

KANSAS
STRATEGIC
HIGHWAY
SAFETY
PLAN

KANSAS STRATEGIC HIGHWAY SAFETY PLAN (SHSP)

Executive Summary

On February 2 -3, 2006, the Kansas Department of Transportation hosted a safety summit to initiate the development of the Kansas Strategic Highway Safety Plan (SHSP). Stakeholders from throughout Kansas were invited to be safety partners in the challenge of reducing highway-related fatalities and life-altering injuries. These stakeholders include those involved in planning, designing, constructing, operating, and maintaining the roadway infrastructure (Engineering), and modifying road user behavior and preventing injury (Education and Enforcement). Challenges and strategies were solicited from all participants. From their input, data-driven emphasis areas were identified to focus immediate efforts. All-encompassing themes, including the importance of multi-stakeholder involvement, the effects of vehicle speed on crash severity, and the conflicting attributes between rural and urban roadways, play fundamental roles in all emphasis areas.

Through integrating the work of all stakeholders, this SHSP defines a system, organization, and on-going process for managing the attributes of the road, driver, and vehicle to achieve the highest level of highway safety. To reduce the number of fatalities and life-altering injuries in Kansas, these stakeholders must commit resources (staff, time, dollars, etc.) to further develop, implement, and maintain this SHSP beyond this first phase.

Emphasis area teams will be formed and comprehensive, coordinated, and communicative safety strategies of Engineering, Education, Enforcement, and Emergency Medical Service will be developed collectively with the safety partners. Implementation plans with measurable objectives will be the products of these efforts. To that end, priority will be given to funding safety initiatives and projects supporting the SHSP goal.

The stakeholder group identified the following direction for the SHSP:

MISSION: Reduce deaths, injuries and economic costs resulting from motor vehicle crashes in Kansas.

VISION: Safest drivers, safest roads for Kansas.

GOALS: Reduce the number of traffic-related deaths from 459 (1.57 MVMT) in 2004 to less than 400 (1.35 MVMT) in 2008 and less than 365 (1.20) by 2010, AND reduce the number of traffic-related disabling injuries from 1,860 in 2004 to less than 1,600 in 2008 and less than 1,400 in 2010.

EMPHASIS AREAS

The most successful strategic plans have a focus on the areas where the greatest impacts can be made. To that end, the group of partners that convened at the Summit in February 2006 brainstormed problem areas. Using data to support the decision process, the group identified six key emphasis areas. These six represent the group's best estimate of which areas provide the biggest potential for reducing fatalities and serious injuries on Kansas roadways.

- Impaired Driving
- Occupant Protection
- Lane Departure
- Intersections
- Inexperienced/Novice/Teen Drivers
- Driver Behavior and Awareness

Under each emphasis area, strategies are listed that may help Kansas reach the objective for that area. Some strategies were suggested because they have been proven successful in other states or regions. Other strategies were produced by stakeholders at the SHSP summit. These will require investigation by the emphasis area team to determine if testing of the strategy should occur. The emphasis area teams will also find that many of these strategies are already being used by KDOT and other safety partners. Their appearance here in the SHSP as a specific countermeasure to one of these identified could be used to assign more priority to that endeavor. However, even established strategies need to be evaluated for effectiveness, using crash data, and that is why this plan is to be considered a living document. Our resources are limited, and to reach our goals we must use those resources in the most effective way.

IMPLEMENTATION PROCESS

This plan contains recommendations and strategies covering very diverse disciplines. It will require not only coordination but also accountability among all of the partners in order to implement the comprehensive approach to Kansas' emphasis areas. Each of the emphasis teams will meet to develop priorities and schedules for both short-range strategies that can effect immediate change and for the longer-term strategies that may require time for planning and for commitment of funds. These emphasis area teams will report back their schedules to be included in this Plan as it is updated over time.

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MISSION:

Reduce deaths, injuries and economic costs resulting from motor vehicle crashes in Kansas.

VISION:

Safest drivers, safest roads for Kansas.

GOALS:

Reduce the number of traffic-related deaths from 459 (1.57 per 100 million VMT) in 2004 to less than 400 (1.35 per 100 million VMT) in 2008 and less than 365 (1.20 per 100 million VMT) by 2010. These goal rates are adjusted for an increase in miles traveled consistent with Kansas travel trends.

Reduce the number of traffic-related disabling** injuries from 1,860 in 2004 to less than 1,600 in 2008 and less than 1,400 in 2010.

Figure 1: Kansas Highway Fatalities: Goals

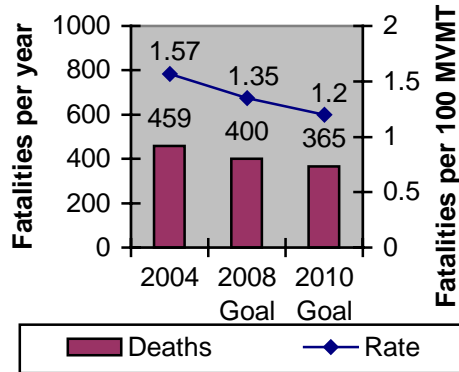
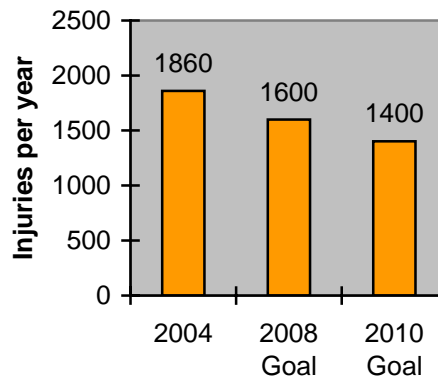


Figure 2: Kansas Highway Disabling Injuries: Goals



* Kansas defines a traffic-related death as a roadway user dying within 30 days of a crash

** Kansas defines a disabling injury as a roadway user left physically or mentally diminished after a crash, also defined as a Type A injury

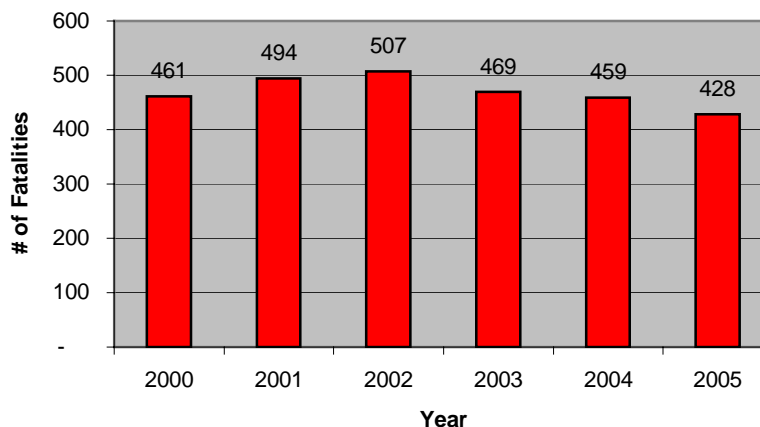
INTRODUCTION

Background

Deaths and injuries resulting from traffic crashes are serious public health concerns and are not conducive to the high quality of life expected in the state of Kansas. Traffic crashes continue to be the leading cause of death in children and young adults. The economic loss due to traffic crashes in Kansas is estimated at \$1.9 billion annually. This amounts to a cost of over \$1000 per citizen. This substantial impact within local communities relative to medical costs, lost wages, insurance costs, taxes, police, fire and emergency medical services, legal and court costs, as well as property damage, is significant. An immeasurable emotional toll is also demanded from Kansans whose loved ones are casualties of traffic crashes.

In 2005, there were 428 people killed in 384 fatal crashes, for an average of 1.11 deaths per fatal crash. The corresponding traffic-related death rate was 1.43 deaths per 100 million vehicle miles traveled (VMT), while nationally the average rate was 1.46 deaths. From 2000-2004, there was no significant reduction in the Kansas fatality rate, but a reduction of 31 traffic-related deaths occurred between 2004 and 2005. Highway travel in Kansas has continued to increase and reached an all-time high of over 30 billion vehicle miles traveled per year. In 2005, the seatbelt use rate was 69 percent, which ranks 43rd out of the 50 states.

Figure 3: Kansas Roadway Fatalities Trend



Partners

A Safety Summit was held in February 2006. Stakeholders from throughout Kansas were invited to be safety partners in the challenge of reducing highway-related fatalities and incapacitating injuries. These stakeholders include those involved in planning, designing, constructing, operating, and maintaining the roadway infrastructure (Engineering), modifying road user behavior and preventing injury (Education and Enforcement), and also controlling injury (Emergency Medical Service). Challenges and strategies were solicited from all participants. From their input, data-driven emphasis areas were identified to focus immediate efforts. All-encompassing themes, including the importance of multi-stakeholder involvement, the effects of vehicle speed on crash severity, and the conflicting attributes between rural and urban roadways, play fundamental roles in all emphasis areas. The following partners attended the February 3, 2006 meeting:

Partners in the Kansas SHSP Development

AAA Kansas

**American Public Works Association. Kansas
Chapter (APWA)**

**American Traffic Safety Services Association
(ATSSA)**

**Federal Motor Carrier Safety Administration
(FMCSA) Kansas**

Federal Highway Administration (FHWA) Kansas

Kansas Corporation Commission (KCC)

Kansas County Highway Association (KCHA)

**Kansas Department of Health & Environment
(KDHE)**

Kansas Department of Revenue (KDOR)

Kansas Highway Patrol (KHP)

Kansas Motor Carriers Association (KMCA)

Kansas Operation Lifesaver, Inc. (KS OL)

Kansas Turnpike Authority (KTA)

Kansas Department of Transportation (KDOT)

Mid-America Regional Council (MARC)

**National Highway Traffic Safety Administration
(NHTSA)**

**Safety & Health Council of Western Missouri &
Kansas**

Development Process

Through integrating the work of all stakeholders, this SHSP represents the first phase of an on-going process. The SHSP defines a system, organization, and course of action for managing the attributes of the road, driver, and vehicle to achieve the highest level of highway safety. To reduce the number of fatalities and incapacitating injuries in Kansas, these stakeholders must commit resources (manpower, staff, time, dollars, etc.) to further develop, implement, and maintain this SHSP beyond this first phase.

Emphasis area teams will be formed and comprehensive, coordinated, and communicative safety strategies of Engineering, Education, Enforcement, and Emergency Medical Service will be further developed collectively with the safety partners. Implementation plans with measurable objectives will be the products of these efforts. To that end, priority will be given to funding proven and effective safety initiatives and projects supporting the SHSP goal resulting in the saving of lives and reduction in the number of disabling injuries to provide a higher quality of life throughout Kansas.

This SHSP is a tool to assist in achieving the goal of significantly reducing the number of traffic-related deaths and disabling injuries in Kansas.. The Kansas Department of Transportation (KDOT) has an existing Highway Safety Plan (impaired driving, occupant protection, data improvement, and other behavior programs) and a Highway Safety Improvement Program (HSIP) (roadway infrastructure and highway- railroad crossing safety). The Kansas Highway Patrol maintains the Motor Carrier Safety Assistance Program (commercial driver and vehicle safety). This SHSP includes, builds upon, and integrates these programs in reducing fatalities and incapacitating injuries on Kansas roadways and contains performance-driven strategies that focus the limited highway safety resources toward this common goal.

An SHSP shares similar goals with the transportation planning process: to increase State and local decision-makers' awareness of safety needs, to improve the effectiveness of planning and programming through the use of accurate and timely data, and to expand the participation of major State and local stakeholders. State Departments of Transportation and Metropolitan Planning Organizations (MPOs) should consider safety as a factor in the transportation planning process. Incorporating the appropriate elements of the SHSP throughout the stages of the transportation planning process should give safety issues higher visibility and greater understanding among stakeholders, elected and appointed officials, and the public. It ensures that the appropriate SHSP initiatives are incorporated into the planning and policy documents of State DOTs and MPOs (i.e. transportation plans and corridor plans), into the program of projects in the Transportation Improvement Programs/Statewide Transportation Improvement Programs (TIPs/STIPs), and are eligible for Federal-aid transportation funding.

