

National Cooperative Highway Research Program

RESEARCH RESULTS DIGEST

March 2002—Number 265

Subject Area: IVB Safety and Human Performance

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AASHTO Strategic Highway Safety Plan—Case Studies

This digest presents the results of NCHRP Project 17-18(6), "AASHTO Strategic Highway Safety Plan—Case Studies."

The objectives of this study were to document how states have used the Plan to develop their own strategic safety plans and to identify successful applications of the Plan's initiatives by the states. The digest was prepared by John J. Zogby, Transportation Safety Management Systems.

SUMMARY

This digest presents the findings of five case studies documenting the use of the AASHTO Strategic Highway Safety Plan in developing state strategic safety plans. The innovative concepts and initiatives undertaken by these states will be of interest to safety practitioners in other states and local agencies.

INTRODUCTION

The Standing Committee for Highway Traffic Safety of the American Association of State Highway and Transportation Officials (AASHTO) has, since its inception, played a prominent role in advancing highway safety action for the nation's highways. The AASHTO Strategic Highway Safety Plan builds on past efforts in partnership with the Transportation Research Board (TRB), the Federal Highway Administration (FHWA), and the National Highway Traffic Safety Administration (NHTSA) to identify the most promising areas to reduce crashes by strategically targeted countermeasures.

"This plan embodies a bold and concerted effort across elements of highway safety to achieve the goal of reducing highway fatalities by 5,000 to 7,000 per year by 2004, both cost-effectively and in a manner acceptable to most Americans."¹ The Strategic Plan is part of a larger process to prepare the highway safety community in the nation to deal with changes in the highway environment. The Plan will integrate current highway safety functions and future program plans through the efforts

of state and local highway safety partners and stakeholders.

The need to increase the awareness of safety is highlighted throughout the AASHTO Strategic Highway Safety Plan. Efforts are needed to increase understanding by practitioners, the public, and decision makers about issues in highway safety to change behaviors, to increase support for safety programs and projects, and to use the most effective practices to ensure the highest level of highway safety. It is critical that the proper messages get delivered to each target audience.

To achieve this end, the TRB, through the NCHRP, is pursuing several research initiatives intended to encourage the implementation of the recommendations of the AASHTO Strategic Highway Safety Plan that will, in fact, be applied in practice. The following are research projects under way:

- Project 17-18: Strategic Highway Safety Plan Implementation Support,
- Project 17-18 (2): Strategic Highway Safety Plan Web Site,
- Project 17-18 (3): Strategic Highway Safety Plan Implementation Guidelines,
- Project 17-18 (4): Highway Safety Manual,
- Project 17-18 (5): Model Statewide Safety Approach,
- Project 17-18 (6): AASHTO Strategic Highway Safety Plan—Case Studies (this report),
- Project 17-18 (7): Technology Transfer Plan, and
- Project 17-18 (8): Human Factors Guidelines for Road Systems.

Background

AASHTO, through its Standing Committee for Highway Traffic Safety, began this initiative in 1996 by assembling safety professionals from across the nation with expertise in all areas of highway safety. This assemblage included representatives from the private and public sector at national, state, and local levels. The charge was to address all areas of highway safety, including highway infrastructure, vehicle design, driver behavior, injury prevention, and occupant protection in the three analytical phases of the crash matrix.

The Plan is organized into six major safety categories with 22 topical areas and encompasses 92 strategies. The major categories are Drivers, Special Users, Vehicles, Highways, Emergency Medical Services, and Management. The management category places requirements on cost-effective implementation and the prerequisite for safety management procedures to be in place for effective development of practices and outcomes. The Plan also identifies areas where safety professionals from different disciplines and agencies must work together in partnership to achieve the stated goals.

Finally, the Plan also "...provides a basis for adjusting priorities in capital funding and research. It makes the case for devoting more resources to safety and for considering safety explicitly in all aspects of highway planning, design, operations, and maintenance."²

Objective

The objective of this research effort is to present, through case studies, innovative, integrated, and successful application of the initiatives in the AASHTO Strategic Highway Safety Plan by state and local safety officials.

Methodology

The primary method used in this effort was on-site visits to five preselected states. A set of 24 questions and a list of six management issues were sent to the states prior to the visits (see Appendix A). Safety officials from all five states were familiar with the AASHTO Plan and have indicated using the Plan in their state's safety programs.

STATE CASE STUDIES

Several states have used the AASHTO Plan as a comparison against their own strategic plan. Others have used it as a checklist or a benchmarking document. This research presents the case studies of five states that have used the AASHTO Plan in their highway safety planning and programming processes. The five states studied were Iowa, North Carolina, Pennsylvania, Washington, and Wisconsin. See Table 1 for the state safety profiles. Their case studies follow.

IOWA

Iowa's highway safety program is administered through its Safety Management System (SMS) Committee, which oversees management approach. The Committee is a broad-based membership of highway safety advocates from federal, state, and local governments; academia; and the private sector. The formation of this Committee was a result of the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. Because of its successful communication, coordi-

TABLE 1 Safety profile contrast of the five study states

STATE	POPULATION	ROAD MILEAGE		CRASHES		
		State	Local	Fatalities	Injuries	Total
Iowa	2,926,324	8,833	94,438	445	35,534	64,485
North Carolina	8,049,313	78,245	21,542	1,563	142,925	220,082 ^a
Pennsylvania	12,281,054	40,606	78,394	1,520	131,471	147,253 ^b
Washington	5,984,100	7,046	73,219	712	83,781	140,215 ^c
Wisconsin	4,891,769	11,752	100,153	744	61,577	130,950 ^d

^a Reporting threshold \$1,000 property damage to any one vehicle or injury

^b Reporting threshold property damage to any one vehicle that requires the vehicle to be towed

^c Reporting threshold \$700 property damage to any one vehicle

^d Reporting threshold \$1,000 property damage to any one vehicle or injury

nation, and collaboration with member safety partners, it continues as a dynamic safety organization despite the loss of a regulatory mandate from federal legislation.

In order to address its most pressing highway safety problems, Iowa developed a “Toolbox of Potential Highway Safety Improvement Strategies” that was modeled following the strategies of the AASHTO Strategic Highway Safety Plan. The Iowa toolbox modified the AASHTO Plan in some strategic areas and added seven emphasis areas based on their safety analysis and input from its SMS Committee partners.

The Iowa Office of Traffic and Safety provides many of its safety partners with automated analytic tools for their safety analysis. The software was developed in collaboration with technical staff in the Center for Transportation Research and Education of the Iowa State University. This program also provides hands-on training to local safety analysts in the analytic software tools.

The SMS Committee establishes task forces to address the various highway safety issues. Membership on a task force is not limited to Committee members, and safety advocates are invited to present their ideas and join in the task force deliberations and problem resolution activity. The Toolbox strategies were distributed to more than 800 agencies, counties, and cities for review and comment. A statewide public opinion survey was conducted, and selected focus group input was solicited from enforcement officers, older drivers, young drivers, and highway and traffic engineers.

