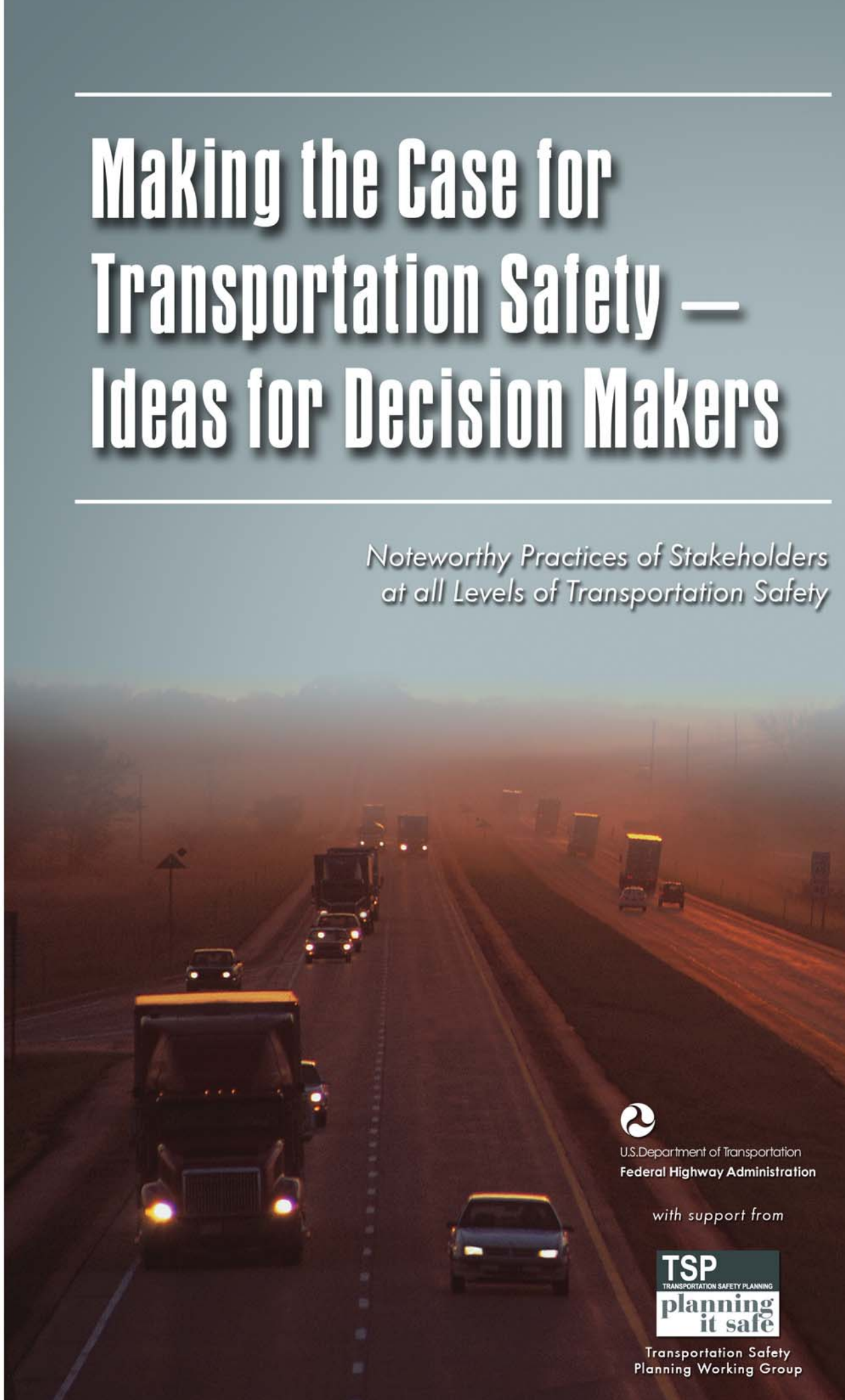


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# Making the Case for Transportation Safety — Ideas for Decision Makers

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*Noteworthy Practices of Stakeholders  
at all Levels of Transportation Safety*



U.S. Department of Transportation  
Federal Highway Administration

*with support from*



Transportation Safety  
Planning Working Group



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July 2008

## Message from the FHWA Associate Administrators of the Office of Safety and Planning

We would like to take this opportunity to express our appreciation to all the transportation professionals working to reduce the number of deaths and serious injuries on our roads, and improving the intermodal transportation system to be safer for all users. To help further promote a safer transportation system, we want to share some of the successful strategies, projects, and programs that have been planned and implemented across the nation. *Making the Case for Transportation Safety – Ideas for Decision Makers* is a compilation of the noteworthy practices that have been implemented at all levels, by stakeholders, executives, managers, and practitioners. The twenty case studies in this book detail what States, Tribal governments, Metropolitan Planning Organizations, transit agencies, and their partners have implemented; their key accomplishments; the results; contact information; and additional resources. We hope that these case studies spark your creativity and enthusiasm to promote and address safety in all aspects of your transportation planning and programming activities. If you are interested in duplicating any example in this document, please use the contact information provided at the end of each case study.

Sincerely yours,

Jeffrey A. Lindley  
Associate Administrator for Safety  
Federal Highway Administration

Gloria M. Shepherd  
Associate Administrator for  
Planning, Environment, and Realty  
Federal Highway Administration





## TABLE OF CONTENTS

## PAGE

Introduction.....	4
The Importance of Integrating Safety into the Transportation Planning Process .....	5
Prioritizing Traffic Law Enforcement, Oklahoma County Sheriff’s Office, OK.....	8
Reorganizing Highway Safety Office to Support SHSP, Washington Traffic Safety Commission .....	9
Establishing Driving Under the Influence (DUI) Court to Reduce Recidivism, .....	10
Alaska Highway Safety Office	
Developing Sustained Tribal Safety Initiative, Colville Confederated Tribes, WA .....	11
Cable Median Barrier Helps Achieve SHSP Goal, Missouri Department of Transportation .....	12
Crash Reduction Initiative on Secondary and Rural Roads, .....	13
South Carolina Department of Transportation	
Rogue Valley COG Elevates Safety, Rogue Valley Council of Governments, OR.....	14
Sustained DUI Checkpoint Effort, Delaware Office of Highway Safety.....	15
Providing Tools and Support for Local Safety Conscious Planning, .....	16
Iowa Department of Transportation Office of Traffic and Safety	
Data Improvements at the MPO Level, Mid-Ohio Regional Planning Commission .....	17
Successful Approach for SHSP Implementation, California Department of Transportation .....	18
Raising the Importance of Transportation Safety, California Department of Transportation .....	19
Development of Technical Solutions, Iowa Department of Transportation Office of Driver Services .....	20
Minnesota Speed Management Program, Minnesota State Patrol .....	21
Tazewell County Teen Safety, Tazewell County Sheriff, IL.....	22
Statewide Implementation of Road Safety Audits, Tennessee Department of Transportation .....	23
Road Weather Safety Audits Initiative, University of Wisconsin-Madison .....	24
A Multidisciplinary Approach to Safety, Colorado Department of Transportation.....	25
Transit Agency Takes Multifaceted Approach to Pedestrian Safety, .....	26
Washington Metropolitan Transit Authority	
LYMMO Downtown Circulator – Dedicated Busway .....	27
Central Florida Regional Transportation Authority	
Transportation Safety: What Will it Take? .....	28
Transportation Safety Resources.....	29
Glossary.....	31



## TABLE OF CONTENTS

**Executives** – Safety champions such as the Governor, Executive Directors or Commissioners of State agencies, local or regional agency leaders (i.e., MPOs, enforcement agencies, etc.), Tribal leaders, and transit agency leaders who make safety and safety planning a priority.

Case Study	Agency	Page
Prioritizing Traffic Law Enforcement	Oklahoma County Sheriff’s Office, OK	5
Reorganizing Highway Safety Office to Support SHSP	Washington Traffic Safety Commission	6
Establishing Driving Under the Influence (DUI) Court to Reduce Recidivism	Alaska Highway Safety Office	7
Developing Sustained Tribal Safety Initiative	Colville Confederated Tribes, WA	8
Cable Median Barrier Helps Achieve SHSP Goal	Missouri Department of Transportation	9
Crash Reduction Initiative on Secondary and Rural Roads	South Carolina Department of Transportation	10
Rogue Valley COG Elevates Safety	Rogue Valley Council of Governments, OR	11
Sustained DUI Checkpoint Effort	Delaware Office of Highway Safety	12
Providing Tools and Support for Local Safety Conscious Planning	Iowa Department of Transportation Office of Traffic and Safety	13
Data Improvements at the MPO Level	Mid-Ohio Regional Planning Commission	14

**Managers** – Leaders such as DOT department directors, Sheriffs, and MPO transportation directors who manage practitioners.

Case Study	Agency	Page
Developing Sustained Tribal Safety Initiative	Colville Confederated Tribes, WA	8
Cable Median Barrier Helps Achieve SHSP Goal	Missouri Department of Transportation	9
Crash Reduction Initiative on Secondary and Rural Roads	South Carolina Department of Transportation	10
Rogue Valley COG Elevates Safety	Rogue Valley Council of Governments, OR	11
Sustained DUI Checkpoint Effort	Delaware Office of Highway Safety	12
Providing Tools and Support for Local Safety Conscious Planning	Iowa Department of Transportation Office of Traffic and Safety	13
Successful Approach for SHSP Implementation	California Department of Transportation	15
Raising the Importance of Transportation Safety	California Department of Transportation	16
Development of Technical Solutions	Iowa DOT Office of Driver Services	17
Minnesota Speed Management Program	Minnesota State Patrol	18
Tazewell County Teen Safety	Tazewell County Sheriff, IL	19
Statewide Implementation of Road Safety Audits	Tennessee Department of Transportation	20
Road Weather Safety Audits Initiative	University of Wisconsin-Madison	21
A Multidisciplinary Approach to Safety	Colorado Department of Transportation	22
Transit Agency Takes Multifaceted Approach to Pedestrian Safety	Washington Metropolitan Transit Authority	23
LYMMO Downtown Circulator – Dedicated Busway	Central Florida Regional Transportation Authority	24



## TABLE OF CONTENTS

**Practitioners** – Professionals who work directly on safety and are responsible for implementation in the field such as transportation engineers and planners, EMS responders, staff in the Governor’s Office of Highway Safety, and law enforcement officers.

Case Study	Agency	Page
Development of Technical Solutions	Iowa Department of Transportation Office of Driver Services	17
Minnesota Speed Management Program	Minnesota State Patrol	18
Tazewell County Teen Safety	Tazewell County Sheriff, IL	19
Statewide Implementation of Road Safety Audits	Tennessee Department of Transportation	20
Road Weather Safety Audits Initiative	University of Wisconsin-Madison	21
A Multidisciplinary Approach to Safety	Colorado Department of Transportation	22
Transit Agency Takes Multifaceted Approach to Pedestrian Safety	Washington Metropolitan Transit Authority	23
LYMMO Downtown Circulator – Dedicated Busway	Central Florida Regional Transportation Authority	24





## INTRODUCTION

**Are tens of thousands of lives and millions of injuries every year the price we are willing to pay for a mobile society?**

The answer from individuals involved in transportation – managers, operations personnel, planners, engineers, law enforcement, educators, and emergency medical services staff – is “No!” Measures can be taken to protect our lives and well-being and still maintain an effective transportation system.

According to the National Highway Transportation Safety Administration (NHTSA), in 2007 more than 41,000 people were killed and nearly 2.5 million were injured in crashes. The number of people killed annually on U.S. roadways is the equivalent of two jumbo jet crashes every week, a situation that would prompt widespread outrage and action. The consequences of traffic crashes are felt not only by those directly involved but also by family members, friends, and coworkers who must deal with a devastating loss or find resources to cope with disabling injuries. The costs to society such as lost productivity, property damage, medical costs, emergency services, and travel delays are also tremendous.

In 2006, 202 million licensed drivers used more than 4 million miles of U.S. roadways, according to the Federal Highway Administration (FHWA). The complex surface transportation system depends on the behavior and attitude of the users, the number and performance of the vehicles, and the condition of the roadways and surrounding environment. A breakdown in any one of those areas can result in death, injury, property damage, and delay. Considerable effort has been made to improve safety on our roads. The reality, however, is that reductions in deaths and injuries have stagnated over the past 10 years.

### **So what should transportation professionals do?**

First and foremost, never forget that transportation safety is very personal to each family member and friend who has lost a loved one. This fact is frequently lost in the tally of total transportation deaths, which can result in a sense of apathy about this unacceptable loss of life. Secondly, transportation professionals need to focus on what they can do as opposed to what they cannot. There will always be a need for more resources – people, time, and money. However, we can invest our existing resources in ways that reduce the number of lives lost each day. And lastly, never forget that what you do each day does make a difference, and success stories documenting this fact abound in transportation safety.

