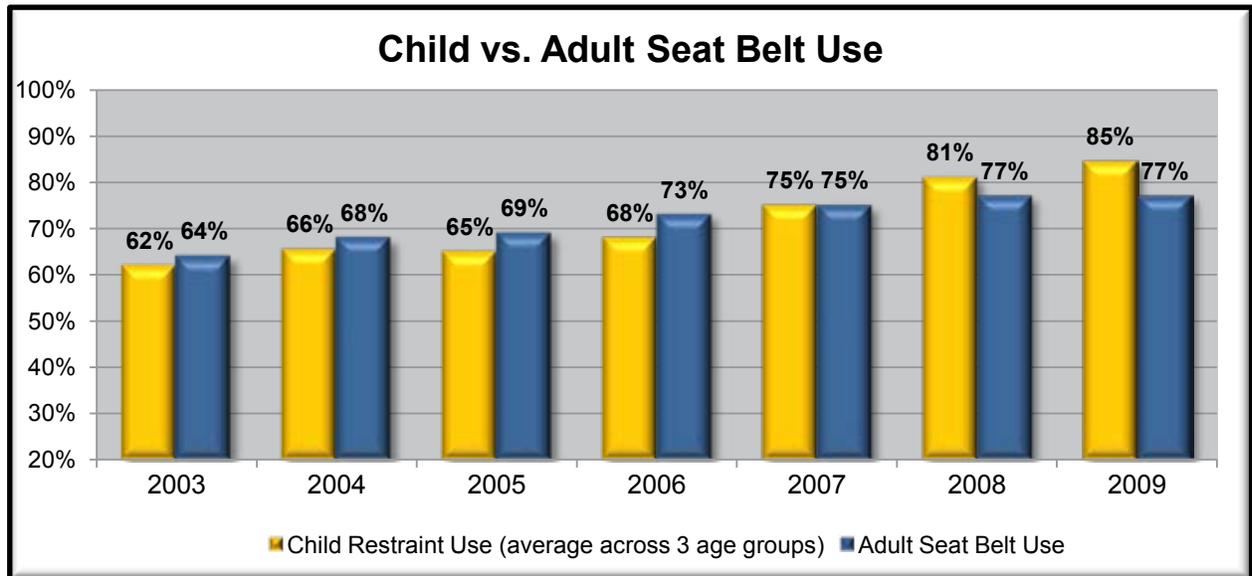
Those ages 16 to 20 are at highest risk of death or serious injury from failing to buckle up. People 25 to 34 are the second most vulnerable group.

3. More Kansans are keeping themselves and their kids safe.

Kansas still falls below the national average in terms of adult use of seat belts, but the state gained ground between 2000 and 2009. And Kansans are increasingly buckling their children into safety seats or getting them to buckle up.

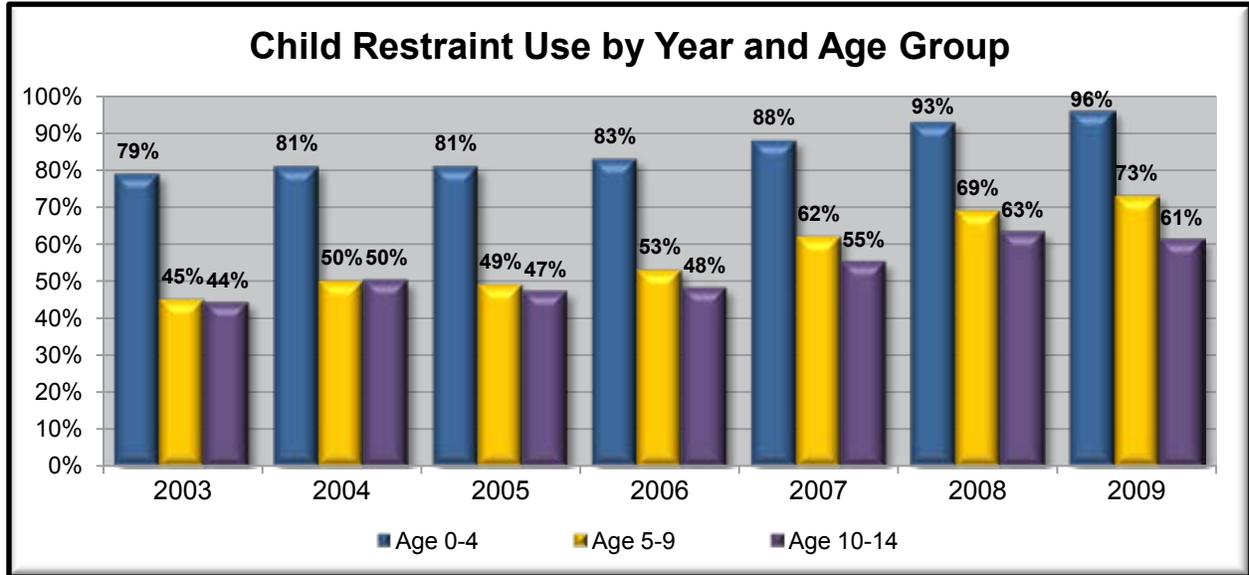


In 2009, Kansas ranked 43rd in the nation in terms of seat belt use -- but was closing the gap relative to the national average.



The first year that child restraint use equaled adult seat belt use was 2007. Now child restraint use surpasses adult seat belt use.

4. Yet as children become teenagers, their seat belt use drops.



From 2004 to 2009, the percentage gains in seat belt use among children were greatest among children under 10. But use of restraints falls off sharply between the toddler and teenage years: from 96 percent to 61 percent in 2009. It should be noted that the child observational survey only measures whether the children were restrained. It does not show whether the restraints are correctly installed, or whether the type of restraint is appropriate for the age and size of the child.



OCCUPANT PROTECTION

5. Still, on every type of road, more people are using seat belts.

Seat Belt Survey						
	2004	2005	2006	2007	2008	2009
Seat Belt Rate	68%	69%	72%	75%	77%	77%
Seat Belt Use by Road Type						
Rural Interstate	80%	76%	83%	83%	89%	89%
Rural State Roads	69%	68%	71%	72%	76%	75%
Rural County Roads	59%	56%	57%	63%	66%	66%
Urban Interstate	74%	75%	84%	86%	84%	82%
Urban State Roads	65%	64%	69%	68%	76%	76%
Urban City Streets	60%	58%	57%	59%	70%	69%
Child Restraint Use						
0-4	81%	81%	83%	88%	93%	96%
5-9	50%	49%	53%	62%	69%	73%
10-14	50%	47%	48%	55%	63%	61%
Seat Belt Use by Fatality Victims	34%	30%	40%	39%	30%	30%

Seat belt surveys are conducted by trained observers. They occur in a representative sample of Kansas counties, based on population. Among the findings: People are most likely to buckle up on interstates, least likely on rural county roads or urban city streets. Yet between 2004 and 2009, seat belt use increased on each of the six classes of roads in Kansas. See <http://www.ksdot.org/burTrafficSaf/safblt/safbltusag.asp> for more details.



OCCUPANT PROTECTION

Performance Measures

The goal of the occupant protection emphasis area team is to halve motor vehicle fatalities and serious injuries within 20 years by increasing the use of safety restraints. Interim goals will help us measure our progress along the way. By doing so, we can adjust our strategies if they're not having the desired effect.

An annual survey in Kansas is conducted by trained observers to monitor vehicles and record seat belt use. Between 2005 and 2009, the average annual observed seat belt use was 75 percent. Our goal is to increase the five-year average to 80 percent by 2012 and to 86 percent by 2016. Statistics support that success in increasing proper seat belt use would naturally decrease the number of fatalities.

Goals and Strategies

The occupant protection team has chosen six goals as the focus of its efforts. It seeks to

1. Influence policymakers to pass laws that increase seat belt use
2. Create data-driven safety programs that promote, through media, education and law enforcement, the use of restraints by everyone
3. Collaborate with state and local partners to promote a consistent message regarding restraint use
4. Develop tactics to get all law enforcement officers to buckle up
5. Provide resources and support for efforts to enforce occupant protection laws
6. Use data to target areas of Kansas where restraint use is low

The challenge is to identify the strategies, or combination of strategies, with the greatest impact on the behavior of drivers and passengers.

Goal 1: Influence policymakers to pass laws that increase seat belt use in Kansas

Current Strategy:

- ❖ Utilize KDOT staff and its safety partners to garner grassroots support, testify before the Kansas Legislature and provide information to the media on the benefits of strong safety restraint laws

New Strategies:

- ❖ Focus policy efforts on passing a seat belt law that requires primary enforcement in all seating positions
 - ❖ Background: Data from other states and the National Highway Traffic Safety Administration show that requiring seat belt use by everyone has a stronger effect on changing seat-belt-related behavior than requiring restraints only for minors and front-seat occupants.
 - ❖ Method: legislation
 - ❖ Costs: minimal
 - ❖ Lead agency and contact: KDOT, Traffic Safety Section
 - ❖ Challenges: generating legislative support for expanding required seat belt use
 - ❖ Target date: by the end of the 2013 legislative session
- ❖ Focus policy efforts on increasing the fine for a seat belt violation to \$60
 - ❖ Background: Data from other states and NHTSA show that a substantial fine for seat belt violations has more effect than a small fine.
 - ❖ Method: legislation
 - ❖ Costs: minimal
 - ❖ Lead agency and contact: KDOT, Traffic Safety Section
 - ❖ Challenges: legislative support
 - ❖ Target date: by the end of the 2013 legislative session

- ❖ Conduct study to determine comparative post-crash costs of hospitalization for belted and unbelted occupants
 - ❖ Background: Studies in other states show much higher medical costs for individuals in crashes who are not wearing seat belts, compared with those who are. The findings of a Kansas study could be presented to the Legislature.
 - ❖ Method: research
 - ❖ Costs: \$250,000 (estimated)
 - ❖ Lead agency and contact: KDHE, Kansas Trauma Program
 - ❖ Challenges: data access
 - ❖ Target date: December 2013

Goal 2: Create data-driven safety programs that promote, through media, education and law enforcement, the use of restraints by everyone

Current Strategies:

- ❖ Continue Click It or Ticket (CIOT) media/enforcement campaign
- ❖ Research methods for retaining and recertifying law enforcement personnel trained in child passenger safety
- ❖ Support continuing education opportunities for such personnel and their instructors

New Strategies:

- ❖ Expand Seatbelts Are For Everyone, or SAFE, program
 - ❖ Background: The SAFE program, launched in 2008 in Crawford County in six schools, led to impressive increases in seat belt usage. It was successfully expanded to Cowley, Wyandotte, Montgomery and Neosho Counties in 2010. As of June 2011, it has expanded to 29 counties and 95 schools while another eight counties have expressed interest in the program. Groups such as AAA, State Farm, KDHE Regional Trauma Programs and local communities have all supported the program. To date, at all participating schools there has been a combined increase of 14 percent in seatbelt usage. An annual 20-county seatbelt survey also indicates that there has been a large jump in most of the counties where SAFE has been implemented.
 - ❖ Method: program
 - ❖ Costs: \$85,000 to date (estimate)
 - ❖ Performance measures:
 - ❖ Maintain the SAFE program in schools now using it
 - ❖ In the short run, establish SAFE in every county within the jurisdiction of KHP Troop B (NE Kansas) and Troop H (SE Kansas)
 - ❖ In the long run, establish SAFE in every Kansas County
 - ❖ Lead agency and contact: Kansas Traffic Safety Resource Office



- ❖ Challenges: Curricular requirements leave schools little time to sponsor new programs. It is difficult to start the program in large school districts. Where there is limited involvement from law enforcement the program is not as effective.
- ❖ Target date: June 2012 (short term)
- ❖ Expand use of non-traditional media (social networking sites, internet, games) to promote CIOT message
 - ❖ Background: KDOT uses Twitter, Facebook and YouTube to reach target audiences. It's also studying the possibility of using on-line gaming sites to promote CIOT.
 - ❖ Method: program
 - ❖ Costs: \$35,000 (estimated)
 - ❖ Performance measure: number of impressions (views) by target audience
 - ❖ Lead agency and contact: KDOT, Traffic Safety Section
 - ❖ Challenges: finding cost-effective ways to use nontraditional media to reach the target audience in their particular internet community
 - ❖ Target date: ongoing

Future Strategies:

- ❖ Provide model transportation policies to groups like churches, day-care agencies and schools that regularly transport children
- ❖ Promote employer buckle-up programs
- ❖ Promote teen-driven community surveys and presentations in coordination with local events

Goal 3: Collaborate with state and local partners to promote a consistent message regarding restraint use

Current Strategies:

- ❖ Continue funding support for a Kansas representative on the National Child Passenger Safety Board
- ❖ Promote such curricula as Boosters to Belts and Safety Breaks

New Strategies:

- ❖ Survey attitudes about and knowledge of seat belt laws annually and use the results in public education efforts
 - ❖ Background: NHTSA and the Governors Highway Safety Association agree that a survey of this type would be a cost-effective, informative way of targeting our safety messages.
 - ❖ Method: research
 - ❖ Costs: \$22,000/year (estimated)
 - ❖ Performance measure: percentage of respondents aware of seat belt laws and programs before and after the education programs
 - ❖ Lead agency and contact: KDOT, Traffic Safety Section
 - ❖ Challenges: designing a scientific survey that produces accurate and credible results
 - ❖ Target date: September (annually)
- ❖ Reach out to school resource officers and school nurses in order to provide seat belt education and information to students
 - ❖ Background: The earlier a child wears a seat belt, the more likely he or she is to continue – and influence others to do so.
 - ❖ Method: program
 - ❖ Costs: minimal
 - ❖ Performance measure: number of students reached
 - ❖ Lead agencies: Kansas Traffic Safety Resource Office
 - ❖ Challenges: existing curricular requirements leave little time for new programs
 - ❖ Target date: Academic year 2011/2012

- ❖ Develop partnerships with the medical and faith communities to promote occupant protection strategies to senior citizens and minority group members
 - ❖ Background: Research indicates that when communicating messages to some demographic groups with the goal of changing behavior, it helps to team with organizations or leaders trusted by the groups.
 - ❖ Method: project
 - ❖ Costs: minimal
 - ❖ Performance measure: the number of group members reached
 - ❖ Lead agency and contact: Kansas Traffic Safety Resource Office
 - ❖ Challenges: Identifying leaders within these communities to promote partnering
 - ❖ Target date: 2012

Goal 4: Develop tactics to get all law enforcement officers to use seat belts

Current Strategy:

- ❖ Continue presentations on occupant protection at the KDOT Traffic Safety Conference and Special Traffic Enforcement Program luncheon

New Strategy:

- ❖ Require all agencies that receive KDOT grants to have an enforceable seat belt usage policy
 - ❖ Background: Those who receive KDOT grants are more likely to promote seat belt use, and officers who obey the law are more likely to enforce it than those who don't.
 - ❖ Method: policy
 - ❖ Costs: none
 - ❖ Lead agency and contact: KDOT, Traffic Safety Section
 - ❖ Challenges: law enforcement agency resistance to the seat belt law in some regions of Kansas
 - ❖ Target date: December 2011

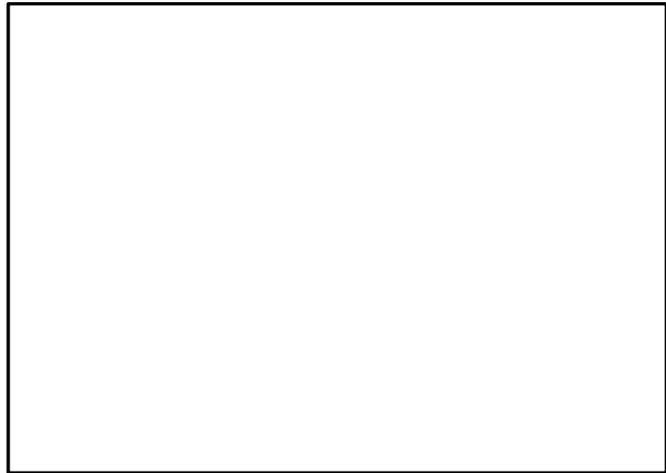
Goal 5: Provide funding and other forms of support for law enforcement efforts to uphold occupant protection laws.