This collaborative effort has fostered a multidisciplinary approach to safety problem resolution with a high level of consensus on selected strategies. The strategies involve improvements to the road physical structure along with education, enforcement, and emergency response. Everyone is invited to participate in program development, and selection with implementation is left to the responsible operating agency according to its safety and budgetary needs. The Toolbox is considered a living or dynamic plan with upgrades and innovative revisions encouraged.

Although the Toolbox strategies are not mandated but rather left to the responsible state or local agencies, private entities, and other jurisdictions to decide on implementation, there is potential funding available through several federal, state, local, and private funding sources. Some of these funding sources include the following:

- Management System Funds (DOT),
- Traffic Safety Improvement Program (funded by one-half of 1 percent of the Road Use Tax),
- Highway Safety Section 402,
- Traffic Records Section 411,
- Seat Belt Incentive Section 157,
- HES Program,
- Statewide transportation enforcement funds,
- Agency budgets, and
- Private matches.

Several strategies have been implemented through the following activities:

- Speed limit task force and annual safety impacts report to state legislators;
- Older driver task force;
- Pavement-marking visibility research for older drivers;
- School-based bicycle safety education pilot;
- Emergency response task force—database development and other projects;
- Traffic-calming urban design;
- Bike/pedestrian accommodation policy;
- Multistate highway safety peer exchange;
- Formation of local safety groups;
- Access management research conference, education, and handbooks;
- Deer/vehicle collision study;
- Improved emergency response to motor vehicle crashes;
- Expanded drug recognition expert training;
- Red light running task force;
- Statewide traffic records advisory committee; and
- The Iowa Traffic Control and Safety Association Conference support.

Strategies under development include the following:

- Rural expressway intersection design;
- Enhanced pavement markings and signing;
- Paved shoulder/rumble strip standards;
- Age-related older and younger driver videos;
- Systemwide highway safety analysis approach;
- Aggressive and distracted driving analysis;
- Older Driver Public Awareness Conference (June 2002);
- Enhanced American Association of Retired Persons’ (AARP’s) 55ALIVE and Assimilate Older Driver Resources; and
- Improved effectiveness of Public Service Announcements review.

Summary

The strength in Iowa’s highway safety program lies in its mature SMS process. Many of the working task force and subcommittee groups of highway safety partners have institutionalized their working relationship through team building activity over the years. This multidisciplinary approach, with the support and encouragement of the Office of Traffic and Safety, continues as a major positive force in Iowa’s highway safety community.

The Toolbox approach to highway safety countermeasures is also a novel approach to a persuasive philosophy of state and local cooperation in resolving the state’s safety problems. This philosophy and working relationship with the Iowa safety partners used the AASHTO Plan con-

structively and applied those strategies most appropriate to Iowa's needs.

NORTH CAROLINA

North Carolina enjoys an active coordination of safety initiatives with federal, state, and local safety agencies. This coordination is an outgrowth of the state's initial efforts in establishing Safety Management Systems (SMS) coordinating committees. In addition, the state safety program is supported by a strong relationship with the Highway Safety Research Center housed at the University of North Carolina.

The principal agencies involved in SMS (in particular the DOT agencies of Traffic Engineering and Safety Systems Branch, Division of Motor Vehicles, and the Governor's Highway Safety Agency) work closely on the state's safety initiatives. The SMS approach has fostered partnerships to address the highway safety problems in the state. This partnership also includes the FHWA, the Federal Motor Carrier Safety Administration (FMCSA) and the NHTSA at the national level, in addition to private organizations most affected by safety initiatives at the state level. The SMS partnership used the AASHTO Strategic Highway Safety Plan as a guide in developing their major safety initiatives in the state's Highway Safety Plan, the Motor Carrier Safety Assistance Program, and the Highway Safety Improvement Plan.

Some of the safety initiatives also emerged from partnership activities such as the interdisciplinary process improvement and safety task force teams. Upgrades and additions to the highway safety information system that are used by the teams have enhanced these efforts. While upgrading to meet national data standards, the system was improved to meet the needs of the safety community user.

While applying the AASHTO Plan as a guide, North Carolina is in the process of developing a safety plan that will identify key safety goals and develop performance measures that will be directed toward reducing automobile crashes and their resulting severity on the state's streets and highways. AASHTO safety strategies were integrated into the North Carolina safety plan on the basis of the informed decision-making capabilities of the highway safety information system.

North Carolina has ongoing safety programs in all of the emphasis areas of the AASHTO Plan; however, it has recently initiated several enhanced programs under the guidance of the AASHTO Plan. Examples of some of these programs follow:

- Examination of head-on, run-off-the-road crashes and fixed object roadside hazards (trees and utility poles);
- Review of two-lane roads (rural and urban);
- Review of pedestrian and bicycle safety;
- 3R/4R opportunities to improve highway safety;
- Improved safety audits; and

- Improved integration of safety into key planning, design, construction, and maintenance project phases.

Major safety initiatives recently implemented by the Traffic Engineering and Systems Branch of North Carolina's DOT are as follows:

- Median barrier program,
- Work zone safety,
- Motor carrier safety,
- Suspended/revoked drivers,
- Treatment of bridge ends, and
- Mitigating the consequences of hitting trees and utility poles.

Following is a description of these major program initiatives:

Median Barrier Program - Safety analysis identified across-median crashes as a major safety concern taking 30 lives and injuring 300 motorists each year on North Carolina's major highway facilities. These losses prompted the state's Traffic Engineering and Safety Systems Branch to develop a three-pronged strategy to address this type of crash. The strategy is being implemented in three phases as follows:

1. Identify and install protective median barriers on freeways with across-median crash histories.
2. Identify and systematically protect all freeway sections with median widths of 70 ft or less.
3. Revise policies to prevent creating additional unprotected narrow freeway median sections.³

Work Zone Safety - The DOT is implementing an extensive statewide public information and education campaign concerning work zone safety. This campaign will target motorists on North Carolina's roadways to alert them of the dangers associated with work zones. Special emphasis in the program will be given to educating DOT employees, contractors, and all state employees on the increasing need for work zone safety awareness.

Motor Carrier Safety - North Carolina intensified its motor carrier safety program as a result of being listed as one of 10 states with the highest motor carrier fatal crash frequencies. The program with the cooperation of the North Carolina Trucking Association included a Truck Watch project whereby trucking company safety directors notify the highway patrol when they observe erratic driving behavior by truck drivers. The safety directors follow up this action by sending a report to the company of the offending driver. Other motor carrier safety programs underway are as follows:

- Reduction in the targeted high commercial-vehicle crash rate in 21 counties that were selected by safety

analysis and input from the 425 enforcement officers in the Commercial Vehicle Enforcement unit.

- Commercial-vehicle awareness public education program.
- Cross training of all officers in the Motor Carrier Enforcement program in all motor carrier programs.

