CHAPTER 27
Creating More Effective Processes and Safety Management Systems

KEY TOPICS

- "4 E's + 1" (engineering, enforcement, education, and emergency reponse, plus "everyone else")
- "4 C's" (communication, collaboration, coordination, cooperation)
- multidisciplinary approach
- safety management system (SMS)
- "2 S's" (synergy and success)

GOALS

- Provide leadership and direction to improve Iowa's highway safety.
- Identify potential highway safety strategies.
- Promote coordination, cooperation, and communication within and between jurisdictions on all matters relating to highway traffic safety.
- Identify, maintain, and enhance highway safety funding sources.
- Initiate, support, and facilitate community-based highway safety programs by providing expertise and assistance in the area of the "4 E's + 1" (engineering, enforcement, education, and emergency reponse, plus "everyone else").
- Integrate highway safety programs and highway safety information systems.
- Establish an ongoing performance measurement system to evaluate the cost effectiveness of safety investments at both project and program levels.
- Identify and support models of highway safety improvement projects that demonstrate comprehensive and multidiscipline processes.
- Form coalitions of public agencies and private organizations to be "champions" for roadside safety.
- Improve information and data resources for monitoring and improving roadside safety.
- Support research and pilot projects to address yet-unanswered roadside safety questions.
- Increase consideration of safety in the development of metropolitan transportation plans.
- Participate in national highway safety conferences and workshops to identify potential highway safety strategies for Iowa.

BACKGROUND

Safety management is a systematic process which increases the chances of reaching safety goals by ensuring that all opportunities to improve highway safety are identified, considered, and implemented as appropriate, and evaluated in all phases of highway planning, design, construction, maintenance, and operations (including traffic and commercial vehicles).

Federal Highway Administration (FHWA)

Highway safety management requires a thorough understanding of the historic and current highway conditions, plus a vision for desired future conditions. The management process must integrate factors from all phases of highway life—roadway design to maintenance, driver attitudes and capabilities to performance, environmental conditions, and their influence on the driving task.

An effective safety management process should include, as a minimum, the following elements:

- Communication, coordination, and cooperation among the organizations responsible for the roadway, human, and vehicle safety elements (both public and private)
- A focal point for coordination of the development, establishment, and implementation of safety management among agencies responsible for these major safety elements
- Short- and long-term highway safety goals to address identified safety problems
- Collection, analysis, and linkage of highway safety data
- Identified safety responsibilities of units and positions
- Public information and education activities
- Identified skills, resources, and training needs to implement highway safety programs

These efforts typically involve the state departments of transportation, law enforcement, education, and public health with the definition of duties largely shaped by state mandates and policies. The need for timely and complete data systems is a key element of safety management to ensure that the best possible decisions are made. Data sharing by those involved in the decision making is also critical.

Safety management brings together all parties with an interest in improving highway safety. When these diverse safety interests work together, there is an integrated approach to safety planning and programs. This ensures that safety is given adequate consideration in transportation decision making.

NATIONWIDE

Multidisciplinary Approaches

Highway safety strategies often require a multidisciplinary approach to craft integrated solutions addressing roadway and driver behavior simultaneously. Effective management requires problem identification, research and analysis of accurate data from multiple sources, strategy selection, resource allocation, role definitions, implementation, and evaluation—all across diverse entities. Beyond engineering or human performance solutions, "effecting social change" is sometimes the ultimate outcome required to resolve specific highway safety issues.

The multidisciplinary approach is recognized widely in transportation safety management as the "4 E's," representing education, enforcement, engineering, and emergency services. In 1991, the federal Intermodal Surface Transportation Efficiency Act (ISTEA) announced a change in focus from "construction to preservation" and mandated that each state develop a safety management plan by October 1994 to address surface modes of transportation. Part of these guidelines are included in this multidisciplinary approach.

Planning

An "effective and efficient transportation system" has been a top priority in this country for much of the last century. The goals defined in the U.S. Department of Transportation's *Strategic Plan* include safety, mobility, economic growth and trade, human and natural environment, and national security.

In 1998, the Transportation Equity Act for the 21st Century (TEA-21) consolidated several planning factors in seven broad areas—one of which reads, "Increase the *safety* and security of the transportation system for motorized and nonmotorized users." State transportation departments and metropolitan planning organizations are now required to include "safety" in their transportation planning processes and activities.