### **So what can you do?**

The good news is that everyone involved in transportation can do something to improve safety. Whether you are a transportation planner, engineer, police officer, emergency medical technician, educator, or elected official, you have an important role to play. Read on to learn what is happening in transportation safety, how safety stakeholders are making a difference, and find out about some new strategies that you could implement in your region.

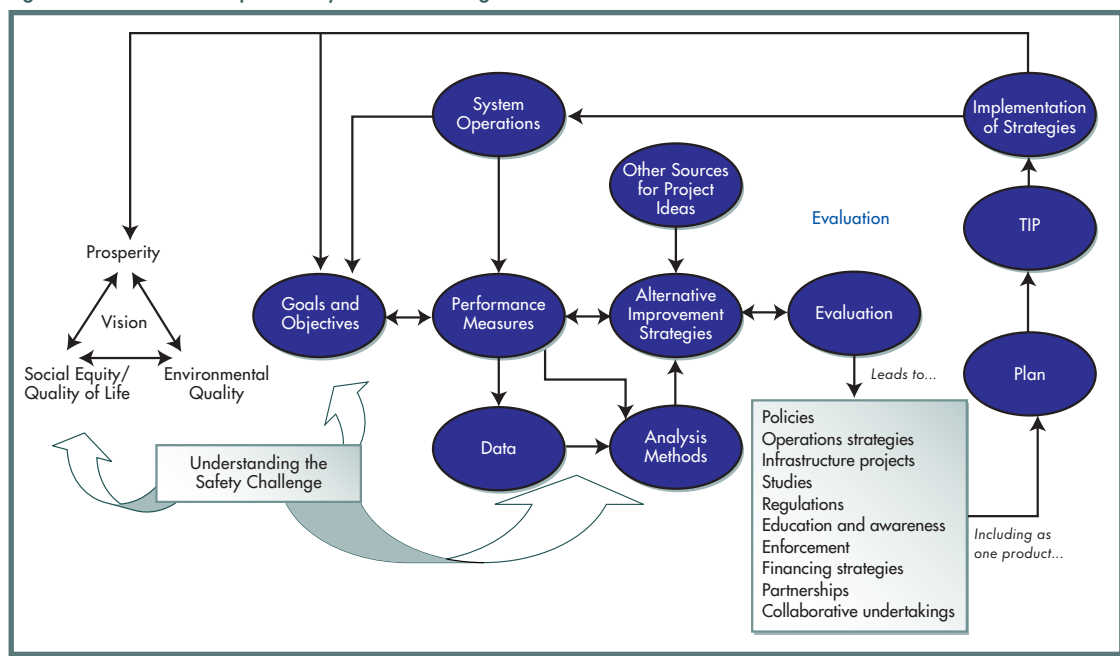


## THE IMPORTANCE OF INTEGRATING SAFETY INTO THE TRANSPORTATION PLANNING PROCESS

The passage of the Safe, Accountable, Flexible and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) in 2005 signaled an increased emphasis on safety. SAFETEA-LU established safety as a core-funded program and revised the regulations governing metropolitan and state transportation plans. Many transportation plans establish safety as a goal, but they often do not integrate safety throughout the process or ensure funded projects and programs have a measurable impact on safety. NCHRP Report 546, Incorporating Safety into Long-Range Transportation Planning provides justification for integrating safety into the transportation planning process:

- Travel safety is affected by how the transportation system is designed, constructed, operated, and maintained. Given that transportation planning leads to changes in the transportation system, safety should be integrated into the planning process.
- The economic impact of motor vehicle crashes is staggering. According to a study of 85 urban areas in the U.S., the cost has reached \$164.2 billion per year in just those communities, or an average of \$1,051 per person in 2005 (AAA). According to NHTSA the economic impact of crashes, in 2000 dollars, is \$230.6 billion per year, or an average of \$820 for every person living in the U.S.
- Crashes represent a major source of nonrecurring congestion, which is estimated in some locations to account for half of all congestion.
- Evidence from around the world and throughout the United States suggests many crashes are preventable. More than 31 percent of U.S. fatalities involve alcohol (NHTSA, 2007). One third of fatal collisions are run-off-road collisions (FARS, 2005).
- Effective safety programs involve a wide range of stakeholders. The transportation planning process can be an important forum for fostering safety program collaboration at the state and metropolitan levels.

Figure 1. The Relationship of Safety to the Planning Process



Source: NCHRP Report 546, Incorporating Safety into Long-Range Transportation Planning.



SAFETEA-LU requires safety to be considered as a separate, stand-alone planning factor in the transportation planning process at both the Metropolitan Planning Organization (MPO) and State level. Transportation planning begins with the creation of a vision, which takes into account desired community benefits such as prosperity, quality of life, social equity, and environmental quality, as shown in Figure 1 displaying the relationship between safety and transportation planning. The vision sets the stage for the establishment of specific goals and objectives, which must be tracked with performance measures to ensure the achievement of desired outcomes. These safety performance measures are an important tool to make certain safety is considered throughout the planning process, and should consider the availability, completeness, and accuracy of transportation-related data.

Once needs and deficiencies on the system are identified and performance measures are determined, potential improvement projects and strategies can be developed, as shown in Figure 1 with “Alternative Improvement Strategies.” Projects should be evaluated according to how well they address system needs and deficiencies, cost, and safety. Additionally, new policies, regulations, partnerships, and processes may be developed to facilitate improvements. Often potential projects can be evaluated and prioritized through a scoring process. Projects that meet defined criteria are included in the long-range transportation plan developed by the state or regional planning agency (Plan). On an ongoing basis the planning agency prioritizes projects in the Plan and moves them into a shorter term plan for implementation, known as the Metropolitan or state Transportation Improvement Plan (TIP). Projects in the TIP are implemented, and system operations resulting from the improvements are evaluated. Throughout this cycle, transportation planners monitor system performance and refine the process.

All states have developed Strategic Highway Safety Plans (SHSPs) involving a wide range of stakeholders. The goals of an SHSP are similar to the goals of 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. Both the SHSP and transportation safety planning processes use a comprehensive approach that includes a broad coalition of safety and planning partners from the engineering, education, enforcement, and emergency medical services (EMS) disciplines.

The new planning rule in SAFETEA-LU recommends all transportation plans be consistent with the SHSP and that long-range statewide and metropolitan transportation plans include a safety element incorporating or summarizing the priorities, goals, and countermeasures contained in the SHSP. Each state is also required to develop and implement, on a continuing basis, a Highway Safety Improvement Program (HSIP), which is a core funding program for highway improvements at hazardous locations established under SAFETEA-LU. Projects should be consistent with strategies described in the State SHSP to be eligible for HSIP funding. As shown in Figure 2, infrastructure safety projects included in the HSIP feed into the State Transportation Improvement Program (STIP) for funding and implementation in the near term (generally within five years).

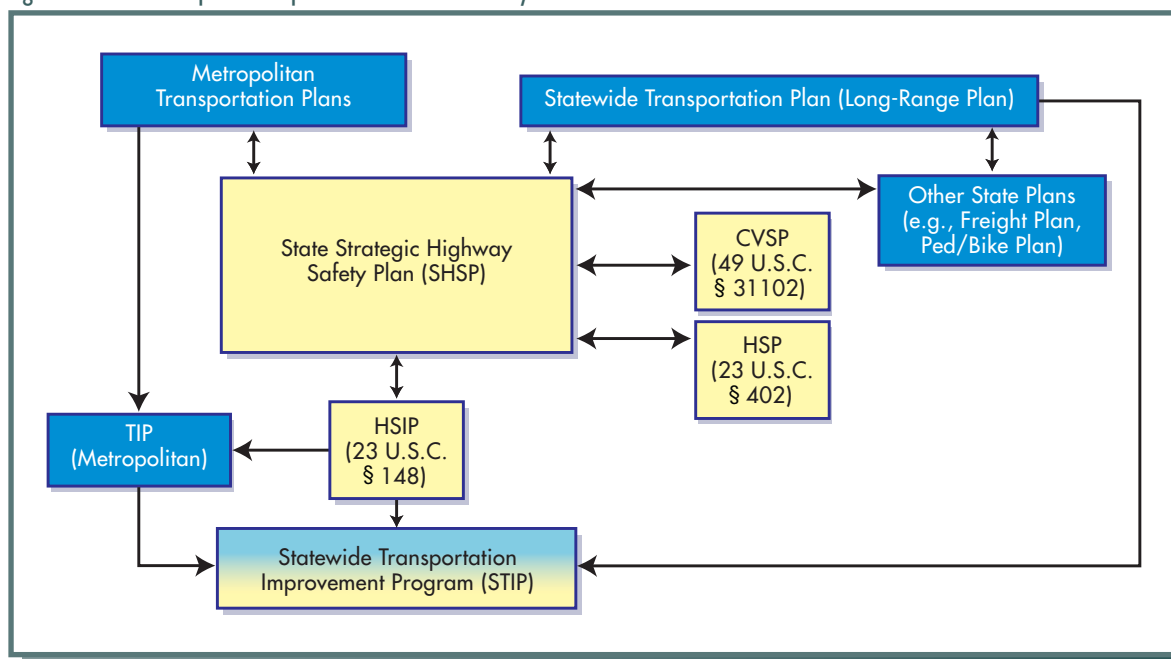
Safety should be explicitly addressed in state and regional transportation planning products. Both states and MPOs are required to develop and update long-range plans with 20- to 30-year planning horizons. The MPOs’ Metropolitan Transportation Plans present a multimodal set of capital, operational, and systems management strategies for the transportation system within their planning areas. State long range transportation plans define policies and strategies for accommodating transportation needs within their borders. Both state and MPO long-range plans feed projects into the shorter-term, fiscally constrained TIP for MPOs and STIP for states. Each year, MPOs develop a Unified Planning Work Program (UPWP) and states develop a State Planning and Research (SPR) program defining planning projects for the year.



The transportation planning process (i.e., transportation plan, TIP, and STIP) applies only to Federal-aid highway and transit programs. For most categories of transportation projects, FHWA/FTA funds cannot be used unless the project is included in a TIP/STIP. Reasonably available or committed revenue sources must be identified to match the estimated costs of the strategies and projects included in the TIP/STIP. Therefore, it is critical that safety be considered during this planning process so Federally funded projects identified in long range plans and TIPs have a positive impact on safety.

States and regions develop a range of other stand-alone plans that also should be consistent with the SHSP. The state's Commercial Vehicle Safety Plan (CVSP), developed under the guidance of the Federal Motor Carrier Safety Administration (FMCSA), addresses safety strategies to reduce truck and bus crashes. The Highway Safety Plan (HSP), developed by the Governor's Office of Highway Safety (GOHS), mainly addresses the behavioral aspects of safety. A state or region may also develop bicycle and pedestrian plans, freight plans, or motorcycle safety plans, all of which should reflect the goals, objectives, and strategies in the SHSP. The relationship among these plans is shown in Figure 2. It is critical each of these plans be data driven and coordinated to ensure transportation funds are spent efficiently in areas with the greatest opportunity for safety improvements.

Figure 2. Relationship of Transportation Plans and Safety Plans



Source: Strategic Highway Safety Plans: A Champion's Guide to Saving Lives.

Safety stakeholders at all levels should understand the transportation planning process in their States or regions, know the strategies that are being implemented to improve safety, and become involved. The SHSPs are organized into emphasis areas, which offer opportunities for direct involvement in areas such as impaired driving, occupant protection, road departure, intersection crashes, and young drivers. Individuals with knowledge in specific emphasis areas and stakeholders with expertise in the 4 Es of safety – engineering, enforcement, emergency response, and education – should contribute their ideas and knowledge to assist in the implementation and evaluation of effective strategies and countermeasures. Safety will continue to improve with increased involvement of committed and knowledgeable executives and practitioners in the field. Be a part of the movement to save lives – it will be the most rewarding part of your career.

# Prioritizing Traffic Law Enforcement

Level: Executive

Agency: Oklahoma County Sheriff's Office, OK

## DESCRIPTION

The workload of law enforcement agencies in America is rapidly expanding at the same time that the available resources are diminishing, forcing police executives to prioritize their enforcement efforts. Unfortunately, traffic law enforcement is often one of the first areas to be cut, as had been the case in the Oklahoma County Sheriff's office prior to Sheriff John Whetsel taking command in 1997. Under the previous leadership, traffic law enforcement was virtually nonexistent; the year before Sheriff Whetsel took the position not a single driving under the influence (DUI) arrest had been made and just 16 traffic tickets were written. Emphasis was placed on crime suppression over traffic stops.

Sheriff Whetsel believes that traffic safety is a priority. When he took command every officer on patrol was expected to enforce traffic safety. As part of many traffic stops, officers also made assessments for drug interdiction. As a result, officers routinely began making seizures of cash and valuables from drug trafficking operations. Under the state's seizure statute, money obtained via this process becomes the property of the agency and can be redirected into law enforcement efforts. In addition, the department receives \$5 from every citation written and grants from the state highway safety office for overtime to fund traffic safety efforts.