Suspended/Revoked Drivers - The Governor's Highway Safety Program Office is undertaking an effort to keep unlicensed/suspended/revoked drivers off the road. This was a project prompted by the AASHTO Plan.

Treatment of Bridge Ends – North Carolina's Bridge Maintenance and Traffic Engineering and Safety Systems Branches are jointly working on identifying and systematically prioritizing narrow bridges with unprotected concrete parapet type rails for protective approach guardrail, end treatments, and, where appropriate, other countermeasures. The development of a collaborative Bridge Approach Safety Index will be used to help identify and prioritize the locations that have had a history of an assortment of bridge approach and bridge involved crashes. An additional criterion is that the bridges are not scheduled and/or funded for replacement or rehabilitation, and are expected to remain in service for over 10 years. The bridges under consideration are characterized as narrow; carry increasing volumes; and carry a variety of vehicle types, sizes and modes.

Much like North Carolina's Median Barrier Safety Initiative, the Exposed Bridge End Safety initiative will provide a significant improvement to traditional Bridge Sufficiency rating scales and traditional Highway Safety Improvement Program Bridge Warrants by providing a proactive, preventative capability while still addressing the locations with historical crash problems.

Mitigating the Consequences of Hitting Trees and Utility Poles – North Carolina's tree- and vegetation-lined scenic roadsides are a part of the State's appeal to tourists, businesses, and citizens. With over 63,000 mi of state-maintained secondary roads—that are, in many cases, old, winding, and often narrow farm-to-market routes that have been paved—North Carolina has a significant ongoing challenge to prevent and reduce the severity of run-off-the-road crashes.

Similar to Pennsylvania's approach to roadside safety, North Carolina has investigated the magnitude of the tree crash problem and has focused efforts to identify the facilities that are experiencing high concentrations of run-off-the-road fixed object crashes with emphasis on fatalities and serious injury crashes. North Carolina's tree-involved crashes are largely concentrated within 20 of the state's 100 counties.

North Carolina also is participating as a demonstration site for the AASHTO Plan implementation of countermeasures to reduce injuries and fatalities from collisions with trees in hazardous locations. Efforts are being made to

strengthen design and operational maintenance policies that influence roadside clear zones.

Summary

North Carolina's DOT did not have a strategic safety plan in place when the AASHTO Plan was published; however, it had a strong highway safety commitment. This commitment was evident by the existence of an SMS with representatives from the major safety agencies in the state. Because of the existence of SMS coordinating activities and the strong champion role of the Traffic Engineering and Safety Systems Branch, the DOT was able to incorporate elements of the AASHTO Plan into their operating structure successfully.

The major safety initiatives being carried out by the DOT have their basis in the AASHTO Plan. These initiatives were modified and enhanced by the state's SMS members through analysis of highway safety information and the state's operating environment.

PENNSYLVANIA

The Pennsylvania Department of Transportation (PennDOT) possesses a very mature strategic planning process. Most recently it has incorporated many of the features of the Baldrige Criteria for Performance Excellence into its management and operating philosophy. A major focus area of the strategic management philosophy is safety. Safety is an essential part of the department's Transportation Improvement Plan (TIP).⁴

The Secretary and his six Deputy Secretaries each championed a focus area in the developmental stage of the department's TIP. When the executive staff were satisfied that the focus area was ready for successful implementation, it was incorporated into the department's operating budget, assigned to the appropriate operating unit and given a charge for achievement by defined performance measures.

It was through this process that the AASHTO Strategic Safety Plan was considered, modified, and made part of the state's highway safety strategy. The focus area is under the Deputy Secretary for Highway Administration who is responsible for achieving a fatality reduction in incremental steps over a set period of time. The Bureau of Highway Safety and Traffic Engineering is the responsible operating agent.

Pennsylvania, like many states, operates on a July 1 through June 30 budgeting cycle. The planning process, usually multiyear, treats the budget year as the action plan year. After the budget is passed by the legislature and signed by the Governor, a re-budget is often necessary to adjust to the changes that are inevitable through this process. However planning for the next budget year has already begun. The action plans (strategic plans) presented to the Governor by agencies under his authority are the building blocks for

the budget process. Budgets are instruments for spelling out the details of the strategic decisions of the Governor and his cabinet. The safety action plans must be directly tied to the allocation of resources and be a part of the state's strategic direction. Selecting a set of highway safety programs also requires the dedication of necessary resources for these programs, often for several years into the future.

The Safety Planning Process

As part of the safety planning process (see Appendix B), the Director of Highway Safety and Traffic Engineering, the lead safety agency in the PennDOT, developed strategies in concert with the direction developed through the Baldrige process mentioned earlier. Through this process, the Department developed a Strategic Focus Area in safety and set a goal of a 10 percent reduction in fatalities by 2005. Two sets of performance measures were established:

1. A reduction in fatalities through implementation of numerous low-cost road safety improvement projects at targeted high crash locations. Locations included sections of roadways that have concentrations of head-on-, tree-, utility pole-, pedestrian-, DUI-, aggressive driving-, unbelted injuries-, run-off-the-road-, and curve or guiderail-associated crashes. Signalized and non-signalized intersections with high numbers of crashes are also included.
2. Safer driver performance through education and enforcement initiatives as follows:
 - Safety belt usage – increase by 3 percent,
 - Alcohol-related fatalities – reduce by 3 percent,
 - Aggressive-driving fatalities – reduce by 3 percent,
 - Truck-related crashes – reduce by 3 percent, and
 - Pedestrian-related fatalities – reduce by 3 percent.

With this strategic goal as a base and the AASHTO Plan as a model, targeted strategies were developed in the following areas that are expected to achieve, if not exceed, the goal.

Drivers

- 16 to 18 years old
- 65 years and older
- Aggressive drivers
- Impaired drivers
- Suspended/revoked drivers
- Unbelted drivers and occupants
- Sleepy/inattentive drivers

Vehicles

- Vehicle defects
- Truck-related crashes
- Motorcycles

Pedestrians

- Urban areas

Highways

- Head-on crashes (two-lane highways)
- Head-on crashes (freeways)
- Nonsignalized intersections
- Signalized intersections
- Curves
- Trees
- Utility poles
- Guiderail
- Pedestrians
- Trains

Post-crash

- Deaths before EMS unit arrives at the scene

Approach

The comprehensive approach used by PennDOT targeted high-crash frequency locations and operating behaviors to realize a high probability of success. There are two major plan components of this safety management plan: (1) Infrastructure improvements (low-cost safety improvements) and (2) Safer driver performance.