Other National Agendas for Highway Safety

In addition to the U.S. Department of Transportation and its agencies, many other national organizations and agencies include highway safety or vehicle crash reduction in their goals and activities. The following short list illustrates the national interest in highway safety and the potential for highway safety advocates to partner in greater state and local efforts to improve highway safety for Americans at national, state, and community levels. See the Resources section in this chapter for additional contact information.

Centers for Disease Control and Prevention

CDC alone cannot protect the health of the American people. However, by engaging with others—from state and local health departments to private corporations, from media outlets to the general public—we can achieve our vision of a better world, with safer, healthier people.

Centers for Disease Control and Prevention (CDC), *Vision for the 21st Century*

Mission: To promote health and quality of life by preventing and controlling disease, injury, and disability.

Major activities: Research into causes of and risk factors for motor vehicle crashes, with special emphasis on older drivers and alcohol-related incidents, pedestrian injuries, promotion of child occupant protection, and bicycle safety (*2000–2001 Fact Book*).

National Safety Council

The National Safety Council is proposing solutions in five key areas of highway safety: occupant safety, young driver safety, drunk driving, large truck safety, and pedestrian safety.

Public Health Service

By year 2010, the Public Health Service aims to reduce motor vehicle-related deaths among people of all ages to no more than 12 per 100,000 people.

American Association of State Highway and Transportation Officials

The American Association of State Highway and Transportation Officials's (AASHTO) goal is to create a *comprehensive* strategic highway safety plan that by 2004 has the potential for *saving 5,000–7,000 lives* each year as well as substantially reducing health care costs (and do this *cost effectively* and in a manner acceptable to most Americans).

American Trucking Association, Inc.
The mission of the American Trucking Association, Inc., is to serve and represent the interests of the trucking industry and to promote highway and driver safety.

AAA Foundation for Traffic Safety
The AAA Foundation for Traffic Safety is dedicated to saving lives and reducing injuries by preventing traffic crashes. It is a not-for-profit, publicly supported, charitable educational and research organization.

Operation Lifesaver
Operation Lifesafer is dedicated to ending tragic collisions, fatalities, and injuries at highway-rail grade crossings and on railroad rights-of-way.

Network of Employers for Traffic Safety
The Network of Employers for Traffic Safety (NETS) mission is to reduce traffic crashes involving America's workers and their families by helping employers implement well-developed policies, dynamic workplace programs, and compelling community activities related to traffic safety.

IOWA

State Agency Highway Safety Program Responsibilities

Iowa's primary highway safety programs are divided between the Iowa Departments of Transportation (Iowa DOT) and Public Safety (Iowa DPS). Other state agencies involved with highway safety efforts in Iowa include the Iowa Departments of Public Health and Education. These departments cooperate in administering various highway safety programs and share highway crash data regarding roadways, vehicles, drivers, citations, injuries, fatalities, and costs. Many other state entities are drawn in to address specific highway safety concerns as they relate to their service areas. Beyond each agency's specified duties, many highway safety issues will require additional creative efforts to discover appropriate solutions, partners, and potential resource allocations.

See the table on the next page for the distribution of Iowa highway safety program areas and responsibilities. The figure on the following page provides an illustration of Iowa's highway safety data integration and analysis system.