Current Strategies:

- ❖ Support child passenger safety training and certification for law enforcement agencies
- ❖ Provide grants to pay for equipment and overtime related to the conduct of seat belt enforcement activities

New Strategies:

- ❖ Support Traffic Occupant Protection Strategies training
 - ❖ Background: 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.
 - ❖ Method: program
 - ❖ Costs: \$10,000 (estimate)
 - ❖ Lead agency and contact: KDOT, Traffic Safety Section, Law Enforcement Liaisons
 - ❖ Challenges: scheduling time for officers to attend training
 - ❖ Target date: 2012
- ❖ Establish “Chief’s Challenge” awards for enforcement of occupant protection laws
 - ❖ Background: Recognizing officers’ efforts energizes them and reinforces the importance of occupant protection.
 - ❖ Method: program
 - ❖ Costs: \$10,000 (estimate)
 - ❖ Performance measure: the number of agencies that participate
 - ❖ Lead agency and contact: AAA Kansas
 - ❖ Challenges: creating and organizing the program
 - ❖ Target date: 2012
- ❖ Pilot a program to enforce nighttime seat belt use
 - ❖ Background: Data show that seat belt use decreases at night, a time when more impaired drivers are also on the road.
 - ❖ Method: program
 - ❖ Costs: \$10,000 (estimate)
 - ❖ Performance measure: percent increase in seatbelt usage at night
 - ❖ Lead agency and contact: KDOT, Traffic Safety Section, Law Enforcement Liaisons
 - ❖ Challenges: spotting unbelted drivers and passengers at night
 - ❖ Target date: 2012



Goal 6: Use data to target areas in Kansas where restraint use is low

Current Strategies:

- ❖ Continue support for local child passenger safety inspection stations and provision of safety seats for low-income families
- ❖ Continue observational surveys conforming to NHTSTA standards

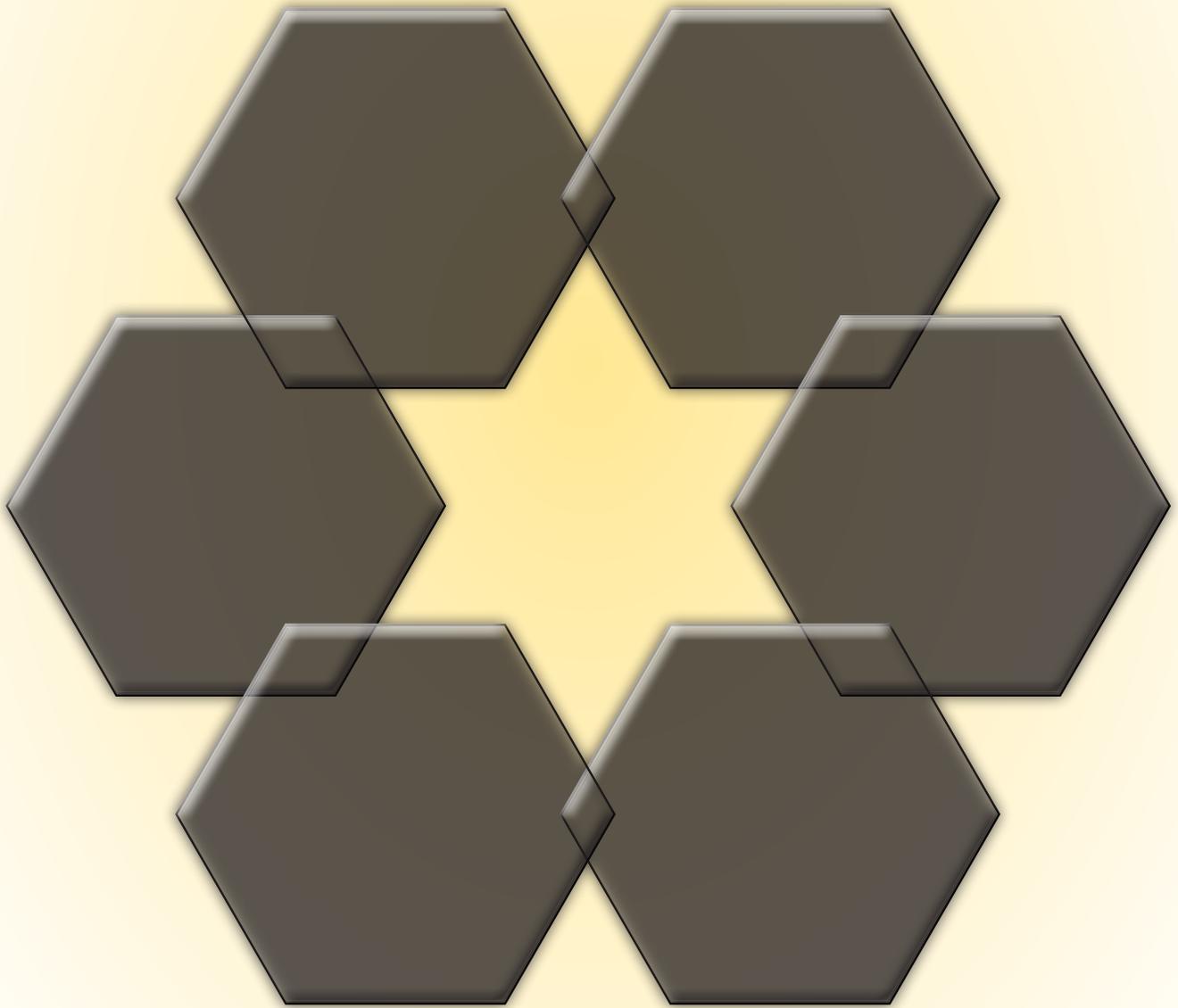
New Strategies:

- ❖ Increase enforcement efforts in traffic corridors with low rates of seat belt use
 - ❖ Background: Extra enforcement efforts often increase seat belt use.
 - ❖ Method: project
 - ❖ Costs: minimal
 - ❖ Performance measure: increased use of seat belts in target areas
 - ❖ Lead agency and contact: KDOT, Traffic Safety Section, Law Enforcement Liaisons
 - ❖ Challenges: lack of law enforcement officers to staff the effort
 - ❖ Target date: 2011
- ❖ Use billboards to communicate messages in parts of Kansas with low rates of seat belt use
 - ❖ Background: Some regions of the state are served by few media.
 - ❖ Method: policy
 - ❖ Costs: \$100,000 (estimate)
 - ❖ Lead agency and contact: KDOT, Traffic Safety Section
 - ❖ Challenges: lack of billboard space in some regions
 - ❖ Target date: 2012
- ❖ Target members of some minority groups for occupant protection education
 - ❖ Background: Members of some minority groups use seat belts less frequently than members of other groups.
 - ❖ Method: project (community needs assessment)
 - ❖ Costs: minimal
 - ❖ Performance measure: increased seat belt use
 - ❖ Lead agency and contact: Kansas Traffic Safety Resource Office
 - ❖ Challenges: determining the best message and media to reach these groups
 - ❖ Target date: 2011

Future Strategies:

- ❖ Evaluate effectiveness of changes to the graduated driver's license law
- ❖ Evaluate effectiveness of primary seat belt law

ROADWAY DEPARTURE



Roadway Departure

Introduction

According to the Federal Highway Administration, 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 inattention). 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 flip. 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 devising a forgiving roadway - an engineering solution to reduce the severity of those incidents that do occur. We propose using both approaches.

The Roadway Departure Emphasis Area Team, or EAT, will develop data-driven action plans to reduce the number and severity of roadway departure crashes in Kansas. Relevant data include both crash statistics and quantifiable results from safety measures designed to reduce crashes. This EAT will develop performance measures, set goals, select strategies and identify resources, including funding, legislation, staffing and agency leadership, that are required to create safety-related programs and projects that lessen the number of roadway departure crashes.

Strategies will address the 4E's: engineering, education, enforcement, and emergency medical services. These could include, for example, low-cost safety improvements deployed systemically, high-cost safety improvements deployed via safety programs or construction projects, policy changes and research initiatives.

The Roadway Departure EAT first met October 15, 2009. These agencies were represented:

- ❖ American Traffic Safety Services Association (ATSSA)
- ❖ TranSystems
- ❖ Federal Highway Administration (FHWA)
- ❖ Kansas Highway Patrol (KHP)
- ❖ Kansas Department of Transportation (KDOT)

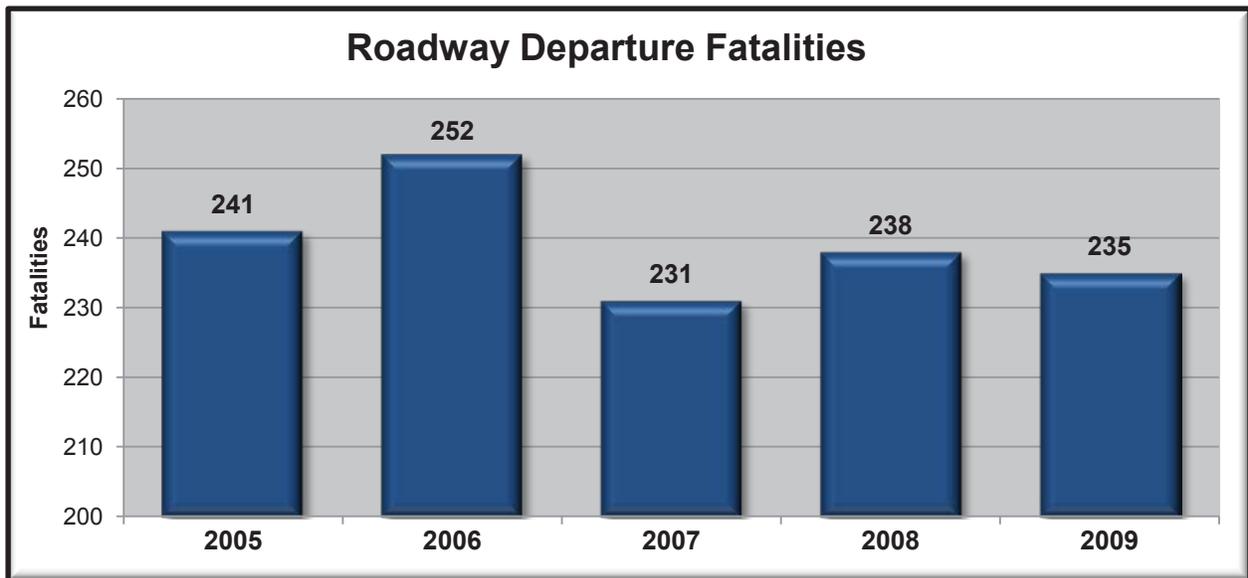
Identifying strategies and means of implementation are only part of the challenge. Deciding where, and to what extent, to apply a strategy is also critical. For example, when considering an engineering solution should we apply a low-cost strategy at 20 locations with a potential for crashes or apply a high-cost strategy at one location – seemingly similar to 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 expenditure of our safety dollars. With input from the Data Support Team, the Roadway Departure EAT will have the tools to select sites and choose project types based on the actual causes of crashes.