Infrastructure Improvements

The targeted improvements were based on the safety analysis of crashes and primarily highway and driver exposure data. The safety analysis shows that 35 to 40 percent of crashes occurred on 3 to 4 percent of the state's public road system. The countermeasures, through this analysis, targeted initiatives where successful outcomes would be most probable. Some of the low-cost initiatives under way required communication, coordination, and cooperation with several safety partners outside PennDOT for successful implementation. Among the more noteworthy of these, which can be emulated by other jurisdictions, are as follows:

- Advanced Curve Warning – Placement of "SLOW" pavement markings at horizontal curves where concentration of crashes occurred in a 5-year period.
- Placement of centerline rumble strips where concentration of head-on crashes occurred on two-lane highways.
- Removal or delineation of trees where concentration of crashes involving trees occurs in a set segment of highway.
- Removal, relocation, and delineation of utility poles where concentrations of crashes occur in a set segment of highway.
- Upgrade and/or delineate guiderail where concentration of crashes occurs for a set segment of highway.
- Installation of median barrier on limited access or free-

way facilities where a high frequency of crossover head-on crashes occur.

- Installation of “SLOW” durable pavement markings, innovative signing, minor brush cutting, and delineation at stop-controlled intersections with a concentration of crashes.
- Application of major improvements at stop-controlled intersections, such as signalization, ITS, or sight distance improvements where 10 or more crashes occur.
- Introduction of “dot” treatments at the high aggressive-driver crash areas. A series of dots were placed on the pavement along with guide signs that assist motorists in maintaining safe following distances.
- Placement of innovative signing messages on highly reflective sheeting to emphasize driver behavior issues in corridors having high incidences of driver-related crashes. These innovative messages were placed in a series along the roadway to identify the detrimental behavior, to emphasize safe driving, and to alert drivers to the presence of active/visible enforcement. Partnering efforts with the state and local police, district magistrate and media were established in an attempt to correct the aberrant driver behavior.

Safer Driver Performance

This initiative focused on (a) intoxicated drivers, (b) aggressive drivers, (c) seatbelt usage, (d) truck-car conflict, and (e) pedestrian safety.

Public Information & Education (PI&E) campaigns are underway to target high DUI and high unbelted-crash areas. These campaigns include paid radio advertisements supplemented by billboards, newspaper, social events, banners, pamphlets, and a sign showing the DUI crash victims along with a safety message. Two highway engineering districts were selected, one for the DUI campaign and the other for the seatbelt campaign. Evaluations of both pilots are underway.

Based on preliminary positive results of these pilots, additional funding is budgeted to expand the effort for the state fiscal year 2001-02. Four additional highway districts were selected for the PI&E campaign. This initiative will use a combination of the paid radio public service announcements, billboards, banners, pamphlets placemats (for bars & restaurants) and special corridor signing to address the DUI or seatbelt issues.

The districts will initiate a collaborative approach with the municipalities, state and local police, liquor control board, the tavern and bar distribution industries, the county comprehensive safety corridors, the MADD organization, alcohol-related safety stakeholders and safety belt stakeholders. A sign with the DUI crash victim’s picture with a safety message is piloted at one location as a supplement to the DUI campaign. Upon completion of evaluations of the pilots, this program will be fully deployed, modified or eliminated based on the results.

Local Road Safety

PennDOT has also targeted high-frequency crash locations on Pennsylvania’s local road system. They are working with the Metropolitan Planning Organizations (MPOs) and the federal Local Transportation Assistance Program (LTAP) to identify solutions (many of the above will be considered) and to help them with implementing countermeasures.

PennDOT is leveraging its available resources (state, federal, and local) to assist local governmental agencies in achieving crash reduction performance measures on the roadways under their jurisdiction.

Summary

The objective of the Pennsylvania approach is to target high concentrations of crashes and apply low-cost physical improvements extensively across the state, along with increased enforcement and education where driving behavior is indicated as a high-frequency contributor to crashes. Expansion of the initiatives is planned where experience indicates success.

The overall objective is to reduce crashes on all public roads in Pennsylvania. The performance measure is a 10 percent reduction of fatalities in a 5-year period ending in 2005. This reduction would amount to 148 lives saved.

WASHINGTON

The state of Washington used the AASHTO Strategic Highway Safety Plan as a guide in developing its strategic highway safety plan. While the Washington plan has initiatives in 20 of the 22 strategic areas suggested in the AASHTO plan, Washington used a 10-year crash data pool to identify the issues to be addressed and the applicability of the strategies chosen to meeting its vision.

The vision was a collaborative effort of many state agencies with a vested interest in highway safety and two private sector organizations: the state chapter of the American Automobile Association (AAA) and the Washington Trucking Association. The focal point of the effort is the three most prominent state safety agencies, the Traffic Safety Commission, the Department of Transportation, and the State Highway Patrol. However, success for achieving the vision will depend to a large degree on local agency participation. This is because two-thirds of the crashes involving death and disabling injury that occur in the state are on public roads under the jurisdiction of local governments. And 75,000 mi of the 82,000 mi of public roads are on the local road system.

The Plan, entitled “Target Zero,” boldly envisions “a transportation system with no deaths or disabling injuries” by the closing of its 30-year planning horizon. The following are the three philosophic underpinnings of the Plan:

- Recognize and build upon existing safety programs,
- Bring traffic safety partners together, and
- Coordinate a statewide safety vision and goals.

“Target Zero” endorses 12 emphasis areas and recommends over 62 safety strategies for implementation by the state’s highway safety stakeholders. The stakeholders can apply for grant money (\$6 million in 2001) set aside by the state Transportation Department and Traffic Safety Commission from its share of the Transportation Equity Act for the Twenty First Century (TEA-21) Sections 153 and 157. In addition to the TEA-21 monies, the state safety partners laced together funds available for highway safety from all budgetary streams to achieve a coordinated safety program. Projects are reviewed and approved for grants if they are in the emphasis areas and will positively affect the overall vision. Annual evaluations of the projects are planned.

The 12 Emphasis Areas

- **Age Extremes:** Identify those most at risk and develop specific crash reduction programs.
- **Aggressive Drivers:** Determine the frequency of road crashes related to aggressive driving and develop appropriate countermeasures.
- **Bicycle Safety:** Develop programs and implement laws to make the road safer for bicycles.
- **Data and Technology:** Require better programs for the collection and distribution of statewide traffic collision data.
- **Emergency Response:** Set appropriate response times and training for emergency services.
- **Impaired Drivers:** Discourage impaired driving as socially acceptable behavior.
- **Large Trucks:** Increase enforcement and education, and encourage safe interaction between cars and large trucks.
- **Pedestrian Safety:** Collaborate to design better pedestrian facilities.
- **Road Environment:** Identify and maintain the overall quality and safety standards of the road, especially in high-frequency accident locations.
- **Safety Restraints:** Focus on the proper use of child safety restraints, and increasing Washington seatbelt use.
- **Sleepy Drivers:** Develop a better understanding of driving while fatigued and awareness of its dangers, and implement appropriate educational and engineering programs.
- **Work Zones:** Develop programs to ensure the overall safety of motorists and road workers.