Iowa Highway Safety Responsibilities*

IOWA DEPARTMENT OF TRANSPORTATION (IOWA DOT)		IOWA DEPARTMENT OF PUBLIC SAFETY (IOWA DPS)	OTHER ENTITIES: FEDERAL, STATE, LOCAL, AND PRIVATE
Motor Vehicle Division **Office of Driver Services** -Iowa crash records -FARS and CVARS -Driver research and statistics -National Model–TRACS -CODES -Driver licensing -Driver files -Driver improvement -Driver education -Motorcycle/Moped education -Public awareness Office of Motor Carrier Services -PRISM Office of Motor Vehicle Enforcement Office of Vehicle Services **Planning and Programming Division** -District Planners Office of Systems Planning Office of Program Management -SMS funds origin Office of Transportation Data **Modal Division** Office of Aviation Office of Public Transit Office of Rail Transportation **Information Technology Division (ITD)** -GIS **Research Management Division** -ITS and AASHTO projects	**Highway Division** -District Safety Engineers **Office of Traffic and Safety (TAS), Bureau of Engineering** -State Safety Engineer -State Traffic Engineer Iowa Safety Management System (Iowa SMS) -Committee Chair -Program Coordinator Crash records analysis, tools, and training distribution Statewide Traffic Records Advisory Committee (STRAC) -STRAC Co-Chair Traffic Engineering Assistance Program (TEAP) -402 and DOT funded Local multidisciplinary safety groups support Traffic Safety Improvement Program (TSIP) -0.5% of Iowa Road Use Tax Fund Hazard Elimination Safety (HES) Program -Top 200 crash locations Resources for district and local offices Signs, signals, work zone safety, pavement markings, advertising management, research, safety studies, audits, ITS, speed studies, and AG litigation support	**Iowa Governor's Traffic Safety Bureau (Iowa GTSB)** -Governor's Program Director NHTSA Programs Iowa's Governor's Representative's Highway Safety Plan -Management Systems Advisory Committee Member 411 Traffic Record Data Improvements Program -Statistical data Statewide Traffic Records Advisory Committee (STRAC) -STRAC Co-Chair 402 grants used in 22 problem counties for enforcement, education, and engineering Local multidisciplinary safety groups support SAFE Communities Program Special Traffic Enforcement Program (STEP) 157 Seat Belt Incentive 405a and 2003b Child Seat Programs 410 Alcohol Incentive Program Drug Recognition Expert Program Police Traffic Services Training and public service announcements **Iowa State Patrol (ISP) Division** -Enforcement -Accident reconstruction -Police communication -Impaired driving -Child seat training -Seat belts **State Fire Marshall Division** -Fire Service Training Bureau **Criminal Investigation Division** -Criminalistics Lab -Evidential breath testing -Records and identification	**Federal Agencies** -Provide funding and/or technical assistance and serve on many safety committees Federal Highway Administration (FHWA) National Highway Safety Administration (NHTSA) Federal Motor Carrier Safety Administration (FMCSA) **Iowa Department of Education** -Driver Education -School Bus Safety **Iowa Department of Public Health** -EMS Records -CODES -Hospital Costs -Bicycle Safety -Injury Prevention **Iowa Department of Emergency Management** -Haz. Mat. **Iowa Department of Elder Affairs** **Judicial Entities** **Regents** University of Iowa -Public Policy Center University of Northern Iowa -Research and Education Iowa State University -Center for Transportation Research and Education (CTRE) -Local Technical Assistance Program (LTAP) **Local County and City Practitioners** **Local Multidisciplinary Safety Teams** **Private Organizations and Businesses**

* Primary safety program management and safety data entities are shaded.

System of Data Gathering, Integration, and Analysis in Iowa

DATA SOURCES AND TYPES

- Traffic crash data
- Geographic Information Management System (GIMS) data
- Coordinated Transportation Analysis and Management System (CTAMS) data
- Roadway inventory data
- Roadway features data
- Pavement management data
- Rail crossing data
- Emergency Response Information System (ERIS) emergency medical services run data
- Crash Outcome Data Evaluation System (CODES) trauma and hospital records
- Injury surveillance systems data
- Data from Iowa DOT/Technical accident investigators
- Driver licensing and history data
- Vehicle registration data
- Criminal incident report form (CIRF) files
- Electronic citation component (ECCO) files
- OWI revocation files
- Iowa Court Information System (ICIS) criminal files
- Division of Criminal Investigation (DCI) lab blood and breath analysis data
- Traffic and Criminal Software (TraCS) traffic citation and conviction data

