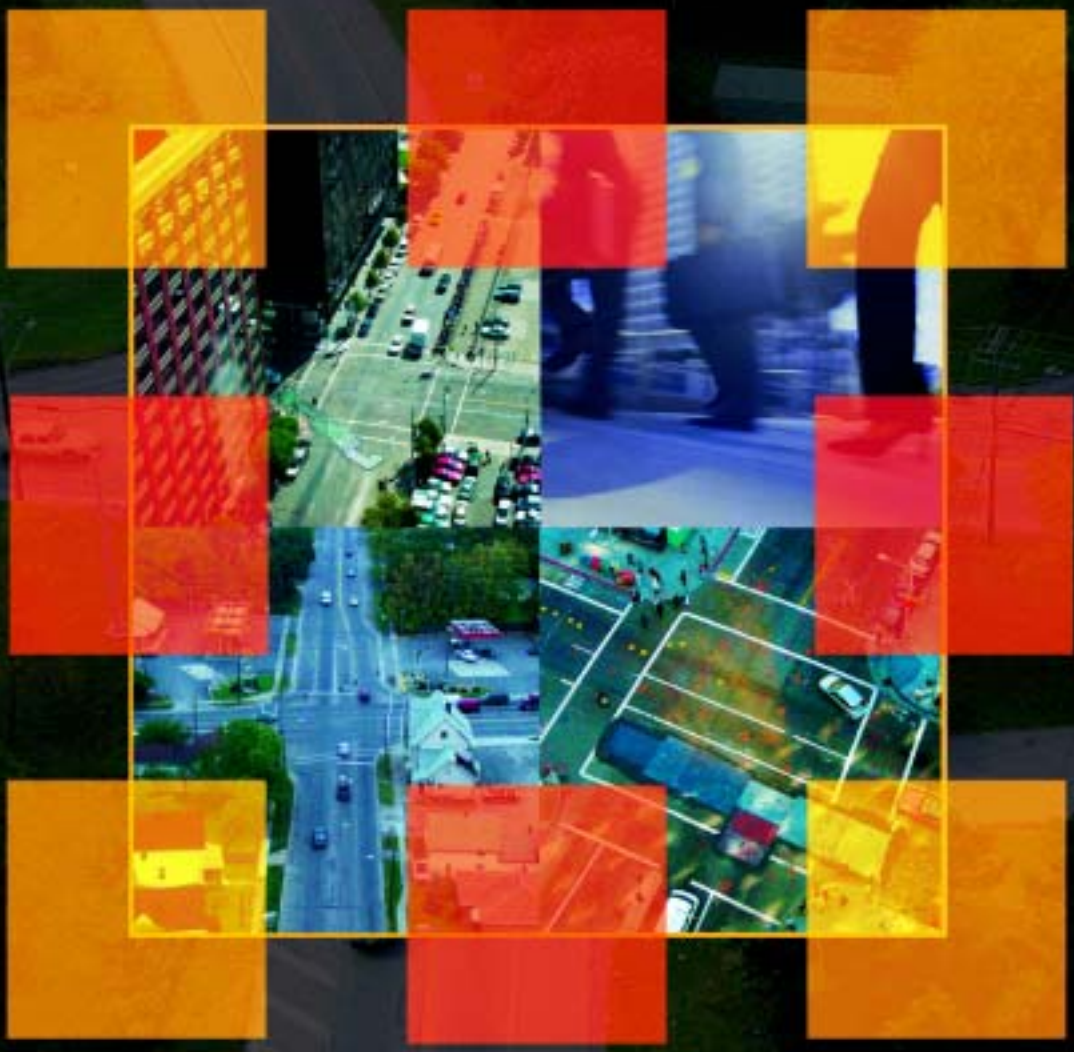
National Agenda for

INTERSECTION SAFETY



Special thanks are given to the following organizations that have assisted in the planning and implementation of this Workshop:

- AAA Traffic Safety Foundation
- Advocates for Highway and Auto Safety
- American Association of State Highway and Transportation Officials Standing Committee on Highway and Traffic Safety
- American Public Works Association
- American Trauma Society
- Association of Metropolitan Planning Organizations
- Better Roads Magazines
- CH2M Hill
- Howard County, Maryland Police Department
- Institute of Transportation Engineers
- Insurance Institute for Highway Safety
- International Association of Chiefs of Police
- International Union of Police Associations
- Maryland State Highway Administration
- National League of Cities
- National Safety Council
- Nationwide Insurance Company
- Roadway Safety Foundation
- State Farm Insurance Companies
- Transportation Research Board
- University of Wisconsin, Madison Campus
- United States Department of Transportation, Federal Highway Administration
- United States Department of Transportation, Federal Motor Carrier Safety Administration
- United States Department of Transportation, National Highway Traffic Safety Administration
- Wisconsin Department of Transportation