Subcommittees studied the 12 emphasis areas and safety analysis indicated strategies to be implemented to address the problems identified in each. Subcommittee membership

has representation from state, local, and private traffic and safety organizations. The strategies were finally approved by the Washington Traffic Safety Commission, which is chaired by the Governor and includes representatives from the major safety agencies at the state and local levels. The partnering agencies, public and private, were encouraged to implement the strategies with monies made available through provisions of the TEA-21, federal highway safety and motor carrier safety funds, state and local transportation funds, and private matching funds.

The subcommittees were formed along the following safety discipline areas:

- Community traffic safety/DUI task forces,
- Road rage/aggressive driving task force,
- EMS and injury prevention regional offices,
- Corridor traffic safety programs,
- State and local law enforcement,
- Truck safety professionals,
- Driver education professionals, and
- State and local road engineers.

Examples of strategies developed under the 12 emphasis areas show the broad scope of “Target Zero” and the prominence of the local road safety concern.

Corridor Safety Program – Sixteen corridors were identified through safety analysis for treatment. These community safety programs mobilized support and selected leadership at the local level. The program began with a public relations event, which was followed up with public hearings. These “safety fair” events solicited input from the community as to the most pressing safety issues to be addressed. WSDOT posted signs identifying the boundaries of the corridor and the safety issue in question. \$100,000 to \$120,000 was set aside for each corridor with \$40,000 earmarked for physical improvements.

Sleepy Drivers – In addition to educational and awareness programs aimed at fatigued and sleepy drivers, the DOT is increasing the use of shoulder and centerline rumble strips to alert drivers before they leave the road or cross the center line.

Road Rage – The Washington Traffic Safety Commission, in support of “Target Zero,” will sponsor a statewide conference on road rage to promote awareness and solicit countermeasure ideas. The commission is also supporting stronger enforcement against aggressive drivers, especially in sensitive areas such as work zones, school zones, and ferry facilities.

Smartzone Deployment – WSDOT has received a “Target Zero” Program grant, under the work zone safety emphasis area for a Work Zone Safety Enhancements Pilot

Project. The ADDCO SmartZone system is a key element in the Pilot Project. The SmartZone will be used to monitor work zone speeds using radar and video monitoring capabilities. Speed data will be collected and compared with work zone conditions and speed emphasis enforcement patrols by the Washington State police. Along with work zone monitoring and data collection capabilities, the SmartZone also utilizes a full matrix changeable message sign that can be remotely operated to provide drivers with real-time information. Warning and advisory messages related to traffic and work zone conditions, as well as active speed enforcement messages will be used.

Summary

As previously mentioned, “Target Zero’s” underlying philosophy is to recognize and build on existing safety programs, bring traffic safety partners together, and coordinate a statewide safety vision and goals. “Target Zero” provides guidance to all agencies, groups, and individuals working in the field of traffic safety for development of their programs and projects. Short-term actions include the following:

- Incorporation of “Target Zero” initiatives into plans and programs of key traffic safety agencies.
- Commitment of agency resources and funding for “Target Zero” strategies.
- Identification of indicators to measure the effects of “Target Zero” initiatives.
- Disclosure of information including progress reports on the implementation of strategies and the impact on statewide traffic safety.
- Support agencies, groups, and individuals working together to implement “Target Zero” strategies.”⁵

“Target Zero” is a daring attempt by Washington State highway safety officials to challenge the state’s highway safety community to build on and exceed current safety program effectiveness with innovation and the refusal to accept any level of crashes that result in major injury or death.

WISCONSIN

The Wisconsin Department of Transportation (WisDOT) has long been a leader in traffic safety having established a central transportation safety unit when organized as a DOT in the early 1970s. It later adopted one of the nation’s first Strategic Safety Plans in the early 1990s. A recent reorganization of WisDOT established a Board of Directors of leadership from its six major divisions. The Board of Directors was instrumental in creating vision and mission statements covering all activities for which the department has responsibility. This Board meets weekly to review activity and progress.

The Planning Process

In August 1999, WisDOT identified transportation safety as a priority during its “Strategic Change Event,” an effort involving employees representing many different disciplines to identify the agency’s mission, vision, and values.

In September 2000, some 160 WisDOT employees and transportation safety partners met in a Traffic Safety Strategic Change Event to further identify specific actions and to develop action plans to increase traffic safety. The attendees included representatives from the AAA, the Department of Public Instruction, the University of Wisconsin, the NHTSA, the FHWA, the AARP, the courts, the media, the legislature, and law enforcement.

The discussions centered on the AASHTO Strategic Highway Safety Plan and its 22 emphasis areas. Two other action areas (“reduce deer/other animal crashes” and “drive more safely in inclement weather”) were added because they were major traffic safety issues in Wisconsin.

Through WisDOT’s Traffic Safety Strategic Change Event, the Wisconsin list of 24 emphasis areas was pared to seven that participants felt were not only important, but could be influenced by actions taken by WisDOT. Groups were formed to develop strategies that include specific projects and policy recommendations for each of seven safety areas. Wisconsin’s schema for rating safety strategies (see Appendix C) is a process worthy of note due to its intricacy and widespread use within the state.

Safety Priority Issues

The following focus areas were selected for implementation based on their importance to the state’s safety environment and their chance of success:

- Institute graduated driver licensing,
- Improve the design and operation of intersections,
- Increase seat belt use,
- Increase driver safety awareness,
- Improve data and decision support systems,
- Keep vehicles on the roadway and minimize the consequences of leaving the roadway, and
- Reduce impaired driving.

Intra-agency teams selected from the list of attendees at the second “strategic change event” were formed to develop action plans for implementing strategic changes in the department’s approach to these seven issues. The teams are lead by a high-level champion for each issue under review. Each team also developed performance measures to gauge and monitor the effectiveness of each strategic issue. Teams were comprised of subcommittees with leadership from the operating unit responsible for the day-to-day operation of activities relating to the particular issue. The roles of team champion, team leader, and team member have been de-

financed and presented to each involved safety participant. Overall responsibility for the strategic safety initiative is vested with the Director of the Bureau of Transportation Safety in WisDOT.

Each of the priority issues to be implemented was defined with project objectives and outcome performance measures. The team champion, team leaders, and members were also noted along with milestones identifying activity to be undertaken, the person(s) responsible, and due dates for each action item. Expected completion dates, resources available to the project, and team training was also identified. The strategies developed at this point will be fine-tuned as the implementation process unfolds and several will incorporate the AASHTO Plan Implementation Guidelines being developed under NCHRP Project 17-18(3).

Several projects resulting from the Wisconsin safety process are worthy of note:

SHOP. The Special Highway Operations Program (SHOP) was initiated in 1998, based on funding opportunities created by TEA 21. WisDOT allocated \$5 million annually to make statewide and corridorwide safety and operations improvements. The following eight projects were selected for implementation that typify the projects under this program:

1. Permanent plowable raised pavement markers on all 65-mph highways,
2. Dotted-edge line extensions through all interchange off-ramps,
3. Advanced crossroad name signs on expressways,
4. Advanced crossroad name signs on two-lane highways on the NHS,
5. Retrofit shoulder rumble strips on freeways,
6. Retrofit shoulder rumble strips on expressways,
7. Highway lighting at certain intersections on 65-mph expressways, and
8. Retrofit highway lighting at department traffic signal locations.