DATA ANALYSIS TOOLS

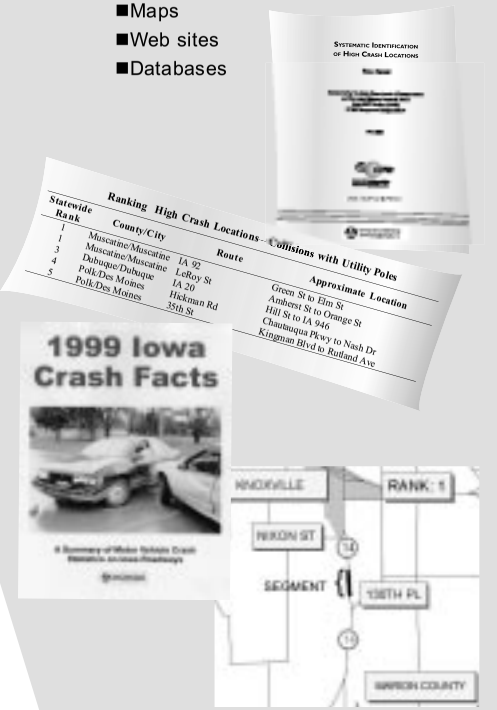
- GIS-ALAS
- Access-ALAS
- ArcView
- ArcExplorer
- GeoMedia
- Intersection Magic
- Crash Analysis Reporting Environment (CARE) system

DATA ANALYSTS AND MANAGEMENT

- State agencies
- Local and regional agencies
- Universities and researchers
- Consulting firms

PRODUCTS AND RESULTS

- Tables, charts, and graphs
- Reports
- Crash location rankings
- Maps
- Web sites
- Databases



Safety Information and Management Systems

Iowa's highway safety collaboration is accomplished through two primary multidisciplinary, multi-agency groups: the Statewide Traffic Records Committee (STRAC) and the Iowa Safety Management System (Iowa SMS).

Statewide Traffic Records Committee

Effective use of safety information systems forms the backbone of a safety management system. STRAC is charged with the responsibility of monitoring and improving highway safety information systems. Through STRAC, key decision making issues that may significantly impact highway safety are identified, and guidance is provided to facilitate the selection and analysis of safety data for decision making. STRAC addresses data collection, data sharing, and data analysis.

Ultimately, the data gathered, shared, and analyzed are used by

- State agencies
  - Iowa DOT
  - Iowa Governor's Traffic Safety Bureau (Iowa GTSB), Iowa DPS
  - Iowa Department of Public Health
  - Iowa Department of Education
- Local and regional agencies
  - Cities
  - Counties
  - Municipal planning organizations (MPOs) and regional planning associations (RPAs)
- Citizens and Iowa Legislature
- Federal agencies
  - National Highway Traffic Safety Administration (NHTSA_
  - FHWA
  - Federal Motor Carrier Safety Administration (FMCSA)
- Universities and researchers

Iowa Safety Management System

In February of 1995, the Iowa safety management system effort was implemented, and representatives from a variety of agencies and organizations across Iowa formed the Iowa SMS Coordination Committee in compliance with ISTEA legislation. In 1997, the federal mandate was withdrawn, but Iowa has continued its SMS initiative.

Iowa SMS provides a focal point for Iowa's diverse highway safety partners. Because leading parties and stakeholders for highway safety include a wide range of public and private entities, as well as the motoring public, Iowa's SMS membership includes representatives from diverse entities that comprise the "4 E's + 1" of highway safety. These "E's" include engineering, enforcement, education, and emergency reponse, plus "everyone else" representing a wide range of state and local agencies and interests from public and private perspectives. The "4 E's + 1," along with the "4 C's" (communication, collaboration, coordination, and cooperation), lead to the "2 S's" (synergy and success).

While Iowa SMS has designated the Iowa DOT as its focal point, the purpose of the group is to "coordinate and facilitate" safety efforts rather than dictate or control the efforts of its many member entities.

- Iowa SMS addresses highway safety issues related to both "pavement and people."
- Iowa SMS provides a forum for communicating highway safety developments and concerns among highway safety practitioners.
- Iowa SMS sponsors the STRAC as a longstanding subcommittee (see Chapter 25, Improving Information and Decision Support Systems).
- Iowa SMS seeks to identify unmet safety needs and opportunities for shared efforts to achieve more than existing programs and systems alone.
- Iowa SMS members collaborate to develop and maintain a multidisciplinary approach to public safety that provides this "toolbox" of strategies and ideas to select and apply to transportation safety issues.
- Iowa SMS tools may involve hard engineering solutions—or tools that are less tangible—and often leverage resources to address education, aptitude, awareness, attitudes, and other human factors to resolve highway safety issues.
- Iowa SMS task forces are formed around specific issues to research and report, initiate pilot studies, or suggest solutions.