With drug seizure revenue, the department was able build a fully funded and dedicated traffic safety department comprised of seven full-time deputy officers that work traffic safety. Vehicles for the entire police department are

## Key Accomplishments

- The county crash rate decreased more than 80 percent one year after reprioritizing traffic safety.
- Comprehensive organizational change resulted in significant benefits to the agency and the public.
- Created a model documenting that traditional crime fighting and traffic law enforcement are complimentary, not mutually exclusive.

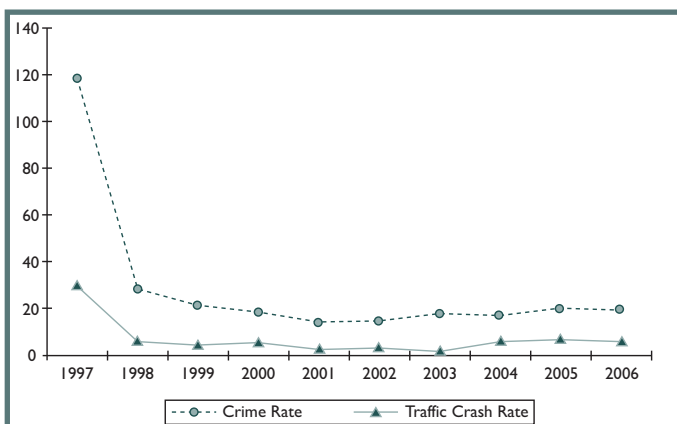
replaced using drug seizure money. The department also uses traffic safety data to direct activities, such as ensuring that traffic safety checkpoints are located at the highest crash locations.

The experience in Oklahoma County showed that sustained, focused, and data-driven traffic enforcement can achieve drastic reductions in the number of crashes, fatalities, and injuries. Another benefit from this program was the unprecedented increase in criminal arrests, which demonstrated that support for traffic enforcement benefits all law enforcement. The key to the success of this program is Sheriff Whetsel who created a highly successful traffic safety unit in an atmosphere that had previously favored using law enforcement for crime suppression instead of traffic control.

## RESULTS

Crash and crime rates both decreased substantially within one year of increasing traffic safety efforts in the County, and have remained at the lower rates for the past 10 years. In 2006, the department made 16,000 traffic stops, of which 7,000 resulted in citations.

Crime and Crash Rates – Oklahoma County, Oklahoma (1997-2006)



Note: Crime and crash rate are calculated on numbers per 100,000 population as is the standard for the FBI uniform crime report.

## CONTACTS AND RESOURCES

Sheriff John Whetsel  
Oklahoma County  
405-869-2511  
johwhe@oklahomacounty.org



# Reorganizing Highway Safety Office to Support SHSP

Level: Executive

Agency: Washington Traffic Safety Commission

## DESCRIPTION

In 2006, the Washington Traffic Safety Commission (WTSC) led the development and implementation of the State's Strategic Highway Safety Plan (SHSP) – "Target Zero." When the plan was in its final stages of development, agency leadership realized the existing organizational and funding structures were not aligned to fully integrate and lead statewide implementation of the SHSP. The WTSC determined changes would be required in agency organization, spending prioritization, and performance measurement.

Under WTSC leadership, staff responsibilities were shifted to align with the emphasis areas identified in the SHSP. Reorganizing the WTSC office presented challenges since all employees had worked for a dozen years or longer under the existing structure, and some were invested in areas where emphasis would be decreased as a result of the SHSP analysis. Management knew it was critical to obtain staff buy-in for these individuals to promote the SHSP to external audiences, and worked closely with the team reviewing the data that provided the necessary justification for the change. The reorganization resulted in several new programs, including one that focused on crashes involving speeding. The reorganization was accomplished in 14 months and completed approximately four months before the Governor signed the SHSP.

Historically, safety grant awards had been made fairly equitably among traffic safety topical areas by the WTSC. However, the SHSP analysis determined the majority of fatal and injury crashes were occurring in just a few emphasis areas – 77 percent of all fatalities involved speed,

### Washington Safety Metrics

	Percent Change	2002-2006 Average	2007
Interstate and state highway-related fatalities	-5%	223	212
County road and city street-related fatalities	-16%	241	203
Motorcyclist fatalities	-8%	62	57
Motor vehicle occupant fatalities	-11%	349	310
Nighttime fatalities	-16%	243	204
August and September fatalities	-34%	128	85
Speed-related fatalities	-18%	188	154
Impaired driver-related fatalities	-22%	219	170

Note: Preliminary 2006 and 2007 data as of February 26, 2008.

## Key Accomplishments

- Organizationally realigned the Washington Traffic Safety Commission with the SHSP to provide the most effective structure from which to lead traffic safety initiatives statewide.
- Identified key emphasis areas where the majority of crashes were occurring and redistributed grant funding to those emphasis areas where the most lives could be saved and serious injuries prevented.
- Positioned the WTSC to lead by example when working with partners and stakeholders to implement and integrate the SHSP at the local level.

impairment, and/or nonuse of safety belts – and that other areas had relatively low crash involvement. As a result, the WTSC leadership realigned the agency's funding mechanisms to directly support the SHSP priorities. After the realignment virtually all grant funding was spent on SHSP Priority Areas One (impaired driving and speeding) and Two (safety belts, crashes at intersections, and traffic records). This ensured maximum resource investment in programs where the most lives could be saved and injuries prevented. The WTSC became much more prescriptive about spending dollars and increased the requirements for performance data to be sure projects were making a difference year to year. The radical restructuring positioned the WTSC to lead by example when directing SHSP partners and stakeholders to do the same statewide at the local level.

## RESULTS

Washington began to see measurable results from its SHSP in 2007, the first full year of implementation. As of April 2008, fatalities were down from 625 in 2006 to 567 in 2007, a 9 percent decrease statewide. The average decrease for the previous five years was 5.6 percent. An analysis of fatality causal factors showed the largest decreases were realized in impaired driving (13 percent) and speeding (9 percent).

## CONTACTS AND RESOURCES

Lowell Porter  
Director

Washington Traffic Safety Commission  
360-753-4018

lporter@wtsc.wa.gov  
www.wtsc.wa.gov



# Establishing Driving Under the Influence (DUI) Court to Reduce Recidivism

Level: Executive

Agency: Alaska Highway Safety Office

## DESCRIPTION

In Alaska, many of those arrested for DUI are repeat offenders. In 2001, the nonprofit organization Partners for Progress worked with two judges to pass legislation establishing a dedicated therapeutic court to handle DUI cases and provide offender rehabilitation. The statute creates an option for repeat DUI offenders to enter the Therapeutic Court System, administered by the Alaska Court System (ACS). The system provides intensive addiction treatment and compliance monitoring. These courts offer a systematic and coordinated approach for prosecuting, sentencing, treating, and monitoring DUI offenders. The goal is to reduce the number of traffic offenses committed by repeat offenders, and change the offenders' behavior by identifying and treating their alcohol problems.

ACS operates therapeutic courts in Anchorage, Bethel, Fairbanks, Juneau, and Ketchikan and is examining opportunities to open an additional court. Therapeutic courts require participants to engage in treatment, participate in educational activities, and be employed. A wide range of coordinated support services are made available to assist offenders in meeting these requirements. Participants meet regularly with a counselor and report their progress to the court on a monthly basis. Law enforcement officers, court staff, treatment staff, and prosecutors meet monthly with a coordinator to track participants' progress. Infractions are

## Key Accomplishments

- Decreased the percentage of alcohol-related traffic fatalities in Alaska from 38 percent in 2002 to 29 percent in 2007.
- Reduced recidivism rates among participants.
- Brought together law enforcement, the court, treatment staff, and prosecutors to contribute to the rehabilitation process.
- Established a therapeutic judicial process that provides an alternative to incarceration and helps offenders reintegrate into the communities as law-abiding, healthy citizens.

reported to the judge who can revoke the individual's participation in the program and reinstate the original sentencing. Graduates of the program remain on probation for two full years with supervision by a probation officer. The Alaska Therapeutic Courts treat approximately 140 people each year. The program is funded by grants from the Alaska Highway Safety Office (\$2.2 million in FY 2009) with additional funding for treatment provided by the Alaska Mental Health Trust.

## RESULTS

A recent recidivism study (February 2007) conducted by the Alaska Judicial Council at the request of the ACS shows graduates of the program are significantly less likely to reoffend than people with similar offenses and prior conviction records. Thirteen percent of therapeutic court graduates were rearrested within a year of their graduation, compared to a 32 percent rearrest rate within a year of release for a comparison group.

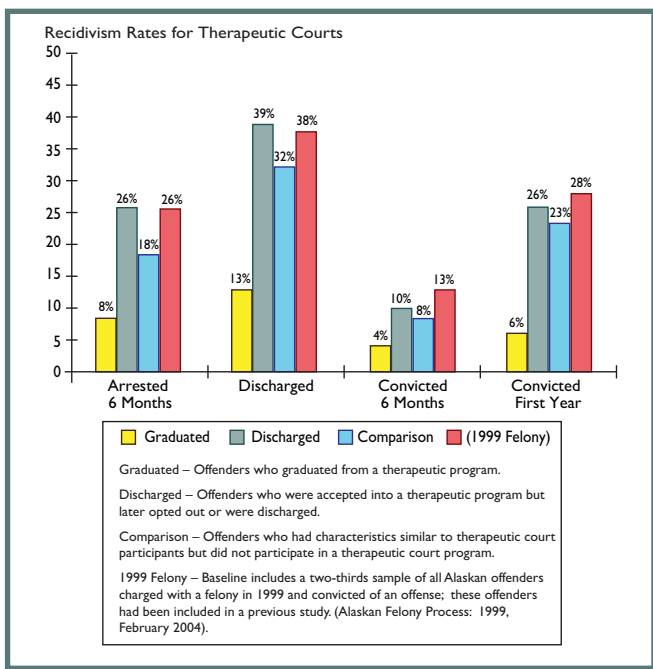
## CONTACTS AND RESOURCES

Cindy Cashen  
Director  
Alaska Highway  
Safety Office

907-465-4374  
Cindy.Cashen@alaska.gov

Original bill enabling establishment of Therapeutic Courts (HB172F) in 2001:  
<http://www.legis.state.ak.us/PDF/22/Bills/HB0172F.PDF>

Statute governing Therapeutic Courts passed in 2006 (HB441D):  
<http://www.legis.state.ak.us/PDF/24/Bills/HB0441D.PDF>



Source: Alaska Judicial Council, February 2007.



# Developing Sustained Tribal Safety Initiative

Level: Executive and Manager

Agency: Colville Confederated Tribes, WA

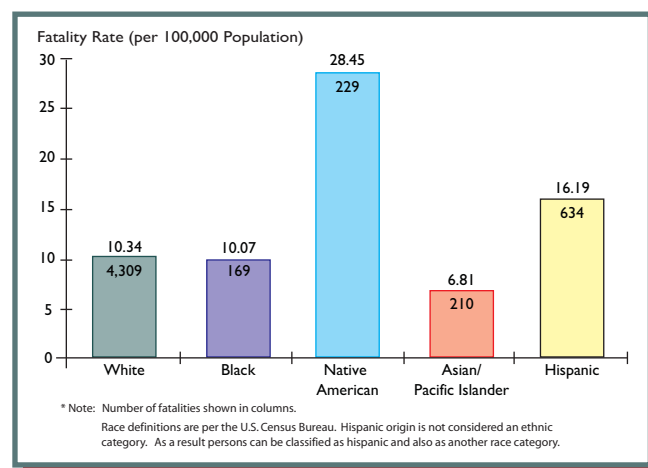
## DESCRIPTION

The Colville Confederated Tribes in Washington, like many tribal nations, have recorded epidemic levels of fatal and serious injury traffic crashes. A five-year review of data from the Washington Traffic Safety Commission (WTSC) showed Colville tribal members were dying at a rate three times that of nontribal members in the State. Many of the victims were young, which highlighted the threat to Tribal culture in the future.

WTSC presented the crash data to the Colville Tribal Council, which decided to develop their own Traffic Safety Task Force, similar to a process developed at the State level, so strategies could be directly implemented and managed by the Tribe. These task forces are multidisciplinary, regional-level extensions of the State Highway Safety Office that tailor implementation of the State's SHSP to local community needs thereby maximizing community support. The WTSC provided state and Federal funding to support the first two years of task force activities, which enabled the Tribes to hire a traffic safety coordinator and initiate traffic safety efforts.

The Traffic Safety Task Force, formed in 2006, is led by the Tribal roads engineer and Tribal police department chief. Because the crash types on the reservation were similar to those on the State level, the Tribe adopted the goals in the State's SHSP. Colville leaders believed this model would identify countermeasures best suited for their communities, while directly supporting Washington's SHSP goal of zero traffic deaths. The WTSC and State Department of

Washington Traffic Fatality Rate  
1999-2006



Source: WTSC.