The major difference between SHOP projects and similar projects undertaken by the department lie in the statewide and corridorwide approach as opposed to the traditional spot or specific-length approach. The responsibility for the SHOP projects is vested in the central office (Bureau of Highway Operations) rather than a district office.

Perform Death-Defying Acts - Buckle up, Slow Down, and Drive Sober. WisDOT inaugurated a public awareness campaign that targeted three driving behaviors that safety analysis showed as the highest crash-producing behaviors. These driving behaviors are particularly significant among youthful drivers. Using a circus theme, public service announcements, brochures, lapel buttons, and posters were provided to media and highway safety partners for

statewide distribution. The campaign was re-enforced with enforcement blitzes throughout the state.

Wisconsin County Traffic Safety Commissions. While not a new initiative, the County Traffic Safety Commissions in Wisconsin have been the foundation for implementing safety initiatives at the local level. The Commissions were created by legislative action in 1971. The objective of the Commissions is the improvement of traffic safety on streets and highways in their jurisdiction. They accomplish this through safety analysis of crash data and coordination and cooperation between state and local agencies and citizen groups. Local streets and highways are given high emphasis in Commission activities. Membership on the Commission, also designated by statute, is as follows:

1. County highway commissioner,
2. Chief law enforcement officer,
3. County highway safety coordinator,
4. Education representative,
5. Medicine representative,
6. Law representative,
7. WisDOT law enforcement representative,
8. WisDOT division of highways representative,
9. WisDOT highway safety representative, and
10. Any additional representative so designated by the County.⁶

Summary

A major strength of Wisconsin's safety program lies in the organization of its DOT, which houses all of the major highway safety agencies at the state level. The Divisions of Motor Vehicle, Transportation Infrastructure, State Patrol, and the field offices of each work cooperatively. Within these divisions are the planning and programming functions producing the Highway Safety Plan (HSP), the Motor Carrier Safety Assistance Program (MCSAP), and the Highway Safety Improvement Program (HSIP)

Another strength is the coalition of safety partners from the public and private sectors throughout the state organized as the Wisconsin Highway Safety Partners (WHSP). The WHSP links the local, regional, state, and federal organizations; meets quarterly to review the state's highway safety initiatives; examines progress toward goals; and suggests changes or modifications. The third such organization involved in the state's safety process is the Wisconsin County Traffic Safety Commission mentioned above. The interaction between these organizations has resulted in consensus on initiatives to be developed and implemented at all levels of government. It was also instrumental in the success of the WisDOT "strategic change event" planning processes, since members of each group were involved in the deliberations and recommendations.

CONCLUSIONS

The AASHTO Strategic Highway Safety Plan was the second effort in this decade, in cooperation with the TRB, to develop and present to the nation's highway safety community strategies to address the nation's roadway crash problem. This effort, however, is much broader in scope and participation than the previous effort involving highway safety professionals from 16 national safety organizations; federal, state, and local governments across the country; academia; and private industry.

It is, perhaps, the most comprehensive approach to highway safety since the mid-1960s. A research effort by the Arthur D. Little company, *The State of the Art of Traffic Safety*, was published in 1966, just preceding the seminal federal highway safety acts of 1966: the National Traffic and Motor Vehicle Safety Act and the Highway Safety Act. These federal legislative actions are the foundation of today's traffic safety programs in the country.

The AASHTO Plan covers six main elements: drivers, special users, vehicles, highways, emergency medical services, and management issues. Within these six elements, 22 emphasis areas were examined and 92 strategies were developed for further study and consideration by highway safety operating agencies. The Plan is also being followed up with research to help create an environment for effective implementation by the highway safety agencies across the country.

The Plan is being taken seriously by each of the five states visited for this report. They have reviewed each of the strategies offered in the plan and where appropriate have incorporated the strategy into the state's safety plan. Some states adopted a Strategic Highway Safety Plan of their own using the AASHTO Plan as a model; others used the Plan as a guideline in developing safety programs within current safety organization work plans.

Key to Success

Several common traits appear in each of the states under review that appear to be the catalyst for acceptance of the Plan and the ability of safety officials in those states to incorporate the suggestions of the Plan into their work environment.

The first, and most important, is the active existence of a SMS committee or coordination mechanism. Preliminary findings of a current survey by the Transportation Safety Management Committee of TRB (A3B01) investigating the status of SMS show the five states under study had both an SMS and multidisciplinary committees that were active.⁷ What seems to have occurred since the federal mandate for SMS was expunged is an evolution in these states of safety management partnerships. Philosophies and administration of safety management are shared, and processes and programs are being jointly assessed with safety partners, including the federal partners.

The second trait is an ability to conduct safety analysis suggesting a basic highway safety information system. In each of the states under review, the AASHTO Plan was not inserted without question into the state's safety program process. Rather, as mentioned previously, the Plan was used as a model or guideline and the state's safety community examined their safety environment through analysis of data from their safety information systems to determine the appropriateness of the emphasis areas and the strategies within each. In many instances, new strategies were developed, and modification or rejection of the AASHTO strategies was the action taken.

The third trait is a strong safety presence in the state's transportation missions along with the selection of a person or unit as a champion for highway safety action. A committed responsible safety advocate in each state was charged with reviewing the AASHTO Plan and its use in the state's safety programming process.

Innovation

The AASHTO Plan appears to have stimulated an increase in innovation toward safety program activity. Each of the five states under study while addressing the strategies suggested by the Plan used varying approaches in implementing countermeasures. An example from each state is presented below:

Iowa. Iowa developed a "Toolbox of Potential Highway Safety Improvement Strategies" that was modeled following the strategies of the AASHTO Plan. The Iowa "Toolbox" modified the AASHTO Plan in some strategic areas and added seven emphasis areas based on their safety analysis and input from their Safety Management Systems Committee partners.

The "Toolbox" approach to highway safety countermeasures is a novel approach to a persuasive philosophy of state and local cooperation in resolving the state's safety problems. This philosophy and working relationship with the Iowa safety partners used the AASHTO Plan constructively and applied those strategies most appropriate to Iowa's needs.

North Carolina. Median Barrier Program—Safety analysis identified across-median crashes as a major safety concern taking 30 lives and injuring 300 motorists each year on North Carolina's major highway facilities. These losses prompted the state's Traffic Engineering and Safety Systems branch to develop a three-pronged strategy to address this type of crash. The strategy is being implemented in three phases as follows:

1. Identify and install protective median barriers on freeways with across-median crash histories.
2. Identify and systematically protect all freeway sections

with median widths of 70 ft or less.