Table of Contents

INTRODUCTION 3

Forward 3

Background 3

WORKSHOP RESULTS 5

Programmatic and Legislative Options 5

Political Support 5

Safety Management 5

Research 5

Traffic- and Crash-Record Systems 6

Engineering 6

Intersection Safety Audits 6

Red-Light Running 6

Tools and Best Practices 7

Outreach, Education and Training 7

Marketing and Communications 7

WHAT'S IN PLACE NOW? 8

WHERE DO WE GO FROM HERE? 10

DOCUMENT ORGANIZATION 11

THE NATIONAL INTERSECTION SAFETY PROBLEM 12

S-1: Programmatic and Legislative Options 13

S-2: Political Support 15

S-3: Safety Management 16

S-4: Research 18

S-5: Traffic Crash Record Systems 20

S-6: Engineering 22

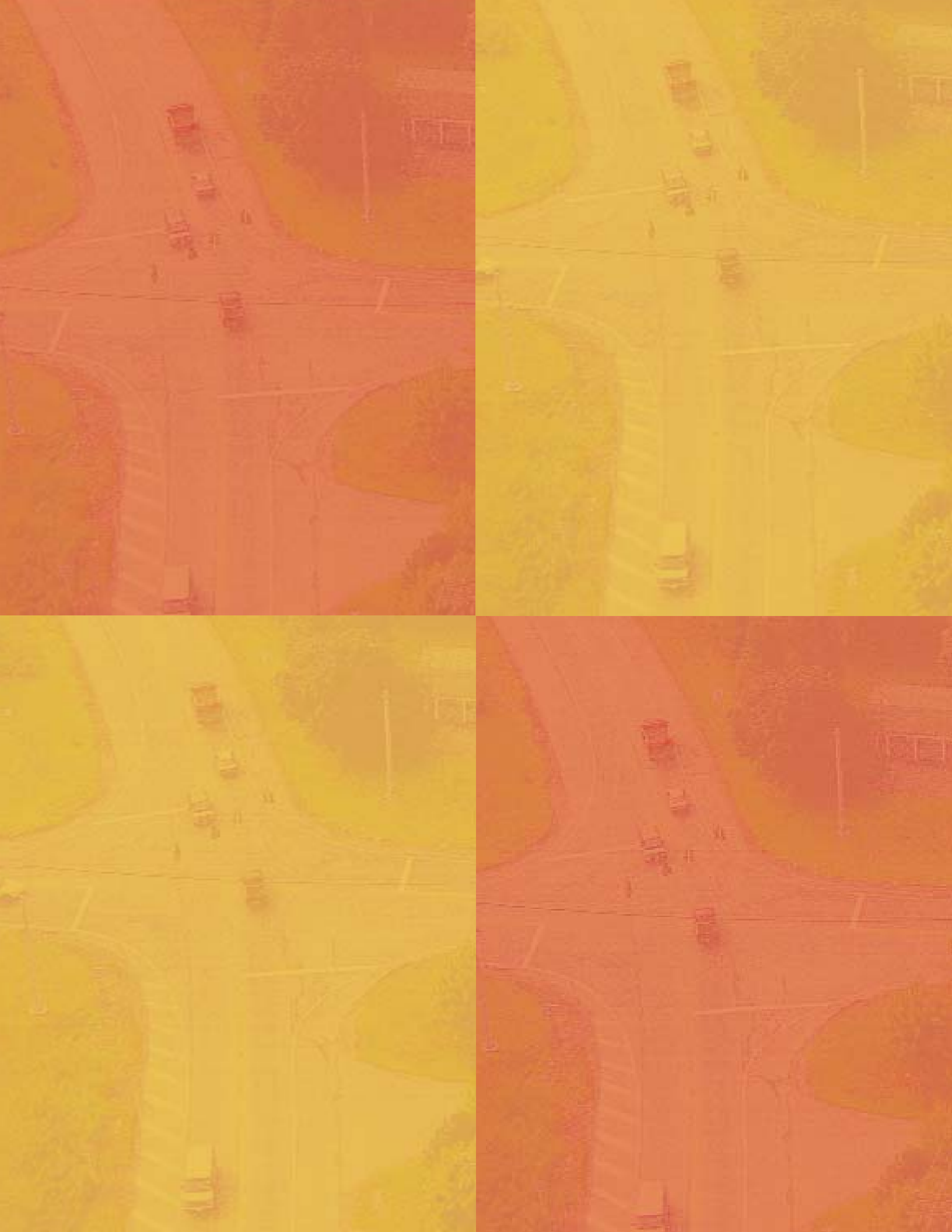
S-7: Intersection Safety Audits 23

S-8: Red-Light Running 24

S-9: Tools and Best Practices 26

S-10: Outreach, Education and Training 28

S-11: Marketing and Communications 30



INTRODUCTION

Forward

The national agenda for intersection safety was developed as a result of the information, data and discussions that occurred at the National Intersection Safety Workshop held in Milwaukee, WS on November 14-16, 2001. Readers are encouraged to provide comments on the Agenda to Office of Safety, Federal Highway Administration, 400 Seventh Street, SW Washington DC 20590. The national agenda for intersection safety should be viewed as a "living document," and as such, will be modified periodically based on comments received and actions implemented by transportation and safety agencies.

Background

More than 2.8 million intersection-related crashes occurred, representing 44 percent of all reported crashes, in the Year 2000. Approximately 8,500 fatalities (23 percent of the total fatalities) and almost 1 million injury crashes (more than 48 percent of all injury crashes) occurred at or within an intersection environment. Given this high number of fatalities and injuries at intersections, many transportation and safety agencies and organizations are developing plans and programs to address the intersection safety problem.

Intersection safety is one of the emphasis areas in the American Association of State Highway and Transportation Officials (AASHTO) Strategic Highway Safety Plan. The AASHTO Strategic Plan is a comprehensive plan that brings together engineering, enforcement, education and emergency response management. Intersection safety is also included in the Institute of Transportation Engineers' Safety Action Plan. Intersection safety is recognized as one of four priority areas in the Federal Highway Administration's Performance Plan. The FHWA, AASHTO and ITE have several initiatives to improve safety at our nation's intersections.

Traditional and non-traditional organizations must work together to make a substantive difference in the reduction of intersection-related crashes. To focus the transportation and safety community's attention to intersection-safety, AASHTO, ITE, FHWA, State Farm Insurance Company and a host of other organizations,