SAFETEA-LU, the transportation authorization passed by Congress in 2005, requires states to develop SHSPs, provides a substantial funding increase (doubling the previous safety funding level) and adds new funding categories which can be tapped to address the safety issues identified herein. Examples of these new categories include:

- Section 408 establishes a new program of incentive grants to encourage States to adopt and implement effective programs to improve the timeliness, accuracy,

completeness, uniformity, integration, and accessibility of safety data, to evaluate the effectiveness of efforts to make such improvements; to link these data systems with other data systems in the State; and to improve the compatibility of the State data system with national data systems to enhance the ability to observe and analyze national trends in crash occurrences, rates, outcomes, and circumstances. Kansas developed a [Traffic Records Strategic Plan](#) in order to take advantage of the Section 408 grants, and it can be found here:
<http://www.ksdot.org/burTrafficSaf/TRCC.asp>

- Section 406 establishes a new program of incentive grants to encourage the enactment and enforcement of laws requiring the use of safety belts in passenger motor vehicles. A State may use these grant funds for any safety purpose under this Title or for any project that corrects or improves a hazardous roadway location or feature or proactively addresses highway safety problems. However, at least \$1 million of amounts received by States must be obligated for behavioral highway safety activities.

http://www.nhtsa.dot.gov/nhtsa/whatsup/tea21/GrantMan/HTML/Sec_2005_406.html

- The High-Risk Rural Roads (HRRR) program provides funding for those federal-aid-eligible roads that have a history of crashes exceeding those of similar roads. More information can be found here:

<http://safety.fhwa.dot.gov/safetealu/hrrrattachment.htm>

- Safe Routes to School (SRTS) provides funding for a coordinator and for projects which encourage children to walk and bike to their school and to help them do so more safely. More information can be found here:

<http://safety.fhwa.dot.gov/saferoutes/index.htm>

Information Systems for Decision Making

Understanding and making optimal use of information technology is a critical challenge facing Kansas' highway safety professionals. Knowing the "who, what, when, where, why, and how" of traffic crashes is the foundation of a comprehensive traffic safety analysis system. In order to help protect public safety, proper understanding and use of integrated traffic records is necessary to plan and assess safety programs and influence resources.

Crash, traffic, citation, medical, judiciary, and driver records must be available to enable proper decision-making for applying limited resources to safety improvements and providing better services to taxpayers. Furthermore, these data influence effective development and implementation of safety policies and projects. This effort requires coordination among all stakeholders.

A complete traffic records program is necessary for planning, problem identification, operational management or control, and evaluation of a state's highway safety activities. This program should include and provide information for the entire state. Its functionality is basic to the implementation of all highway safety countermeasures and is the key ingredient to its effective and efficient management.

Timely and accurate crash data is vital to the analysis necessary for successful highway safety public information and enforcement programs. In order to provide easy access to the data, a comprehensive data mining and reporting system, as well as appropriate staffing, must be pursued.

A system for locating crashes on highways owned and maintained by the Kansas Department of Transportation (KDOT) is currently in place. Crashes are assigned a milepost that corresponds to a unique point on the State highway system. Thus crash patterns can be detected and road sections can be compared to identify potential safety problems. But a similar system is not yet in place for the approximately 100,000 miles of streets and roads not maintained by KDOT. A network database of these roadways is being developed, but administration of that roadway information will be a continual challenge as cities continue to develop and add streets. Another challenge will be tying the crashes to points on the network. New crashes can be given a reference point, but to go back into history and locate crashes will mean that the locator will need to know every past name for the road, and also any changes to its alignment. The process of getting the needed training and equipment to all local agencies will take considerable time, and will also require maintenance. These challenges must be overcome, however, for the State to have a comprehensive picture of crash history, and to be able to evaluate countermeasures installed “off-system”.

Engineers and planners use crash data and roadway data to identify problem locations. But there are other traffic records that can be used to improve the safety of roadways and drivers. Law enforcement can use crash data and driver citation data to target enforcement. Courts can use citation data to look up a driver’s history before allowing a diversion. Medical cost data can be used to help justify needed countermeasures. Many of these information exchanges within the State of Kansas are currently non-existent or are too slow or incomplete to be of use.

During 2004, the Bureau of Traffic Safety (BTS) of the Kansas Department of Transportation (KDOT) requested that the National Highway Traffic Safety Administration (NHTSA) facilitate a traffic records assessment. NHTSA proceeded to assemble a team of traffic records professionals representing the various disciplines involved in a state traffic records system. Concurrently the State carried out the necessary logistical and administrative steps in preparation for the onsite assessment. The recommendations may be found in the report titled “Traffic Records Assessment” dated March 21-25, 2005 and may be found here:
<http://www.ksdot.org/burTrafficSaf/reports/TRAssess2005.pdf>.

The Kansas Traffic Records Coordinating Committee (TRCC) was established with representation from all state and local agencies that collect and maintain traffic records data, as well as NHTSA and FHWA, for the purposes of interagency communication, as well as steering and approving the strategic planning effort.

In June of 2006, the agencies represented on the TRCC signed a memorandum of agreement on the Traffic Records Strategic Plan. That Plan identifies strategies and projects that will facilitate the creation of a virtual repository of all traffic record data, including citations, sentences, diversions/dismissals, and many other data.

SAFETEA-LU also has new reporting requirements for States. According to Section 148, each state must list not less than 5 percent of locations exhibiting the most severe safety needs, including discussion of potential remedies to the locations identified, estimated costs of the remedies, and impediments to the implementation of the remedies other than costs. Currently, KDOT does not have a database of non-state roads that would support such an analysis. The Traffic Records Strategic Plan contains provisions for a system that will include all public roads in Kansas.

Regarding the state highway system, however, Kansas has been a leader in using objective data to analyze and prescribe improvements. The Priority Formulas take into consideration safety (crash) data on each section of road, as well as other important criteria. Given the limited funds Kansas has to spend on its roads, the Priority Formulas consider all factors using a weighted approach. More information about how the Priority Formulas address safety can be found in Appendix C.

Other Strategic Safety Initiatives

The Kansas Department of Transportation (KDOT), the Kansas Highway Patrol (KHP), and the Kansas Department of Health and Environment (KDHE) each are extremely concerned about the number of deaths and injuries on Kansas roadways and continue to work hard to reduce the numbers. In response to this epidemic, the heads of these agencies have joined together in a unique cross-agency endeavor, the Kansas Safe Driving Campaign.

The first step in the campaign was to raise awareness about the number of people being killed and injured on Kansas roadways. The Secretary of Transportation, the Superintendent of the Kansas Highway Patrol, and the Secretary of Health and Environment hosted several community forums across the state to start a discussion with citizens, city/county officials and legislators about their perspective and thoughts on traffic crashes and the impact they have on everyone's lives. From those forums, it has become clear that this is a multi-faceted problem with no single solution. In conjunction with these forums, the agency executives also met with several editorial boards across the state. These meetings resulted in supportive editorials calling for changes.

Experience has shown that agency recommendations alone do not carry the weight that citizen recommendations do. With that in mind, the three agencies formed a task force of citizens from across the state representing different disciplines related to traffic safety to tackle this ever-increasing problem. This task force, known as the Driving Force, was announced in February 2006 by Governor Kathleen Sebelius. The Driving Force will explore the issues that have been raised in the community forums and produce a series of recommendations that can be implemented to reduce fatalities and injuries on Kansas's roadways. The Driving Force will be much more effective in calling for legislative changes as well as underscoring the need for changes across the state in areas of education, enforcement and engineering.

SHSPs are typically geared around a few emphasis areas with technical programs, but the goal of the task force is to incorporate non-technical aspects that deal with the legislative, education and enforcement side of roadway safety. Hence the Driving Force initiative and the SHSP are very complementary efforts. The Driving Force will be critical in providing

those non-technical pieces of the SHSP, which will enhance the state's efforts to reduce roadway fatalities and injuries. Recommendations that come from the Driving Force will be incorporated into the SHSP when they are finalized later in 2006. This plan will be used as a blueprint for safety activities for years to come and has the potential to make a huge difference in the safety of Kansas roadways. It will require updates on a regular basis, even after the emphasis area teams have formulated action plans.

Metropolitan areas are required in the transportation planning process to incorporate safety into their decision-making. Mid-America Regional Council, the planning organization that serves the Kansas City area, has developed a safety plan in conjunction with the States of Missouri and Kansas. A committee of safety professionals representing the states and cities and other local groups, called Destination:Safe, meets regularly to coordinate safety efforts which align with the focus areas chosen in the regional safety plan. KDOT looks forward to working with the metropolitan areas of Wichita, Topeka, Lawrence, and St. Joseph-Elwood on further developing safety components in the planning process that support both state and regional safety goals.

EMPHASIS AREAS

The most successful strategic plans have a focus on the areas where the greatest impacts can be made. To that end, the group of partners that convened at the Summit in February 2006 brainstormed problem areas. Using data to support the decision process, the group identified six key emphasis areas. These six areas represent the group's best estimate of which areas provide the biggest potential for reducing fatalities and serious injuries on Kansas roadways.

- Impaired Driving
- Occupant Protection
- Lane Departure
- Intersections
- Inexperienced/Novice/Teen Drivers
- Driver Behavior and Awareness

Under each emphasis area, strategies are listed that may help Kansas reach the objective for that area. Some strategies were suggested because they have been proven successful in other states or regions. Other strategies were produced by stakeholders at the SHSP summit. Emphasis area teams will be formed and will investigate to determine if testing of the strategy should occur. The emphasis area teams will also find that many of these strategies are already being used by KDOT and other safety partners. However, even established strategies need to be evaluated for effectiveness, using crash data, and that is why this plan is to be considered a living document. Our resources are limited, and to reach our goals we must use those resources in the most effective way.

Emphasis Area:

Impaired Driving

Impaired Driving

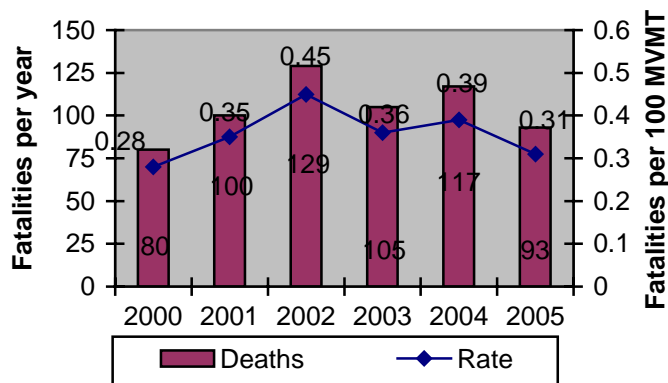
Background:

In 2005, 93 people were killed and 1,932 injured in alcohol-related traffic crashes in Kansas. Alcohol-related crashes with drivers under the age of 21 accounted for 18.9% of all alcohol-related crashes and 16.2% of all alcohol-related fatalities. Drug-related crashes, while problematic, are more difficult to isolate. Often drugged drivers are under the influence of alcohol, and standardized testing is not conducted for illegal drugs.

Table 1: Alcohol and Traffic Crashes in Kansas

	2000	2001	2002	2003	2004	2005
Total Crashes Alcohol-Related	3531	3678	3666	3442	3322	3039
Fatal Crashes	68	84	111	95	99	88
Injury Crashes	1673	1773	1635	1519	1417	1356
Property Damage Crashes	1790	1821	1920	1828	1806	1595
Fatalities	80	100	129	105	117	93
Fatalities per 100 Million VMT	0.28	0.35	0.45	0.36	0.39	0.31
Injuries	2533	2562	2419	2285	2005	1932
Proportion of Alcohol-Related Fatalities	17%	19%	25%	23%	25%	22%
DUI Arrests	22,320	22,001	21,835	21,235	18,303	17,672

Figure 4: Alcohol-Related Traffic Deaths and Rate Trend



Objective:

- To reduce the number of alcohol-related fatalities and injuries to 88 and 1,973 respectively by 2006, and to 76 and 1,945 respectively by 2008.
- To increase the number of local law enforcement agencies participating in grant funded impaired driving deterrence programs to 35 in 2006 and 40 in 2008.
- To lower the percentage of teen alcohol-related crashes by 2% to 16.4% in 2006 and to 12.4% in 2008

Performance Measures:

- Number of alcohol-related fatalities
- Number of alcohol-related injuries
- Number of local projects with law enforcement agencies participating in impaired driving deterrence programs
- Number of teen alcohol-related crashes

Strategies to be considered:**Education and awareness**

- Increase the number of presentations and distribution of materials given to the general public on the dangers of impaired driving.
- Increase paid media dedicated to reducing impaired driving.
- Continue providing education for high school students on the dangers of impaired driving.

Enforcement

- Continue providing local agencies with training and resources needed for conducting sobriety checkpoints.
- Recruit additional law enforcement participation in the Impaired Driving Deterrence Program (IDDP).
- Underwrite education for court system personnel on impaired driving laws and techniques used in removing impaired drivers.
- Increase the number of Drug Recognition Experts in the state and provide opportunities for officers to maintain their certification.
- Provide new state of the art breath alcohol testing equipment for use by law enforcement.
- Research and begin process of establishing a pilot DUI court in Kansas.
- Improve offender identification for law enforcement on drivers' licenses and improve identification of diversions in driving records.
- Support tougher DUI sentencing for all offenders.
- Increase enforcement such as random checkpoints and concentrated enforcement corridors.
- Advocate stronger and more uniform implementation of "Ignition Interlock" and vehicle impoundment.
- Improve data collection for alcohol related crashes and improve coding for DUI offense.