## Key Accomplishments

- Developed strategic partnerships between the Colville Nation and the State's traffic safety and transportation communities.
- Implemented a proven strategy used successfully in other Washington communities and aligned Tribal traffic safety initiatives with the State's SHSP.
- Increased awareness among Tribal members of the primary safety belt law and realized a significant increase in safety belt use.

Transportation (DOT) served as resources for the task force, which is also reaching out and developing relationships with other stakeholders in the region.

The first focus area for the Task Force was occupant protection. Many Tribal members were unaware of the State's safety belt law and an outreach effort was initiated to raise the level of awareness. Fifty infant seats and booster seats were also distributed as part of this effort

## RESULTS

This initiative produced success almost immediately. The safety belt use rate increased dramatically, from under 30 percent to above 80 percent. In the first 15 months of the Task Force's operation, seven lives were saved because passengers were wearing safety belts in severe crashes that previously would have resulted in death or serious injury. These early successes cemented the Traffic Safety Task Force model within the Colville Nation. Recently, the Tribe was awarded a grant from the Bureau of Indian Affairs (BIA) to continue the Task Force initiative for an additional three years. The BIA funding will be given directly to the Tribe for transportation safety efforts and WTSC will provide local oversight.

## CONTACTS AND RESOURCES

Brian Clark  
Colville Confederated Tribes Transportation Department  
509-634-2589  
brian.clark@colvilletribes.com





# Cable Median Barrier Helps Achieve SHSP Goal

Level: Executive and Manager

Agency: Missouri Department of Transportation

## DESCRIPTION

In Missouri, from 2001 to 2003, head-on crashes resulted in 480 fatalities and 2,433 serious injuries, nearly 15 percent of all fatalities and 10 percent of disabling injuries. This prompted Missouri to identify head-on crashes as one of the eight emphasis areas in the State's SHSP, "Blueprint for Safer Roadways." One of the countermeasures to address this problem was to install three-strand median cable barrier, a proven effective countermeasure.

The Missouri Department of Transportation (MoDOT) first identified locations with a high number of crossover crashes and assembled a team to install cable barrier on most Interstates throughout the State. As of mid-2008, Missouri had installed 500 miles of median cable barrier including all of I-44 and I-70, and portions of I-435, I-55, and I-29. While most of the installations are on Interstates, MoDOT evaluates crash data on a continuous basis and installs the barrier on State routes where the number of cross median type crashes is high. Funding for the program (\$10 million per year) is supplied from Section 154 transfer funds. Missouri is subject to the penalty (i.e., funds transferred from the construction program to safety) because the State has failed to pass an Open Container law.

### High Tension Cable Median Barrier



Source: Missouri Department of Transportation.

## Key Accomplishments

- Implemented an SHSP strategy that helped the State achieve its goal for fatality reductions a year early.
- Nearly eliminated cross median fatalities on I-70 and I-44. Fatalities in these types of crashes have been reduced from a high of nearly 50 per year to 2 fatalities in 2007.
- Implemented a proven countermeasure on 500 miles of roadway using a systemwide safety approach. This method varies significantly from the "black spot" approach.

## RESULTS

Prior to installation, the State experienced more than 50 cross median fatalities on divided Interstates each year. In 2007, the number of fatalities had dropped to 9. On the 500 miles of freeway where cable median barrier have been installed, only 2 cross median fatalities occurred in 2007. Installation of cable median barrier has also contributed to Missouri's success in achieving their SHSP goal a year ahead of time. Fatalities in the State dropped dramatically from 1,257 in 2005, to 1,096 in 2006 (the largest drop in 2006 of any state in the nation), and to under 1,000 in 2007 (a nearly 21 percent reduction over the last two years). Missouri traffic fatalities have not been this low since 1993.

## CONTACTS AND RESOURCES

John Miller  
Traffic Safety Engineer  
Missouri DOT  
573-526-1759  
[John.p.miller@modot.mo.gov](mailto:John.p.miller@modot.mo.gov)

# Crash Reduction Initiative on Secondary and Rural Roads

Level: Executive and Manager

Agency: South Carolina Department of Transportation

## DESCRIPTION

In 2002, South Carolina had the third highest death rate by vehicle miles traveled (VMT) in the nation, with 2.23 deaths per 100 million VMT, a rate 48 percent higher than the national average of 1.5. Most of the safety problems were occurring on rural secondary roads, which had a fatality rate over three times higher than Interstate highways (3.42 versus 0.92). The South Carolina Department of Transportation (SCDOT) is responsible for over 65 percent of the State's roadway system including the majority of secondary roads. Most of the secondary roads are not eligible for Federal-aid funding, and SCDOT previously had dedicated few resources to address problems on those roads.

In 2003, SCDOT initiated the Crash Reduction by Improving Safety on Secondaries (CRISOS) program, which used crash and fatality rates to identify high-risk rural secondary roads. These roadways were also screened for crash patterns that could be mitigated with engineering solutions. Once a list of CRISOS roadways was developed, SCDOT coordinated an initial site visit to determine whether low-cost strategies would be applicable. For eligible locations, a multidisciplinary Road Safety Audit (RSA) team conducted a full field review and made project recommendations.

SCDOT allocated \$16 million per year over five years for low-cost improvements on CRISOS roads. Funding for the CRISOS program was initially made possible due to an innovative TEO-45 indirect cost soft match program approved by FHWA. This allowed the SCDOT to recover eligible administrative costs that would not otherwise be claimed on Federal-aid projects. This savings provided the flexibility for the SCDOT to advance the CRISOS program as a state funded activity. Some improvements implemented on CRISOS roads since 2004 include extra large stop signs, guardrail installation, vegetation removal, rumble strips,

## Key Accomplishments

- Developed a targeted hazardous location program (CRISOS) that decreased traffic related fatalities and serious injuries.
- Used Road Safety Audits to identify problems and potential solutions. (SCDOT has completed nearly 150 RSAs on CRISOS roads since 2004.)
- Expanded the CRISOS program to all rural roads and included low cost, short-term safety improvements in the State's Strategic Highway Safety Plan.
- Implemented a multidisciplinary approach to traffic safety including engineering improvements, increased enforcement and education, and support from the emergency medical services community.

retroreflective sheeting on sign channel posts, and chevron signs on curves.

To complement the infrastructure improvements, SCDOT worked with emergency medical services (EMS) public information and education specialists to incorporate information on roadway departure crashes and safe driving strategies into their ongoing outreach activities. SCDOT worked with local and state law enforcement agencies to conduct targeted enforcement on CRISOS roads, and officers added information on rural secondary road safety to their public outreach efforts. SCDOT's Safety and Communications Offices also secured significant print and electronic media coverage of the issue.

## RESULTS

Fatalities on CRISOS roads declined from an average of 71 deaths per year between 1998 and 2002 to an average of 62 deaths from 2006 to 2007, a 13 percent reduction. An average of 1,752 injuries occurred on CRISOS roads from 2006 to 2007, which is a reduction of 116 (6 percent) compared to the annual average of 1,868 injuries between 1998 and 2002.

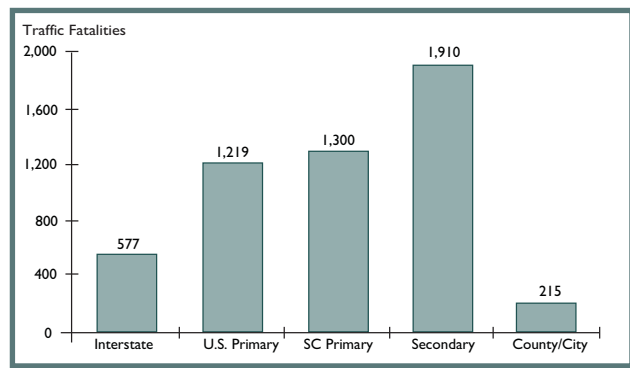
Due to success of the CRISOS program, it has been expanded to all high crash rural roads regardless of classification, and is now funded through traditional methods of indirect cost recovery

## CONTACTS AND RESOURCES

Terecia Wilson  
Director, Strategic Highway Safety Plan  
SCDOT  
803-737-0403    wilsonwtw@scdot.org

## South Carolina Traffic Trends

Traffic Fatalities by Route Category, 2001-2005



Source: South Carolina Department of Transportation.



# Rogue Valley COG Elevates Safety

**Level: Executive and Manager**

**Agency: Rogue Valley Council of Governments**

## DESCRIPTION

In 2004, the Rogue Valley Council of Governments (RVCOG) in Oregon began a project to analyze transportation safety at the regional level in an effort to reduce high crash rates. Prior to the safety initiative, RVCOG's seven local government members managed their own crash data and reported results independently, which hampered efforts to compare data across jurisdictions. A grant from the Oregon DOT allowed RVCOG to regionally map crashes along three major corridors using geographic information systems (GIS) and categorize them by crash type. This study ultimately resulted in the regional identification of hazardous locations where safety projects were needed.

Since many of the projects included in the long-range transportation plan were along the corridors identified in the safety study, the results enabled use of refined safety criteria by a technical committee for ranking projects. The GIS information and a travel demand model were also used to forecast future volumes and the expected number of crashes based on population growth.

The emphasis on transportation safety planning also resulted in safety being designated as one of the core goals in the regional transportation plan (RTP). The goal is supported by five policy recommendations. The multimodal safety element in the 2005 RTP, which included data from the 2004 safety study, recommended continued mapping and analysis of hazardous locations and a project prioritization process that ensures safety is given adequate weight and priority.

## Key Accomplishments

- Increased the importance of safety in the regional planning process.
- Used GIS technology to map crashes and identify hazardous locations.
- Analyzed safety at a regional level for the first time.
- Reinforced a commitment to safety in the RTP project prioritization process.

## RESULTS

The project ranked third for safety involves capacity, bike lanes, sidewalks, and a center turn lane, and has already been constructed because funding was secured. The top ranked safety project, which involves realignment, traffic signal placement, and access management, is slated to go out to bid in 2008. The first and second ranked projects are being completed later than the project ranked third due to more complex planning requirements and higher project costs.

## CONTACTS AND RESOURCES

Matt Herman  
Associate Transportation Planner  
Rogue Valley Council of Governments (RVCOG)  
541-423-1361  
mherman@rvcog.org

### Rogue Valley MPO

*Transportation Safety Planning Project Final Report*

#### Rogue Valley Metropolitan Planning Organization

#### Transportation Safety Planning Project



**Final Report**

**April 23, 2004**



# Sustained DUI Checkpoint Effort

Level: Executive and Manager

Agency: Delaware Office of Highway Safety

## DESCRIPTION

The goal of the Delaware Office of Highway Safety (OHS) Checkpoint Strikeforce program is to conduct as many DUI checkpoints as possible within a six-month timeframe. During the second half of the year an average of 4 checkpoints is conducted per week for a total of more than 100 checkpoints during the emphasis period. Checkpoints are located at high crash locations based on crash data analysis. During nonemphasis months, 1 checkpoint is conducted per month, or near holiday periods to sustain the message.

Prior to initiating the Checkpoint Strikeforce program in 2002, few checkpoints were conducted given the labor intensive nature of the program, and the large number of small police departments throughout the State. To address these manpower challenges, Delaware OHS created a task force model in each county, utilizing officers from various municipal jurisdictions who banded together to form a roving team. Each officer was provided statewide arrest authority for the checkpoint program from the Attorney General, which allowed the team to conduct DUI checkpoints in small towns that would have otherwise not had the activity. In addition to the extended enforcement, the program also has created a great sense of camaraderie among law enforcement that opened the door for additional cooperative efforts.

A media effort is conducted to complement the program, including television, radio, and billboard advertising to publicize the checkpoints. Radio and television ads are targeted to media that reaches key demographic groups, such as males ages 21 to 34, who are disproportionately represented in crashes involving alcohol. The effort is funded by the

## Key Accomplishments

- Developed a DUI checkpoint program that overcame manpower challenges in a State with many small police departments.
- Reduced the percentage of alcohol-related fatalities from 46 percent in 2001 to 35 percent in 2006.
- Increased multijurisdictional cooperation among law enforcement agencies and camaraderie among law enforcement officers.

Delaware OHS with approximately \$200,000 in overtime enforcement grants and \$250,000 for media each year.