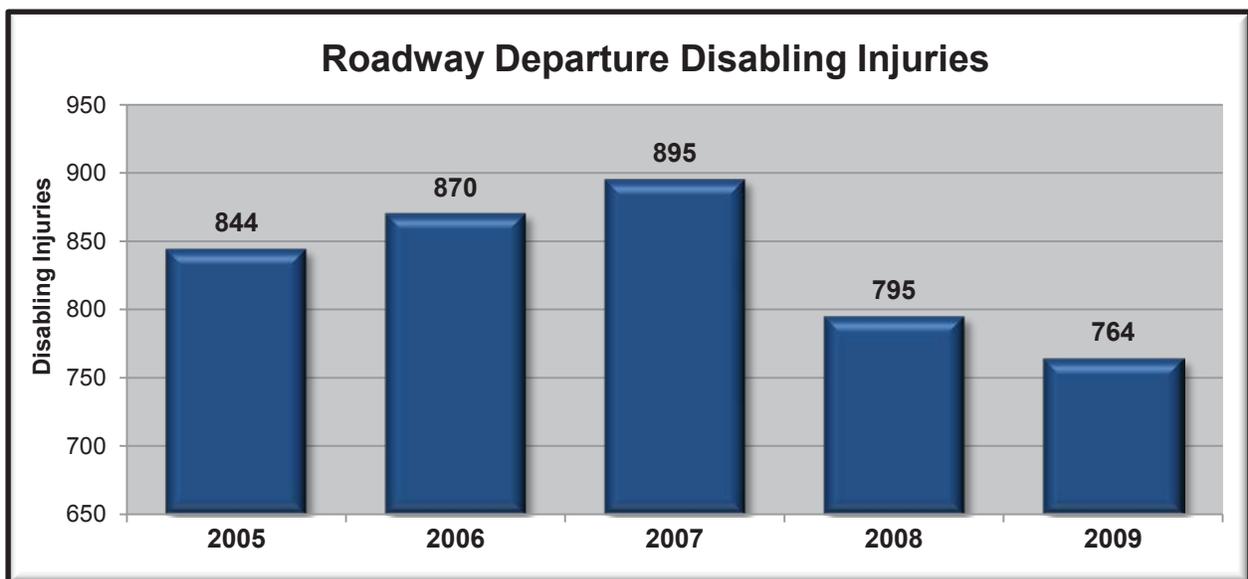
Data Points

1. Roadway departure is the cause of less than a quarter of Kansas crashes but almost half the serious injuries and deaths.

Between 2005 and 2009, 1,197 fatalities and 4,168 disabling injuries resulted from roadway departures, making these the No. 1 source of danger to drivers and passengers in Kansas. During these years, such crashes accounted for 23 percent of all those reported in Kansas; yet 49 percent of the serious injuries or deaths were associated with them. In sum, compared with other crash causes, the impact of roadway departures on drivers and passengers is likely to be more severe.



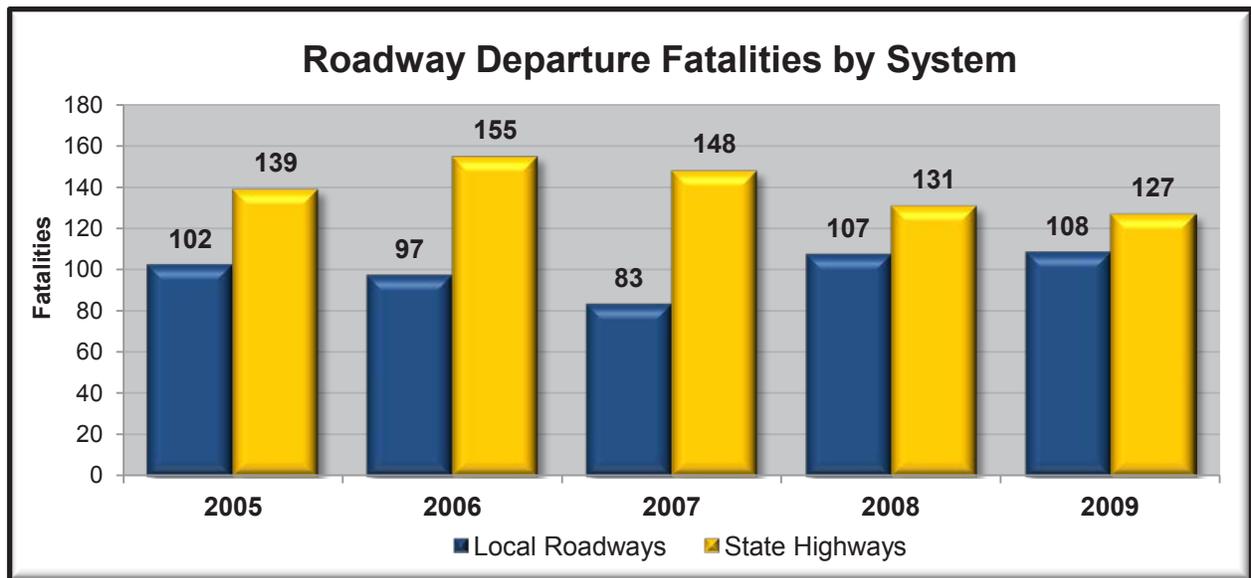
Roadway departures can be deadly. They represent only 23 percent of *all* crashes but more than 58 percent of *fatal* crashes.



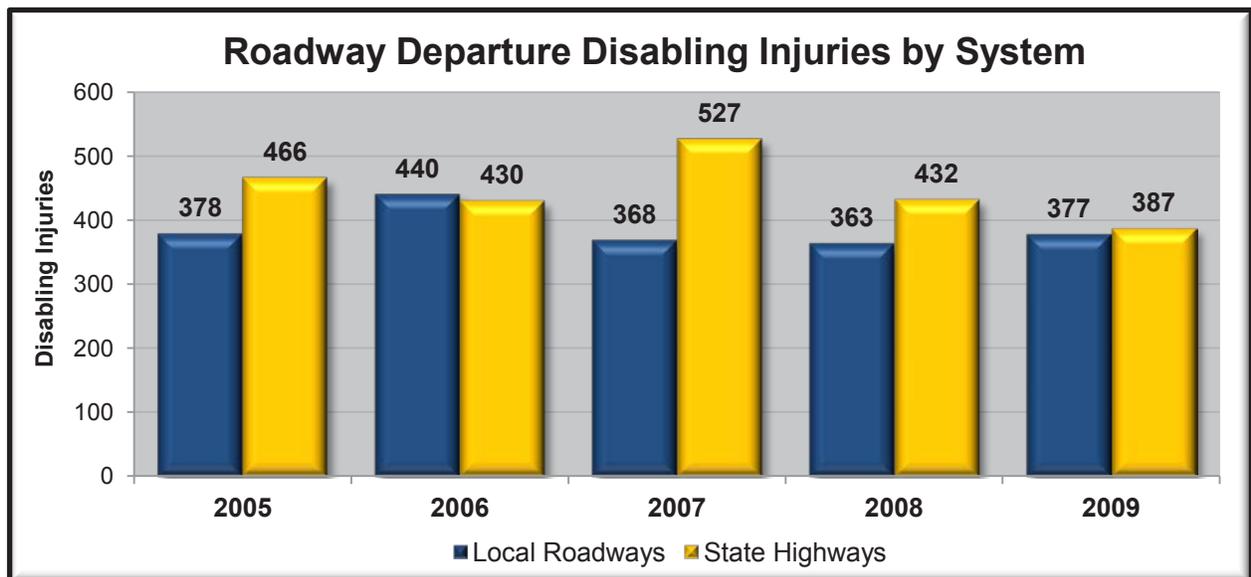
Similarly, roadway departure is the source of more than 47 percent of disabling injury crashes.

2. Roadway departures on state highways and local roads result in fatality and serious injury crashes.

Between 2005 and 2009, 56 percent of **all fatalities** occurred on state highways and 58 percent of **roadway departure fatalities**. During the same period, 48 percent of **all disabling injuries** occurred on state highways and 54 percent of **roadway departure disabling injuries**. There are far more miles of local roads, but state roads carry more traffic. When those factors are taken into consideration, both road classes have similar overall fatal crash rates: one death per 122 million vehicle miles traveled on state roads and one death per 130 million miles traveled on local roads. These statistics argue against a disproportionate focus on either system.



Between 2005 and 2009, about 58 percent of roadway departure fatalities occurred on state highways, with the remaining 42 percent on local roads.



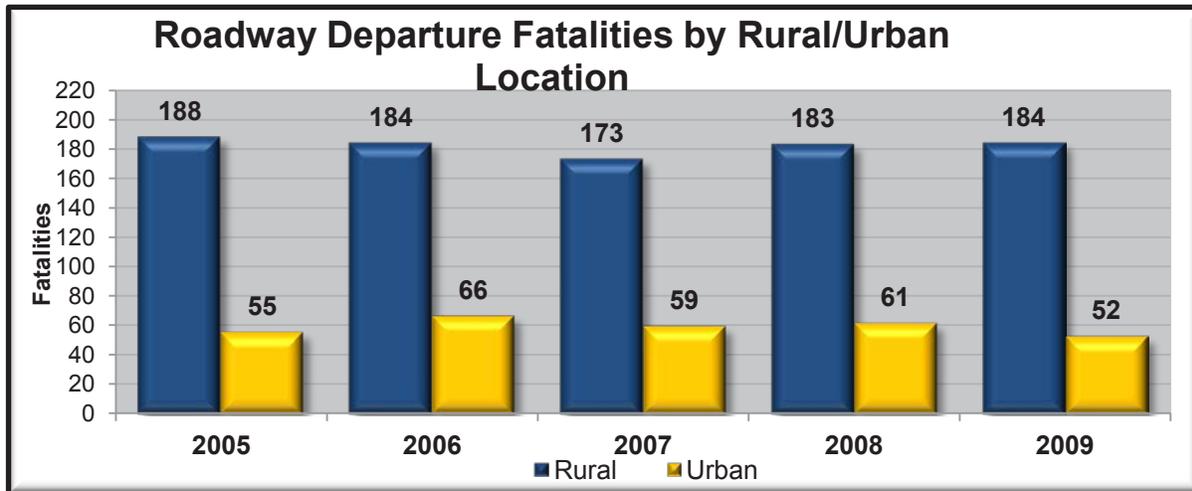
Except in 2006, the distribution of disabling injuries by system has run parallel to the distribution of fatalities.

3. More than two-thirds of all roadway departure serious injuries and fatalities occur on rural roads and highways.

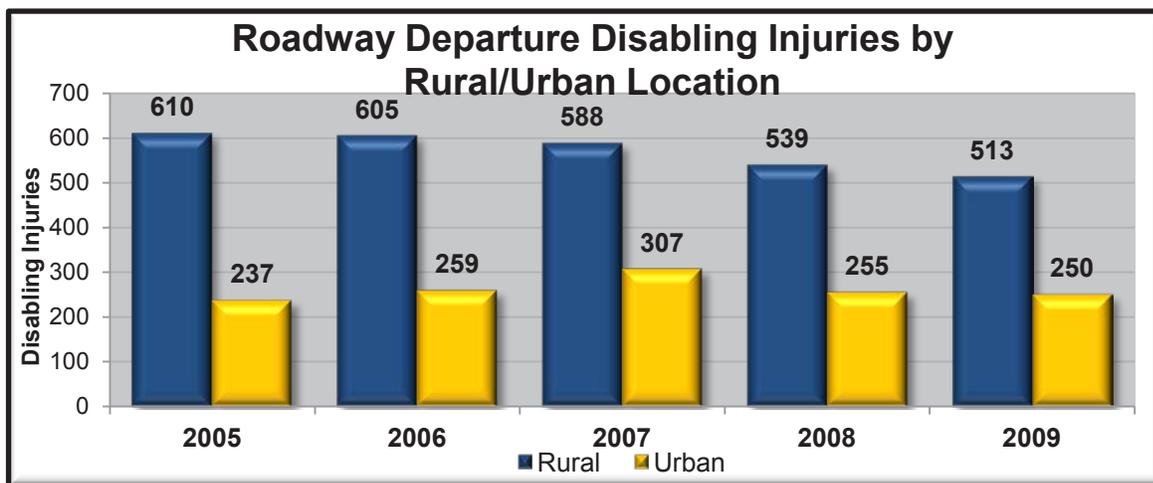
Between 2005 and 2009, over 75 percent of roadway departure fatalities occurred on local roads and state highways in rural areas. This is slightly higher than the figure for all fatalities: 71 percent occurred in rural areas. During the same period, 68 percent of roadway departure disabling injuries, and 54 percent of all disabling injuries, occurred in rural areas. In sum, statistics show that roadway departure crashes on rural roads, compared with those on urban roads, are deadlier and more injurious.

One contributing factor is obvious: Speed limits are higher on rural roads than most urban streets. Speeds are also higher on urban expressways and interstates, which account for nearly 40 percent of roadway departure fatalities in urban areas.

These numbers explain why the Roadway Departure EAT will concentrate on strategies that address rural roads, urban expressways and interstates.



Seventy-five percent of roadway departure fatalities occur on rural roads. That figure is striking given the level of use of Kansas roads: In 2009, the average daily vehicle-miles traveled on urban roads was about 41.2 million, on rural roads, about 39.6 million.



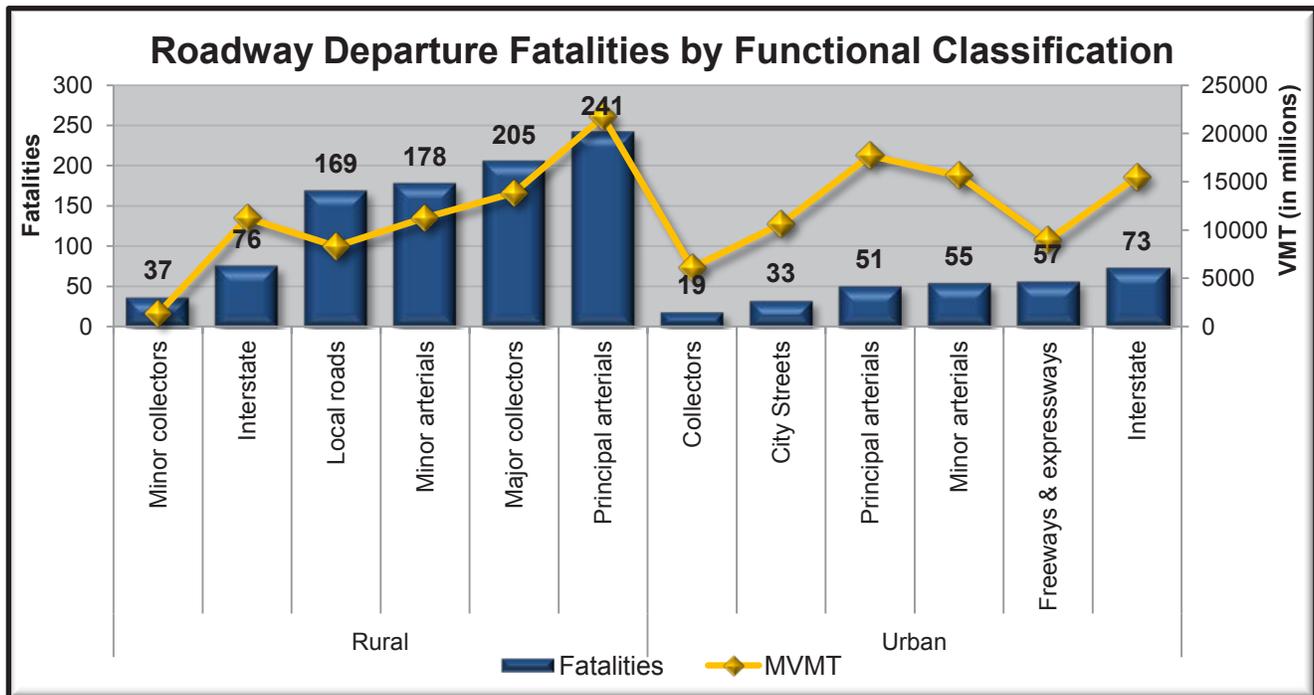
The gap between rural and urban locations as contributors to roadway departure disabling injuries has been closing slightly in recent years. But the fact that two-thirds of the injuries occur in rural areas is significant given that urban areas are more heavily traveled.