3. Revise policies to prevent creating additional unprotected narrow freeway median sections.

Pennsylvania. Infrastructure Improvements (low-cost safety improvements)—Targeted improvements were based on safety analysis of crash and primarily highway and driver exposure data. The safety analysis shows that 35 to 40 percent of crashes occurred on 3 to 4 percent of the state’s public road system. The countermeasures targeted initiatives where successful outcomes would be most probable. Some of the low-cost initiatives underway required communication, coordination, and cooperation with several safety partners outside PennDOT for successful implementation.

This innovated approach has conceived several specific countermeasures, such as:

- “Advanced Curve Warning” treatments that addressed high frequency of crashes on horizontal curves at locations that were identified with higher than average number of crashes having roadway curvature as a contributing factor. Of the total 1,631 fatalities occurring on curves over a 5-year span, 325 occurred on 3.9 percent of the road system. The implementation plan called for advanced slow warning treatment in each direction at locations that experienced five or more crashes over the 5-year period. The treatment consisted of two transverse bars, a “SLOW” legend, and an arrow indicating the direction of the upcoming curve.

The overall objective is to reduce the upper percentile speed, thereby reducing the number of vehicles leaving the roadway and subsequently the number of vehicles involved in a crash. A site-selection study identified over 400 eligible locations based on the criteria of crashes and geometric suitability of the treatment. PennDOT partnered with the Insurance Institute for Highway Safety (IIHS) for evaluation of the overall project’s effectiveness. The IIHS randomly selected 200 sites for implementation with the remaining 200 sites to be used as a control source. The treatment costs for each site are calculated at \$1,350.00, which includes markings, time and equipment. The expected return is four lives saved annually.

- Innovative signing messages that were developed and placed on highly reflective sheeting to emphasize driver behavior issues in corridors having high incidences of driver-related crashes. These innovative messages were placed in a series along the roadway to identify the detrimental behavior, to emphasize driver safety, and to alert drivers of the presence of active/visible enforcement. Partnering efforts with the state and local police, district magistrate, and the media were established in an attempt to correct the aberrant driver behavior.
- “Dot” treatments that were introduced at the high-level aggressive-driver crash areas. A series of dots were

placed on the pavement along with guide signs to assist motorists in maintaining safe following distances.

Washington. The Plan, entitled “Target Zero,” boldly envisions “a transportation system with no deaths or disabling injuries” by the closing of its 30-year planning horizon. The originality of “Target Zero” is in its daring to state that no frequency of fatal or disabling injury crashes is acceptable. The philosophic underpinnings of the Plan are, as stated previously:

- Recognize and build on existing safety programs,
- Bring traffic safety partners together, and
- Coordinate a statewide safety vision and goals.

Following is one of the innovations coming out of the “Target Zero” Plan:

- The SmartZone that will be used to monitor work zone speeds using radar and video monitoring capabilities. Speed data will be collected and compared to work zone conditions and speed emphasis enforcement patrols by the Washington State police. Along with work zone monitoring and data collection capabilities, the SmartZone also utilizes a full matrix changeable message sign that can be remotely operated to provide drivers with real-time information. Warning and advisory messages related to traffic and work zone conditions, as well as active speed enforcement messages will be used.

Wisconsin. WisDOT inaugurated a public awareness campaign that targeted three driving behaviors that safety analysis showed as the highest crash-producing behaviors. These driving behaviors are particularly significant among youthful drivers. The campaign titled “Perform Death-Defying Acts - Buckle up, Slow Down, and Drive Sober” used a circus theme, with public service announcements, brochures, lapel buttons, and posters provided to media and highway safety partners for statewide distribution. The campaign was re-enforced with enforcement blitzes throughout the state.

RECOMMENDATIONS

- AASHTO, with its federal partners, and the National Association of Governor’s Highway Safety Representatives, should continue support of SMS coordinating committees in the member states. It should also encourage the appointment of a safety advocate with the responsibility of coordinating the state’s highway safety program.
- AASHTO should follow up the results of the NCHRP 17-18 projects by the member states and encourage that project results are implemented where appropriate and

actively monitored through these SMS-type coordinating committees.

- It was apparent that highway safety information is critical to establishing, implementing, and evaluating strategic safety initiatives. While some of the NCHRP projects may address the AASHTO Strategic Highway Safety Plan emphasis issue 21, *Improving Information and Decision Support Systems*, many instances of deficiency remain. An objective should be established to study the strategies in this emphasis area to develop a common information management infrastructure to support federal, state, and local highway safety information management needs. This can be done through the AASHTO standing committees, especially the Standing Committee on Highway Traffic Safety and the Administrative Sub-Committee on Information Systems.

Several agencies within the U.S.DOT are extremely interested and are investing funds and manpower in assuring appropriate highway safety information is available to highway safety planners and managers. AASHTO is also currently involved in a major effort called the Transportation Safety Information Management System with member states. Partnering on this issue should also be pursued especially with the Association of Highway Safety Data Professionals of the National Safety Council.

- AASHTO should revisit this strategic plan every 10 years to examine progress toward objectives and apply necessary revisions. The 10-year time frame between revisions of the strategic plan appears appropriate given implementation schedules and a time interval for adequate results.

AUTHOR ACKNOWLEDGMENTS

This study was conducted under NCHRP Project 17-18(6), "AASHTO Strategic Highway Safety Plan-Case Studies." It was guided by NCHRP Project Panel 17-18, chaired by Mr. Thomas E. Bryer, with members: Dr. Leanna Depue, Ms. Adele Derby, Ms. Barbara Harsha, Ms. Margaret Moore, Ms. Kim Nystrom, Mr. Peter F. Rusch, Mr. Rudy Umbs, Mr. Anthony Wyatt, Mr. Ray Krammes, Dr. Jesse Blatt, Mr. Ken Kobetsky, and Dr. Richard Pain. Mr. John J. Zogby served as principal investigator.

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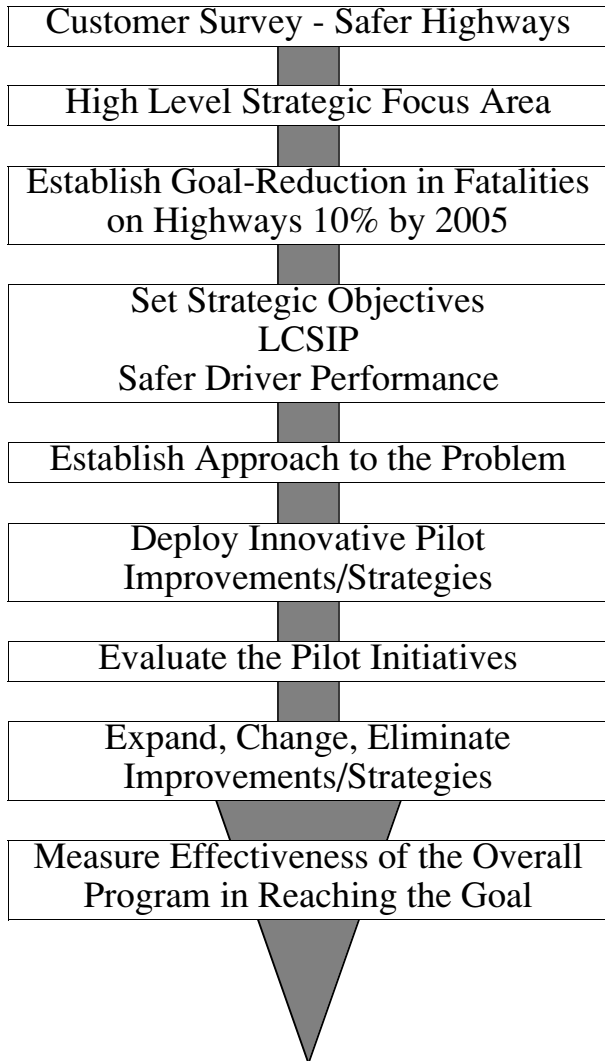
APPENDIX A
CASE STUDY QUESTIONS FOR STATE VISIT