INTRODUCTION

sponsored a National Intersection Safety Workshop. More than 180 transportation and safety professionals convened in Milwaukee, Wisconsin on November 14-16, 2001 for the workshop. The goals were to convene an expert group from the education, enforcement and engineering groups to identify and describe the intersection safety problem, to share and discuss the best practices for improving intersection safety, and most important, to develop a national agenda on intersection safety that provides a vision for the improvement of intersection safety.

The workshop contained presentations focusing on law enforcement, engineering and education topics related to intersection safety, and a series of breakout sessions and conversation circles designed to elicit input from all participants. Each breakout group included 20 to 30 people who focused their discussions on urban, suburban, or rural aspects of intersection safety. Three breakout sessions each had a specific focus.

The first session focused on problem/opportunity identification. The objective was to identify the major issues, challenges and barriers to reduce intersection crashes.

The second session had the objective of developing solutions. The group considered the following: (1) what resources/solutions do we already have in place to assist in intersection crash reduction efforts? what do we have already that is working? (2) what resources/solutions are not in place to assist in crash reduction efforts? and (3) other creative resources/solutions that have not been tried. Within the third session, the objective was to develop the national agenda based on the solutions developed for each group. The agenda included strategies and a discussion of how they might be implemented.

Workshop Results

The National Agenda includes 11 categories of solutions and possible strategies. A summary of each strategy is provided below:

1. Programmatic and Legislative Options

Key strategies for programs and legislation recommended by workshop participants include:

- Actively promote increased safety funding in reauthorization.
- Create safety program funds for use by local governments.
- Make the current program more helpful at the local level.
- Take "3%" of the highway funds in a given year and use for safety purposes.
- Seek legislation that provides for 100 percent obligation of safety set aside funds.
- Implement best practices by providing incentives to states and local governments.
- Tie funding to accountability and demonstration of results. Federal safety funds would be tied to performance standards.
- Provide funding for safety evaluation training for engineers and technicians.
- Develop a clearinghouse for intersection safety.
- Seek legislation that provides dedicated funding for automated crash reporting.