4. Rural Roadway Risks: High Speeds, Delays in Emergency Services

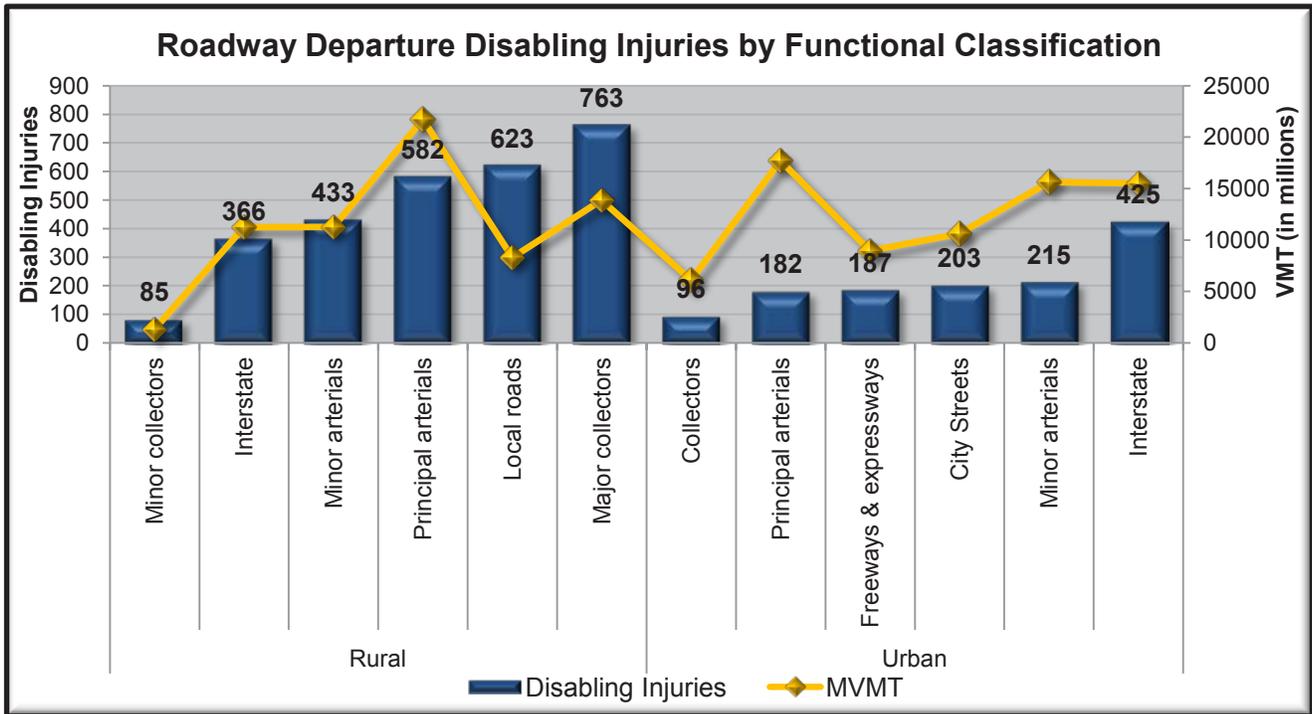
Urban boundaries are developed collaboratively by KDOT and local governments every 10 years, coinciding with the taking of the census, and often include unincorporated areas on the edge of town. As the charts below reveal, more crashes, resulting in more deaths and injuries occur on rural roads than on urban roads. Rural crashes account for 71 percent of all fatal crashes, but just 58 percent of the crashes in which property, alone, is damaged.

Of 140,609 miles of public roads in Kansas, 127,858 – 91 percent – are rural. On the other hand, only 49 percent of all vehicle miles traveled in Kansas are on rural roads. If the number of vehicle miles traveled on rural and urban roads is nearly equal, why do rural roadways experience more fatal and serious injury crashes as a result of roadway departure than urban roadways? There are a number of contributing factors:

- ❖ 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 the crash occurred to when they are discovered and transported has an impact on the patient’s 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, the patient’s needs may exceed the capability of the rural health care facility.
- ❖ Engineering standards: Many of our rural local roads were designed and built long before modern safety standards.



The greater the separation between vehicle miles of travel (VMT) and fatalities, the lower the fatality rate. (Information on functional classifications can be found in Appendix C.)

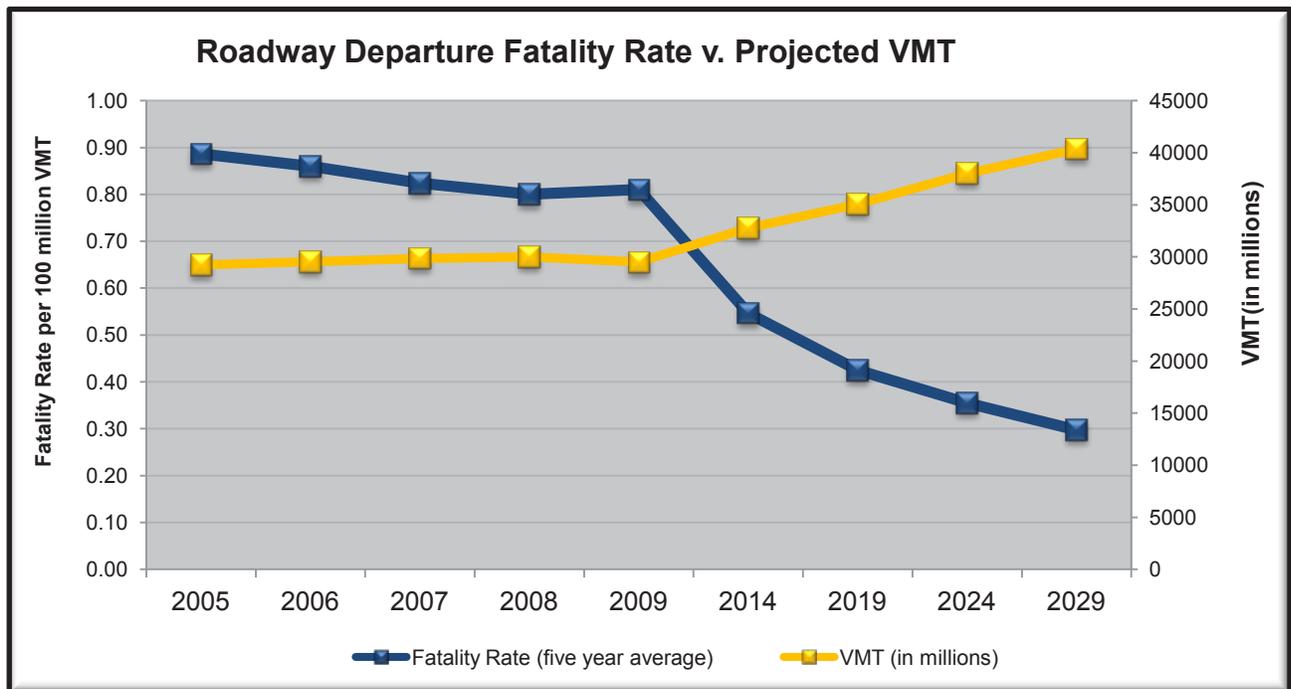


Urban disabling injuries are almost three-and-a-half times higher than urban fatalities, while rural disabling injuries are about two times higher than rural fatalities. This suggests urban crashes may be more survivable than rural crashes. But, rural interstate disabling injuries are almost four times higher than rural interstate fatalities. This indicates rural interstate crashes also have a high rate of survival. Therefore, in the case of single-vehicle crashes, discovery, emergency response and delivery are possible contributing factors.

Performance Measures

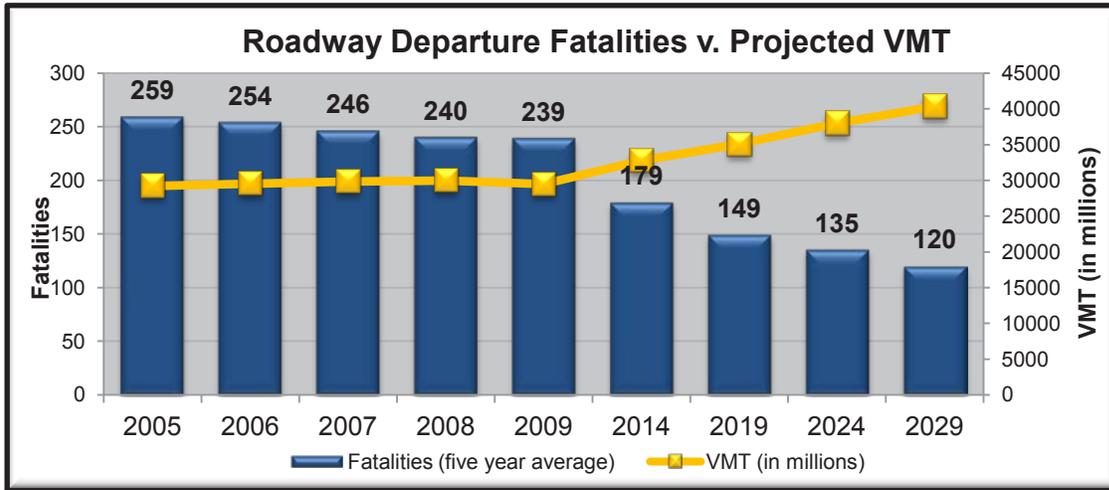
Consistent with this plan’s overall goal, the Roadway Departure EAT seeks to halve roadway departure fatalities and serious injuries within 20 years. In the five years between 2005 and 2009, we averaged 239 roadway-departure-related fatalities and 834 roadway-departure-related disabling injuries per year. Meeting our goal will require reducing the average fatalities per year to no more than 120, and the disabling injuries to at most 417, by the years 2025 to 2029.

The figure below depicts this goal for fatalities in the difficult context in which it must be achieved – a period of increased miles of vehicle travel in Kansas. KDOT planners project that between 2005 and 2009 and 2025 and 2029, Kansas will experience a 37 percent increase in vehicle miles traveled, making halving fatalities all the more challenging to achieve. Since 2005, the roadway departure fatality rate has decreased by 9 percent. To reach our goal, we would need to decrease the rate by an additional 63 percent over the next 20 years.



One barrier to halving roadway-departure-related fatalities in Kansas over the next 20 years: forecasts of a substantial increase in vehicle miles traveled.

Interim goals will let us track our progress. The chart below shows our five-year goals. Our aim is to achieve 50 percent of our goal within five years, 75 percent within 10 years and 100 percent within 20. We are optimistic that in the early years, the new primary seat belt law will reduce fatalities.



Achieving this goal would save about 1,629 lives over a twenty-year period.

Goals and Strategies

Articulating our objective – a radical reduction in the number of roadway departure crashes that kill or disable – is only a start. What goals and strategies will help us accomplish that objective? The roadway departure EAT has chosen the following.

1. Dedicate safety dollars to data-driven programs with the greatest potential to reduce the number of fatal and severe injury crashes on Kansas public roads.
2. Use available traffic records, crash data and roadway data to assist in safety program and project management.
3. Promote proven engineering strategies that focus on keeping drivers on the road and in their lanes.
4. Promote mitigation strategies that lessen the consequences of a crash.
5. Introduce experimental engineering strategies.
6. Promote enforcement campaigns that target locations and corridors with a higher-than-expected number of roadway departure crashes.
7. Promote education campaigns that target over-represented factors in roadway departure crashes.

There is no shortage of ideas about achieving these goals using a 4E approach: *engineering* centerline rumble strips and keeping the roadside clear of fixed objects, *enforcing* impaired driving and distracted driver laws, *educating* drivers and passengers about seat belt use and improving *emergency medical service* coordination to reduce the human cost of crashes, for example. The challenge for the roadway departure team is to identify realistic strategies, prioritize them and seek implementation.

Goal 1: Dedicate safety dollars to data-driven programs with the greatest potential to reduce the number of fatal and severe injury crashes on Kansas public roads.

Current Strategies:

- ❖ Maintain sign retro-reflectivity (visibility when lighted by headlights) on state highways by replacing sign sheeting at scheduled intervals based on anticipated service life.
- ❖ Maintain pavement marking retro-reflectivity on state highways with a program that selects routes for maintenance based on the routine collection of retro-reflectivity data.