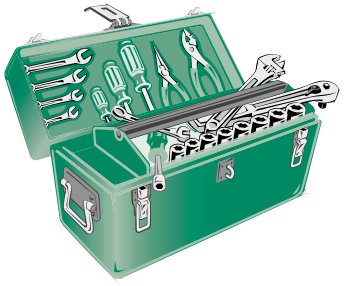
The Iowa Safety Management System has continued to succeed through the strength of its diverse membership. Using a multidiscipline approach, Iowa SMS is able to identify issues, comprehensively test and evaluate strategies, and ultimately apply tangible solutions that produce the most return from available resources. Perhaps the most rewarding aspect of Iowa's safety management system is strengthened cooperation and collaboration among its many groups in helping fill Iowa's transportation safety toolbox with the most innovative and effective solutions available for statewide, regional, and local applications.

In November 1999, the FHWA presented the Partnership in Excellence Award to Iowa SMS. Bobby W. Blackmon, Division Director of FHWA, wrote: "It is my pleasure to honor you as one of the first recipients of the FWHA Partnership in Excellence Award. This award honors the partnership efforts of state and local governments, private industry, other federal agencies, and FHWA working together to help insure the best possible transportation system for the traveling public."

National Model

Iowa also hosts the National Model: Statewide Application of Data Collection and Management Technology to Improve Highway Safety. Iowa is a model for the nation in how agencies work together to "define new business processes and streamline the flow of safety information."

POTENTIAL STRATEGIES



Legislation, Policy, and Enforcement

- Continue the Iowa SMS program and increase funding.
- Assist the Iowa Legislature and department managers in identifying and evaluating alternative highway safety initiatives.
- Expand the Iowa Traffic Safety Fund program from one-half percent to one percent of the road use tax.
- Maintain appropriate crash cost values and crash reporting thresholds to assist in appropriate data analysis, evaluation criteria, and ranking of high-risk locations.
- Enhance speed enforcement on rural two-lane corridors through multidisciplinary task forces and identify candidate corridors (use Iowa GTSB Special Traffic Enforcement Program [STEP] model).

- Initiate a cooperative corridor safety program using the efforts of state and local government, business, and civic leaders to reduce crashes through a variety of low-cost solutions (use STEP model; also note that the Washington state model was recognized by FHWA in 1996 for innovation, effectiveness, and efficient use of resources).
- Involve the business community in educational as well as policy-related strategies to reduce the impact of traffic-related deaths and injuries on their businesses (New Mexico model).
- Expand coordination among substance abuse, juvenile justice, and operating while intoxicated (OWI) prevention programs (New Mexico model).
- Involve the judiciary as full partners in preventing and reducing traffic-related deaths and injuries (New Mexico model).
- Seek additional funding for highway safety programs.
- Continue providing traffic safety consultants to local jurisdictions to maximize the safety program impact in local cities and counties.

Education and Public Awareness

- Sponsor a statewide workshop for local multidisciplinary teams to network and learn. Involve existing and potential teams (see Successes and Strategies Implemented section in this chapter).
- Participate in national safety campaigns and collaborate with partners to spread the message (e.g., the Put the Brakes on Fatalities Day [October 10, 2001]).
- Include local use of data tools, data availability, etc. in the proposed Iowa DOT Office of Traffic and Safety handbook for district and local office traffic engineers (Washington, Michigan, and Wisconsin models).
- Study recent observations on effective public service announcements campaigns to determine which strategies would be most effective for promoting Iowa's highway safety goals (see Successes and Strategies Implemented section in this chapter).
- Support professional education initiatives and formal education programs, including state traffic safety workshops (see Successes and Strategies Implemented section in this chapter).
- Support development and training to enhance safety integration into planning through MPOs and RPAs with training and resource availability (federal standards now require inclusion of safety planning in MPO plans) (see Successes and Strategies Implemented section in this chapter).