2. Political Support

This issue addresses the need to inform political leaders to increase understanding of the importance of promoting and investing in safety programs. Participants indicated that transportation and safety professionals should redefine intersection safety as a quality of life issue. One way to do this would be to demonstrate benefits, including lives saved. Communications is necessary to get the message to political leaders and the public that intersection safety is a national public health issue.

3. Safety Management

This issue addresses the lack of a systems approach. Good information must get to the local level where intersection safety can be addressed. One strategy includes developing and effectively using partnerships. Improving intersection safety will require the development of strong and permanent partnerships between law enforcement, education and engineering organizations. Participants commented that the "institutional table" needs to be widened to include existing and new advocates, professionals and business groups to support traffic safety initiatives, senior citizens, the disabled and insurance companies. Communication and a team approach are keys to achieving successes. Partnerships are one way of ensuring communication.

4. Research

Major issues that were addressed included: (1) lack of reliable data on the effectiveness of various safety countermeasures; (2) lack of focused research on the intersection problem; and

WORKSHOP RESULTS

(3) the need for a better understanding of human factors as related to the drivers' decision-making process within an intersection environment. Major strategies recommended include the conduct of research on (1) driver information countermeasures, (2) costs and benefits of intersection safety countermeasures, (3) advanced technologies and intersection collision avoidance systems and (4) human factors research.

5. Traffic- and Crash-Record Systems

Participants cited a lack of accurate crash data, specifically, inadequate coding, lack of standardized formats and lack of information on the environment (e.g., signals) at the time of the crash. Participants indicated a dialogue is essential between users and collectors of crash data. The development and use of a standardized crash reporting system was designated as a top priority, including the use of GIS/GPS, logic checks and other quality control measures, and user-friendly applications. The development of a "data warehouse" to provide for common linkages among databases was a second key strategy that was discussed. Another significant issue is the fact that the number of reported crashes to governmental entities is going down. The thresholds for reporting crashes to police are being raised and consequently, traffic engineering and law enforcement agencies may not be getting the entire picture on crash history and patterns at an intersection.

6. Engineering

Participants cited lack of understanding of the need for regular signal retiming programs. Proper signal timing is not universally achieved or maintained in numerous jurisdictions because of manpower and budget constraints. Participants cite a need to inform communities, political leaders, and safety and transportation professionals on the safety and operational benefits of signal retiming. In addition, they cited a need to train new and current traffic engineers on how to time a traffic signal.

7. Intersection-Safety Audits

The Federal Highway Administration is providing training for road safety audits and road safety audit reviews to state departments of transportation throughout the United States. The participants indicated that a program for intersection safety audits/reviews should be developed. More specifically, participants indicated that a national practice is needed and that a separate process should be developed both for urban and rural intersections. The national practice should develop criteria for when an intersection audit should take place using such factors as vehicular and pedestrian volumes, school zones, crashes and complaints. Participants indicated that an understanding of the requirements for pedestrians, cyclists and persons with disabilities should be included in the intersection audit.

8. Red-Light Running

Issues include the need to clarify the benefits and dispel the myths associated with automated enforcement and the need to correctly calculate appropriate yellow clearance times at traffic signals. Participants cited the need to develop a best practices manual that would show suc-

cessful strategies, avoid pitfalls and build support. Participants supported increased enforcement, including the use of cameras as a solution where engineering and education efforts have fallen short.

9. Tools and Best Practices

Participants indicated that substantial information has been produced. However, an inventory is needed to catalogue existing intersection safety analysis tools. It was suggested that a "combined" design and operations handbook for intersections be developed that integrates the requirements of vehicles, pedestrians and cyclists, and the disabled. Part of the need once this information is catalogued is to disseminate it to state and local agencies and communities. Participants indicated that Local Technical Assistance Program (LTAP) centers and the organizations that have participated in the development of the National Agenda for Intersection Safety should be used for this purpose. Access control was another major topic that was highlighted. Again, participants cited a need for a synthesis of state and local design standards and model ordinances, as well as a best practices handbook for access control.