Cross-Cutting

- Implement the findings of the Alcohol Assessment of Kansas programs conducted in July 2006. <http://www.ksdot.org/burTrafficSaf/reports/KSDUIRpt06.pdf>
- Initiate emergency room assessments and improve data collection.
- Utilize NCHRP Report 500 - Volume 2: A Guide for Addressing Collisions Involving Unlicensed Drivers and Drivers with Suspended or Revoked Licenses. <http://safety.transportation.org/guides.aspx?cid=23>
- Utilize NCHRP Report 500 – Volume 16: A Guide for Reducing Alcohol-Related Collisions. http://gulliver.trb.org/publications/nchrp/nchrp_rpt_500v16.pdf

Emphasis Area:

Occupant Protection

Occupant Protection

Background:

According to NHTSA, proper use of passenger restraints is the single most cost-effective and immediate means of reducing motor vehicle deaths and injuries. Drivers and occupants are becoming more aware of the importance of using safety belts, how to properly use them, and how to properly position children using safety restraints within air bag-equipped vehicles. In 2005, 350 people were killed in passenger cars, trucks, SUVs, and vans, of which 70 percent were not properly restrained. Kansas ranks 43rd out of the 50 states with a seatbelt usage rate of 69%. Only 81 percent of children ages 0-4 were observed in a passenger restraint. The number drops to 50 percent for age groups 5-9 and 10-14.

Table 2: Occupant Protection in Kansas

	2000	2001	2002	2003	2004	2005
Seat Belt Rate	61%	60%	61%	64%	68%	69%
Seatbelt Use by Road Type						
Rural Interstate	78%	77%	70%	79%	80%	76%
Rural State Roads	60%	58%	60%	63%	69%	68%
Rural County Roads	47%	50%	52%	53%	59%	56%
Urban Interstate	68%	69%	70%	72%	74%	75%
Urban State Roads	51%	57%	59%	59%	65%	64%
Urban City Streets	42%	53%	56%	56%	60%	58%
Child Safety Seat Use by Ages						
0-4	81%	92%				
4-14	55%	52%				
0-4			*	79%	81%	81%
5-9			*	45%	50%	49%
10-14			*	44%	50%	47%
* Baseline Study						
Fatalities	461	494	507	469	460	428
Fatality Rate	1.6	1.72	1.76	1.61	1.57	1.43
Fatal Crash Occupant Use	27%	23%	27%	26%	34%	30%
<u>Motorcycle Statistics</u>						
Fatalities	24	24	33	32	32	35
Percent Wearing Helmet	14.3%	26.1%	18.2%	31.3%	26.7%	20.0%
Injured	678	692	733	766	897	944
Percent Wearing Helmet	26.0%	24.3%	23.6%	28.0%	31.1%	31.5%

Excludes occupants in vehicle body types: moped, farm equipment, all-terrain-vehicle, bus, train, emergency vehicle, other, and unknown.

Figure 5: Seatbelt Rate vs. Fatality Rate

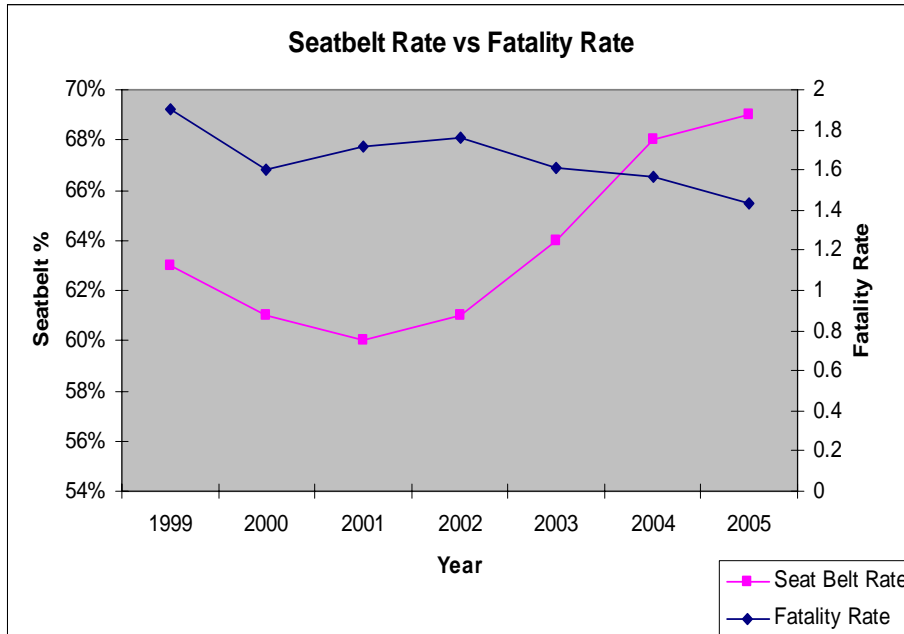
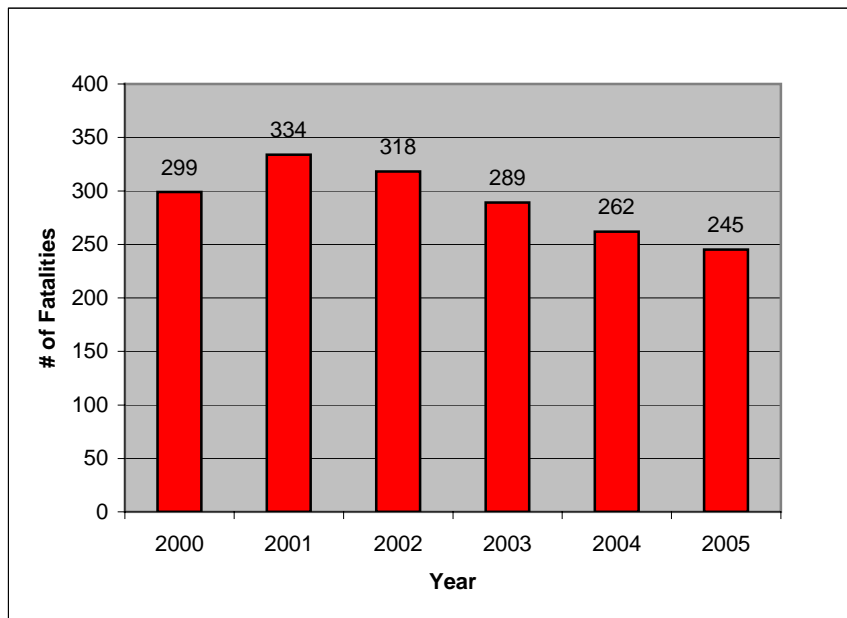


Figure 6: Occupant Restraint Non-Use among Fatalities



Objective:

- To raise the seatbelt usage rate by 3% each year to 78% in 2008
- To raise the child restraint rate for 0-4 year olds by 2% per year to 85% in 2006 and 89% in 2008, to raise the rate for the 5-9 and 10-14 year old groups by 4% per year to (5-9) 58% in 2006 and 66% in 2008; (10-14) to 58% by 2006 and 66% by 2008.
- Work toward changing driver culture/attitude about seat belt use by making non-use socially unacceptable.

Performance Measures:

- State seat belt usage rate as determined through observational surveys
- Traffic fatality rate per 100M VMT

- Child restraint usage rate as determined through observational surveys

Strategies to be considered:

Education and awareness

- Encourage adults to set good examples for children by example. Encourage safety and transportation professional to set good examples for the general public.
- Provide more early education so children develop good safety habits at a young age.
- Provide statewide occupant protection public education and information through media campaigns in conjunction with law enforcement mobilizations and special corridor activities – English and Spanish.
- Make the campaigns personal by “putting a face and a name with the crash” and creating anecdotes.
- Educate drivers about supplemental restraint systems and how they work together with - rather than in place of - seat belts.
- Increase number of CPS Safety Seats available state-wide in recognized distribution/fitting stations, targeting booster seats, and expand the number of seats distributed to approved fitting stations for low income families. Provide more training for technicians that educate drivers and install safety seats.
- Continue KSBEEO Adult/Child Safety Belt Surveys, and Boosters to Belts education state-wide through presentations, brochures etc.
- Continue state-wide media awareness campaign on occupant protection.
- Continue CPS Safety Training using NHTSA standardized curricula.
- Calculate seat belt related cost data and then convey the economic impact of seatbelt usage.
- Initiate a seatbelt coalition.
- Educate motorcyclists about the benefits of helmet use as well as informing the public about the societal costs of motorcyclists not using helmets.
- Support motorcyclist training and enhanced license requirements.

Enforcement

- Enact legislation for a primary seat belt law.
- Enact legislation for increased violation fines and points for motor vehicle records.
- Provide more grants to law enforcement agencies for overtime enforcement of safety belt violations through the Special Traffic Enforcement Program (STEP).
- Utilize corridor enforcements to sustain occupant protection use. Increase statewide enforcement in general.
- Use seatbelt survey results to target problem areas of the state.
- Support legislation requiring helmets for all motorcycle riders.

Cross-Cutting

- Increase seatbelt use by pick-up truck drivers and in target locations.
- Discuss seat belt use incentives or penalties that can be implemented by the insurance industry.
- Find solutions for more comfortable, better fitting seatbelts.

- Utilize NCHRP Report 500 - Volume 11: A Guide for Increasing Seat Belt Use.
<http://safety.transportation.org/guides.aspx?cid=28>

Emphasis Area:

Lane
Department

Lane Departure

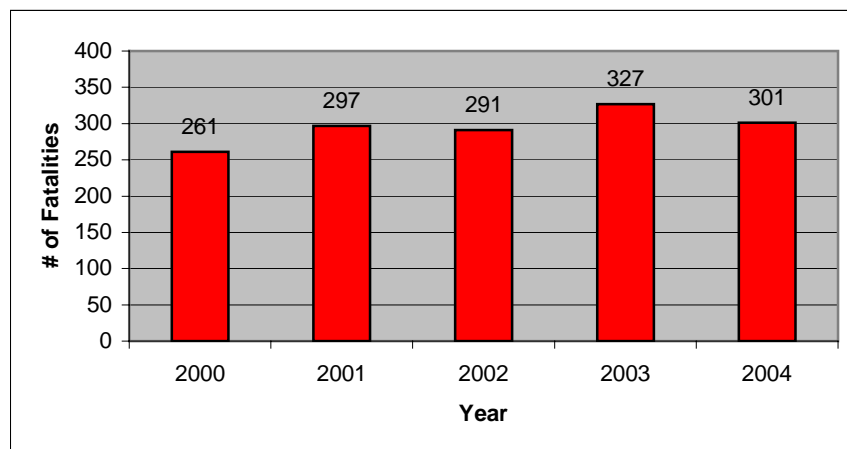
Background:

Lane departure crashes are considered crashes in which a vehicle unintentionally departs from its lane and crashes with another vehicle, or rolls over, or hits a fixed object. Lane departure crashes are a substantial portion of statewide motor vehicle crashes. Over the past five years, the numbers and rates of lane departure fatal and serious injury crashes have remained relatively constant. From 2000 through 2004, these crashes accounted for over 55% of the statewide crashes involving serious injuries and deaths and 22% of all crashes. Approximately 31% of all fatal and serious injury crashes in lane departure crashes occur on rural state highways, followed by 26 percent on county roads. As identified through data analysis, the states lane departure fatalities can be reduced by focusing attention on roadway curves, rollovers, ditches, fixed objects, illegal driving actions, unbelted drivers and occupants, and inattentive and fatigued drivers.

Many of the challenges relating to roadway departure in Kansas include:

- Inaccurate crash locating from crash reports.
- Data issues regarding local system roadway characteristics and inventory.
- Lack of a common local reference system.
- Identification of driver and roadway causal factors.
- Development and retrofit of improved and crashworthy roadside hardware.
- Limited resources to upgrade or rebuild existing roadway infrastructures.
- Geographical constraints of EMS response capabilities and “911” range.
- Determination of accurate impact of deer crashes.
- Lack of certified trauma centers to mitigate trauma for victims of LD-type crashes.

Figure 7: Lane Departure Fatalities



Objective:

To reduce the lane departure serious injury and death rate from 3.37 in 2002 to 3.03 in 2008, preventing 112 serious injuries and deaths.