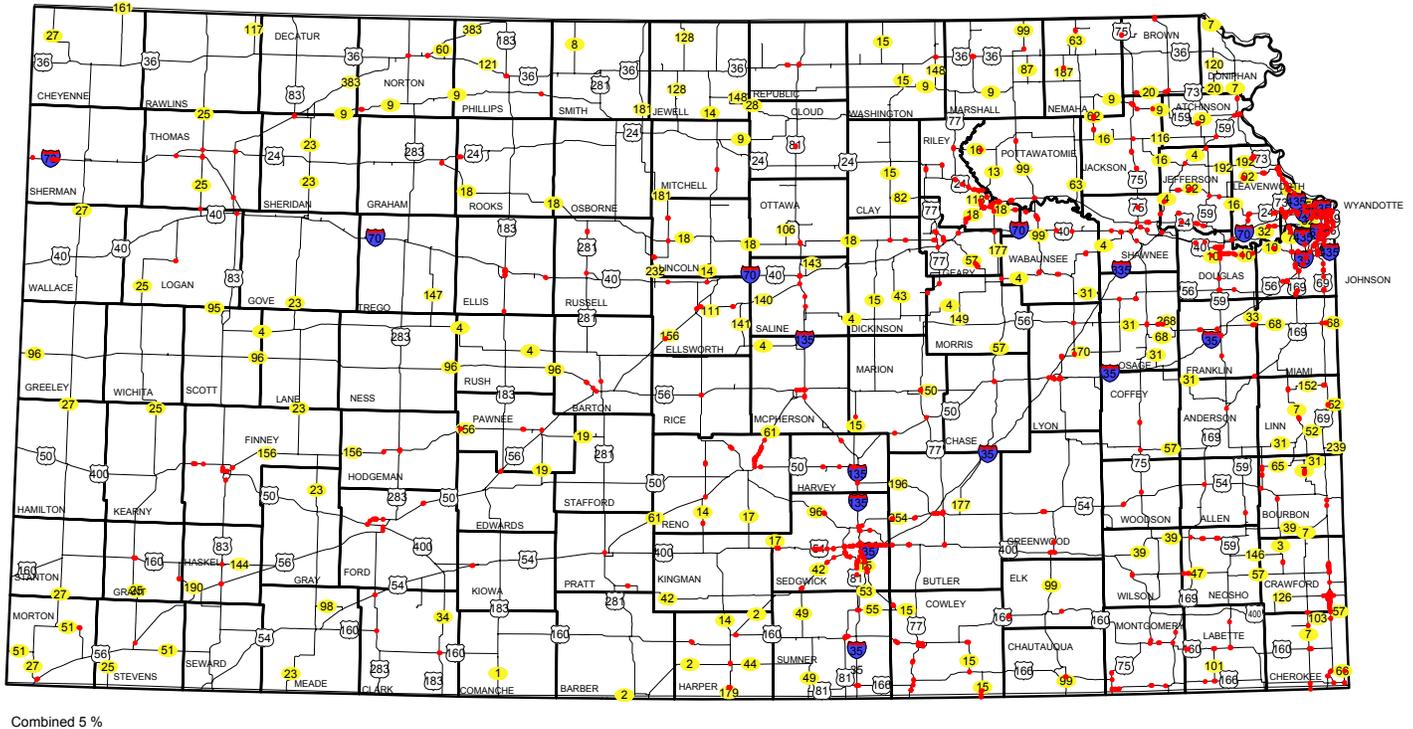
New Strategy:

- ❖ Recommend new distribution of Highway Safety Improvement Program, or HSIP, funding based on Kansas crash statistics. (This is a strategy jointly recommended by the roadway department and intersections EATs.)
- ❖ Background: HSIP is a federal-aid safety program, established under SAFETEA-LU in federal fiscal year 2006, “to achieve a significant reduction in traffic fatalities and serious injuries on all public roads.” In 2011, Kansas received \$28.4 million, which was distributed to the following safety programs:
 - ❖ Highway-Railway Grade Crossing and Rail Set-aside (42 percent)
 - ❖ Intersection Safety (24 percent)
 - ❖ Pavement Marking Set-aside (15 percent)
 - ❖ Lighting Set-aside (7 percent)
 - ❖ Signing Set-aside (6 percent)
 - ❖ High Risk Rural Roads (6 percent)Some of this distribution is determined by SAFETEA-LU, but most of it results from KDOT practice. The purpose of this strategy is to reallocate the money based on the goals articulated in this document. KDOT will form a working group to review the history of fund distribution, review data and make recommendations. The working group will also explore ways to streamline federal and state spending by local jurisdictions.
- ❖ Method: policy
- ❖ Costs: minimal
- ❖ Lead agency and contact: KDOT, Traffic Engineering Section
- ❖ Challenges: changing existing programs and practices
- ❖ Target date: begin implementation following federal reauthorization of the HSIP program

Goal 2: Use available traffic records, crash data and roadway data to assist in safety program and project management.

New Strategy:

- ❖ Identify and analyze outstanding variables related to crashes that occur away from intersections and don't involve animals, based on the Kansas 2010 Five Percent Report. (See Data Support chapter for action plan.)



Combined 5 Percent High Accidents

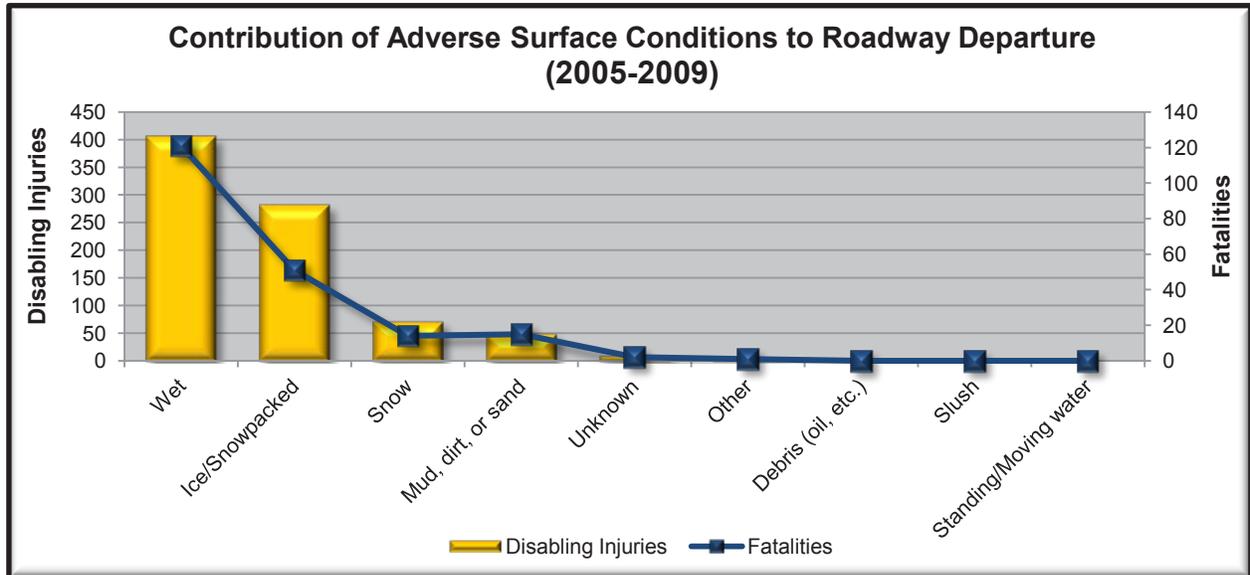
Future Strategy:

- ❖ Develop a process to account for recommendations from traffic studies (such as road safety assessments and Traffic Engineering Assistance Program studies) to generate projects within existing safety programs and contribute to new and future projects in other programs.

Goal 3: Promote proven engineering strategies that focus on keeping drivers on the road and in their lanes.

Current Strategies:

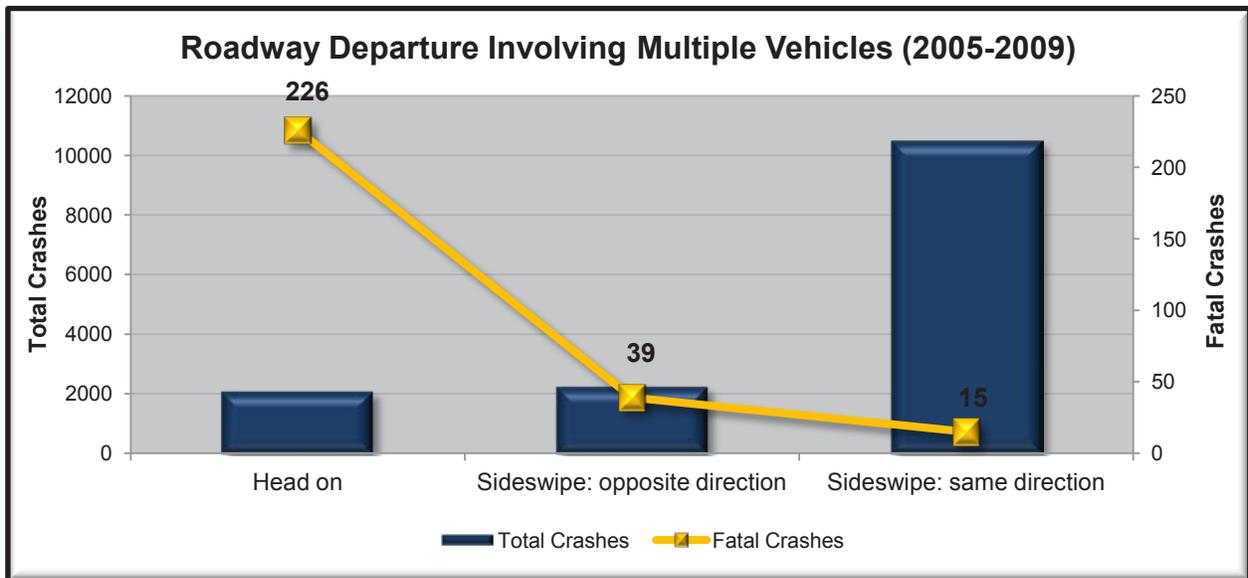
- ❖ Maintain 6-inch-wide edge lines on state highways.
- ❖ Improve shoulders where reasonable.
- ❖ Install shoulder rumble strips where appropriate.
- ❖ Revitalize KDOT's Wet Pavement Accident Reduction Team.



Adverse surface conditions are noted as a factor in about 15 to 20 percent of all crashes, depending on the year.

New Strategies:

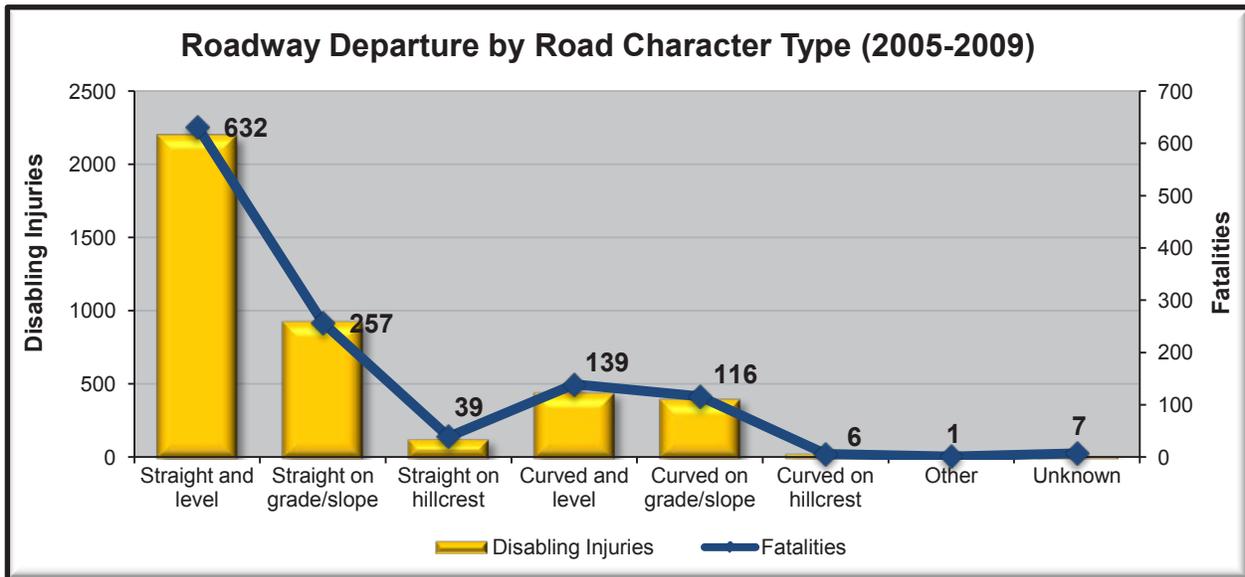
- ❖ Research the potential impact of expanded use of centerline rumble strips
 - ❖ Background: The FHWA has designated centerline rumble strips, or CLRS, as one of its [Nine Proven Countermeasures](#) to reduce highway fatalities. CLRS target head-on crashes and sideswipes involving multiple vehicles. In 2007, KDOT established a policy on milled-in CLRS, allowing their use on two-lane rural highways with a shoulder width of at least three feet. Since 2007, KDOT has installed over 300 miles of CLRS, with more than 3,000 miles of state highways eligible based on the policy. If we eliminate the minimum shoulder width criterion additional state highway miles will be eligible. How many local roads utilize CLRS is unknown. An unresolved question remains, however: do drivers shy away from CLRS and increase their odds of running off the right side of the road?



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.

- ❖ Method: research and policy
- ❖ Costs: \$60,000
- ❖ Performance measure: reduction in head-on crashes on road types added under an expanded policy
- ❖ Lead agency and contact: KDOT, Highway Safety Unit
- ❖ Challenges: well-designed research that validates expansion of policy and additional project costs
- ❖ Target date: final research report in state fiscal year 2012

- ❖ Create a program that funds the deployment of low-cost safety improvements at rural or high speed urban horizontal curves.
 - ❖ Background: It's estimated that in the Kansas state highway system, there are about 1,000 miles of curves – a tenth of the total roadway mileage. But about 17 percent of fatal crashes happen on horizontal curves. This program will take into account proven and experimental countermeasures to prevent crashes on rural horizontal curves and on urban high-speed curves. These would include, for example, adding high-friction materials to road surfaces and improving *delineation* (a term that refers to methods used by highway engineers to define roadway operating areas for drivers).



The contribution of curves and hills to injury and fatality statistics exceeds the proportion of the entire Kansas road system they represent.