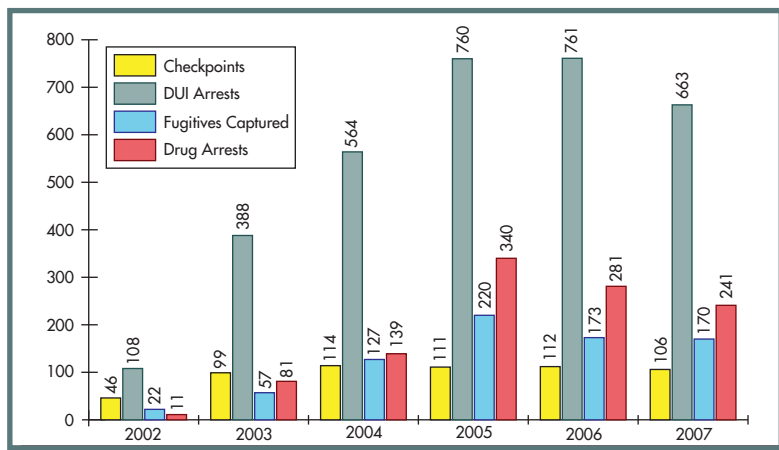
## RESULTS

The Checkpoint Strikeforce program resulted in a reduction of alcohol-involved fatalities from 46 percent to 35 percent, and in more than 650 DUI arrests in each of the past three years (2005-2007). In addition to stopping alcohol-impaired drivers, the program resulted in the apprehension of fugitives and drug users. The extensive media outreach also has educated the public on the risks of drinking and driving.

## CONTACTS AND RESOURCES

Lisa Shaw  
Delaware Office of Highway Safety  
302-744-2746  
Lisa.shaw@state.de.us

## Yearly Checkpoint Strikeforce Results



Source: Delaware Office of Highway Safety.

# Providing Tools and Support for Local Safety Conscious Planning

Level: Executive and Manager

Agency: Iowa DOT Office of Traffic and Safety

## DESCRIPTION

In Iowa, roughly 50 percent of fatal and serious injury crashes occur on rural local roads. While good quality crash data has been available in Iowa for many years, local jurisdictions often lack the technology or expertise to analyze the data. Iowa DOT believes the most effective method for increasing local safety activities is to mentor and support local and district staff. The Center for Transportation Research and Education at Iowa State University developed the Iowa Traffic Safety Data Service to facilitate local access to data and data analysis capability. The service is funded through a partnership between the Governor's Traffic Safety Bureau (GTSB) and the Office of Traffic and Safety (TAS). It enables localities to make free crash data requests and facilitates local safety data analysis. Since 1987, Iowa has allocated one-half of one percent of the Road Use Tax Fund to the Transportation Safety Improvement Program supporting the majority of Iowa DOT Traffic Safety efforts.

The Iowa DOT also provides software and data analysis tools on CD and free on-site training for local jurisdictions. The most sophisticated analysis tool, Safety Analysis Visualization and Exploration Resource, is used primarily by the Iowa DOT, but a few local jurisdictions work with it as well. A more user-friendly tool, the Crash Mapping Analysis Tool, is widely used by local governments, and a similar Incident Mapping Analysis Tool allows law enforcement to map crashes and other incidents. The Iowa DOT also provides a statewide software license for the development of intersection collision diagrams. Planners, law enforcement officers, and engineers are invited to attend training on the tools, which has the added benefit of facilitating cross-agency discussion and collaboration, along with incentives for accurate law enforcement crash reporting. The Iowa

## Key Accomplishments

- Developed a suite of analysis tools and training available at no cost to district and local staff.
- Demonstrated exposure to safety data and information results in more safety improvements and becomes a rewarding career aspect for district and local engineers.
- Significantly decreased the number of traffic fatalities over the past 14 years.

DOT recently conducted municipal- and county-level crash data analysis and provides a wide range of crash type and cause results on the Iowa DOT web site.

The Iowa DOT also uses a variety of delivery mechanisms to disseminate safety information to local and district engineers. The Department organizes an annual Traffic and Safety Engineering Forum peer exchange to expose engineers to traffic safety issues; delivers presentations on traffic safety at the annual meetings of counties throughout the State, the Iowa chapter of the American Public Works Association, and the Iowa Association of Regional Councils; and provides free courses on safety engineering to city and county engineers.

Iowa DOT developed the Traffic Engineering Assistance Program to provide safety engineering support to jurisdictions without an engineer on staff. The program funds a consultant with traffic and safety expertise to conduct local safety studies. It is helpful for jurisdictions with limited resources that might have hired a general civil engineer without safety expertise. The program emphasizes customized, low-cost safety improvement solutions and is funded by GTSB and TAS. Each project is limited to 100 hours of consultant time. Data analysis support and training programs increase low-cost safety improvements throughout the State.

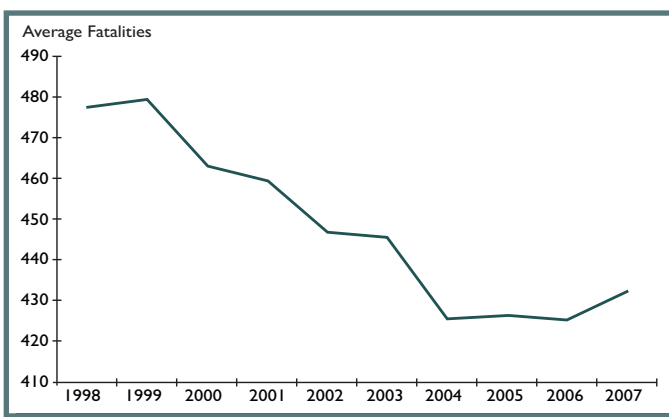
## RESULTS

Iowa has decreased traffic fatalities over the past 14 years from a 5-year average of 478 between 1994 and 1998 to an average of 433 between 2003 and 2007.

## CONTACTS AND RESOURCES

Tom Welch, P.E.  
State Transportation Safety Engineer  
Iowa Department of Transportation  
515-239-1267  
Tom.Welch@dot.iowa.gov

Iowa Highway Fatalities  
Five-Year Running Average



Source: Iowa Department of Transportation.



# Data Improvements at the MPO Level

Level: Executive and Manager

Agency: Mid-Ohio Regional Planning Commission

## DESCRIPTION

Crash data in Ohio often lack important information, such as accurate location, safety belt use, and contributing crash factors. Inconsistent location reporting also has compromised the ability to direct safety resources to the most hazardous locations. Law enforcement officers often indicate crash location by noting the closest intersection or nearest point on the road centerline file rather than by latitude and longitude. As a result, the State's SHSP identified traffic records as an area in need of improvement.

The Mid-Ohio Regional Planning Commission (MORPC) took up the challenge to improve data collection by proposing an "Interagency Safety Partner Program" that would inform law enforcement on the need for high quality crash data and explain how these data are used to identify multidisciplinary transportation safety countermeasures. MORPC partnered with local engineers, the safe communities program, the municipal court, and City of Columbus police, which reported 75 percent of crashes in the MPO area, on 2 two-hour workshops where participants could share their experiences with crash data. At the first session, officers explained the current crash reporting process and discussed the high demands and limited resources dedicated to crash reporting.

In the second workshop, crash data users presented practical examples of work products that utilize crash statistics, which helped officers understand why information in crash reports is crucial for improving transportation safety. The officers

### MORPC Coordinates Video Shoot on Importance of Accurate Crash Reporting



Source: MORPC.

## Key Accomplishments

- Improved communications between law enforcement and the regional planning organization.
- Developed a low-cost educational tool to reach hundreds of law enforcement personnel on the value of accurate crash data.
- Established the goal of improving crash reporting by changing the training module on crash reporting in the police academy.

also realized road safety improvements would reduce traffic crashes and free up law enforcement resources.

## RESULTS

MORPC received a \$7,500 grant from the FHWA Office of Safety office to produce a 6.5 minute video that included testimonials from law enforcement officers, transportation planners, engineers, health departments, and State officials on the importance of accurate data for improving transportation safety. The video was distributed to all Columbus police precincts in June 2008 and is shown during roll-call. Distribution to other central Ohio jurisdictions and other agencies across the State is underway.

## CONTACTS AND RESOURCES

Kerstin Carr  
Senior Planner  
Mid-Ohio Regional Planning Commission (MORPC)  
614-233-4163  
kcarr@morpc.org  
www.morpc.org

# Successful Approach for SHSP Implementation

Level: Manager

Agency: California Department of Transportation

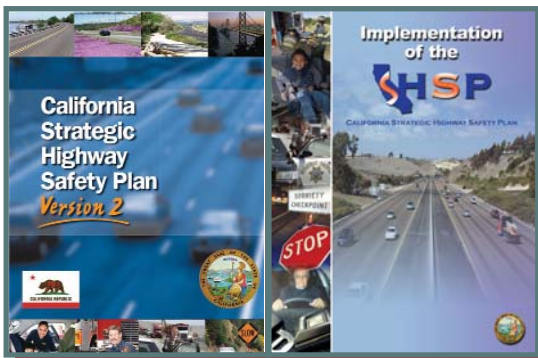
## DESCRIPTION

California has a large and complex road transportation system with 347,000 lane miles of roadways serving over 36 million residents. The range of safety issues facing California's road users reflects not only the size of the state but also the diversity of its population and geography. With the Strategic Highway Safety Plan (SHSP) the California Department of Transportation (Caltrans) took advantage of the opportunity to stimulate collaboration across agencies and practice areas necessary to successfully reduce transportation fatalities and injuries.

California's SHSP was developed and approved in 2006 as required by Federal law. Caltrans partnered in this effort with the California Office of Traffic Safety, the California Highway Patrol, and the California State Association of Counties to lead a 13-member Steering Committee providing guidance to 16 Challenge Area teams. The multidisciplinary teams are comprised of experts from the 4Es of safety, and are led by co-leaders who serve as champions for the SHSP and help guide the work of the Challenge Areas. These teams were initially tasked with developing SHSP goals and strategies to address the State's most pressing transportation safety issues. Following approval of the SHSP, these groups continued to meet and developed detailed actions for implementation in each Challenge Area. This approach garnered continued participation from safety stakeholders from state, city, and county agencies, private sector businesses, grass-roots organizations, and other key participants to successfully implement the SHSP.

In May 2008 Caltrans hosted Safety Summits in Northern and Southern California, featuring State and Federal dignitaries and unveiling the 152 SHSP actions. Participants then broke out into workshop groups to delve into the SHSP actions and discuss implementation. During the workshop sessions, new stakeholders were encouraged to participate in

## SHSP Documents



Source: Caltrans.

## Key Accomplishments

- Held monthly Steering Committee and many Challenge Area meetings to develop the framework for SHSP implementation.
- Developed action steps for each of the 16 Challenge Areas to implement the SHSP.
- Held Safety Summits to gain participation from safety stakeholders across the State.
- Garnered the active involvement of over 300 safety stakeholders from 80 public and private agencies and organizations.
- Established the SHSP Executive Committee through a memorandum of understanding.
- Governor proclaimed Traffic Safety Week.
- Published *SHSP Version 2* and *Implementation of the SHSP*.
- Developed a tracking tool for 152 actions and SHSP performance measures.

the Challenge Area teams and commit to implementing the SHSP within their organization and/or circle of influence. Participants also shared their ideas and local best practices and identified other safety stakeholder groups, organizations, and individuals not in attendance who should receive outreach materials and be invited to participate in ongoing SHSP efforts.

## RESULTS

In addition to the announcement of the actions, the Summits were designed to get new local Safety Stakeholders involved in implementation and encourage them to join the current group of more than 300 safety stakeholders. The goal was that new stakeholders would comprise at least half of the attendees at each event. This goal was accomplished, as 277 of the 479 people who attended the Summits (58 percent) were new participants.

## CONTACTS AND RESOURCES

Jesse Bhullar, P.E., T.E.  
State Highway Safety Engineer  
Division of Traffic Operations  
California Department of Transportation  
916-654-5026  
jesse\_bhullar@dot.ca.gov



# Raising the Importance of Transportation Safety

Level: Manager

Agency: California Department of Transportation

## DESCRIPTION

In State Departments of Transportation, safety improvement projects compete for limited funding with nonsafety projects, which may result in a limited number of safety improvements on the final list of funded projects. In the late 1990s, Caltrans instituted a practice to ensure funding for all safety improvement projects identified under their Highway Safety Improvement Program (HSIP).

High collision locations are identified by analyzing collision data from the Traffic Accident Surveillance and Analysis System database and comparing it to statewide collision data on similar facilities. In addition, Caltrans uses three annual monitoring programs (Median Barrier, Two- and Three-Lane, and Wrong Way) to identify locations warranting additional evaluation. The combined lists of locations are given to the District Traffic Safety Engineers for follow-up safety investigations. The investigations gather and analyze relevant data from collision reports and observations during site visits to identify contributing collision factors and potential countermeasures, which may include maintenance work orders, sign installation, or a safety project.

When a safety project is recommended, the project is evaluated for eligibility in the State Highway Operation and Protection Program (SHOPP) Collision Reduction Category. The Collision Reduction Category is one of eight categories that make up SHOPP, a multi-year program of transportation projects on the state highway system. The Collision Reduction Category is designed to reduce the number and/or severity of collisions and includes two programs, Safety Improvements and Collision Severity Reduction.

### California Strategic Highway Safety Plan Version 2



Source: Caltrans.

## Key Accomplishments

- Elevated safety improvement as Caltrans' top priority.
- Established a safety threshold as opposed to a funding threshold for implementing safety improvement projects.
- Developed criteria for evaluating and selecting safety improvement projects.