1. Does your state have a strategic safety plan?
2. Did the chief executive of your agency approve the plan?
3. Please describe the planning process?
4. Were other state agencies involved in the strategic planning process?
5. Were the MPO's involved? Other local agencies?
6. Is your safety planning integrated with the departments overall transportation planning process? (STIP - TIP)
7. Is there a Safety Management System/Process in your state?
8. How much of the AAHSTO strategic safety plan did your state adopt?
9. Did you accept the particular strategies as presented or were they modified to meet your state's safety climate or culture?
10. Which strategies did you incorporate into your safety plan?
11. Did you consider strategies from each of the six major categories?
12. Why were other strategies not acceptable?
13. Were performance measures established for each strategy?
14. Did you attempt a cost/benefit analysis?
15. Have any strategies been implemented?
16. Do you have an evaluation system in place?
17. Does your state have a highway safety information system?
18. What level of information technology support is available for use in safety analysis and programming?
19. What level and sources of funding are available for highway safety projects?
20. Were funding an issue in accepting and/or rejecting any of the AASHTO safety strategies?
21. Is there a particular safety strategy the state employs that you feel is innovative?
22. Is there a particular safety strategy you feel is the most effective?
23. Which sections of the AASHTO safety plan were most useful to you regarding the development of your state's highway safety plan/program?
24. Which sections or strategies were not?

Management Issues

- Management processes
 - Planning processes
 - Problem I.D. process
 - Budgeting process
 - Source of funding
- Evaluation process
 - types of evaluation
- Analytic techniques
 - manual/automated
- Information technology
 - systems configuration
 - integration of safety related files
 - access to data
 - software tools

**APPENDIX B
STRATEGIC PLANNING PROCESS**



**APPENDIX C
TRAFFIC SAFETY STRATEGIC CHANGE EVENT
PRIORITIZATION EXERCISE**

Action/Strategy	Fatalities Rank	Injuries Rank	Wisconsin Performance Data (1999)
8 - Increase seat belt use and air bag effectiveness	1	11	341 unbuckled vehicle occupants killed [46% of total]; 2,127 people seriously injured [3% of total]
15 - Keep vehicles on the roadway	2	4	237 deaths in crashes with fixed objects [32% of total]; 10,686 injuries [17% of total] 23,276 crashes [18% of total] 79 deaths in overturn crashes [11% of total] 3,235 injuries [5% of total] 4,376 crashes [3% of total]
16 - Minimize the consequences of leaving roadway	2	4	[See performance measures for Item #15]
5 - Reduce impaired driving	3	7	270 alcohol-related deaths [36% of total]; 6,563 injuries [11% of total] 8,446 crashes [6% of total]
17 - Improve the design and operation of intersections	4	1	233 deaths in intersection crashes [31% of total]; 31,251 injuries [51% of total] 49,401 crashes [38% of total]
4 - Curb aggressive driving	5	6	203 speed - related deaths [27% of total]; 12,196 injuries [20% of total] 20,259 crashes [15% of total]
6 - Keep drivers alert	6	2	151 deaths with inattentive driving as a factor [20% of total]; 15,225 injuries [25% of total] 24,624 crashes [19% of total]
3 - Sustain proficiency in older drivers	7(tie)	9	43 people age 65-74 killed [6% of total]; 2,466 people injured [4% of total] 97 people age > 74 killed [13% of total]; 2,058 people injured [3% of total]
23- Drive more safely in inclement weather	7(tie)	3	140 deaths in snow/ice/slush/wet condition crashes [19% of total]; 14,872 injuries [24% of total] 32,055 crashes [24% of total]
1 - Institute Graduated Driver Licensing	8	5	110 people age 16-20 killed [15% of total]; 12,724 people injured [21% of total]
12 - Make truck travel safer	9(tie)	8	95 deaths in heavy truck crashes [13% of total]; 3,469 injuries [6% of total] 9,146 crashes [7% of total]
2 - Insure drivers are licensed/competent	9(tie)	5	475 drivers involved in 1993-1997 fatal crashes were unlicensed or had suspended, revoked, expired or canceled licenses [9.5% of total] - (average of 95)
18 - Reduce head-on and cross-median crashes	10	10	79 deaths in head-on passenger vehicle crashes [11% of total] 2,331 injuries [4% of total] 2,112 crashes [2% of total]

continued

Action/Strategy	Fatalities Rank	Injuries Rank	Wisconsin Performance Data (1999)
11 - Improve motorcycle safety	11	12	65 motorcyclist deaths [9% of total]; 1,965 motorcyclists injured [3% of total] 2,012 crashes [2% of total]
9 - Make walking and street crossing easier/safer	12	13	55 Pedestrian deaths [7% of total]; 1,653 pedestrian injured [3% of total] 1,675 crashes [1% of total]
10- Insure safer bicycle travel	13	14	18 bicyclist deaths [7% of total]; 1,279 bicyclists injured [3% of total] 1,342 crashes [1% of total]
19 - Design safer work zones	14	15	17 deaths in work zone crashes [2% of total]; 1,200 injuries [2% of total] 2,175 crashes [2% of total]
24 - Reduce deer and other animal crashes	15	16	6 people killed in deer crashes [0.8% of total]; 841 people injured [1% of total] 21,289 crashes [16% of total]
14 - Reduce vehicle-train crashes	16	17	5 deaths [0.7% of total]; 53 injuries [0.1% of total] 97 crashes [0.1% of total]
7 - Increase driver safety awareness	17	18	[No performance measure data available]
21 - Improve data and decision support systems	17	18	[No performance measure data available]
13 - Increase safety enhancements in vehicles	17	18	[No performance measure data available]
20 - Enhance Emergency Medical Services to increase survivability	17	18	Average 11 minutes EMS response time to rural fatal crashes; Average 6 minutes EMS response time to urban fatal crashes
22- Create more effective processes and Safety Management Systems	17	18	[No performance measure date available]
			744 Deaths/ 61,577 Injuries/ 130,950 Reported Crashes