10. Outreach, Education and Training

A number of challenges in transportation and safety agencies are related to training. Participants indicated that a limited number of trained professionals, especially at the local level, a lack of safety training for the design of rural intersections and a lack of human factors training, are major issues that should be addressed in the national agenda. Strategies identified include: (1) development and implementation of a training program for intersection safety that would educate professionals on those cost-effective improvements that hold the most promise for crash reductions; (2) increased use of safety peer-to-peer exchanges; (3) training on how human factors issues impact the complex intersection environment and (4) development of community education venues and materials for drivers and pedestrians. Overall, the participants citied the need for all types of training venues such as ITE's online safety courses, web-based, distance learning resources, university training and continuing education opportunities. NHTSA's Safe Community Program does not include intersection safety as a principal component; however, participants believed that this venue would be an excellent organizational mechanism that is already in place to conduct intersection safety outreach activities.

11. Marketing and Communications

Intersection safety is not accepted nationally as a public health problem. The public is not getting the message. Participants recommended that a number of steps be taken to address this issue, including the allocation of resources to market intersection safety and the use of communications specialists to conduct market research and to advise transportation and safety professionals on how to market the gravity of consequences for violating the law at intersections. In addition, participants recommended that a media campaign be developed to create and sustain public awareness of intersection safety issues.

WHAT'S IN PLACE NOW?

Several efforts now in place begin to address the intersection safety problem. The coalition of organizations and agencies that helped developed the National Agenda can begin to use these resources to implement measures to assist with the goal of intersection crash reduction.

- AASHTO Strategic Highway Safety Plan. The goal for this strategic plan is to improve the nation's present and predicted statistics on vehicular related death and injury. The plan contains six main elements (drivers, special users, vehicles, highways, emergency medical services and management) and 22 emphasis areas. The National Agenda for Intersection Safety ties its strategies to specific AASHTO emphasis areas to ensure coordination among various coalition partners. The AASHTO Strategic Highway Safety Plan can be found at: http://safetyplan.tamu.edu.

- Project 17-18(3), FY 2000: Guidance for Implementation of the AASHTO Strategic Highway Safety Plan. This research will develop guidance to assist state and local highway agencies with implementing strategies to reduce fatalities by 10 to 15 percent in aggressive driving, head-on and run-off-the-road crashes on two-lane roads, people who drive with suspended and revoked licenses, hazardous trees that need to be addressed in an environmentally acceptable manner and unsignalized intersections. Information can be found on the Transportation Research Board's Web site: http://www4.trb.org/trb/crp.nsf. Click on NCHRP, All Projects and go to "Area 17."

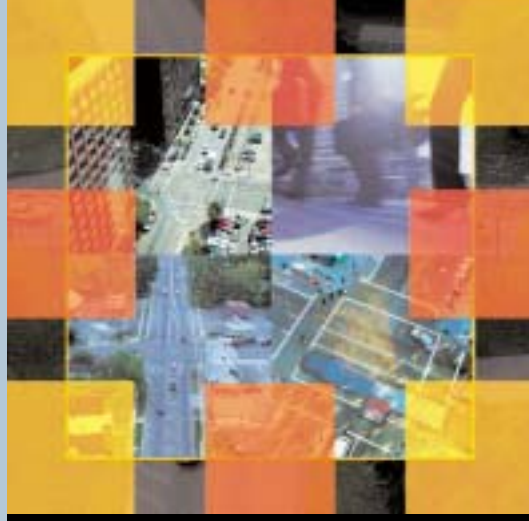
- Outreach Toolkit. This outreach toolkit will allow policymakers to have a user-friendly way to be able to communicate and elevate the awareness and understanding of the intersection safety problems when speaking to the public. A set of briefing sheets is under development. These briefing sheets will include facts, issues and potential solutions about various aspects of intersection safety. During CY 2002, the following briefing sheets will be available: (1) The National Intersection Safety Problem; (2) Red Light Running; (3) Red Light Cameras; (4) Basic Countermeasures to Enhance Intersection Safety; (5) What are Traffic Control Devices: Their Use and Misuse; (6) Intersection Safety Enforcement; (7) Safety of Pedestrians and Bicyclists in Intersections; (8) Human Factors Issues in Intersection Safety; (9) Intersection Safety Myths vs. Reality; (10) Highway and Street Work Zone Intersection Safety Issues; and (11) Intersection Safety Resources. This outreach toolkit will be made available on both the FHWA and ITE Web sites.

- Intersection Safety Video. This video, "Red Light, Green Light" will provide the general traveling public and the entire transportation community with an

increased awareness on the critical importance of intersection safety. This video allows the viewers to identify steps they can take to improve their own safety, as well as provides information on what the transportation profession is doing to help create safer intersections. ITE will disseminate this product.