Performance Measures:

- Fatalities and serious injuries per 100M VMT in lane departure-type crashes (run-off road, fixed object, sideswipe, and head-on collision)
- Geometric changes constructed
- Signing/delineation locations improved

Strategies to be considered:

Education and awareness

- Continue support of local and state officials' ability to provide safer roadways through training and educational materials.
- Add a component on lane departure crashes to the KDOT's "Safe Driving" campaign
- Implement driver awareness programs on the dangers of impaired (alcohol), fatigued, and distracted driving.
- Continue to support all safety belt education of the public, engineering, enforcement, judiciary, and legislators.
- Provide awareness and education for drivers, especially novice and older drivers, on how to avoid lane departure crashes, such as Operation Lifesaver's initiatives on highway-rail grade crossings.
 - Education about roadway materials (ability to stop on gravel)
 - Driver awareness of rules of the road when not striped (gravel)
 - Train and educate drivers to safely recover after leaving the roadway.
- Use Traffic Assistance Services for Kansas and Local Transportation Assistance Programs to spread information to local public works officials about innovative and cost-effective ways to improve awareness.
- Positive enforcement effort – "catch them doing it right". Reward correct behavior with coupon to local business, which targets the younger driver.

Engineering

- High Risk Rural Roads program, just initiated in SAFETEA-LU, provides funds to those types of roads where lane departure is the most common cause of the crash. Kansas is developing data-driven procedures to implement the HRRR program.
- Continue KDOT's Hazard Elimination Safety Program through remediation of high crash locations on State and local roads.
- Traffic Engineering Assistance Program can help local jurisdictions identify and design countermeasures
- Systematic deployment of low cost engineering improvements.
- Incorporation of additional low cost safety features in the 1R and 3R programs
- Edgeline and centerline milled rumble strips
 - Review KDOT's rumble strip policy for consistency with state-of-the-practice
 - Continue to install shoulder rumble strips
 - Develop KDOT policy for "edge line" rumble strips on highways with no shoulders
 - Develop KDOT policy for "center line" rumble strips on highways
- Continue to design roadway improvements using prevailing criteria and the "Forgiving Roadside Concept".
 - Guardrail
 - Median barrier
 - Removal of utility poles, tree, and other fixed objects

- Shoulders
- Flattening side slopes
- Continue to provide the edge wedge at pavement or shoulder edge to mitigate pavement edge drop offs
- Add information to Low Volume Road and Small Cities Handbooks pertaining to innovative, low-cost countermeasures for lane departure crashes or roads that may be prone to lane departure.
- Review policy on roadway geometry and the use of traffic control devices.
 - Work Zones (consider variable speed limits as a strategy, Washington State has shown effectiveness)
 - Signing, delineation, and marking policies, especially for curves
 - Raised pavement markers
 - Lighting of roadway
 - Florescent yellow sign sheeting warning signs including No Passing Zone pennants
 - Passing opportunities
- Continue Road Safety Audits and implementing their recommendations.
- Continue to implement warranted roadway safety improvements such as:
 - Signing
 - Centerline rumble strips and markings
 - Shoulder rumble strips and markings
 - All-weather pavement markings
 - Wide pavement markings
 - Raised pavement markings
 - Roadway lighting
 - Alignments meeting minimum design speeds
 - Improved shoulders
 - New median barrier devices and installations
 - Passing lanes on rural two-lane roads

See Appendix D for more information on how these types of projects are currently funded for state highways.

Enforcement

- Provide selective enforcement directed at speeding, occupant protection, and impaired driving.
- Develop a procedure for law enforcement officers to request engineering assessments of crash sites.
- Improve enforcement training on crash reporting.
- Consider implementing automated speed enforcement.
- Provide better information about location, causation, and conditions.
- Improve work zone safety.
- Initiate “Quick Clearance Legislation”, aimed at giving authority to agencies to take whatever action is necessary to unblock traffic lanes at an incident and get traffic moving again.

Cross-Cutting

- Implement corridor enforcement/education/engineering initiatives
- Evaluate the use of Intelligent Transportation Systems (ITS) to alert traffic of errant vehicles.

- Update, enhance, and maintain 911 systems and databases to better facilitate EMS response.
- Utilize NCHRP Report 500 - Volume 3: A Guide for Addressing Collisions with Trees in Hazardous Locations. <http://safety.transportation.org/guides.aspx?cid=24>
- Utilize NCHRP Report 500 - Volume 4: A Guide for Addressing Head-On Collisions. <http://safety.transportation.org/guides.aspx?cid=25>
- Utilize NCHRP Report 500 - Volume 6: A Guide for Addressing Run-Off-Road Collisions. <http://safety.transportation.org/guides.aspx?cid=27>
- Utilize NCHRP Report 500 - Volume 7: A Guide for Addressing Collisions on Horizontal Curves. <http://safety.transportation.org/guides.aspx?cid=32>
- Utilize NCHRP Report 500 - Volume 8: A Guide for Addressing Collisions Involving Utility Poles. <http://safety.transportation.org/guides.aspx?cid=31>

Emphasis Area:

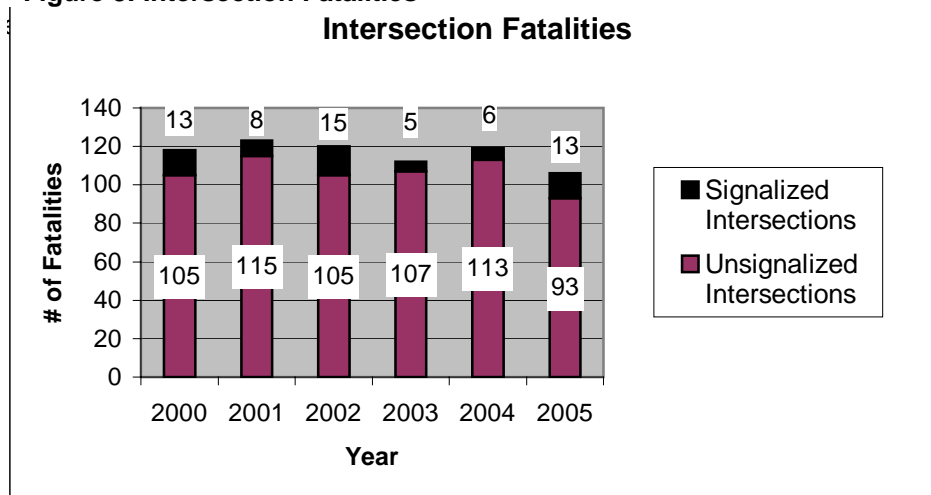
Inter- state 50 5 (5)

Intersections

Background:

There were 97 fatal crashes within Kansas in 2004 occurring at intersections. Rural intersections accounted for 47 crashes (48 percent), of which 6 were at signalized intersections, and 41 were at unsignalized intersections. The following figure highlights the trends in intersection crashes over the past 6 years. Intersections accounted for 50 fatal crashes, of which 24 were signalized intersections, and 16 were unsignalized intersections. In general, many intersection-related crashes are attributed to: failure to yield and speeding and take place on rural roads and at highway-rail grade crossings.

Figure 8: Intersection Fatalities



Objective:

To reduce the intersection disabling injury and death rate from 0.87 per 100 million vehicle-miles traveled in 2004 to 0.70 in 2008 (a 20% reduction) and prevent 53 disabling injuries and deaths.

Performance Measures:

- Intersection-related fatalities and serious injuries per 100 million vehicle-miles traveled
- Intersections improved, either with signals or geometric changes

Strategies to be considered:

Engineering

- Identify intersections with a disproportionately large number of fatal and serious injuries crashes.
- Develop standard operating procedure for intersection improvements, including the use of left-turn phasing and turn lanes.

- Consider the use of roundabout designs for intersection improvements.
- Participate in intersection safety audits.
- Implement left turn safety countermeasures such as “jug handles” (indirect left turns), offset dedicated left turn lanes, and protective signalization.
- Upgrade traffic signals for timing optimization and dilemma zone protection.
- Upgrade traffic signal equipment and locations. Install mast arms to replace post-mounted signals.
- Consider recommendations for older drivers such as intersection geometry, larger font sizes on signs, and wider pavement markings.
- Design intersections to better accommodate larger vehicles such as commercial motor vehicles.
- Improve intersection lighting, sight distance and driver expectation.
- Improve pedestrian crosswalks and pedestrian signal timing.
- Provide better corridor management and access management. Educate local officials about land development and safety.
- Maintain rural vegetation control for better sight distance.
- Install better quality pavement markings.

See Appendix D for more information on how these types of improvements are currently funded for state highways.

Enforcement

- Enhance law enforcement at high crash intersection locations.
- Implement automated enforcement such as red light running countermeasures, speeding countermeasures and photo enforcement cameras.

Cross-cutting

- Provide better bicycle accommodations.
- Improve data collection at intersections.
- Evaluate the use of Intelligent Transportation Systems (ITS).
- Safe Routes to School activities.
- Continue KDOT’s Hazard Elimination Safety Program through identification of high crash locations on State and local roads.
- Utilize NCHRP Report 500 – Volume 5: A Guide for Addressing Unsignalized Intersection Collisions. <http://safety.transportation.org/guides.aspx?cid=26>
- Utilize NCHRP Report 500 – Volume 12: A Guide for Reducing Collisions at Signalized Intersections. <http://safety.transportation.org/guides.aspx?cid=33>

Emphasis Area:

Novice Drivers

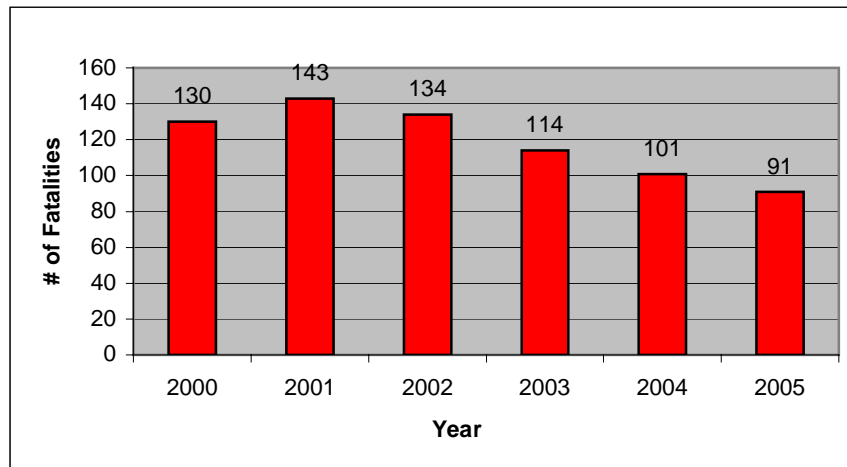
Inexperienced/Novice/Teen drivers

Background:

Young drivers ages 14-20 continue to be over-represented in fatal and incapacitating injury crashes. In 2004, drivers (ages 14-20) were involved in 94 fatal crashes. The three major contributing factors for Kansas' youthful driver fatal crashes are speeding, failing to yield, and drinking. According to the Kansas Department of Health almost four out of five accidental deaths for teenagers and young adults are due to motor vehicle crashes. Kansas high-school students are not required to take driver's education, and schools are finding it more difficult with other educational requirements, staff availability, and insurance considerations to offer driver's education.

The Driving Force task force has placed great importance on the problem of novice drivers. Research has shown that two factors greatly increase the chances of a teen driver being involved in a life-changing crash: driving late at night and having teen passengers. Kansas is part of a shrinking minority of states with no restrictions on either of these factors.

Figure 9: Fatalities Involving Drivers Age 14-20



Objective: To reduce fatal crashes involving drivers aged 14-20 to less than 75 per year.

Performance Measures:

- Fatal crashes involving drivers aged 14-20

Strategies to be considered:

Education and awareness

- Provide better (mandatory) driver education that includes emphasis on driver behavior, responsibility and accountability.
- Educate novice drivers about driving near commercial vehicles such as the “Share the Road” and the “No Zone Campaign” (alerts drivers to tractors’ blind zones).
- Provide education to parents about driver responsibility and role modeling. Provide driver safety education at the elementary school level.

Engineering improvements

- Consider novice drivers when designing intersections near schools.

Enforcement

- Institute an enhanced Graduated Driver's License (GDL) program. Enforce GDL restrictions.
- Research the possibility of using black box data to determine a driver's actions prior to the crash, especially for novice drivers.
- Consider legislation that limits the number of passengers that novice drivers can transport, requires nighttime restrictions, and imposes penalties on novice drivers that are involved in crashes caused by driver distractions. More specifically, driver distractions would include other passengers, cell phones, stereos, and grooming.