- ❖ Method: program
- ❖ Costs: \$250,000 annually (estimated)
- ❖ Performance measures: number of curves treated and consequent reduction in crashes
- ❖ Lead agency and contact: KDOT, Highway Safety Unit
- ❖ Challenges: funding a new program and identifying curves where treatment would be likely to produce the best results
- ❖ Target date: begin letting projects in state fiscal year 2013.
- ❖ Explore expanded use of edgeline rumble stripes.
 - ❖ Background: In 2007, KDOT established a new policy for the use of centerline rumble strips and revised its policy on the use of shoulder rumble strips. Both edgeline rumble stripes, or ELRS, and shoulder rumble stripes alert drivers when they drift off the road. The difference is that for ELRS the white edgeline is placed right over the top of the rumble strip while shoulder rumble stripes are sited farther right, on the shoulder. Potential advantages to ELRS are improved visibility of the edgeline in wet weather, use on two-lane roads that lack shoulders and use on two-lane roads with narrow shoulders. An added benefit to using ELRS on two-lane roads with narrow shoulders is that ELRS

accommodate bicyclists. But few demonstration projects using edgeline rumble stripes have been completed in Kansas.

- ❖ Method: research and policy
- ❖ Costs: \$60,000 (estimated)
- ❖ Lead agency and contact: KDOT, Highway Safety Unit
- ❖ Challenges: finding road segments for experimentation; policy changes that will raise project costs
- ❖ Target date: policy change, where appropriate, by July 2013

Future Strategy:

- ❖ Promote wider edgeline pavement markings on local roads.
- ❖ Experiment with the Safety Edge.

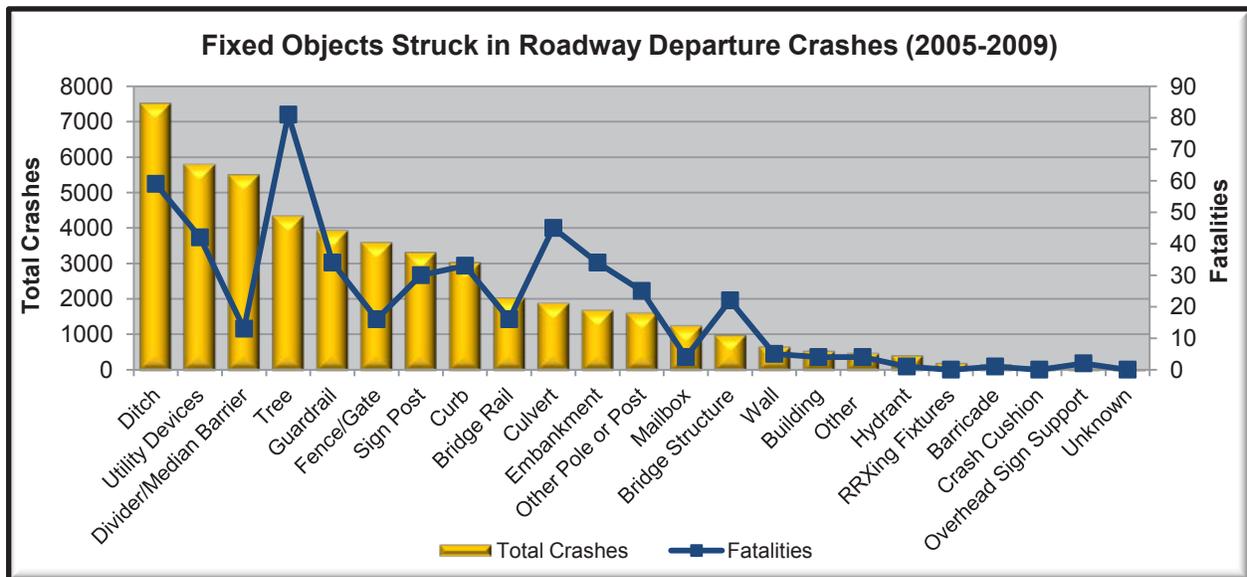
Goal 4: Promote strategies that mitigate the consequences of a crash.

Current strategy:

- ❖ Continue application of the most current Roadside Design Guide in highway design. The guide is a document that highway agencies commonly use to develop standards and policies.

New strategy:

- ❖ Create a program that funds the removal of fixed objects.
 - ❖ Background: In a “fixed-object crash,” a vehicle leaves its lane and runs into a ditch, an object (a light pole or tree, for example) or a barrier (such as a guardrail). Analyzing the types of objects struck, and at what frequency, might suggest targeted countermeasures or policy changes in fixed object placements.



Objects mostly likely to be hit when drivers leave the road include ditches, utility devices (such as a telephone pole) and median barriers. However, striking a tree results in the highest number of fatality crashes. Some objects are engineered and positioned in the roadside environment with driver survival in mind (median barriers and guardrails, for example) while others (like trees) are not.

- ❖ Method: program
- ❖ Costs: \$250,000 annually (estimated)
- ❖ Performance measure: reduced numbers of crashes involving objects targeted by the program
- ❖ Lead agency and contact: KDOT, Bureau of Local Projects
- ❖ Challenges: funding a new program, partnering with local agencies to identify fixed objects, addressing environmental sensitivities to tree removal
- ❖ Target date: begin letting projects in federal fiscal year 2013

Goal 5: Promote enforcement campaigns that target locations and corridors with a higher than expected number of roadway departure crashes.

Current strategies:

- ❖ Support implementation and expansion of the primary seat belt law.
- ❖ Select stretches of road for targeted enforcement efforts.

Future strategy:

- ❖ Develop and implement a Safety Corridor Program.
 - ❖ Background: 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 to identify treatments and strategies to improve corridor safety.

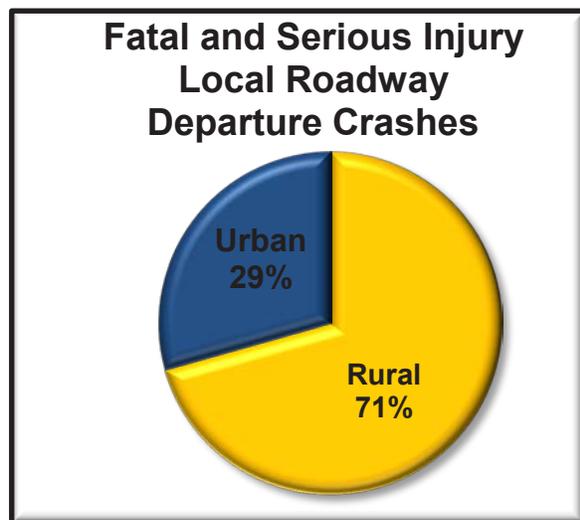
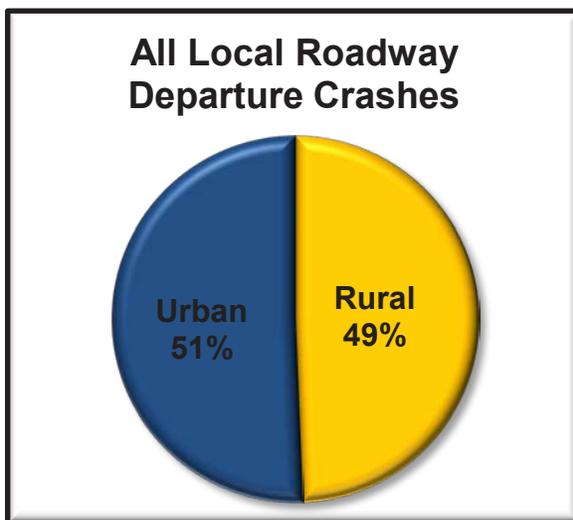
Goal 6: Promote education campaigns that alert the public to the most frequent causes of roadway departure crashes.

Current strategies:

- ❖ Continue media campaigns highlighting the danger of impaired or distracted driving.
- ❖ Promote 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.
- ❖ Provide training and educational materials to public works departments and other local agencies through the Local Transportation Assistance Program, or LTAP, at the University of Kansas and the Traffic Assistance Services for Kansas, or TASK, program at Kansas State University.
- ❖ Promote defensive driving training.

New strategy:

- ❖ Conduct road safety assessments on local roads under the umbrella of the High Risk Rural Roads Program.
 - ❖ Background: The High Risk Rural Roads Program is a federal safety program for locally owned rural roads. Of the 140,000 miles of public roads in Kansas, about 130,000 are under the jurisdiction of cities, counties and townships. Ownership, however, is not the issue: The users of all public roads benefit from a road safety assessment, or RSA. According to the [FHWA](#), an RSA is a “formal safety performance examination of an existing or future road or intersection by an independent and multi-disciplinary team. It estimates and reports on potential road safety issues and identifies opportunities for improvements in safety for all road users.”

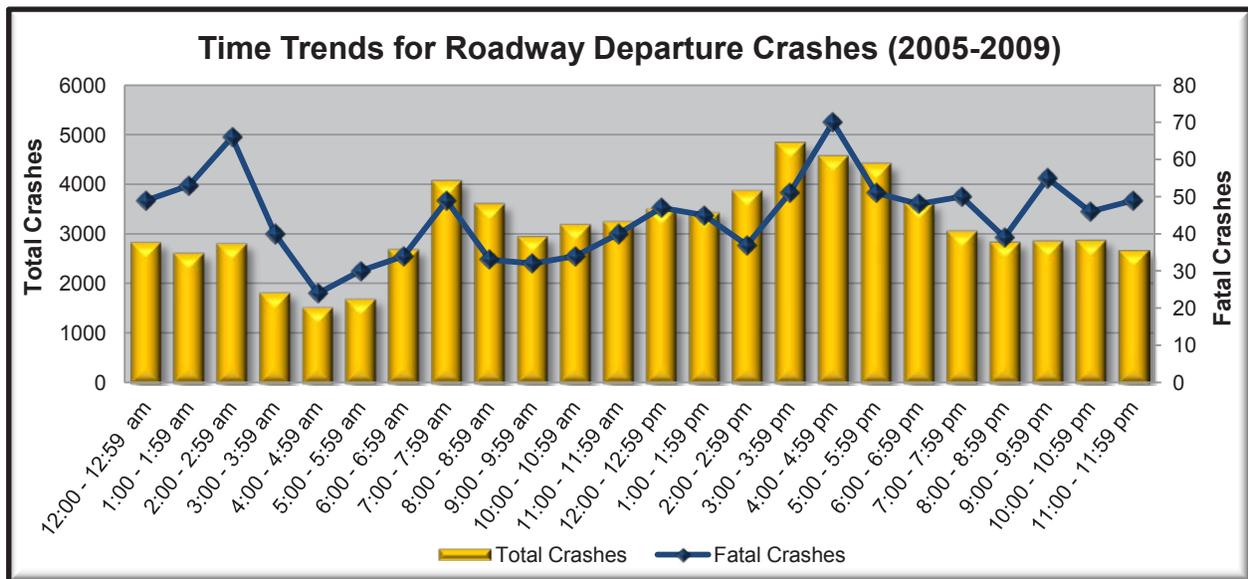


On local roads, roadway departure crashes are evenly split between urban and rural settings. But rural roadway departure crashes tend to be more severe.

- ❖ Method: program
- ❖ Costs: minimal
- ❖ Performance measures: number of RSAs completed
- ❖ Lead agency and contact: KDOT, Bureau of Local Projects
- ❖ Challenges: finding and training volunteers to serve on teams, promoting local participation.
- ❖ Target date: immediate

Future strategy:

- ❖ Raise public awareness of more and less safe times to drive.



Total number of roadway departure crashes generally trends with traffic patterns throughout the day, and severity follows, especially between 4 a.m. and 9 p.m. At night however, particularly between 9 p.m. and 4 a.m., the total crash rate increases significantly (less traffic, similar number of crashes) with a greater share of these severe or fatal.

APPENDIX A

**(Policies, Programs, Personnel,
Achievements)**

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 State Highway Safety Plan, by the Driving Force Task Force and in other initiatives. Some of the results are described below.

❖ Engineering:

- 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.
- Kansas is a national leader in the promotion and use of roundabouts.
- In 2005 KDOT increased the width of the white edgeline on all state highways from 4 inches to 6 inches.
- In 2007 KDOT implemented a new centerline rumble strip policy. Since then, more than 300 miles of rumble strip have been installed.
- In 2009 KDOT developed a policy on the use of cable median barriers, which may prevent vehicles from crossing narrow grass medians and colliding with other vehicles.
- KDOT continues to manage a longstanding program related to the intersection of highways and railroad lines. It oversees about 50 projects a year. Most involve replacing static signs with gates and signals where road and rail intersect. This program and another, Operation Lifesaver, have reduced fatalities in the past decade.

❖ Education:

- KDOT has sponsored Bucks for Buckles since 2005. This statewide seat belt awareness campaign has been directly credited for saving a life.
- KDOT aggressively promoted motorcycle awareness after cyclist fatalities in 2006 doubled from the average of previous years.
- KDOT has provided a three-year grant to fund the Buckle Up program. It provides child safety seats, training and other support to enhance child passenger safety.
- The Kansas Operation Lifesaver program was fourth in the nation in the number of presentations and events held in 2009. It reached more than 97,000 Kansans.
- In 2009 the Crawford County sheriff and KDOT initiated Seatbelts Are for Everyone, or SAFE, a program to promote seatbelt use among high school students. The program, launched in one county and six schools, now reaches at least 25 counties and 60 schools. Partnering with KDOT to provide funding for SAFE are the six Kansas trauma councils, AAA of Kansas/Missouri and State Farm Insurance, as well as numerous local organizations and businesses.
- The KDOT Traffic Safety Section utilizes federal funds to promote safety programs in Kansas and to raise public awareness about safety issues on Kansas roadways. These campaigns include safety messages related to seat belt and child safety seat use; impaired and distracted driving; motorcycle, pedestrian and bicycle safety; and other road safety issues.

- The Traffic Assistance Services for Kansas program trains public employees charged with traffic safety responsibilities. More than 100 local officials are trained each year.
- The Kansas Rural Transit Assistance Program, or RTAP, provides defensive driving/emergency procedures training to about 600 transit agency employees annually. The RTAP newsletter reaches a thousand Kansans with roadway safety information.
- The Kansas Highway Patrol, or KHP, and the Kansas Motor Carriers Association, or KMCA, are promoting Teens and Trucks, a program aimed at teaching new drivers about the dangers of driving in the vicinity of large commercial motor vehicles and how to minimize accident risks.
- KHP has visited 669 motor carriers new to the interstate motor carrier industry. During the visits, carriers learn about industry safety requirements.