- Create an Iowa SMS web site and post appropriate SMS information, documents, resources, and links. Link to Iowa SMS member web sites. List the databases created, maintained, under development, or used by Iowa SMS members and partners. List traffic safety organizations and entities providing research, education, and public information. (See Successes and Strategies Implemented section in this chapter.)
- Collaborate in multi-agency efforts to coordinate safety resources in library, handbook, and electronic access developments (e.g., Iowa DOT, Center for Transportation Research and Education [CTRE], and Iowa Department of Public Safety).
- Participate in national highway safety workshops, task forces, and research projects.
- Sponsor statewide conferences and workshops to draw interested disciplines and raise awareness of specific highway safety concerns (e.g., local safety groups and older drivers) (see Successes and Strategies Implemented section in this chapter).
- Consider promoting Iowa involvement with the Employer Traffic Safety Program (offered by the Network of Employers for Traffic Safety) and other workplace-focused driver safety programs.

Design and Technology

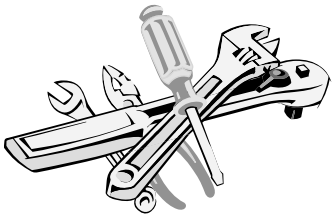
- Use context-sensitive design principles in selecting appropriate safety design implementation based on site-specific conditions.
- Support more systemwide proactive safety projects (e.g., improve signing at high-accident horizontal curves and complete the installation of paved shoulders on rural freeways).
- Continue to participate in, monitor, and implement appropriate research, technology, strategies, and product improvements, including AASHTO's *Strategic Highway Safety Plan* and related projects under National Cooperative Highway Research Program (NCHRP) Project 17-18, as well as the Transportation Research Board's (TRB) *National Safety Agenda.*
- Create an Iowa DOT intelligent transportation systems (ITS) engineer position to identify and implement appropriate ITS technologies.

Other Initiatives

- Continue to use partnerships with the health community, including but not limited to emergency medical services, injury prevention programs, aging Iowans, and substance abuse and prevention programs. Review Iowa SMS membership and identify under- or unrepresented traffic

safety players (e.g., judicial, health, business, insurance, substance abuse prevention and treatment, and education).

- Use the NHTSA publication *The Art of Appropriate Evaluation* in implementing new safety initiatives.
- Use the TRB article "Safety Conscious Planning."
- Use the FHWA web site *Context Sensitive Design/Thinking Beyond the Pavement*.



SUCCESSES AND STRATEGIES IMPLEMENTED

- Improved crash data and analysis tools are available or under development (see Chapter 25, Improving Information and Decision Support Systems).
- The Iowa DOT sponsored a study of traffic safety improvement projects. The *Effectiveness of Roadway Safety Improvements* study (conducted by CTRE) of 94 traffic safety projects concluded that there was a mean crash reduction rate of 23% on these hazard elimination and safety improvement fund projects.
- The *Traffic and Safety Informational Series* is sponsored by the Iowa Department of Transportation Office of Traffic and Safety. The goal of this project was to make available clear, concise, and consistent answers to 25 traffic and safety questions, commonly asked by local officials and the public. The information may be altered, distributed, and used as seen fit by area officials and/or transportation professionals. It is available in print, on disk, and on the web.
- The Iowa DOT Office of Traffic and Safety is developing the "TAS" manual for highway safety practitioners and engineers at the state and local levels (to be available in print and on the Office of Traffic and Safety web site in 2002).
- The Iowa DOT Office of Traffic and Safety sponsors the annual Traffic and Safety Forum each fall to help city, county, state, and consulting highway safety engineers stay up-to-date on recent developments in highway safety technology and practice.
- The Iowa SMS web site was initiated early in 2001 at www.IowaSMS.org.
- In 1999, the Iowa SMS produced the *Iowa Strategic Highway Safety Plan* and distributed the document to over 800 entities for review and comment. The plan served as a catalyst for discussion and a wider range of potential highway safety strategies, resulting in this toolbox, which is available on the Iowa SMS web site.