Emphasis Area:

Driver Behavior & Awareness

Driver Behavior and Awareness

Background:

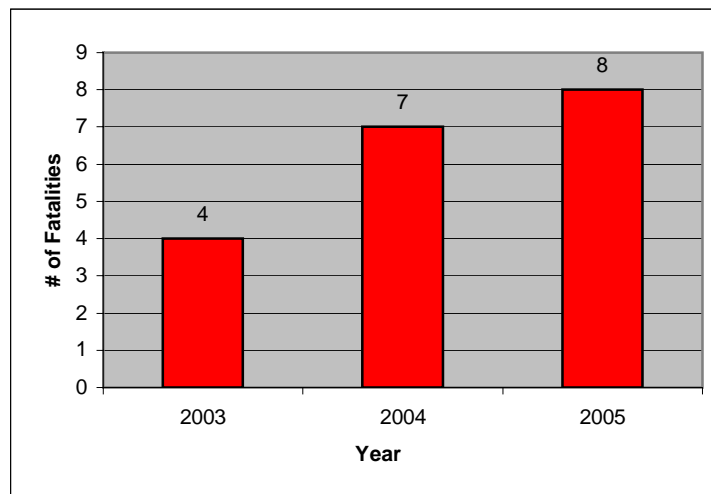
Nationally, more than 60 percent of drivers consider unsafe driving by others as a major personal threat to themselves and their families. Statistics show that unsafe driving is becoming more prevalent across the country and is also increasing in severity.

Addressing inappropriate or hazardous driver behaviors is a critical factor in reducing fatal and incapacitating injury crashes. Unsafe driving behavior may include, but is not limited to, distracted/inattentive drivers, driver fatigue, and aggressive driving. Also, with the increase in the average age of the population of Kansas there is also a need for improved driver awareness for older drivers. The US Census predicts that 19.5 percent of all Kansans will be 65 years of age and over by the year 2025.

Distracted and Inattentive Drivers

Distracted and inattentive drivers pose problems to the transportation community. Part of the problem is that most every driver is either distracted or inattentive at some point, so there is no focused target group. This causation is also very difficult to track due to underreporting; there is no post-crash test to determine if the driver was paying proper attention. Kansas has only had the distracted code on its accident form since 2003. In 2005, 2 percent of Kansas fatal crashes were related to driver distraction as coded on the accident form, but “failure to give full time and attention” is the most-often coded contributing circumstance in Kansas crashes.

Figure 10: Fatalities involving Distracted Drivers
(as coded on accident form)



Objective: To make drivers place the utmost importance on the task of driving.

Performance Measure:

- Distracted driving deaths and serious injuries

Strategies to be considered:

- Institute a legal ban on use of cell phones by drivers.
- Enforce the ban on screens such as DVD's in front seats.
- Collect better data on distracted and inattentive drivers. This would include training law enforcement to better detect these crash causation factors.
- Research the possibility of using black box data to determine a driver's actions prior to the crash.
- Utilize NCHRP Report 500 – Volume 14: A Guide for Reducing Crashes Involving Drowsy and Distracted Drivers.
http://gulliver.trb.org/publications/nchrp/nchrp_rpt_500v14.pdf

Driver Fatigue

The National Highway Traffic Safety Administration (NHTSA) estimates that nationally drowsiness is a factor in 100,000 police reported crashes each year, resulting in 76,000 injuries and 1,500 deaths. In 2005, 826 Kansas crashes listed “fell asleep” as a contributing circumstance, but it is reasonable to assume that of the “failure to give full time and attention” (28% of all crashes) a good portion were related to driver fatigue.

Objective: To impress on every driver the very real dangers of fatigued driving.

Performance Measure:

- Develop a surrogate for fatigued driver deaths and serious injuries

Strategies to be considered:

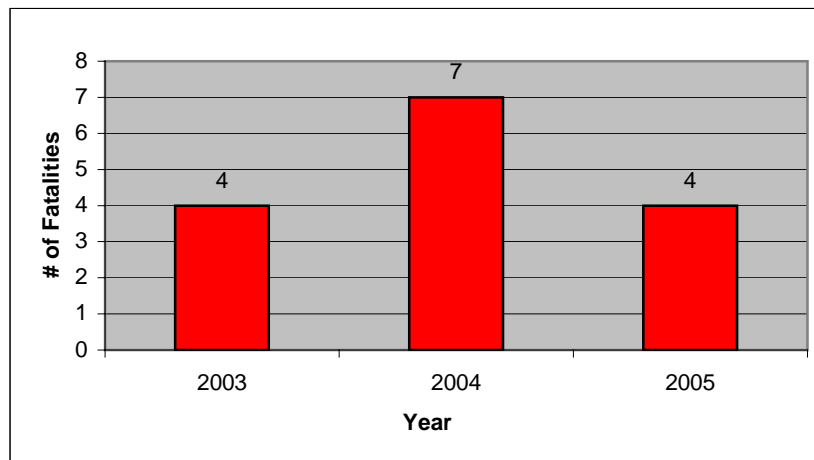
- Pass legislation that places stricter penalties for those who drive fatigued.
- Implement detection technology.
- Install roadway tactile warnings such as rumble strips.
- Provide increased law enforcement training and education for better detection and data gathering.
- Provide more public awareness and education on the seriousness of driving fatigued.
- Provide increased education for companies who employ commercial vehicle drivers.
- Provide more commercial vehicle parking, rest areas, and pull-overs.
- Utilize NCHRP Report 500 – Volume 14: A Guide for Reducing Crashes Involving Drowsy and Distracted Drivers.
http://gulliver.trb.org/publications/nchrp/nchrp_rpt_500v14.pdf

Aggressive Drivers

Aggressive Driving takes on many forms, but most often illegal or unsafe speed is the leading factor in crashes as well as disregard for traffic control devices, following too close, improper passing, and improper, unsafe lane changes. Kansas added Aggressive/Antagonistic Driving to the accident form in 2003. The reporting officer can record this contributing circumstance code as it applies to the driver's actions, with aggression defined as an offensive action/unprovoked attack, while antagonism is actively expressed opposition or hostility. In fatality and serious injury crashes, these may be underreported as the drivers/witnesses may be unable to speak with the officer. As aggressive driving is a behavioral issue, and according to the National Highway Traffic Safety Administration (NHTSA), behavioral issues can most significantly be changed through the use of increased enforcement. Highly visible and regular traffic

enforcement is a priority in reducing aggressive driving. In 2005, 1 percent of Kansas fatal crashes were related to aggressive driving.

Figure 11: Fatalities involving Aggressive Drivers
(as coded on accident form)



Objective: To deter aggressive driving behavior, which leads to unsafe situations.

Performance Measure:

- Aggressive driving deaths and serious injuries

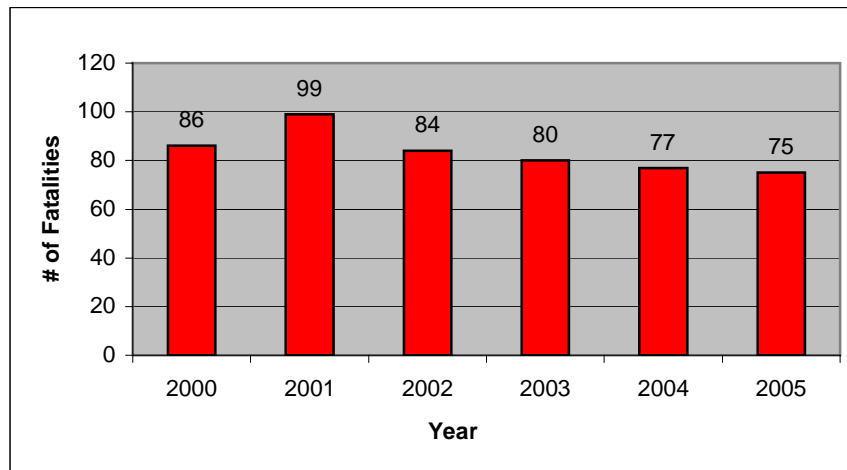
Strategies to be considered:

- Increase enforcement strategies
- Increase public awareness and education about the dangers of aggressive driving.
- Provide an “Aggressive Driver Hotline” to anonymously report aggressive drivers.
- Post travel delays and traveler information to decrease driver frustration.
- Implement speed detection between toll booths and automate fines.
- Educate drivers to share the road with commercial vehicles, bicycles and pedestrians.
- Implement innovative technology such as following distance warning devices and [car ahead] speed-sensitive cruise control.
- Utilize NCHRP Report 500 – Volume 1: A Guide for Addressing Aggressive-Driving Collisions. http://trb.org/publications/nchrp/nchrp_rpt_500v1.pdf

Older Drivers

While the data show that most older drivers are quite responsible (e.g. have high safety belt usage, lower alcohol-related crash rates), national fatality rates per 100M VMT for the oldest drivers mirror the high rates for teen drivers. Plus, the inherent frailty of older drivers reduces their chances of surviving a crash, once it occurs. Current crash data show that older drivers are involved in only 8% of total Kansas’ crashes in 2004, but 12% of the fatal Kansas’ crashes. The top contributing factors to older driver related fatalities are: inattentive driving, failure to yield right of way, drivers who are ill or passed out, and failure to keep in proper lane.

Figure 12: Fatalities involving Drivers Older than 65



Objective: To reduce fatal crashes involving older drivers by optimizing both driving skills and roadway environment.

Performance Measure:

- Older driver deaths and serious injuries per million registered older drivers

Strategies to be considered:

- Institute mandatory and more frequent retesting for license renewal including written, driving and eye tests.
- Explore driver restrictions.
- Provide supplemental transportation for older drivers such as transit or para-transit in rural areas.
- Provide comprehensive educational programs that include older driver's education, the side affects of prescription medications on driving abilities and physical limitations.
- Provide innovative services or programs such as "trade your car" programs.
- Increase physician's roles in driving competency evaluation and recommendations.
- Consider older driver handbook recommendations during roadway design, rehabilitation and construction.
- Provide anonymous reporting for retesting and license renewal notification.
- Provide vocational rehabilitation.
- Provide "Share the Road" education for older drivers.
- Research the possibility of using black box data to determine a driver's actions prior to the crash.
- Utilize NCHRP Report 500 – Volume 9: A Guide for Reducing Collisions Involving Older Drivers. http://trb.org/publications/nchrp/nchrp_rpt_500v9.pdf

IMPLEMENTATION PROCESS

This plan contains recommendations and strategies covering very diverse disciplines. It will require not only coordination but also accountability among all of the partners in order to implement the comprehensive approach to Kansas' emphasis areas. Each of the emphasis teams will meet to develop priorities and schedules for both short-range strategies that can effect immediate change and for the longer-term strategies that may require time for planning and for commitment of funds. These emphasis area teams will report back their schedules to be included in this Plan as it is updated over time.

EVALUATION PROCESS

Evaluation of the strategies using data is critical to formulating an effective plan. As some of the strategies are considered very experimental, thorough, yet timely, evaluation will be needed to determine whether to expand implementation or discontinue it. Strategies that have been established already may require reevaluation or refinement if the data show that their effectiveness is lower than expected. Therefore, the emphasis area teams will need to meet annually after the data has been processed. Each emphasis area team will be given latitude to determine standards for effectiveness, as the different disciplines have varying degrees of immediacy and coverage (engineering and enforcement strategies tend to have a focused target area, while education strategies affect broader areas over greater time periods. These annual meetings will also give the teams a chance to propose new strategies. It is important to remember that change occurs at different speeds on different levels, and that one-year swings in the data can be attributed to "noise" (normal fluctuation of quasi-random events). Therefore, the evaluation process needs to always look at the big picture before judging a strategy or group of strategies.

NEXT STEPS

This approved Strategic Highway Safety Plan holds little significance if the strategies heretofore mentioned are not prepared for implementation. An emphasis area team will be organized for each of the six major issues. These teams will acquire whatever information needed to support the evaluation and prioritization of the strategies. The action plans for each emphasis area will be assembled into the next edition of the SHSP. Meanwhile, the Driving Force task force will issue its recommendations regarding traffic safety and there will be opportunities for cross-over between the two efforts, to be administered by the Kansas Department of Transportation.