❖ **Enforcement:**

- Operation Impact was launched in the Kansas City area in 1990, in Wichita in 2010. In these efforts, coalitions of law enforcement agencies execute selective enforcement campaigns.
- More than 60 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 sponsored an Occupant Protection Safety Assessment in December 2003. An expert panel felt that upgrading the seat belt law, adding law enforcement partners and increasing the number of child passenger safety technicians in Kansas were keys to occupant protection. Since then, Kansas has made strides in these areas, including passage of a primary seat belt law in 2010.
- KHP executes Roving Aggressive Violation Enforcement, or RAVE, saturation patrols on high priority corridors statewide. RAVE targets impaired drivers, seat-belt use, child passenger safety, speeding and other traffic infractions.
- The Kansas Impaired Driving Assessment conference, from July 10 to 14, 2006, had several results. Drivers with blood alcohol levels of 0.15 or greater now face heavier penalties and a DUI advisory board, which meets quarterly, was created. Although the conference did not give rise directly to this decision, the state also hired a traffic safety resource prosecutor to conduct training statewide and to provide prosecutors with information to assist them in cases involving driving under the influence of alcohol.
- KHP, with the support of KMCA and funding from the Federal Motor Carrier Safety Administration, or FMCSA, has implemented the Trucks on Patrol for Safety program. It aims to reduce commercial vehicle crashes caused by unsafe driving by others 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. These agencies visited 92 carriers in federal fiscal year 2010 to check their management processes and procedures for compliance with safety requirements.
- KHP conducted 52,458 commercial vehicle and bus safety inspections in federal fiscal year 2010. These inspections are designed to remove unsafe vehicles from highways and collect data on carrier safety.

❖ **Emergency Medical Services:**

- 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.
- Driving Force recommended support for trauma centers in each of six state regions. In 2010, Kansas had seven designated trauma centers and three hospitals working toward trauma center verification. As of this writing, hospitals have been verified as trauma centers, or are working toward verification, in all but one region (southwestern Kansas).
- 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. The national Emergency Nurses Association ranks Kansas 17th, along with 11 other states, in its report “2010 ENA National Scorecard on State Roadway Laws: A Blueprint for Injury Prevention.”
- Stormont-Vail Health Care Trauma Services continues to conduct presentations to high schools on roadway safety.

❖ **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.

APPENDIX B

**(Safety Support Groups:
Recordkeeping, Education,
Research)**

Safety Support Groups: Recordkeeping, Education, Research

The Traffic Records Coordinating Committee, or TRCC, works to increase the amount of electronic reporting by law enforcement. Electronic records are both timelier and more comprehensive than paper records. The TRCC and Kansas Highway Patrol developed the Kansas Law Enforcement Reporting tool. One of the tool's uses is the electronic reporting of crashes. More than 60 law enforcement agencies use it to submit crash reports to KDOT. The agencies can view and amend these reports, lessening the amount of paperwork they maintain internally. The next TRCC project involves collection of electronic citation data, including DUI arrest and adjudication information.

The Kansas Local Technical Assistance Program, or LTAP, at the University of Kansas provides safety training and information to local transportation agencies. LTAP is part of a national program that provides services to improve the safety and operating efficiency of local roads and bridges. Roadway and worker safety are emphasized. Road construction and maintenance workers, public works personnel and local elected officials are the primary audiences. LTAP provides training for about 500 persons a year; houses a lending library of training videos; publishes a quarterly newsletter that's mailed to about 3,500 LTAP customers and stakeholders; and maintains a website. LTAP 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.

The AAA Foundation for Traffic Safety provides research and educational resources to support strategic highway safety planning. In addition to research on teen driving, distracted driving, senior mobility, child passenger safety and licensing issues related to crashes, the foundation has studied the problem of criticism by drivers of others' behavior (such as aggressive or distracted driving) that they fail to recognize in themselves. The AAA foundation reported the results in its [Traffic Safety Culture Index](#). The AAA also works to identify roadways that are crash-prone and funds improvements to them.

APPENDIX C

(Definitions and Data)

Definitions and Data

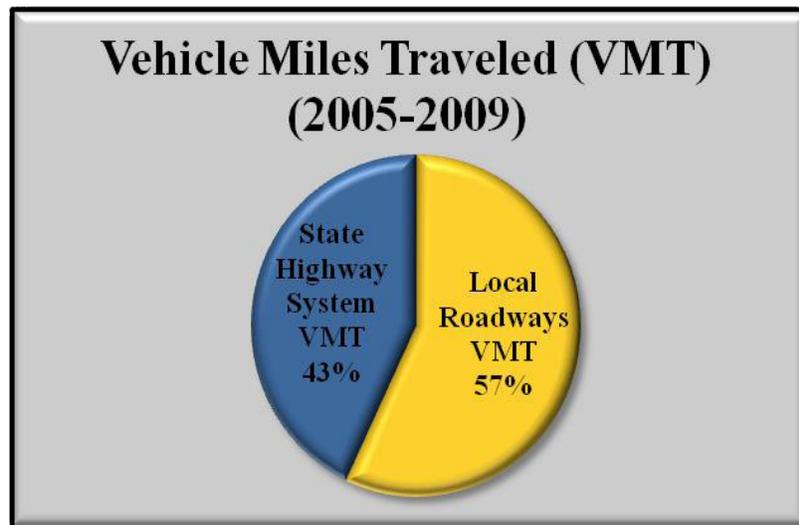
The highways and byways of Kansas constitute a complex network sprawled across a range of settings. Here are the elements of the system.

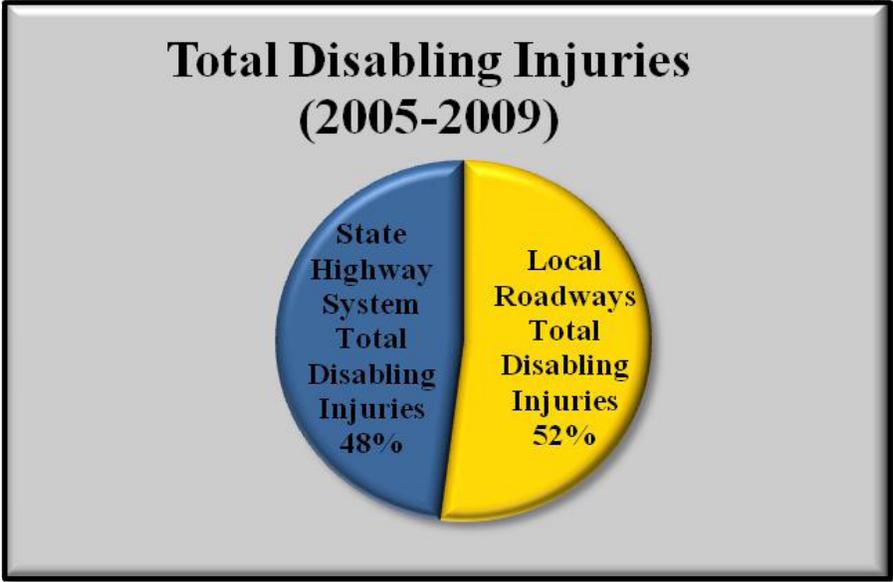
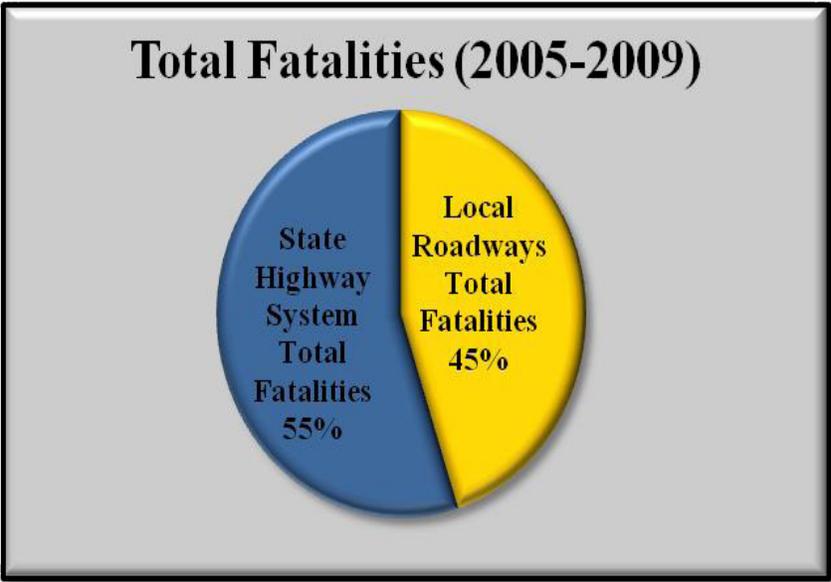
- ❖ The **state highway system** includes all highways with the route designation I (for interstate), US or K. It includes some urban streets designated as city connecting links.
- ❖ **Local roadways** are all public roads outside of the state highway system. They're owned and maintained by local jurisdictions including cities, counties and townships.
- ❖ **Small urban areas**, as defined by the U.S. Bureau of the Census, have a population of at least 5,000 and less than 50,000 people and aren't sited within an urbanized area.
- ❖ **Urbanized areas** are defined by the census bureau as those with a population of 50,000 or more.
- ❖ **Rural areas** are those that fall outside the boundaries of small urban and urbanized areas, as defined above.
- ❖ **Functional classification** is the categorizing of streets, roads and highways by reference to the service they provide. From the most heavily traveled to the least heavily traveled, they are designated *interstate*, *principle arterial*, *minor arterial*, *major collector*, *minor collector* and *local road*. An overview of the difference between arterials, collectors and local roads appears in [Chapter 3](#) of the Federal Highway Administration document "Flexibility in Highway Design." There's a more detailed discussion of the functional classes in "[FHWA Functional Classification Guidelines](#)."

Data Points

- ❖ State highway crashes are deadlier than those on local roads.

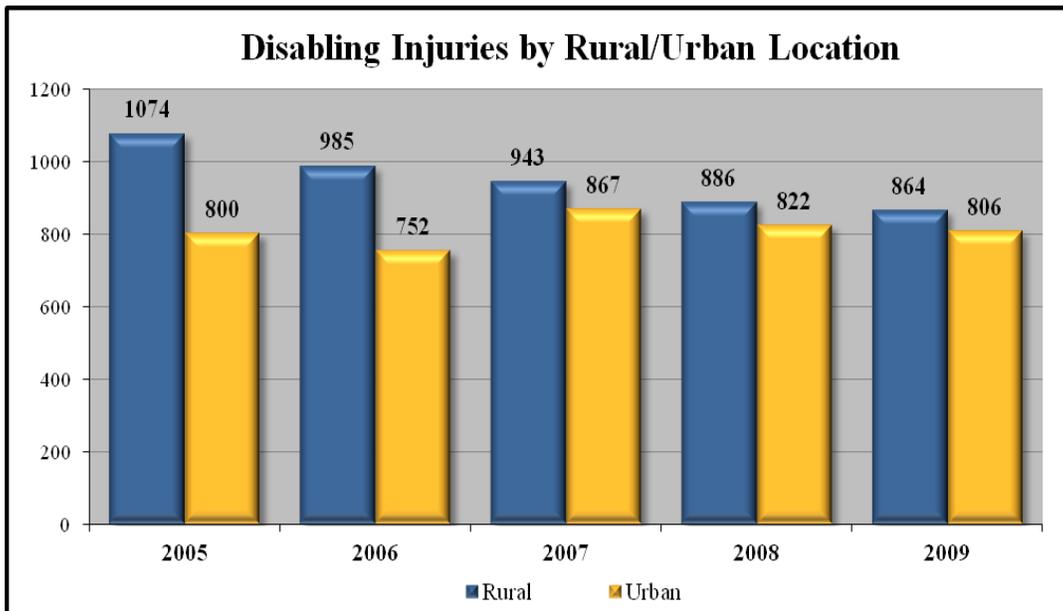
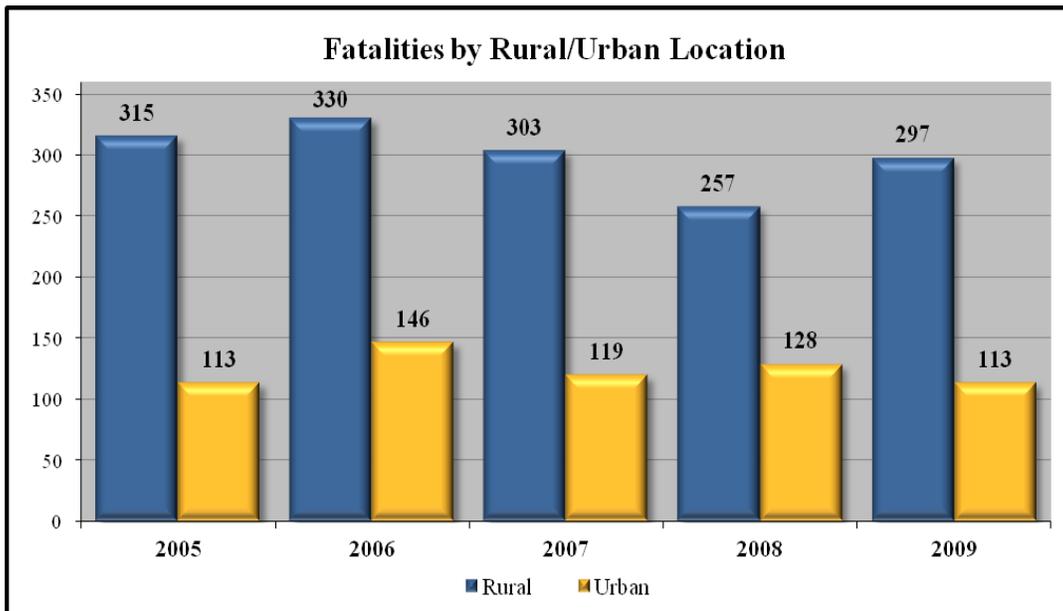
About 8 percent of all the miles of Kansas roads, those in the state highway system, account for 43 percent of the vehicle miles traveled in the state, 55 percent of the fatalities and 48 percent of the disabling injuries. Ninety-two percent of the miles —those in the local road system – account for 57 percent of the vehicle miles traveled, 45 percent of the fatalities and 52 percent of the disabling injuries.