## RESULTS

Safety improvement projects are Caltrans' top priority and are funded and delivered as soon as the project initiation document is approved. Eligible projects are based on collision history and include those with a Traffic Safety Index greater than 200 (which relates to a cost benefit ratio of one-to-one) or those identified through one of the annual monitoring programs, each of which has specific criteria. These types of projects are also reflected in California's Strategic Highway Safety Plan. Typical improvements include new or modified signals, modified intersections, curve improvements, shoulder widening, rumble strips, open graded asphalt concrete, pavement grooving, median barriers, etc. All safety improvement projects meeting the criteria are guaranteed funding from Federal HSIP and state SHOPP funds. The average annual expenditure on safety improvement projects is nearly \$200 million, of which only about \$60 million is from Federal sources.

## CONTACTS AND RESOURCES

Janice Benton, P.E.  
Chief, Office of Traffic Safety  
Division of Traffic Operations  
California Department of Transportation  
916-654-5176  
janice\_benton@dot.ca.gov

Jesse Bhullar, P.E., T.E.  
State Highway Safety Engineer  
California Department of Transportation  
916-654-5026  
jesse\_bhullar@dot.ca.gov



# Development of Technical Solutions

Level: Manager and Practitioner

Agency: Iowa DOT Office of Driver Services

## DESCRIPTION

Iowa's high-quality crash data enables good state-level safety analysis. However, the software that allows for quick electronic collection did not allow law enforcement agencies to access the data in real time or utilize standard mapping tools. The Iowa Statewide Traffic Records Coordinating Committee (STRCC) decided that a new software interface was needed to correct these deficiencies, resulting in creation of the Incident Mapping Analysis Tool (IMAT).

IMAT was developed through a partnership between the Center for Transportation Research and Education at Iowa State University and the Iowa DOT Office of Driver Services. The project was funded by the Governor's Traffic Safety Bureau using §408 and §411 funds and is available through the Office of Driver Services at no cost to law enforcement agencies. IMAT software was piloted by the City of Marion Police Department, which provided significant input on law enforcement needs.

Prior to IMAT, jurisdictions had to wait months to obtain state crash data. With IMAT, they have access to incident data immediately after it is uploaded at the end of an officer's shift. IMAT can map and analyze any electronically captured data, including traffic incidents and crimes, in real time. Crashes, citations, crimes, and DUIs are captured within different layers of data and can be manipulated separately. For example, IMAT can be used to view all crash reports associated with a specific location over a given time period.

IMAT benefits law enforcement by enabling data-driven patrol deployment decisions. It provides a comprehensive view of crashes, thus allowing management to identify and act

### Map of Number of Crashes by Severity at Marion Locations



Source: Marion City Police Department.

## Key Accomplishments

- The STRCC developed user-friendly customized software to address a data and analysis need.
- Law enforcement now has access to its own data in real time.
- Law enforcement can evaluate what types of traffic enforcement are occurring on an ongoing basis and quickly modify assignments based on need.

on citywide problems. For example, when stop signs or turn lanes are added, new crash patterns may quickly become evident. IMAT analysis enables prompt response to such situations. By reviewing the IMAT system daily or weekly to assess the magnitude and types of citations being written, a manager can ensure officers are enforcing the desired traffic laws in the right location at the right time of day.

## RESULTS

In the City of Marion, IMAT helped flag an intersection where two fatalities and several serious injury crashes occurred over a two year period. IMAT analysis revealed a significant proportion of the crashes occurred between 7:00 and 8:00 a.m. on weekdays. As a result, the department now assigns officers to this intersection during the morning commute to slow traffic in an attempt to reduce fatalities and injuries.

IMAT enables law enforcement to respond quickly to changing patterns in traffic violations and crime in the community and to deploy enforcement patrols accordingly. The software is useful for managing law enforcement staffing levels.

## CONTACTS AND RESOURCES

Lieutenant Mike De La Mater  
City of Marion Police Department  
319-377-1511  
116@marionpolice.com

Robert Thompson  
Governor's Traffic Safety Bureau  
Iowa Department of Public Safety  
515-725-6134  
rthompson@dps.state.ia.us



# Minnesota Speed Management Program

Level: Manager and Practitioner

Agency: Minnesota State Patrol

## DESCRIPTION

In 1997 the National Maximum Speed Limit Law was repealed, and Minnesota increased speed limits on rural Interstates to 70 mph and on certain expressways to 65 mph. However, little enforcement or education accompanied the change despite the fact that fatalities increased 93 percent on four-lane divided expressways and 70 percent on rural freeways. Data analysis revealed speeding was a factor in 864 of the 3,000 fatal crashes that occurred in the State from 2000 to 2004.

In 2005, the Minnesota Department of Transportation (Mn/DOT) and the Office of Traffic Safety (OTS) partnered with the Minnesota State Patrol (MSP) and local law enforcement agencies to launch a Speed Management Program combining engineering, enforcement, and public education strategies. As part of this effort, Minnesota increased speed limits by 5 mph on 930 miles of highways to limit the dangerous disparity in driving speeds, which ranged from 55 mph to 65 mph. This change was complemented by the Highway Enforcement of Aggressive Traffic (HEAT) program designed to control speeding and remind drivers that the posted speed was the speed limit. The MSP, county sheriffs' offices, and local police departments conducted additional enforcement for eight-week periods followed by four weeks of normal enforcement repeated throughout the year. In the first year of the project, police stopped approximately 88,000 vehicles and issued nearly 34,000 speeding citations.

### Speed Management Program Map



Source: Minnesota DOT.

The education component of the program involved 10,000 paid radio advertising spots throughout the year, which ran at the beginning and end of the enforcement periods. HEAT was supported in 2006 with \$3.0 million in Federal funds: \$2.5 million for increased enforcement; \$350,000 for media; and about \$150,000 for data collection, analysis, and evaluation. HEAT was relaunched statewide

## Key Accomplishments

- Cooperation among key traffic safety agencies e.g., Mn/DOT, MSP, and OTS.
- Reduced fatal crashes 13 percent in first program year.
- Decreased number of drivers traveling more than 10 mph above the posted speed limit.
- Issued nearly 34,000 speeding citations in the first year.

in June 2007 and funded with \$1.5 million, which provided nearly 25,000 law enforcement hours and additional paid media support.

## RESULTS

HEAT contributed to a 13 percent reduction in fatal crashes in 2006 and an 11.2 percent reduction in the fatal crash rate per 100 million VMT (more than three times the national average fatal crash rate reduction from 2005 to 2006). Mn/DOT also observed a steady decline in high-speed traffic. For example, on U.S. 2 and U.S. 71 the number of vehicles traveling over 70 mph dropped nearly 42 percent following initiation of HEAT. Additionally, the public's perception of speed enforcement changed; more drivers believed they would be ticketed at only 5 mph over the speed limit, compared to the previous expectation of 10 mph over the limit.

## CONTACTS AND RESOURCES

Ernest H. Mattila  
Grants and Federal Projects Administrator  
Minnesota State Patrol  
651-201-7112  
ernest.mattila@state.mn.us

Lt. Mark Peterson  
Minnesota State Patrol  
mark.peterson@state.mn.us

Project web site:  
<http://www.dot.state.mn.us/hottopics/speedlimits/index.html>



# Tazewell County Teen Safety

Level: Manager and Practitioner

Agency: Tazewell County Sheriff

## DESCRIPTION

Between March 2005 and July 2006, 15 teenagers died in traffic crashes on Tazewell County, Illinois roadways, sparking a cry for action. A range of agencies, including Illinois State Police District 8, Illinois Department of Transportation, Tazewell County Sheriff, Tazewell County Coroner, Tazewell County Regional Superintendent of Schools, Tazewell County Health Department, Tazewell County Youth Board, Red Cross, and local police agencies teamed up to form the Tazewell County Teen Initiative – a multifaceted public awareness campaign. The group established four committees oriented around the 4Es of transportation safety to develop teen transportation safety strategies.

In the spring of 2007 student groups at each of the seven Tazewell County high schools competed in a contest to develop the best teen-led safe driving campaign. Using the Ford Driving Skills for Life curriculum, one team from each school developed a comprehensive safe-driving awareness program (including an implementation timeline and media plan) and created a unique name and slogan.

Several schools created public service announcements (PSA), with one school receiving permission from the rock band Pearl Jam to use their song “The Last Kiss” in their PSA. Another school welded safety belts to all the chairs in a classroom to get students in the habit of buckling up. Rap songs about safe driving were created and performed during lunch breaks. Picture locket key chains were passed out at the prom with a safe driving message attached. One school created 19 cardboard mannequin cutouts, dressed them, and placed them around the school to represent the average of 19 teenagers who die every day in America as a result of a fatal vehicle crash. The winning school received \$5,000, and each student on the winning team was awarded a \$500 U.S. Savings Bond.

### Teens Participating in Safe Driving Clinic



Photo: Tazewell County Sheriff's Office.

The engineering community reviewed reports for each of the crashes resulting in the 15 teen fatalities. They did not find a common safety factor linking them all, but they identified hazardous locations for further review. The enforcement community conducted a “shoulder to

## Key Accomplishments

- Demonstrated that teens can develop effective safety messages for their own peer group.
- Developed a collaborative relationship between teens and law enforcement.
- Expanded the partnership with Ford and the Illinois DOT to conduct the Driving Skills for Life program statewide in 2008. More than 200 schools applied, and 105 were accepted to receive grant money for safety programs. In May 2008, more than 1,000 Illinois students participated in the safe driving clinics.

shoulder” campaign in which law enforcement officers attended football and basketball games and distributed information about safe driving. At halftime, enforcement officers walked onto the field to stand shoulder to shoulder while an announcement was made explaining why they were present at the games. Additionally, the State Police created a web site where teenagers can anonymously report underage drinking parties: <http://www.drunkstopper.com>.

Tazewell County schools participated in the first Ford Motor Company Fund-sponsored Ride and Drive event in Illinois. Professional drivers conducted a driving clinic to teach teens how to handle challenging driving situations, such as coming out of a skid. In 2007, 300 Tazewell County teens participated in the program.

## RESULTS

Since July 2006, only one Tazewell County teen has died in a crash. Illinois also has achieved significant gains in safety among teens statewide. Teen fatalities in the State fell from 57 between January 1 and April 15, 2007 to 22 during the same period in 2008.

## CONTACTS AND RESOURCES

Deputy John Shallenberger  
Crime Prevention Unit  
Tazewell County Sheriff's Office  
309-346-4141  
[jshallenberger@tazewell.com](mailto:jshallenberger@tazewell.com)



# Statewide Implementation of Road Safety Audits

**Level: Manager and Practitioner**

**Agency: Tennessee Department of Transportation**

## DESCRIPTION

In 2005, the Federal Highway Administration conducted a National Highway Institute course on Road Safety Audits (RSA) and low-cost safety improvements for the Tennessee Department of Transportation (TDOT). Managers who attended the course realized adoption of a rigorous RSA process involving a broad cross section of staff would improve high-risk location safety analysis. Improving the identification of hazardous locations and implementation of low-cost safety improvements were important components of the State's Strategic Highway Safety Plan (SHSP), which indicated more than 65 percent of crashes were lane departures and a large percentage occurred at intersections.

Coordination of the formal RSA program occurred at the TDOT bureau level with support from the TDOT safety management team comprised of the Safety Program Manager, State Traffic Engineer, and the Project Planning Director. A new position – RSA Coordinator – was created by the Director of Project Planning to manage the process.

The RSA process started by identifying lane departure locations with a fatal and incapacitating injury crash rate 3 or more times the State average and intersections with a fatal or serious injury crash with 3.5 times the average. The information is provided annually to the Project Planning Division for further RSA screening. The Tennessee RSAs involve a team that includes traffic engineers, operations specialists, transportation planners, road superintendents, roadway design engineers, highway maintenance supervisors, and local officials. The goal of each RSA is to identify specific hazards at each location and recommend low-cost improvements, such as signage, pavement striping, and guardrails. In the first year of the program, TDOT conducted an RSA every two weeks.

Improvements are funded by the High Risk Rural Roads program, with up to \$50,000 per project, and the Federal Hazard Elimination Safety Program, with up to \$1 million per project. These limits may be exceeded with proper approval. If the location involves a local roadway, the RSA includes representatives from the local jurisdiction, which may be asked to provide a 10-percent match for some items. In accordance with Section 120 of Title 23 some safety items are eligible for 100 percent Federal funding. A formal evaluation of the program comparing before and after crash rates at the RSA locations is conducted for a three year period following implementation.

## Key Accomplishments

- Established a dedicated RSA program supported by a full-time staff coordinator.
- Completed more than 60 comprehensive RSAs since 2006.
- Identified low-cost safety improvements to benefit the traveling public.
- Increased dialogue about the importance of safety.

## RESULTS

The TDOT RSA program resulted in the implementation of numerous low-cost safety improvements. An added benefit has been the level of safety dialogue within the TDOT and throughout the State as a result of TDOT leadership presentations on the process to engineering and planning groups.