REFERENCES

Kansas Highway Safety Plan, KDOT Bureau of Traffic Safety

Kansas Motor Carrier Safety Assistance Plan

Kansas Lane Departure Action Plan

Kansas Traffic Records Strategic Plan

KC Regional Blueprint for Safety

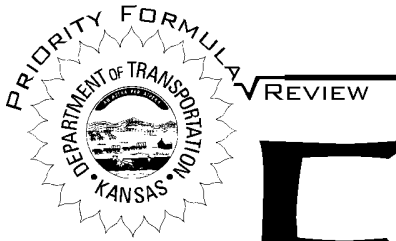
Appendix A: Kansas Traffic Safety Facts

	2000	2001	2002	2003	2004	2005
Statewide Crash Data						
Total Crashes	78,241	78,856	78,314	75,012	74,119	68,675
Fatal Crashes	405	433	445	419	390	384
Injury Crashes	19,497	19,353	18,508	17,041	16,634	16,185
Property Damage Crashes	58,339	59,070	59,361	57,552	57,095	52,106
Fatalities	461	494	507	469	459	428
Fatalities per 100 Million VMT	1.6	1.72	1.76	1.61	1.55	1.43
Injuries	29,110	28,842	27,073	24,798	23,783	22,723
Injuries per 100M VMT	100.54	100.28	93.88	84.91	80.91	76.39
Fatality & Serious Injury Rate per 100M VMT	9.65	9.38	8.71	8.55	7.86	7.63
Fatality Rate/100k Population	17.15	18.33	18.67	17.22	16.78	15.64
Fatality and Serious Injury Rate /100k Pop	103.41	100.09	92.46	91.17	84.85	83.70
Alcohol Related Fatalities	80	100	129	105	117	93
Alcohol-related Fatality Rate per 100M VMT	0.28	0.35	0.45	0.36	0.39	0.31
Percentage of Alcohol Related Fatalities	17%	19%	25%	23%	25%	23%
Population (in thousands)	2,688	2,694	2,715	2,723	2,735	2,736
Vehicle Miles Traveled (millions)	28,814	28,749	28,821	29,049	29,524	30,000
# of Licensed Drivers (in thousands)	1,941	1,903	1,997	2,022	2,015	2,008
# of Registered Vehicles (in thousands)	2,392	2,426	2,439	2,401	2,488	2,529
Seat Belt Rate	61	60	61	64	68	69
Contributing Circumstances of Crashes						
Inattention	31,473	31,838	30,948	27,342	26,427	23,447
Failure to Yield	11,569	10,705	10,347	9,928	9,707	8,871
Speed	7,816	7,729	7,950	7,688	7,452	7,508
Animals	6,334	6,907	6,562	6,823	7,453	6,880
Following to Closely	4,700	4,867	5,235	5,273	5,852	5,615
Novice Driver Statistics (ages 14-20)						
Total Crashes	24,401	24,082	23,672	22,083	21,265	19,153
Fatal Crashes	113	121	115	97	90	76
Injury Crashes	6,965	6,772	6,304	5,759	5,550	5,159
Property Damage Crashes	17,323	17,189	17,253	16,227	15,625	13,918
Total Fatalities	130	143	134	114	101	91
Total Injuries	11,002	10,714	9,799	8,923	8,380	7,611
Percentage of Overall Crashes	31.2%	30.5%	30.2%	29.4%	28.7%	27.9%
Alcohol-related Crashes	847	830	879	782	768	649
Alcohol-related Fatalities	17	19	41	21	21	13
Alcohol-related Injuries	704	639	652	590	530	512

Appendix B: Glossary

ACRONYM	WHAT IT STANDS FOR
AASHTO	American Association of State Highway and Transportation Officials
ATMS	Advanced Traffic Management System
BAC	Blood Alcohol Content
BAU	Breath Alcohol Unit
BLP	Bureau of Local Projects
BTS	Bureau of Traffic Safety
CFR	Code of Federal Regulations
CIOT	Click it or Ticket
CPS	Child Passenger Safety
DRE	Drug Recognition Expert
DVMT	Daily Vehicle Miles Traveled
DWI	Driving While Intoxicated
FHWA	Federal Highway Administration
GDL	Graduated Driver Licensing
GHSA	Governors Highway Safety Administration
HSIP	Highway Safety Improvement Program
HSP	Highway Safety Plan
HSRC	Highway Safety Research Center
IDDP	Impaired Driving Deterrence Program
ITS	Intelligent Transportation System
KARS	Kansas Accident Records
KDDPP	Kansas Drunk Driving Prevention Project
KHP	Kansas Highway Patrol
KMCA	Kansas Motor Carrier Association
KSBE0	Kansas Safety Belt Education Office
KUTC	Kansas County Highway Association
LRTP	Long-Range Transportation Plan
MPO	Metropolitan Planning Organization
MVRP	Motor Vehicle Reporting System
NCHRP	National Cooperative Highway Research Program
NCUTLO	National Committee on Uniform Traffic Laws and Ordinances
NHTSA	National Highway Traffic Safety Administration
OP	Occupant Protection
PI & E	Public Information and Education
PSA	Public Service Announcement
RAVE	Roving Aggressive Violations Enforcement
RPC	Regional Prevention Center
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: a Legacy for Users
SFST	Standardized Field Sobriety Testing
SHSP	Strategic Highway Safety Plan
STEP	Special Traffic Enforcement Program
STP	Surface Transportation Program
TASK	Traffic Assistance Services for Kansas
TEA-21	Transportation Equity Act for the 21st Century
TEAP	Traffic Engineering Assistance Program
TIP	Transportation Improvement Program
TIPS	Training for Intervention ProcedureS
TSP	Traffic Safety Program
VMT	Vehicle Miles Traveled

Appendix C: Priority Formula Factsheet



Factsheet

MARCH 2000

Safety – A Top Priority

Safety

When it comes to transportation, there's no doubt that everyone is concerned about safety. The transportation system is a vital part of all our lives and the future of our state. But transportation systems also carry an inherent risk even though modern technology continues to help make travel safer. The transportation system is designed to help vehicles operate both efficiently and safely, so the Kansas Department of Transportation (KDOT) is very concerned about safety – and that's why safety is a key criteria in each of the current Priority Formulas, which are used to select Major Modification (Interstate and Non-Interstate Roadways) and Priority Bridge highway improvement projects.

What Does KDOT Do to Promote Safe Roads?

At times, some people may feel a particular roadway needs more work to address safety concerns, and they may wonder why the need isn't apparent to everyone else, including KDOT. In reality, KDOT is very aware of safety issues on our state's roads and makes every effort to monitor and address safety problems as soon as they appear. However, people have individual perceptions of safety, and those perceptions do not always coincide with the data KDOT uses to measure safety.

A road that seems "safe" to one person may actually have safety problems which will show up in the objective, measurable data that KDOT uses to identify specific problems. Another road may seem "unsafe" to a different person – when in reality that road has an excellent rating for safety based on the same data. Making decisions about where to spend limited resources and which problems to work on first is one of the toughest challenges KDOT faces. Using the Priority Formulas

and making choices based on objective data, KDOT can focus its resources on real safety issues rather than individual perceptions.

How Does KDOT Currently Handle Safety Issues?

It is virtually impossible to separate safety from any of KDOT's programs, since the goal of the agency is to provide effective transportation systems that operate with a maximum of efficiency and a minimum of risk. However, because safety is so intertwined with nearly all aspects of transportation, it is also sometimes difficult to identify and measure risks precisely – and even more difficult to develop a priority formula that addresses every single safety issue that may arise.

In addition to the Major Modification (Interstate and Non-Interstate Roadways) and Priority Bridge Programs determined by the Priority Formulas, several other smaller programs have a specific safety focus. The Major Modification program includes set-asides for railroad crossing improvements, guard fence upgrades, intelligent transportation system applications, and geometric improvements – all of which are related to safety issues in one way or another. The Major Modification program also has a specific component called "Hazard Elimination" which is designed to reduce accident rates.

Many other KDOT programs are directly related to safety. For example, Substantial Maintenance programs maintain, repair and replace signs, pavement markings, structural components, and lights – all of which are related to safety concerns as well as other transportation issues. There is even a separate Substantial Maintenance program called "Safety Projects" which directs funding to accident reduction efforts at spot locations. In fact, a quick glance at the list of programs

that KDOT manages will show that nearly every one is related to safety in one way or another.

The Priority Formulas – How is Safety Addressed?

The Priority Formulas look at several “attributes” to evaluate roads and bridges in Kansas. These “attributes” are compared to a set of standards for each type of road or bridge. An “attribute” describes a specific deficiency of a roadway or bridge that can be corrected with an improvement of some kind. Under the KDOT Priority Formulas, safety is measured by evaluating “driver exposure” to the risk of an accident. That “exposure to risk” is measured by looking at several specific “attributes” – like the width of shoulders, number of severe curves, and other specific geometric conditions that may create the potential for an accident.

In addition, the accident rate for a particular section of road is measured and used to adjust the overall need for a highway improvement project as determined by the Priority Formulas. The Priority Formulas use the driver exposure attributes and accident rate for roadways to evaluate “safety.” Safety factors, along with roadway and bridge condition factors, are used by the Priority Formulas to determine the overall need for an improvement project.

What Changes Are Being Considered?

While the safety factors and other attributes and adjustment factors used now in the Priority Formulas are good, it may be possible to make them even more effective. Changes to the way safety is measured in the current formulas will be researched in more detail in the coming year.

Non-Interstate Priority Formula

The set of driver exposure attributes and adjustment factors in the current formula does not include traffic congestion or commercial traffic (large trucks). The current formula does consider these factors, but not directly as they relate “driver exposure.” Because they play an important role with regard to

increased potential for an accident, treating traffic congestion and commercial traffic as a driver exposure attribute will be tested.

The current formula uses the overall accident rate of a particular roadway as an adjustment factor. No separate adjustment is made for the fatal accident rate. The use of a separate adjustment for the fatal accident rate or a combined factor will be tested.

Interstate Priority Formula

Because Interstate roadways are of relatively recent construction and built with more modern standards, substandard roadway features are generally not present. However, traffic congestion on the Interstate system particularly in urban areas, could be a potential safety concern. The current Interstate Priority Formula does not take traffic congestion into account. It will be tested as a driver exposure attribute along with the appropriate adjustment factors such as accident rate.

Bridge Priority Formula

Like the Non-Interstate and Interstate Priority Formulas, the Bridge Priority Formula evaluates the safety of a bridge in terms of driver exposure to the risk of an accident. The attribute used in the Bridge Priority Formula to evaluate driver exposure is the bridge width. An additional driver exposure attribute, “Bridge Roadway Restriction,” will be tested. This attribute identifies bridges where the bridge is narrower than the roadways on either end of the bridge.

CONCLUSION

Safety is one of the most complex issues reflected in the Priority Formulas. KDOT has a good start with the current formulas which target the right highway improvement projects. Because of the complexities and tradeoffs that occur within the formulas, any proposed modifications must be thoroughly tested. Any changes to the formulas must be made in a way that gives KDOT better ability to make safety improvements when needed, while retaining the benefits of the current safety factors in the formulas.

Appendix D: KDOT Construction Funding Categories

From the KDOT Annual Report:

The Fiscal Year (FY) 2000-2009 Comprehensive Transportation Program (CTP) has four program categories that were originally established by the FY 1990 - 1997 Comprehensive Highway Program: Substantial Maintenance; Major Modification; Priority Bridge; and System Enhancement. Within each of these major categories are funding and/or project-type subcategories. The selection criteria used in developing projects are tailored to the intent and funding constraints of each program component.

■ SUBSTANTIAL MAINTENANCE

Substantial Maintenance projects, the first major component, are intended to protect the traveling public and the public's investment in its highway system by preserving the "as built" condition as long as possible. These projects are financed with funds that are reserved (or set aside) for specific purposes.

Without proper maintenance, the cost for major repairs and/or replacement at a later date can be several times greater than the cost of timely maintenance. The Substantial Maintenance set-aside funds include Non-Interstate Resurfacing, Interstate Resurfacing, City Connecting Link (KLINK) Resurfacing, Contract Maintenance, Safety Projects, Emergency Repair, Bridge and Culvert Repair, Bridge Painting, Signing, Pavement Marking, and Lighting.

Non-Interstate Resurfacing

Approximately 1,200 to 1,400 miles of two-lane non-Interstate pavement are resurfaced or repaired annually through this set-aside program. The program's intent is to maintain non-Interstate pavements in adequate condition and keep rideability at an acceptable level.

These projects are selected by using the Pavement Management System (PMS). PMS is an integrated set of procedures that was developed by KDOT and Woodward-Clyde Consultants. It recommends pavement maintenance and rehabilitation strategies on both a network and a project level. PMS consists of three interconnected subsystems:

The Pavement Management Information System (PMIS) is a data base and supporting computer programs and tools which contain network and project-level survey results, information downloaded from the planning database, and output from the Construction Priority System. Information from the planning database includes data on geometric features, traffic, and truck load information. Information is regularly transferred between these multiple data sources.

The Network Optimization System (NOS) models the highway network and determines the action for each one-mile segment of the entire system to produce the optimal statewide benefit. The system can operate in either a "desired-performance" mode or a "fixed-budget" mode. In the desired-performance mode, the system selects actions to achieve the selected performance level at the lowest cost. In the fixed-budget mode, the system selects the set of projects that produces the "best" total system performance for the fixed-budget level. A linear programming model is used to minimize the long-term expected average cost of rehabilitation, subject to certain short-term requirements. Program development is a two-part process. NOS selects "locations only" for projects to be let to contract two years following the survey year. The second process (described below) develops scopes for resurfacing projects for the year following the pavement survey.

The Project Optimization System (POS) will serve two functions. First, it is a comprehensive design system for pavement structural sections on new grades. Second, it utilizes site-specific cost and material parameters to revise tentative project scopes from the NOS. Alternative rehabilitation strategies for a single project, or for groups of projects which meet cost and performance constraints from the NOS, are further evaluated. The POS selects the strategy which minimizes the need for future maintenance.