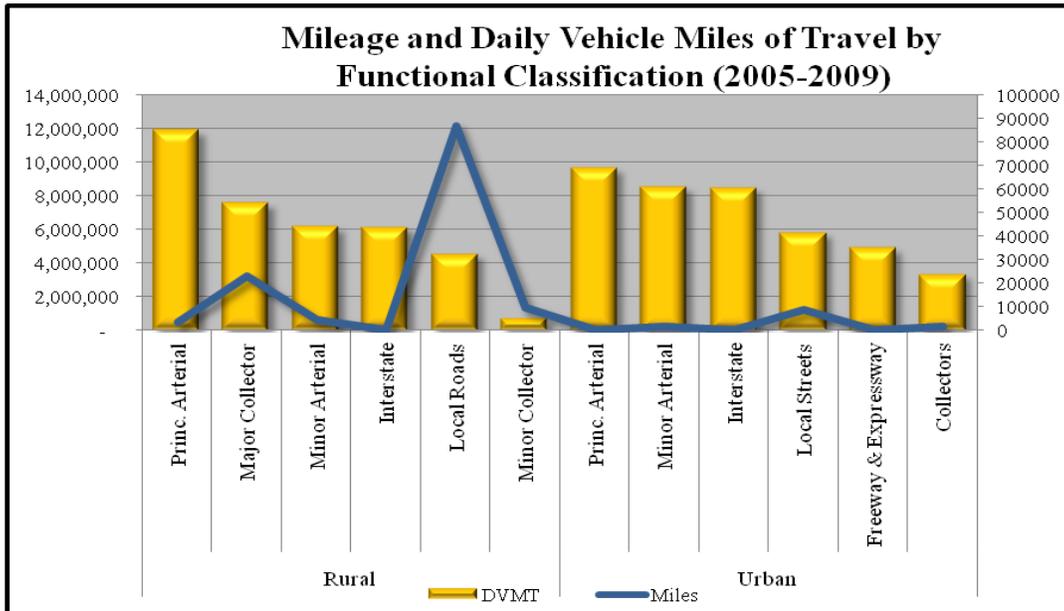
❖ Rural crashes are more often fatal than urban crashes.

Twice as many people died in crashes in rural Kansas than in urban Kansas between 2005 and 2009. Only 48 percent of the vehicle miles traveled in Kansas are in rural areas – but that’s where 71 percent of the fatalities and 54 percent of the disabling injuries occur. Fifty-two percent of the vehicle miles traveled are in urban areas, but only 29 percent of the fatalities and 46 percent of the disabling injuries occur there. The numbers underscore the importance of available and timely emergency medical assistance systems to rural areas.



- ❖ Principal arterials in rural Kansas carry the largest volume of traffic.

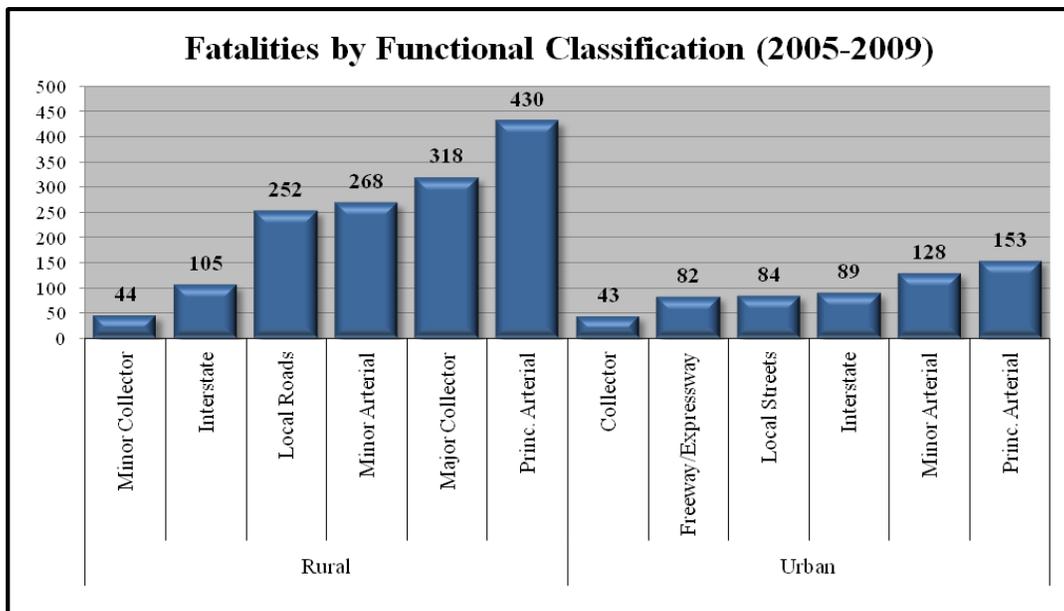
Principal arterials are the most heavily traveled roads in the state. According to the Federal Highway Administration, or FHWA, these roadways “provide the highest level of service at the greatest speed for the longest uninterrupted distance, with some degree of access control.” Between 2005 and 2009, drivers traveled 12 million miles a day on principal arterials in rural Kansas. Principal arterials in rural areas frequently connect urban areas and deliver traffic from rural collectors and rural local roads to urban areas. In urban areas, principal arterials are often commercial corridors.



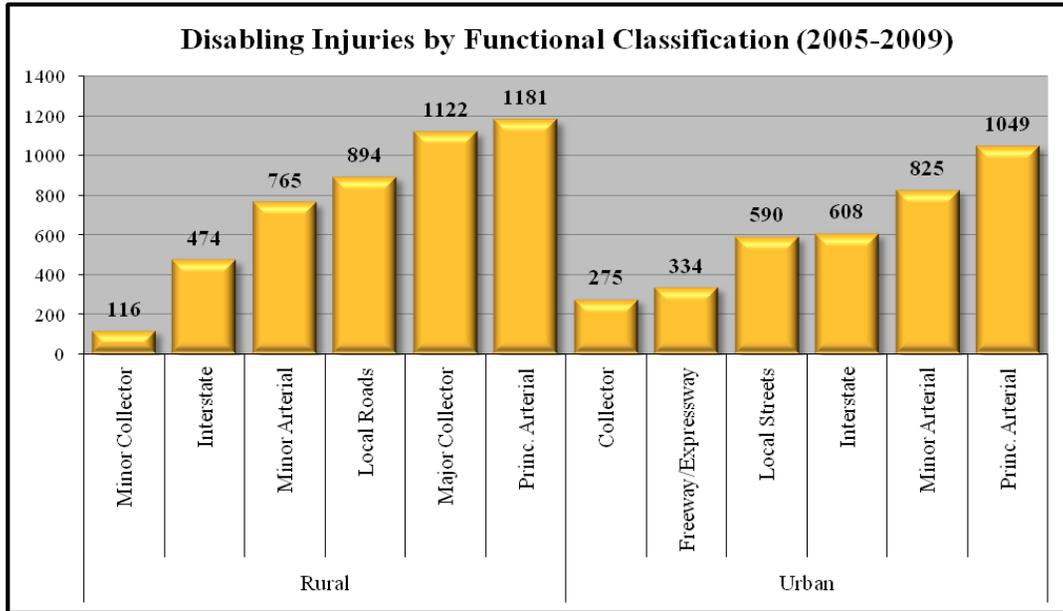
Kansas has more miles of local road than of any other class. These roads, according to the FHWA, provide drivers with great access to a variety of destinations but at a cost: They must proceed more slowly.

- ❖ The fatality volume is highest on principal arterials.

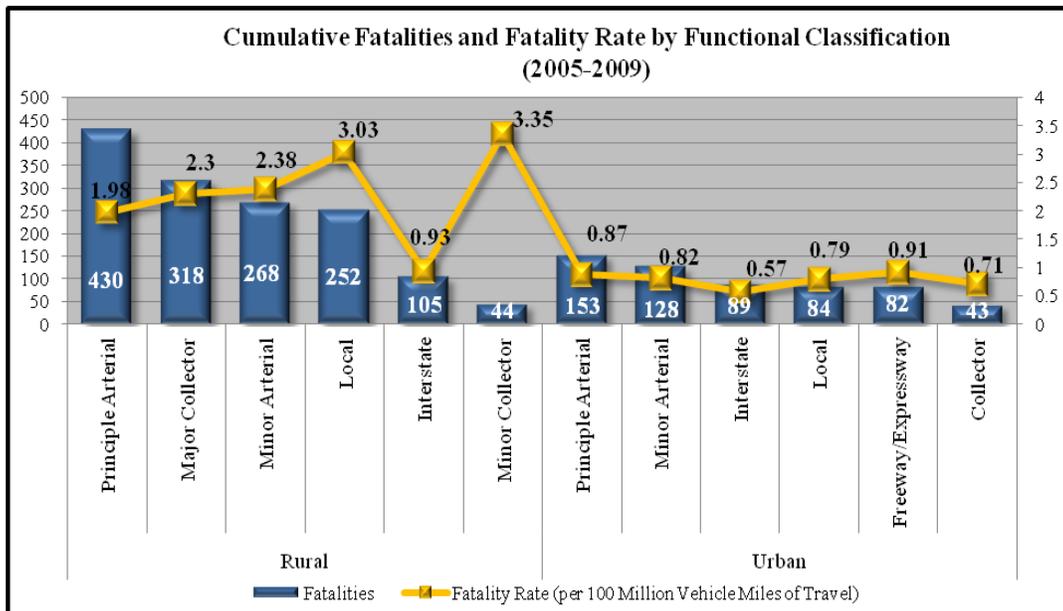
Fatal or disabling injury crashes are least likely to occur on minor collectors in rural areas and collectors in urban areas. According to the FHWA, collectors are streets and highways that provide “a less highly developed level of service [than arterials] at a lower speed for shorter distances by collecting traffic from local roads and connecting them with arterials.”



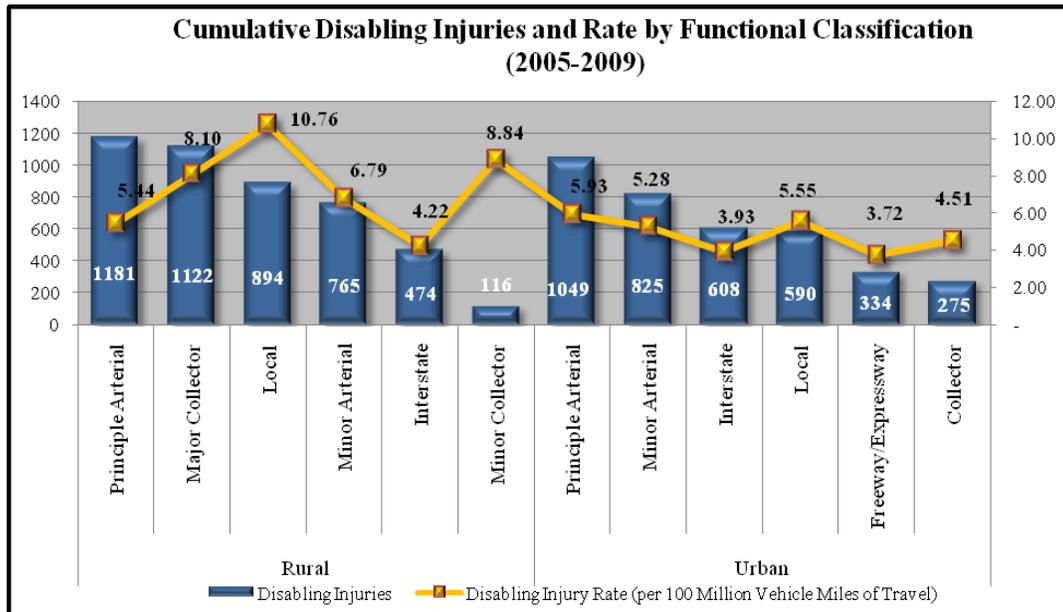
Arterial roads permit travel at higher speeds for longer distances. Local roads provide high access but less mobility. Collectors strike a balance between the need for mobility and access.



- ❖ The fatality rate is highest on the least traveled roads. There are more deaths for every mile driven on minor collectors than on any other class of road.



Rural minor collectors and rural local roads have normal to low fatality **counts** but still pose a hazard: Given the low number of vehicle miles traveled on them, they have a disproportionately high fatality **rate**.



Rural minor collectors and rural local roads, compared with other road classes, have disproportionately high rates of disabling injuries.

APPENDIX D

(Safety in Numbers)

Safety in Numbers

As regional safety coalitions are established in Kansas, there's a successful model they can study: Destination Safe.

The Mid-America Regional Council, Missouri Department of Transportation and Kansas Department of Transportation founded the coalition in 2005, with the council providing administrative support. In 2007, the coalition won a Federal Highway Administration National Roadway Safety Award.

A team approach to transportation safety, it involves local, regional, state and federal agencies and blends the expertise of law enforcement, healthcare providers, emergency medical responders, information technology specialists, traffic engineers, public works officials, transportation safety advocates and victim support organizations.

It establishes transportation safety priorities for a region that includes the Kansas City metropolitan area and adjacent counties on both sides of the Missouri/Kansas border.

Regional and state priorities sometimes differ.

For example, in Kansas, fewer than 5 percent of fatalities involve pedestrians, so the Executive Safety Council has not emphasized pedestrian safety in the new Strategic Highway Safety Plan. In urban Kansas City, however, 10 percent of the fatalities involve pedestrians, so Destination Safe emphasizes their safety.

Besides setting priorities, another value of a group like Destination Safe is as a coordinator of systemic efforts to improve safety. In 2009, the safety coalition's leadership team had 29 members, with a subset of the membership meeting bimonthly.

The coalition's agenda is set by the [Kansas City Regional Transportation Safety Blueprint](#). The blueprint focuses on six transportation safety priorities and serves Greater Kansas City in the same way that the SHSP serves Kansas.

In Missouri, Destination Safe projects are funded from District 4 of the Missouri Department of Transportation. In Kansas, Destination Safe reviews and forwards recommendations to the KDOT Bureau of Transportation Safety and Technology for possible funding thru the federal Section 402 program.