## CONTACTS AND RESOURCES

Steve Allen  
Project Planning Director  
Tennessee DOT  
615-741-2208  
steve.allen@state.tn.us

### RSA Location on Secondary Road



Source: Tennessee Department of Transportation.

# Road Weather Safety Audits Initiative

Level: Manager and Practitioner

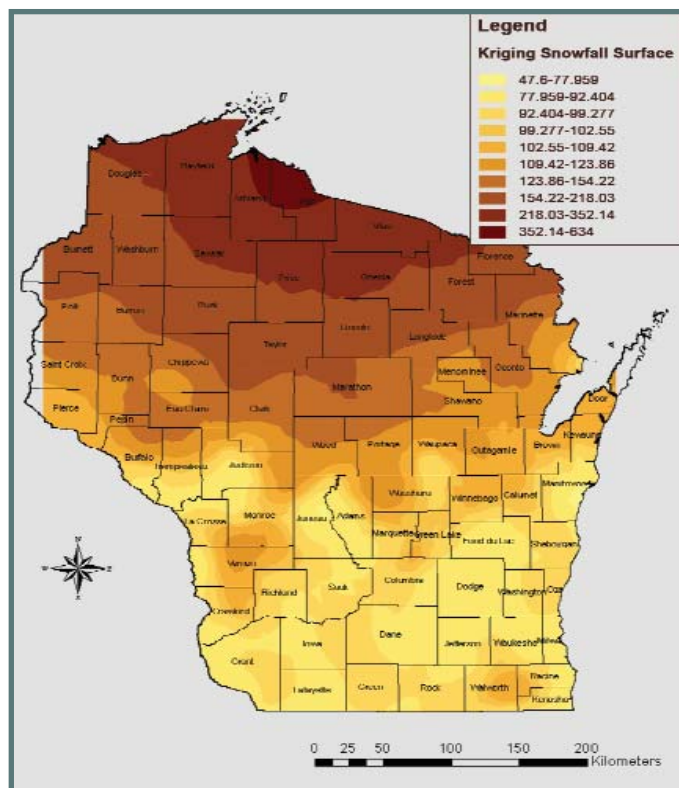
Agency: University of Wisconsin-Madison

## DESCRIPTION

Weather-related crashes are a significant safety concern in Wisconsin, which experiences major seasonal weather changes ranging from hot summers to long winters with heavy snowfall and ice. Approximately 1,430 persons were killed and 116,790 injured in more than 300,000 weather-related crashes on Wisconsin roads from 1999 to 2002. The effects of adverse weather, however, were minimally considered during the Wisconsin Department of Transportation (WisDOT) project planning process or RSAs designed to improve road safety.

To improve the RSA process, the Traffic Operations and Safety Laboratory at the University of Wisconsin-Madison (UW) and WisDOT developed the Road Weather Safety Audits (RWSA) program to review the crash potential and safety performance of roadways in Wisconsin from an adverse weather perspective. The RWSA process attempts to determine the impact of adverse weather conditions (e.g., snow, ice, fog, rain, and wind) and adds a dimension to traditional engineering safety audits. The RWSA

### Wisconsin Predicted Snowfall Levels



Source: Qin, Xiao, David A. Noyce, Zylkia Martin, and Ghazan Khan. Road Weather Safety Audit Program Development and Initial Implementation. In *Transportation Research Board 86th Annual Meeting Compendium of Papers CD-ROM*, TRB, National Research Council, Washington D.C., 2006.

## Key Accomplishments

- A significant contributing factor in traffic fatalities and injuries is now considered through the integration of road weather safety audits into the traditional WisDOT RSA process.
- Several RSAs including weather analysis have been conducted on BHO projects.
- Data on Wisconsin weather patterns, weather-related crash locations, and the relationship between weather patterns and crash rates are available to WisDOT planners and engineers.

process is designed to reveal Wisconsin weather patterns, their relationship to weather-related crashes, and data deficiencies. Data sources now consulted during the traditional RSA process include the Road Weather Information System, National Weather Service COOP weather data, Automated Weather Observing System weather data, and weather-related crash locations.

The RWSA process was developed as part of a UW study funded by the Highway Safety Improvement Program, and has been integrated into WisDOT planning and program practices under the direction of the Bureau of Highway Operations (BHO).

## RESULTS

WisDOT BHO has been piloting the RWSA program since 2007 and has modified the traditional RSA process to incorporate weather elements. WisDOT RSAs use a checklist that now includes weather-related elements in a “Weather Constraints” section. The institutionalization of the RWSA into WisDOT’s RSA process has also heightened awareness of weather issues that impact the infrastructure and operations and affect safety. Recently, WisDOT BHO included the RWSA process and weather data in the long-range traffic operations infrastructure plan.

## CONTACTS AND RESOURCES

Xiao Qin  
Traffic Safety Program Manager - TOPS Laboratory  
University of Wisconsin-Madison  
608-262-3649  
xqin@engr.wisc.edu



# A Multidisciplinary Approach to Safety

**Level: Manager and Practitioner**

**Agency: Colorado Department of Transportation**

## DESCRIPTION

Colorado's advancements in engineering, enforcement, and education over the past seven years resulted in a significant reduction in fatalities. This achievement is the result of a newly implemented problem identification and data analysis process, market research, and targeted enforcement and education campaigns.

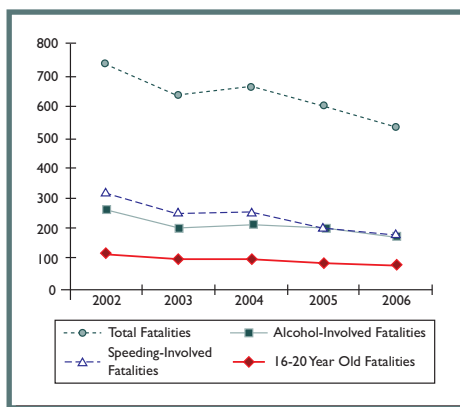
The Colorado Department of Transportation (CDOT) uses a sophisticated analysis methodology to quantify the magnitude of safety problems for different classes of roads. The Level of Service of Safety model compares safety performance at a location with the expected frequency and severity of crashes. Using statistical pattern recognition, CDOT considers 84 elements for every type of facility and looks for any deviation from the norm. For the past seven years every resurfacing, realignment, widening, and hazard elimination project in Colorado has undergone this in-depth safety analysis enabling the identification and mitigation of numerous hazardous locations.

Colorado participates in all five high visibility enforcement initiatives sponsored by the National Highway Traffic Safety Administration, in addition to targeted enforcement on New Years Eve weekend and a weekend in December. In 2003, Colorado began a DUI checkpoint program with earned and paid media targeted at 18- to 34-year olds. Other enforcement initiatives include the purchase of three alcohol breath testing vans in 2006 and a 24-hour course on field sobriety testing. CDOT also started a drug recognition expert training program to identify drivers impaired by legal or illicit drugs.

Another initiative, started in 2005, focused on the Hispanic population because the data show they are overrepresented in highway fatalities. At the time, one of the problems was a lack of tools for the law enforcement community to communicate with Spanish speaking residents who lacked understanding of traffic laws, the effect of alcohol on driving ability, and the court process. The program involved outreach to Spanish speaking community leaders and Spanish language media along with a presence at Hispanic community events to build trust.

The CDOT public information office also targeted other

**Colorado Fatalities  
2002-2006**



## Key Accomplishments

- Developed unique safety performance measures.
- Demonstrated effective multidisciplinary approach.
- Implemented multifaceted approach for reaching the high-risk Hispanic community.
- Developed high level of collaboration between public relations and law enforcement.

high-risk groups through a focus on the 10 counties with the highest number of fatalities. To complement safety belt enforcement, CDOT produced its own Click It or Ticket ads tailored to Colorado and is aggressively obtaining earned media coverage for every enforcement event, which occur eight to nine times per year. Colorado's experience demonstrates an active media plan supported by enforcement and data analysis can change behavior and save lives.

Colorado's success also has been supported by the legislature. The blood alcohol content limit was lowered to .08 in July 2005, and a graduated driver license law was passed in 1999 and strengthened with passenger and other restrictions in 2005.

## RESULTS

- Fatality reduction from 743 in 2002 to 535 in 2006 (28 percent).
- Fatality reductions in key emphasis areas (alcohol, young drivers age 16 to 20, and unbelted drivers and passengers).
- Safety belt use increased from 72 percent to 81 percent (2002 to 2008).

## CONTACTS AND RESOURCES

Jake Kononov  
Director, Research and  
Development, CDOT  
303-757-9973  
jake.kononov@dot.state.co.us

Glenn Davis  
Manager,  
Impaired Driving Programs  
Colorado Office of  
Transportation Safety  
303-757-9462  
glenn.davis@dot.state.co.us

Stacey Stegman  
Director, CDOT Public  
Relations Office  
303-757-9362  
stacey.stegman@dot.state.co.us



# Transit Agency Takes Multifaceted Approach to Pedestrian Safety

**Level: Manager and Practitioner**

**Agency: Washington Metropolitan Transit Authority**

## DESCRIPTION

In the past two years, the safety of pedestrians boarding and exiting buses has taken on a heightened concern in the Washington D.C. area. In January and February 2007, in three separate incidents, a total of four pedestrians died after being struck by a Washington Metropolitan Area Transit Authority (WMATA) bus. In response to these fatal incidents, WMATA implemented a comprehensive set of actions to improve the safety of pedestrians, including assessing high-crash locations, establishing a new bus operator training module on pedestrian safety, and changing bus mirror height.

The District of Columbia DOT (DDOT) and WMATA identified high crash intersections within the city limits based on the number of pedestrian fatalities, injuries, and crashes (including crashes not involving transit buses). The preliminary list was then compared with the top 100 crash intersections to determine any correlation with pedestrian crashes, although no correlation was found. For each identified location DDOT and WMATA evaluated site conditions, the vehicle and pedestrian environment, traffic control devices (including signal phasing), road alignment, transit interface, land use, traffic operations, vehicle speed, parking, lighting, and other factors, and made improvements at 12 locations.

As part of the outreach and training component, WMATA distributed handouts to all bus operators and displayed posters reminding them to pay particular attention to pedestrians and to employ defensive-driving techniques. Additionally, WMATA safety representatives solicited suggestions from bus operators on strategies to improve pedestrian safety, which resulted in a new pedestrian safety training program. In May 2007 WMATA initiated a bus operator refresher course on pedestrian safety. Content for the full-day course, "Street Smart," was developed with input from bus operators, superintendents, street supervisors, transit police, safety department staff, and DDOT Bicycle and Pedestrian Safety staff. Street Smart combines classroom training



Source: Washington Metropolitan Area Transit Authority.

## Key Accomplishments

- Identified and made improvements at 12 high-risk intersections.
- Provided education and information to promote pedestrian safety.
- Developed new operator training refresher course on pedestrian safety.
- Implemented suggestions by bus drivers to make vehicles safer.

with a field trip to a location with concentrated pedestrian and vehicle activity to help operators understand the pedestrian perspective. All 2,500 operators have taken the course and it is now incorporated into new operator training.

Also as a result of bus operator input, WMATA launched a pilot program to determine optimal placement of bus side mirrors. Operators tested bus operation with mirrors installed at varying heights, and lowered mirrors for better visibility of pedestrians.

In April 2008, in conjunction with the regional MPO, WMATA sponsored a Regional Pedestrian Safety workshop focusing on the three 'E's of pedestrian safety: engineering, education, and enforcement. Attendees, including local jurisdiction and WMATA planners, practitioners, and operators, shared best practices in the three areas and converged on several recommendations for WMATA and the MPO Board. One of these was for WMATA to lead an effort to develop bus stop siting guidelines that include safety as a top priority.

## RESULTS

Since WMATA initiated these interventions, only one pedestrian has been fatally injured by a bus (November 2007).

## CONTACTS AND RESOURCES

Kristin Haldeman  
Office of Long-Range Planning  
WMATA  
202-962-1848  
khaldeman@wmata.com



# LYMMO Downtown Circulator – Dedicated Busway

Level: Manager and Practitioner

Agency: Central Florida Regional Transportation Authority

## DESCRIPTION

The Central Florida Regional Transportation Authority (LYNX), the City of Orlando’s Downtown Development Board, and the Community Redevelopment Agency developed the three-mile LYMMO downtown circulator to add capacity to the downtown transportation network by connecting parking facilities around the exterior of the city to major downtown attractions such as the Amway Arena, the Courthouse, City Hall, and major office towers. The dedicated busway configuration was selected to avoid adding more roadways in the downtown and because of the safety benefits of separation from other vehicular traffic.