Interstate Resurfacing

Approximately 20 center-line miles of divided Interstate roadway (40 miles of two-lane pavement) are resurfaced or repaired annually

through the Interstate Resurfacing set-aside program. Input from the Pavement Management System is used to decide which sections of Interstate are to be resurfaced.

City Connecting Link “KLINK” Resurfacing

This is a Local Partnership Program. The KLINK Resurfacing set-aside program provides funding for resurfacing projects on city streets that connect two rural portions of state highway (called City Connecting Links). These projects are funded under a 50 percent state/50 percent city funding matching arrangement for cities with greater than 10,000 population and a 75 percent state/25 percent city ratio for cities with less than 10,000 population. The maximum state share for a project is \$200,000.

KDOT annually solicits requests for eligible projects. All State Highway System City Connecting Links are eligible except those on the Interstate System and fully-controlled access sections on the Freeway System. Cities requesting projects are encouraged to review the proposed projects with the KDOT District Engineer or designated representative before submitting applications. If requested funds exceed available funds, projects are prioritized and selected on the basis of pavement survey conditions.

Contract Maintenance

Maintenance activities are undertaken to offset the effects of weather, deterioration, traffic wear, damage, and vandalism. Eligible projects are those that KDOT is not adequately staffed or equipped to perform. Due to the diverse types of actions and/or geographic location, contracting for the service is the most cost-effective approach for the agency.

Selection is based on priority as seen from a statewide perspective. Basic criteria for contract maintenance projects are: 1) inability to perform necessary actions with existing maintenance forces; 2) not eligible for other maintenance programs; 3) not anticipated (generally the result of weather or traffic conditions). Projects are selected on the basis of statewide need for corrective action, not on a balanced distribution between districts.

Safety Projects

This set-aside program provides for improvement of intersections or spot locations where major improvement is not required. The addition of left-turn lanes, traffic signals, signing,

and pavement marking can be cost effective in reducing crashes at these locations.

The Bureau of Traffic Engineering conducts studies on the physical and operational characteristics of locations. These studies:

1. identify the reason the particular location is being reviewed;
2. identify pertinent conditions;
3. identify concerns;
4. identify possible causes of the concerns;
5. identify possible solutions;
6. estimate cost of each possible solution;
7. rank each solution on the basis of engineering judgment;
8. consider effects on like or similar areas (uniformity factor);
9. provide benefit/cost analysis for each solution;
10. recommend action.

Once projects are identified, they are ranked in descending order by average annual net return. KDOT determines the average annual net return for each location by subtracting the average annual cost from the average annual benefit. First priority is given to the location with the highest average annual net return.

Exceptions to this order are sometimes necessary because city matching funds are unavailable, future projects encompass the selected location, approximate locations are grouped into one project, or several smaller projects are combined resulting in a total net return larger than the return for one project. Projects are scheduled until the available Safety Project funds are exhausted.

Emergency Repair

Funds are set aside annually for emergency repairs that occur as the result of accidents or disasters. Allocation of these funds is authorized by the State Transportation Engineer when accidents/weather-related causes occur.

Bridge and Culvert Repair

The Bridge Repair and Culvert Repair set-aside programs supplement the Priority Bridge program (see B-11). The program aims to restore the structural integrity of bridges and culverts. Bridge repair work includes: overlaying concrete decks; replacing or resetting expansion joints; resetting bearing devices; repairing abutments, piers, or girders; and repairing damage from external sources.

Each District, using the Bridge Management Engineer's recommended repair

list, submits prioritized lists of candidate bridge and culvert projects to the Bureau of Construction and Maintenance and the Bureau of Design. Each candidate project is reviewed for the structure's condition history and latest inspection to confirm necessary repairs or replacement. Statewide lists are prioritized using such factors as maintenance effort, safety, traffic, and engineering judgment. The lists are submitted to the Bureau of Program Management for review to confirm that the candidate structures are not programmed for future work under any other KDOT program. The prioritized lists are merged to create the yearly statewide repair list.

Bridge Painting

There are approximately 800 bridge structures on the Kansas State Highway System that require periodic painting of the structural steel to slow corrosion. These structures contain nearly 242,000 tons of structural steel. They are categorized into two groups:

Group A:

Structures which have 10 tons or more of structural steel.

The Bridge Management Engineer prioritizes these structures (approximately 760 bridges) according to the Bridge Inspection Manual's "Paint Condition Rating." The statewide prioritized list is reviewed by the Bureau of Program Management to confirm that each candidate structure is not programmed for future work under any other KDOT program. Projects are then scheduled in order of priority until available funds are exhausted.

Group B:

Structures having less than 10 tons of structural steel.

Each District is responsible for the painting of these structures (approximately 40 bridges statewide).

Signing

This program was established in 1996 to address necessary sign replacements on the State Highway System due to pending new federal requirements for minimum retroreflectivity of signs. This program schedules sign replacements based upon highway route mileage statewide and the total mileage of all the routes in each District for that year. This program excludes signs on any other state projects that include sign replacement for that highway route in the same year. This program also excludes

any signs that were replaced within seven years of the scheduled date of the replacement project.

Pavement Marking

This set-aside program was established in FY 1996 to address pavement marking necessary due to pending new federal requirements for minimum retroreflectivity of pavement markings. Improvements in this category utilize high-performance, long-life pavement marking materials. Efforts are also made to identify those marking materials with wet-weather retroreflectivity. This program is limited to projects that do not have high-performance markings included under any other KDOT program. Projects are selected by the Bureau of Traffic Engineering based upon a roadway's traffic volumes, past performance of marking material, geometry, surface condition, surface type, crash history, and, in the case of new marking materials, the research benefit.

Lighting

Because lighting is beneficial to the safety and operation of the highway system, this set-aside program was established in FY 2000. Projects are selected by the Bureau of Traffic Engineering based on the roadway's volume and night-time crash history. This program is limited to projects which are not included under any other KDOT program. Projects are scheduled until the available lighting funds are exhausted. (At other locations, lighting may be installed by the local unit of government by obtaining a highway permit. In general, the local entity bears the cost of installation, maintenance, and operation.)

■ MAJOR MODIFICATION

The Major Modification program is the second major component of the FY 2000-2009 CTP. It is designed to improve the service, comfort, capacity, condition, economy, or safety of the existing system. It includes a number of set-aside programs: Economic Development; Geometric Improvement; and the federal-aid Railroad/Highway Crossing and Safety programs. Only a portion of the Railroad/Highway Crossing and Safety funds are included in the state program because most of the projects are off the State Highway System. Two new set-aside programs, Guard Fence Upgrades and Railroad Grade Separations, were established in FY 1996 and 1998 respectively.

For the CTP, four additional new set-aside programs were established: Corridor Management; Railroad Crossing Surfacing; Local Partnership Railroad Grade Separations; and Intelligent Transportation Systems (ITS).

Non-Interstate Roadway and Associated Bridges

Construction Priority System - Major Modification Interstate and Non-Interstate roadway and Priority Bridge projects are selected using the Construction Priority System. It ranks roadway sections and bridges for improvement by the seriousness of their deficiencies.

The system was developed by KDOT and Woodward-Clyde Consultants in 1981. The system originally consisted of two formulas – one for roads and one for bridges – that used input from KDOT’s planning data base to measure the relative need for improvement of all roads and bridges. Both the roadway and the bridge formulas have since been modified by KDOT, and a third formula, for Interstate roadway rehabilitation projects, has been developed by modifying the original roadway formula to apply to Interstate roadway sections only. All three formulas are currently under review.

KDOT runs the three priority formulas annually to update priority ratings by using updated survey information. The output from the formulas, prioritized lists of roadway control sections and bridges, are used to identify logical projects. Projects with the highest relative need are programmed for improvement first within available funding and based on scheduling considerations. This process was used to select projects in the CTP Major Modification program and Priority Bridge program. These are the basic steps used to develop the multiyear program:

1. Develop funding estimates.
2. Identify and prioritize projects, determine improvement scopes, and prepare cost estimates.
3. Earmark set-aside funds.
4. Balance project costs and funding by fund class and obligation limit within each fiscal year.
5. Prepare summary of project costs and funding by fund class and fiscal year.
6. Review of draft program, cost, and funding summary data by Program Review Committee.

Non-Interstate Projects - Roadway work in this category includes reconstruction/heavy rehabilitation of pavement, widening traffic lanes, adding or widening shoulders, and improving

alignment (i.e., eliminating steep hills or sharp curves). Associated bridge work includes widening narrow bridges, replacing obsolete bridges, and modernizing bridge rails for bridges within the limits of each project. Non-Interstate roadway projects were prioritized using the Non-Interstate Roadway Priority Formula. A schematic of the formula is shown on page B-19.

Interstate Roadway and Associated Bridges

Roadway work in this category includes resurfacing, restoring, rehabilitating, and reconstructing pavement on the Interstate System. A separate priority formula was developed for Interstate roadway rehabilitation by KDOT in January 1988. A schematic of the formula is shown on page B-20.

The Interstate Roadway Formula was reviewed prior to selecting projects for FY 1998. As a result of this review, use of the formula was suspended due to data-related issues and the need for the formula to more accurately reflect the structural condition of Interstate pavements. KDOT is in the process of reviewing both current data used in the formula and computer procedures for new data that evaluate pavement by pavement layer type, thickness, age, and axle loadings. For FY 1998-2009, Interstate Roadway projects were selected based on the age of the underlying pavement, pavement deterioration requiring frequent and repeated Substantial Maintenance projects, and system rehabilitation continuity.

Economic Development

Economic Development projects are highway and bridge construction projects intended to enhance the economic development of the State of Kansas. This is a Local Partnership Program in which a project’s cost is shared by the state and a local unit of government. Local support must be at least 25 percent of a project’s total cost. Eligible projects must have the potential to significantly enhance the income, employment, sales receipts, and land values in the surrounding area.

KDOT annually solicits requests for eligible projects. Applicants are encouraged to review proposed projects with the KDOT District Engineer or a designated representative prior to the submission of the application. Upon submission, KDOT’s Bureau of Program Management reviews the proposed project scope and estimate. All projects are then assembled in a single package and presented to the Kansas Highway Advisory Commission.

Staff from KDOT and the Kansas Department of Commerce and Housing assist the Highway Advisory Commission by evaluating the projects. The Highway Advisory Commission recommends a set of projects to the Secretary of Transportation who makes the final selection.

Geometric Improvement

This is a Local Partnership Program. Funds are set aside annually to assist cities in funding geometric improvements on City Connecting Links (city streets which connect two portions of rural state highway). Geometric improvements are designed to widen pavements, add or widen shoulders, and add needed turning, acceleration, and deceleration lanes. The minimum local funding can range from 0 percent to 25 percent of the project cost, depending on the size of the city. The maximum state share ranges from \$700,000 to \$950,000.

KDOT annually solicits requests for eligible projects. Cities are encouraged to review proposed projects with the KDOT District Engineer or a designated representative before submitting the application. Upon submission, KDOT's Bureau of Program Management reviews the proposed project scope and estimate. All projects are then assembled in a single package and presented to the Highway Advisory Commission. KDOT staff assists by providing project-related information and design criteria. The Highway Advisory Commission recommends a set of projects to the Secretary of Transportation, who makes the final selection.

Surface Transportation Program Safety Funds

The 1998 federal Transportation Equity Act for the 21st Century (TEA-21) sets aside a minimum of 10 percent of a state's Surface Transportation Program (STP) funding for use on safety construction projects, including safety projects and railroad/highway crossings. These programs are described below.

Railroad/Highway Crossing

This federal-aid program funds protective device installation and hazard elimination at railroad/highway grade crossings on public roads. Federal-aid finances up to 100 percent of the cost of these projects.

In accordance with Section 130 of the 1973 Federal-aid Highway Act, KDOT has established a state rail crossing inventory and formula to

prioritize all 6,200 at-grade public crossings in Kansas.

The priority formula "hazard index" is used to rate the relative hazard potential for all crossings and is based on highway traffic, train traffic, and a warning device factor. A schematic of the formula is shown on page B-20.

Each year a number of the highest ranked crossings that have not been addressed in prior programs are selected for review. A preliminary review of these crossings is conducted to verify crossing inventory information.

Crossings from this list that pass the preliminary review are scheduled for on-site diagnostic reviews. The diagnostic review team consists of KDOT, railroad, and local government staff. This team makes recommendations for each crossing as to type of warning system, crossing surface work, approach roadway improvements, drainage improvements, and brush and timber clearing. A rough cost estimate of the recommendations is developed for each crossing.

The on-site review is sent to the local government officials who have maintenance responsibilities for the highway or roadway. When crossing projects receive a commitment from local government, railroads, and the State, a project implementation procedure is started that leads to improvements at the crossing. With the implementation of prior federal transportation acts, KDOT now utilizes 100 percent federal funding for these railroad/highway crossing safety projects.