- In 2000, the Iowa SMS commissioned a public opinion survey (*Iowa Strategic Highway Safety Plan Goals and Strategies: Statewide Survey of Adults*) of the highway safety improvement goals and strategies found in the 1999 Iowa SMS *Iowa Strategic Highway Safety Plan*. Iowans were polled to determine which goals Iowans believed were important and which strategies they would support. The survey results are included in this document (Appendix B, Iowa SMS Highway Safety Public Opinion Survey: Summary Results) and are available on the Iowa SMS web site.
- In late 2000, the Iowa SMS sponsored a multistate highway safety peer exchange. Nineteen states and many national groups were represented, sharing a wealth of expert multidisciplinary highway safety knowledge. Proceedings are available on the Iowa SMS web site.
- An Iowa SMS sponsored multidisciplinary older drivers conference is being planned for spring 2002. Funding was approved in April 2001.
- Iowa SMS approved funding in April 2001 to partner with the Iowa Traffic Control and Safety Association (ITCSA) and sponsored a peer exchange for existing and potential local multidisciplinary safety teams in October 2001.
- The Iowa DOT Office of Traffic and Safety has been active in implementing AASHTO's *Strategic Highway Safety Plan*.
- Iowa DOT staff completed the Context Sensitive Design course.
- An ITS engineer position has been created by the Iowa DOT.
- The Iowa DOT has started a complete study of paved shoulder needs on rural freeways, expressways, and Super 2 highway corridors in Iowa.
- Iowa SMS Older Driver Task Force members made initial contact with community college deans and directors to begin forward thinking for lifelong learning.
- Iowa SMS approved funding in April 2001 for a study of effective public service announcements, *What Works*.

NOTE

The potential strategies in this chapter do not represent specific recommendations of the Iowa SMS Coordination Committee or any agency, group, or individual represented in Iowa SMS. The strategies represent a range of alternatives for legislators, department or agency directors, local governments, and citizen groups to consider when they elect to address a specific highway safety concern.

This toolbox is a living document that will continue to provide information, direction, and ideas for highway safety decision makers. Any strategies selected for implementation by Iowa SMS or any other entity will require further development through identifying potential partners, entities impacted, potential funding, steps for implementation, evaluation, and other pertinent tasks.

RESOURCES

Information in this chapter is drawn from many individuals and sources. Known sources are listed here. **Contributors:** Tom Welch (primary), Mark Campbell, Don East, Joyce Emery, Mike Laski, Jack Latterell, Mary Stahlhut, and Bob Thompson.

AAA Foundation for Traffic Safety
http://aaafts.org/Text/about.cfm#Purpose

American Association of State Highway and Transportation Officials
Strategic Highway Safety Plan (Sept. 1997):
A comprehensive plan to substantially reduce vehicle-related fatalities and injuries on the nation's highways.
safetyplan.tamu.edu/plan/toc.asp

American Trucking Association, Inc.
http://www.truckline.com/insideata/membership/index.html

Centers for Disease Control and Prevention
www.cdc.gov/default.htm
Vision for the 21st Century: Healthy People in a Healthy World—Through Prevention 2000–2001 Fact Book

Center for Transportation Research and Education
Systematic Identification of High Crash Locations:
http://www.ctre.iastate.edu/Research/detail.cfm?projectID=315
Effectiveness of Roadway Safety Improvements:
www.ctre.iastate.edu/Research/detail.cfm?projectID=386

Federal Highway Administration
Context Sensitive Design/Thinking beyond the Pavement:
http://www.fhwa.dot.gov/csd/

Iowa Department of Transportation Office of Traffic and Safety
www.dot.state.ia.us/traffic_safety/index.htm
Traffic and Safety Informational Series:
www.ctre.iastate.edu/pubs/tsinfo/index.htm
Iowa Access Management Awareness Project:
Iowa Access Management and Awareness Project Report; Access Management Toolkit; Access Management Handbook.
www.ctre.iastate.edu/Research/access/index.htm
Intersection Magic Analysis Tool Manual:
www.dot.state.ia.us/alas/imw_manual/imw_main.htm
Traffic and Safety ("TAS") Manual (Jan. 2002)

Iowa Safety Management System
www.IowaSMS.org
Iowa Strategic Highway Safety Plan (Aug. 1999):
www.iowasms.org/pdfs/ishsp.pdf
Iowa Strategic Highway Safety Plan Goals and Strategies: Statewide Survey of Adults (Oct. 2000):
www.iowasms.org/pdfs/publicopinionsurveyexecsumm.pdf

National Cooperative Highway Research Program
Project 17-18

National Highway Traffic Safety Administration
The Art of Appropriate Evaluation

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

Operation Lifesaver
http://www.oli.org/ol_basics/mission.html

Transportation Research Board
National Safety Agenda
Safety Conscious Planning. *Transportation Research Circular* (Jan. 2001)