Busway infrastructure was designed to minimize confusion for auto drivers in the vicinity of LYMMO. The dedicated busway system uses trolley signals, which are displayed on horizontal and diagonal bars, so cars will not confuse general purpose roadway signals with LYMMO signals. Additionally, the pavement type in the dedicated lanes is darker and a rougher surface not noticeable by bus riders, so if auto drivers enter the busway they recognize they are not on the general purpose roadway and exit. “Bus only” pavement markings are installed in the busway as well as signage at intersections indicating that autos are not to turn right into the bus lanes, shown below.

The LYMMO route is one of LYNX’s safest routes. In the 12-year period from August 1, 1997 through July 10, 2008, of the 82 bus-vehicle incidents, no fatal or serious injury crashes occurred. Crashes occur at intersections or when an auto enters the bus lanes, which is a concern mainly on the one and a half blocks of route with a minimal division between the busway and general purpose lanes. Of the 19 crashes involving pedestrians, none has been serious or fatal, and most (11) involved a pedestrian walking into the side of the bus.

## LYMMO Dedicated Busway and Signage



Source: LYNX.

## Key Accomplishments

- Operated LYMMO route for 12 years with no fatal or serious injury crashes.
- Designed dedicated busway system to incorporate key safety features.
- Developed enhanced screening during route bidding process for LYMMO bus drivers to ensure high safety performance.

LYMMO drivers are required to have additional customer service and safety training via the Transit Ambassador program to be allowed to bid on the LYMMO route. Any operator involved in a collision works with the risk management department on customized training to address any additional skills or training needed for safe operation.

## RESULTS

Twelve years of safe operations resulting in no fatal or serious injury crashes.

## CONTACTS AND RESOURCES

Doug Jamison  
Senior Intelligent Transportation Systems Developer  
LYNX  
407-254-6071  
djamison@golynx.com

Linda Connell  
Risk Manager, LYNX  
407-254-6101  
lconnell@golynx.com





## TRANSPORTATION SAFETY: WHAT WILL IT TAKE?

Everyone has a role to play in improving transportation safety. If you drive, walk, bicycle, ride a bus, or are involved in planning, building, or operating our transportation system, you care about safety. An important element of safety improvement will be the cultural shift toward viewing driving as more of a privilege than a right, and toward refusing to tolerate fatalities as the cost of mobility. As these case studies show, you can contribute to safety in many ways.

Transportation safety is multidisciplinary, meaning you can make a positive impact no matter where you work or your job title. Transportation planners need to ensure safety is a factor in how transportation projects are prioritized. Planners can and should also become involved in safety beyond infrastructure because many of the major causes of fatal and injury crashes are behavioral. Engineers can ensure safety is a primary consideration in project design and development. They can also contribute their analytical skills to the larger process of safety problem identification.

Active involvement of safety practitioners is critical to developing effective solutions. Advocates for specific groups, such as the elderly, teenagers, and various other populations can provide insight into their needs and help foster understanding about why certain groups are more at risk. Emergency medical services (EMS) staff understand response times are the key to survival for people involved in crashes. The EMS community can work with traffic management and transportation planning staff to improve response time to crash sites despite traffic delays or obstructions.

Law enforcement officers can ensure traffic safety is a major part of their job because attention to safety can help reduce crime overall. Law enforcement professionals should make sure their colleagues understand why complete and accurate data in crash reports are critical for understanding and correcting transportation safety problems. Law enforcement can also be more involved in infrastructure planning to ensure sufficient areas are provided for traffic surveillance purposes. Officers can provide invaluable information about how people are behaving on roadways and their understanding of traffic laws.

Education strategies continually evolve to gain people's attention and change their behavior. Public relations professionals use sophisticated methods to reach key demographics and stretch public information dollars by using media to cover safety stories. School superintendents can reach out to high school students and their parents with critical safety messages. Bar and restaurant owners can educate their servers and patrons on alternatives to drinking and driving.

When people are engaged with passion and creativity, the possibilities for improving transportation safety are limitless. Your involvement will make a difference. Get motivated, get involved, and save more lives!



## TRANSPORTATION SAFETY RESOURCES

### Key Web Sites

FHWA Office of Planning: <http://www.fhwa.dot.gov/planning>

FHWA Office of Safety: <http://safety.fhwa.dot.gov/>

National Highway Traffic Safety Administration: <http://www.nhtsa.dot.gov>

Federal Transit Administration: <http://www.fta.dot.gov>

Federal Motor Carrier Safety Administration: <http://www.fmcsa.dot.gov>

Transportation Safety Planning Working Group: <http://tsp.trb.org>

### Technical Resources

AAA Foundation for Traffic Safety research and educational materials: <http://www.aaafoundation.org>

“Bicycle Safety Education Resource Center” developed by FHWA and hosted by PBIC at: <http://www.bicyclinginfo.org/education/resource/fhwa.html>

*Countermeasures that Work: A Highway Safety Countermeasure Guide for State Highway Safety Offices, Governors*  
Highway Safety Association, third edition, 2008: <http://www.ghsa.org/html/publications/index.html>

Crash Cost Estimates by Maximum Police-Reported Injury Severity within Selected Crash Geometries with information on economic cost per crash by severity level for 22 crash types:  
<http://www.tfhrcc.gov/safety/pubs/05051/>

FARS Web-Based Encyclopedia with links to national reports and statistics: <http://www-fars.nhtsa.dot.gov/>

FHWA Office of Safety – Pedestrian Safety web site: [http://safety.fhwa.dot.gov/PED\\_BIKE/ped/](http://safety.fhwa.dot.gov/PED_BIKE/ped/)

FHWA Office of Safety – Road Safety Audits web site: <http://safety.fhwa.dot.gov/rsa/index.htm>

*FHWA Highway Design Handbook for Older Drivers and Pedestrians:*  
<http://www.tfhrcc.gov/humanfac/01103/coverfront.htm#toc>

*FHWA Roadway Delineation Practices Handbook:*  
<http://www.fhwa.dot.gov/tfhrcc/safety/pubs/93001/93001.pdf>

FHWA resource site about rumble strips:  
[http://safety.fhwa.dot.gov/fourthlevel/pro\\_res\\_rumble.library.htm](http://safety.fhwa.dot.gov/fourthlevel/pro_res_rumble.library.htm)



## Technical Resources (continued)

FHWA web site on safe roadside hardware:

[http://safety.fhwa.dot.gov/fourthlevel/pro\\_res\\_road\\_nchrp350.htm](http://safety.fhwa.dot.gov/fourthlevel/pro_res_road_nchrp350.htm)

Governors Highway Safety Association providing information on safety funding sources and state highway safety activities: [www.ghsa.org](http://www.ghsa.org)

*Guide to Management of Roadside Trees*, Zeigler, 1986:

<http://safety.transportation.org/htmlguides/trees/assets/GuideMgmtRoadSideTrees.pdf>

Insurance Institute for Highway Safety web site tracking legislation and providing research and statistics on highway safety: <http://www.iihs.org>

International Association of Police Chiefs – Traffic Safety:

<http://www.iacptechnology.org/TrafficSafety.html>

*Manual on Uniform Traffic Control Devices (MUTCD)*, FHWA, 2003: <http://mutcd.fhwa.dot.gov/>

Motorcycle Safety Foundation (MSF): <http://msf-usa.org>

*National Agenda for Motorcycle Safety*, NHTSA and Motorcycle Safety Foundation:

<http://www.nhtsa.dot.gov/people/injury/pedbimot/motorcycle/00-NHT-212-motorcycle/toc.html>

National Safe Routes to School Information Center: <http://www.saferoutesinfo.org>

National Work Zone Safety Information Clearinghouse: <http://wzsafety.tamu.edu>

NCHRP Report 500: *Guidance for Implementation of the AASHTO Strategic Highway Safety Plan*:

<http://safety.transportation.org/guides.aspx>

NCHRP Report 501: *Integrated Safety Management Process*:

[http://onlinepubs.trb.org/Onlinepubs/nchrp/nchrp\\_rpt\\_501.pdf](http://onlinepubs.trb.org/Onlinepubs/nchrp/nchrp_rpt_501.pdf)

NCHRP Report 546: *Incorporating Safety into Long-Range Transportation Planning*:

[http://tsp.trb.org/assets/nchrp\\_rpt\\_546.pdf](http://tsp.trb.org/assets/nchrp_rpt_546.pdf)

NCHRP Research Results Digest 299: *Crash Reduction Factors for Traffic Engineering and Intelligent Transportation System Improvements: State-of-Knowledge Report*, November 2005

Network of Employers for Traffic Safety: <http://www.trafficsafety.org>



## GLOSSARY

**4Es** – The four disciplines that contribute to transportation safety: engineering, enforcement, education, and emergency medical services.

**Checkpoint** – Roadblock implemented by law enforcement where every vehicle is stopped and drivers evaluated for possible impairment with alcohol or drugs.

**Countermeasure** – A strategy designed to address a specific safety problem defined by crash data. For example, to prevent roadway departure crashes, rumble strips are often installed along roadways to alert drivers when they are leaving the traveled way.

**Emphasis Area** – Each state is required to develop data-driven safety emphasis areas as part of the SHSP process. These may include the 22 emphasis areas developed by the American Association of State Highway and Transportation Officials and National Cooperative Highway Research Program in their Strategic Highway Safety Plan. Emphasis areas may be identified by infrastructure (e.g., utility pole collisions, intersections), crash types (e.g., head-on collisions, lane departures), behavior (e.g., impaired driving, speeding, occupant protection), vehicle type (e.g., motorcycles, heavy trucks), population at risk (e.g., young drivers, older drivers), or vulnerable users (e.g., pedestrians, bicyclists).

**FARS** – Fatality Analysis Reporting System. National database of fatal crashes since 1975 that allows detailed analysis of the driver, vehicle, involved persons, and crash.

**Federal-Aid Program** – An umbrella term, not defined in law, which in general refers to most of the Federal programs providing highway and transit funds to the states. An example of a Federal-aid program is the Highway Safety Improvement Program (HSIP), which includes the Hazard Elimination Safety Program (HESP) and High Risk Rural Roads Program (HRRRP).

**FHWA** – Federal Highway Administration.

**FMCSA** – Federal Motor Carrier Safety Administration. Focuses on reducing crashes involving large trucks and buses.

**FTA** – Federal Transit Administration.

**GHSO** – Governor’s Highway Safety Office. Each state and territory is required to have a GHSO that manages primarily behavioral safety efforts, most of which are funded through grants from NHTSA. In approximately one-third of states the GHSO is housed within the DOT, and the remainder are located in the Department of Public Safety or Department of Motor Vehicles.

**MPO** – Metropolitan Planning Organization. Required in all metropolitan areas with a population of 50,000 or more, these agencies conduct regional transportation and other planning activities and are required to develop the region’s Metropolitan Transportation Plan.



**MTP** – Metropolitan Transportation Plan (also known as regional transportation plan). Intermodal transportation plan developed and adopted through the metropolitan transportation planning process for the metropolitan planning area.

**NHTSA** – National Highway Traffic Safety Administration. Provides national and state research and analysis on all aspects of transportation safety and funds many behavioral efforts.

**Planning Factors** – SAFETEA-LU requires eight planning factors to be considered within the scope of the transportation planning process. They include economic vitality, safety, security, increased accessibility and mobility, protection of the environment, integration and connectivity of the intermodal transportation system, system management and operation, and system preservation.

**RSA** – Road Safety Audit. A formal safety performance examination of a roadway or intersection by an independent, multidisciplinary audit team to identify the elements of the road that present safety concerns and opportunities for mitigation.

**RTPA** – Regional Transportation Planning Association.

**SAFETEA-LU** – Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users. Authorizes the Federal surface transportation programs for highways, highway safety, and transit for the five-year period 2005-2009.

**SHSP** – Strategic Highway Safety Plan. Required by SAFETEA-LU, these state transportation safety plans include analysis of crash data to identify emphasis areas where a reduction in fatal and injury crashes is needed, as well as strategies for improvement. Plans must be developed via the involvement of a wide range of stakeholders representing the 4Es of safety.

**Statewide Transportation Plan** – Official statewide, intermodal transportation plan that is developed through the statewide transportation planning process.

**STIP** – State Transportation Improvement Program. Identifies projects from the state’s long-range transportation plan that are funded and will be implemented in the short term.

**TIP** – Transportation Improvement Program. Identifies funded projects to be implemented in the short term from the MPO’s regional transportation plan.

**Traffic Safety Information System (Traffic Records)** – Data needed for determining the severity and extent of traffic safety problems includes information on crashes, drivers, vehicles (including commercial vehicles), roadway environment, injuries, and traffic violations. Therefore, the databases that comprise the traffic safety information system are crash, roadway/traffic, vehicle registration, driver licensing, emergency medical services/medical, and citation/adjudication.

**Federal Highway Administration**

*Office of Planning E72-123*

1200 New Jersey Ave, SE, Washington, D.C. 20590

Telephone: 202-366-0106 Fax: 202-493-2198

**Federal Highway Administration**

*Office of Safety E71-115*

1200 New Jersey Ave, SE, Washington, D.C. 20590

Telephone: 202-366-2288 Fax: 202-493-3222

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