- Infrastructure Intersection Collision Avoidance. The Federal Highway Administration has partnered with the departments of transportation in California, Minnesota and Virginia to form an infrastructure consortium. The consortium represents the interests of state and local highway transportation agencies in the development and deployment of advanced highway safety technologies. The research effort includes: (1) analysis of crashes and mitigation concepts; (2) development of intersection collision avoidance concepts and algorithms; (3) development of analytical models to assess safety countermeasures; (4) development of infrastructure-based sensors; (5) examination of human factors issues; (6) definition of vehicle infrastructure communication methods; (7) assessment of benefits, costs and institutional barriers to deployment; and (8) development of in-vehicle systems.

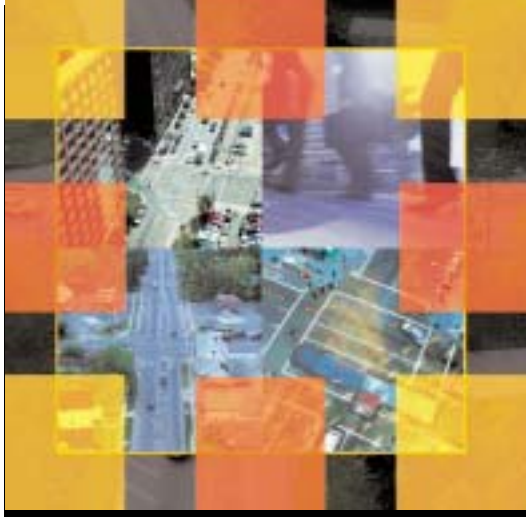
- ITE Online Learning Gateway. ITE has developed one course, in a series of courses to follow, on transportation safety. This course, TS02 Safety of Signalized Intersections, was developed as a guided tutorial approach to assist transportation professionals to analyze crash data and identify appropriate countermeasures to reduce the frequency of crashes and the fatalities, personal injury and property damage involved. The course can be accessed on the ITE Web site, www.ite.org.



WHAT'S IN PLACE NOW?

WHERE DO WE GO FROM HERE?

This document, the National Agenda for Intersection Safety, can be found on: www.ite.org and http://safety.fhwa.dot.gov. Each organization should review the national agenda and develop its safety action plans within the next six to 12 months based on needs and available resources. During the November 2001 Intersection Safety Workshop, many individuals made personal and organizational commitments to make certain outcomes (e.g., processes) and outputs (e.g., results) happen that would have the effect of reducing intersection crashes. Follow up will occur with individuals on their commitments, and progress will be tracked. The workshop is the springboard for the next phase of the transportation and safety community's efforts to achieve the goal of reducing intersection crashes. Sustained partnerships between the law enforcement, engineering and education professionals will be the key to successful communication and, ultimately, achievement of the goal to reduce intersection crashes.



DOCUMENT ORGANIZATION

The National Agenda for Intersection Safety is organized in accordance with the major categories of possible strategies that were developed as part of the Milwaukee, WI Intersection Safety Workshop. These categories are:

S-1: Programmatic and Legislative Options
S-2: Political Support
S-3: Safety Management
S-4: Research
S-5: Traffic Crash Record Systems
S-6: Engineering
S-7: Intersection Safety Audits
S-8: Red-Light Runnin
S-9: Tools and Best Practices
S-10: Outreach, Education and Training
S-11: Marketing and Communications

Prior to the discussion of the major strategies for achieving reductions in intersection crashes, a summary of the national intersection safety problem is set forth.

THE NATIONAL INTERSECTION SAFETY PROBLEM

Intersection safety is a national priority for numerous highway safety organizations. Driving near and within intersections is one of the most complex conditions drivers will encounter. In 2000, there were more than 2.8 million intersection-related crashes representing 44 percent of all reported crashes. Approximately 8,500 fatalities (23 percent of the total fatalities) and almost one million injury crashes occurred at or within an intersection environment. The cost to society for intersection- related crashes is approximately $40 billion every year.

THE NATIONAL INTERSECTION SAFETY PROBLEM

The National Intersection Safety Problem cont.

Intersections are areas of highways and streets that naturally produce vehicle conflicts among vehicles and pedestrians because of entering and crossing movements. Reducing fatalities and injuries can only be accomplished by careful use of good road design, traffic engineering choices, comprehensive traffic safety laws and regulations, consistent enforcement efforts, sustained education of drivers and pedestrians, and the drivers' and pedestrians' willingness to obey and sustain the traffic safety laws and regulations.