In conjunction with the United States Department of Transportation's national highway/railroad crossing safety initiatives, KDOT is also addressing railroad corridor highway/railroad crossing safety projects. For corridor project approval there must be a reasonable number of highway/railroad crossing closures. The highest priority highway/railroad crossings in the corridor are improved with active flashing light and gate signal systems.

STP Safety Projects

These federal-aid projects provide safety improvements on all federal-aid systems. Federal STP Safety funds provide 90 percent of these projects' construction and construction engineering costs. The Bureau of Traffic Engineering administers the majority of the STP Safety program. The Bureau of Local Projects administers a small portion of the program for projects on county roads and for cities under 5,000 population.

Four categories of roadway systems have been established for location analysis and funding to ensure that all roadway systems can benefit from federal-aid safety improvements. Each category is allotted a portion of the total amount of STP Safety funds available at the beginning of each federal fiscal year.

Identification of High-Crash Locations -

For Jurisdictions U and N, cities are requested to submit two years of crash data for up to five high-crash locations on federal-aid routes within their areas. High-crash locations are determined and ranked by descending equivalent-property-damage-only (EPDO) accident rate. The top 50 (approximately) are considered high-crash locations warranting further analysis. Projects in these categories are financed with federal-aid and local matching funds.

For jurisdiction K, to determine if a location is a high-frequency crash location, a comparison is made between the actual crash rate and the statewide average rate for similar highways. The Bureau of Traffic Engineering conducts county-wide road safety audits. From these audits and from traffic studies, high-crash locations are established. High-crash locations are ranked in descending EPDO crash rate order. The top ten are considered high-crash locations warranting further analysis. Projects in jurisdiction K on the rural State Highway System are financed with federal-aid and state funds.

Jurisdiction C projects are financed with federal-aid and local matching funds rather than state funds. These projects are selected by local units of government and are subject to Federal Highway Administration approval. They are administered by the Bureau of Local Projects.

Prioritization - The identified high-crash locations are prioritized on the basis of the average annual net return for each location. The average annual net return is a dollar amount found by subtracting the average annual costs from average annual benefits. First priority is given to the location with the highest average annual net return. Remaining projects are scheduled in descending order until funds are exhausted. Exceptions to this might be caused by the unavailability of city matching funds, future projects that may encompass the selected location, a grouping of proximate locations into one project, or combining several smaller projects for a total net return larger than one project.

Railroad Grade Separations

This program was established in FY 1998 to replace state highway railroad at-grade crossings with grade separation structures. To be eligible for this program crossings must be:

- ◆ a rural or City Connecting Link state highway crossing;
- ◆ main line railroad traffic, excluding industrial spur tracks; and
- ◆ route classification must be "B" or "C" or be on the National Highway System (NHS).

Eligible at-grade crossings are prioritized using KDOT's priority formula hazard index. This is the ranking formula also used for the Major Modification Railroad/Highway Crossing projects. The formula is based on railroad and highway operational characteristics. Projects are funded with a combination of federal, state, railroad company, and local monies.

Guard Fence Upgrades

This program was established in FY 1996 to address guard fence upgrades on Interstate and selected high-priority corridors where guard fence is not a part of any other Major Modification or Priority Bridge project. This set-aside fund is necessary due to federal requirements.

It is anticipated that the program will require several years to be completed. Locations of individual sites for the program are determined and grouped into projects according to proximity. Prioritization is based on traffic exposure with locations having the highest traffic volumes being scheduled for construction in the earlier years followed in subsequent years by routes with lower volumes.

Corridor Management

The Corridor Management set-aside program was created to address the growing need for KDOT, cities, and counties to jointly manage transportation corridors, particularly in high-growth developing areas. This fund is divided into two subcategories with two-thirds going to a project subcategory and one-third to a contingency subcategory. To be eligible for either category of funds, a corridor must be designated in the district plan, there must be a partnering agreement between the Secretary, city, and county, and there must be a binding corridor master plan in place.

The contingency subcategory of funds is designed to address rapidly developing areas or sites where transportation infrastructure changes must be made to better accommodate changes

in demand. This fund requires a minimum 50 percent local match for state monies. There is also a per-project maximum of \$200,000.

The project subcategory of funds is designed to assist newly developing areas in meeting the master plan or to retrofit established areas to master plan standards. Projects are solicited annually and require a minimum 33 percent local match for state monies. There is a per-project maximum of \$250,000.

In addition, Corridor Management funds may be used for advance right-of-way acquisition or corridor studies in some special cases.

Railroad Crossing Surfacing

This program was established in FY 2000. Projects under this program will be for at-grade highway/railroad crossing approach and surface upgrades. Eligible crossings will be rural State Highway System crossings and State Highway System City Connecting Link crossings in cities up to 2,500 population.

Projects will be selected from applications for crossing surface improvement projects submitted by railroad companies and Districts. Project scopes will include all necessary materials and activities required for long-term crossing surface and approach improvements. These projects will be funded with 50 percent state and 50 percent railroad company monies.

Local Partnership Railroad Grade Separations

This is a new program established for the CTP. The Local Partnership Railroad Grade Separation Program addresses highway/railroad at-grade crossings off the State Highway System and crossings on the State Highway System, which are on lower priority routes (Route Class "D" and "E"). Project applications will be solicited from local units of government. The project sponsor will be responsible for providing 10 to 20 percent of the project funds, depending on the population of the city or county. Funds provided by the railroad company will be counted as part of the local match funds; the project sponsor will be responsible for negotiating with the railroad.

Projects will be selected based on KDOT's priority formula hazard index. This is the ranking formula also used for the Major Modification Railroad/Highway Crossing projects. The formula is based on railroad and highway operational characteristics. Additional selection consideration will be given to projects with relatively higher rates of local and railroad match finding in order to leverage state dollars. The project selection

process will also give consideration to the overall positive effects on communities.

Intelligent Transportation Systems (ITS)

The ITS set-aside program was established to meet the funding needs of ITS/technology-related projects in Kansas. The funding is available to apply technology such as advanced sensor, computer, electronics, communications, and management strategies to increase the safety and efficiency of the transportation system. The funding is available to both state and local agencies and is not necessarily limited to agencies that are transportation oriented. ITS has applications in urban areas, rural areas, transit, and commercial vehicle operations, and consideration for funding will be given to all of these areas.

The Bureau of Transportation Planning, along with the ITS Steering Committee, establishes project rankings based on:

- ◆ project support and integration risks;
- ◆ telecommunication considerations;
- ◆ design considerations and factors of success;
- ◆ funding sources and evaluation consideration;
- ◆ cost effectiveness and benefits; and
- ◆ local funding match percentage.

Projects are solicited annually and selected based on the criteria listed above.

■ PRIORITY BRIDGE

The Priority Bridge program, the third major component of the 2000-2009 CTP, is designed to replace or rehabilitate substandard bridges. Substandard bridges are those in a deteriorated condition or with deficiencies in load-carrying capacity, width, or traffic service. Special consideration is given to replacing one-lane bridges (bridges with roadway width less than 20 feet), restricted vertical clearance bridges, and cribbed bridges (bridges with temporary structural supports to keep them in use).

Priority Bridge projects are selected using the Bridge Priority Formula. The formula was developed by KDOT and Woodward-Clyde Consultants in 1981. It was modified by KDOT in July 1987 and again in September 1988. Bridges with the highest relative need are programmed for improvement first within available funding and based on scheduling considerations. A schematic of the formula appears on page B-20.

Bridge Deck Replacement and Culvert-Bridge

Both of these categories expand the Priority Bridge program. The Culvert-Bridge program addresses culverts that are beyond the scope of a Substantial Maintenance project but do not qualify for the Priority Bridge Replacement/Rehabilitation program. The Bridge Deck Replacement program addresses bridges where the bridge superstructure and substructure are in satisfactory condition, but the bridge deck has deteriorated to the point where a Substantial Maintenance project would not be adequate.

Each District, using the Bridge Management Engineer's recommended repair list, submits prioritized lists of candidate projects to the Bureau of Design. Each candidate project is reviewed for the structure's condition history and latest inspection to confirm necessary repairs or replacement. Statewide lists are prioritized using such factors as maintenance effort, safety, traffic, and engineering judgment. The lists are submitted to the Bureau of Program Management for review to confirm that each candidate structure is not programmed for future work under any other KDOT program. The prioritized lists are then merged to create the yearly statewide repair list.

■ SYSTEM ENHANCEMENT

The System Enhancement Program is the fourth major component of the CTP. Legislation authorizing the CTP, House Bill (HB) 2071, provides that the Secretary of Transportation shall include in the CTP "system enhancement projects which include additions to the system of highways or which substantially improve safety, relieve congestion, improve access, or enhance economic development. It is the intent of the Legislature that, as nearly as possible, the amount of \$1.05 billion shall be expended or committed to be expended for the period beginning July 1, 1999, through June 30, 2009." It also states KDOT "shall utilize the selection methodology developed by the Department to select system enhancement projects."

CTP System Enhancement projects were selected using the same approach that was successfully used for the Comprehensive Highway Program System Enhancement Program in 1990. Project applications were solicited from local units of government. Candidate projects were submitted in three separate categories: Corridor Improvements,

Bypass Construction, and Interchange/Separation Improvements.

Each category had unique, objective selection criteria primarily based on engineering and safety factors. Additional credit was given to a candidate project's score for local match funding, lane-miles removed from the State Highway System, and partially complete project development. Local match is a way to measure a local community's support for a project based upon their willingness to invest money in it. Lane-miles removed from the system are a way to gain local cooperation in removing redundant miles from the State Highway System. Credit for projects where project development is partially complete takes into account projects that have previously been determined to be a priority but for which funding has been unavailable.

Only city/county governments or coalitions of city/county governments were allowed to submit an application for a System Enhancement project. System Enhancement projects must be on the State Highway System or a logical addition to the State Highway System.

All of the selected System Enhancement projects for the CTP were announced August 4, 2000. Construction of these projects is contingent upon funding as provided in HB 2071. Any reduction of the HB 2071 funding commitments could negatively impact the System Enhancement projects.

Fund Distribution - No single set of criteria could be used to rate the three very different types of projects. Likewise, a distribution of the funds available had to be made to the various project types. Furthermore, a distribution of funds had to be made between the urban and rural regions of the state.

Funds were distributed between urbanized and nonurbanized counties on the basis of vehicle miles of travel. The breakdown was based on 1997 Annual Average Daily Traffic (AADT) counts that showed approximately 35 percent of all vehicle miles traveled on the State Highway System are in the five urbanized counties. The urbanized counties are Douglas, Johnson, Sedgwick, Shawnee, and Wyandotte. Vehicle miles of travel are used because they are a measure of both the source of highway revenues and highway usage, which in turn relate to need.

The urban and rural fund allocations were further divided between the Corridor Improvements, Bypass Construction, and Interchange/Separation Improvements categories based on their percent of the total

final number of applications received in each category. In addition, \$50 million of the System Enhancement funds were earmarked for the Wichita Rail Project. The chart below shows the fund distribution.

Economic Development Review Panel (EDRP) - An independent group of experts reviewed the economic development potential of the candidate projects. Governor Bill Graves appointed the EDRP in July 1999, and members included Lt. Governor Gary Sherrer (Chairman), Topeka; James M. AuBuchon, Pittsburg; Mary Birch, Overland Park; Sheryl Dick, Garden City; Don A. Hill, Emporia; John G. Montgomery, Junction City; John L. Rolfe, Wichita; Billie Jo Smart, Washington; and Lavern D. Squier, Hays. Based on their own knowledge and experience, their observations, and the information provided by the applicant, the panel assigned the Economic Development Enhancement Rating to each project. The panel could assign a score up to 20 points for each project.

Project Evaluation - As specified in HB 2071, KDOT evaluated and ranked the eligible project requests based on criteria developed by the Department.

KDOT developed a score for each project based on objective engineering criteria, considering such factors as current and projected traffic volume, design, and safety issues. This

score could be a maximum of 80 points. The EDRP considered a project's potential for economic development and assigned a project score of up to 20 points.

These scores were combined and then any points earned through "extra credit" categories were added to the score. A project sponsor could earn extra credit in one of three ways: offer to take over responsibility of lane miles currently on the State Highway System once the System Enhancement project is completed and open to traffic; offer a percentage of the project cost as local matching funds; or submit a project where a portion of the project may already be complete. The combination of these three numbers - KDOT score, EDRP score, and extra credit points - created the project's final score. It was then prioritized against the other projects in its category, and projects were funded from the top down until dollars in that category were exhausted.

KDOT received more than \$5 billion in project requests for the \$1 billion System Enhancement pool. KDOT did decide to fund some projects that were ranked lower than other candidates because these projects could be fully funded with the remaining dollars available in the category. KDOT also decided to partially fund some projects. All of these decisions were made to make the best use of the dollars available.