Despite improved intersection designs and more sophisticated applications of traffic engineering measures, the annual toll of human loss due to motor vehicle crashes has not substantially changed in more than 25 years.

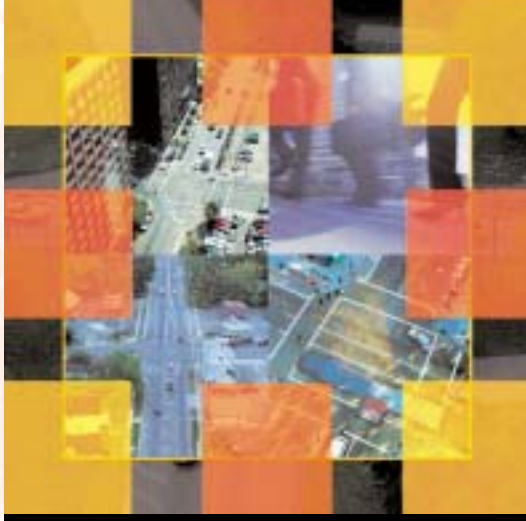
Two subgroups are involved in intersection/intersection- related crashes at high levels: senior drivers and pedestrians.

Senior drivers do not deal with complex traffic situations as well as younger drivers do, and that is particularly evident in multiple-vehicle crashes at intersections. People 65 years and older have a higher probability of causing a fatal crash at an intersection, and approximately half of these fatal crashes involved drivers that were 80 years and older. Older drivers are more likely to receive traffic citations for failing to yield, turning improperly, and running stop signs and red lights.

	NUMBER TOTAL	PERCENT
Total Fatality Crashes	37,409	
Total Intersection-related fatality crashes	8,474	22.6
Total Injury Crashes	2,070,000	
Total Intersection-related injury crashes	995,000	48.1
Total Property-Damage-Only (PDO) Crashes	4,286,000	
Total PDO Intersection-related crashes	1,804,000	42.1
All Crashes	6,394,000	
Total Intersection-related crashes	2,807,000	43.9
Total Fatalities	41,821	
Total Intersection-related injured persons	1,596,128	

Intersections are disproportionately responsible for pedestrian deaths and injuries. Almost 50 percent of combined fatal and non-fatal injuries to pedestrians occur at or near intersections. Pedestrian casualties from vehicle impacts are strongly concentrated in densely populated urban areas where more than two-thirds of pedestrian injuries occur.

Programmatic and Legislative Options



AASHTO Strategic Highway Safety Plan Emphasis area 17:

"Improving the design and operation of highway intersections"

AASHTO Strategic Highway Safety Plan Emphasis area 22:

"Creating more effective processes and safety management systems"

Issues Addressed:

1. There is a lack of resources for rural intersection safety improvements.
2. No federal program focuses on low volume roads.

Possible Strategies:

1.1 Safety organizations should develop their own intersection safety action plans within the next 6-12 months.

1.2 Develop guidance, education, and policies for engineers and others on the relative importance of safety, efficiency and the environment.

1.3 Provide a dedicated safety engineering function at all levels of government.

- Build a coalition of community members and organizations
- Foster public awareness programs
- Formalize a safety management program
- Seek support for implementation
- Metropolitan Planning Organizations and Regional Planning Commissions should disseminate safety-related programs, policies, projects and expertise.

1.4 Actively promote increased safety funding in reauthorization.

- Create safety program funds for use by local governments.
- Make the current safety program more helpful at the local level.
- Use 3 percent of $1 billion of the highway fund in a given year for safety.
- Provide funding for safety evaluation training for engineers and technicians.

STRATEGY S-1

STRATEGY S-1 CONT.

1.4 CONT.

- Seek legislation that provides for 100 percent obligation of safety set aside funds.
- Implement best practices by providing incentives (e.g., financial) to states and local governments.
- Tie federal safety incentive funds to a performance standard.
- Tie funding to accountability and demonstration of results.

1.5 Seek legislation that provides dedicated funding National Agenda for Intersection Safety for automated crash reporting.

1.6 Create model laws for the states that would include data collection requirements, safety reviews and mitigation measures.

1.7 Provide traffic engineering/safety support to local governments.

1.8 Develop a traffic crash data collection program that would identify and establish resources for standardized traffic crash data.

1.9 Add an intersection safety focus to NHTSA's safe communities program.

1.10 Develop a clearinghouse for intersection safety. This would be a centralized location for a variety of stakeholder groups to provide input: [e.g., AASHTO, ITE, IES (Illumination Engineers Society), IACP, Access Board, researchers, DOTs and TRB].

POLITICAL SUPPORT

AASHTO STRATEGIC HIGHWAY SAFETY PLAN EMPHASIS AREA 22:

"Creating more effective processes and safety management systems"

Issues Addressed:

1. There is a need to inform leaders and workers within the political system to increase the understanding of the importance of promoting and investing in safety programs.

2. There is a lack of leadership and focus on intersection safety.
3. Support for safety is split into several factions. There is not "one voice" for traffic safety.

Possible Strategies:

2.1 Redefine intersection safety as a quality of life issue.
- Create analogies (e.g., water quality).
- Conduct field trips for decision makers.
- Show benefit/cost to decision makers (intersection safety improvement vs. medical costs).
- Raise awareness of intersection problems with top department, county and other leaders.
- Show an economic benefit to increased intersection safety.

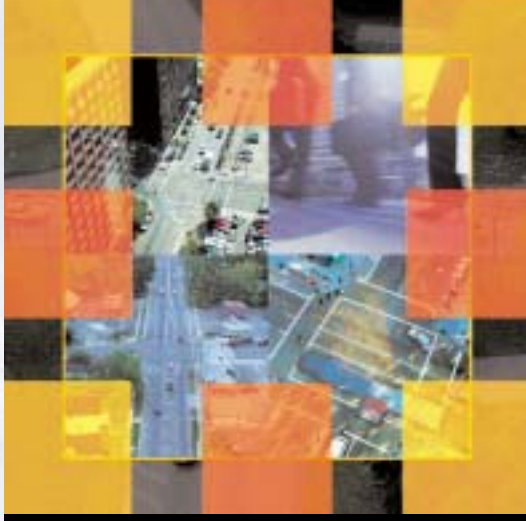
2.2 Provide recognition to jurisdictions or officials that have brought about a significant decrease in intersection crashes.

2.3 Safety professionals should proactively seek opportunities to attend legislative local, state and federal transportation committee meetings and hearings.

2.4 Disseminate information to elected officials on the proper use and requirements for the installation of traffic control devices.

2.5 Use "crime/crash clock" when working with the public and decision makers.

2.4 Inform communities and political leaders on the benefits of signal retiming.



STRATEGY S-2

STRATEGY S-3

SAFETY MANAGEMENT

AASHTO STRATEGIC HIGHWAY SAFETY PLAN EMPHASIS AREA 22:

"Creating more effective processes and safety management systems"

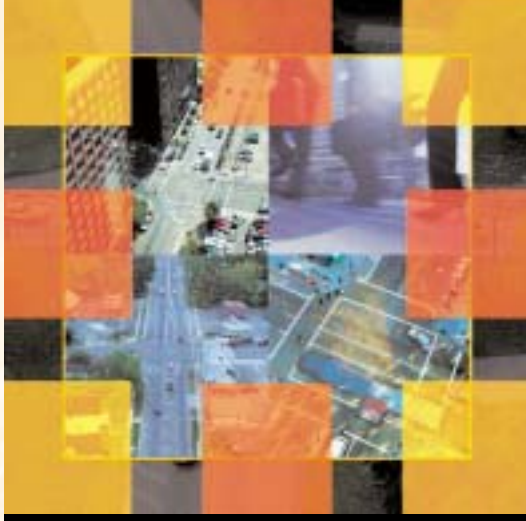
Issues Addressed:

1. The lack of a systems approach to address intersection safety.
2. The competing demands for both congestion and safety, including their interactive effects and the conflicts in achieving one to the detriment of the other.
3. Getting good information to the local level where intersection safety can be addressed.
4. The lack of a common goal that could be used to motivate common efforts by the police, engineers and others.
5. The lack of incident management coordination.

Possible Strategies:

3.1 Develop a multi-disciplinary/multi-agency safety group within each state and locality to address intersection safety issues.

- Identify broad-based stakeholder groups (e.g., federal, state, local, hig way safety office, engineering, enforcement, EMT, private industry and other advocates).
- Widen the institutional table to include existing and new advocates, professionals and business groups to support traffic safety initiatives, senior citizen groups, the disabled and insurance companies.
- Identify ongoing activities by various groups or individuals.
- Set up systems to share information and data. Establish multi-jurisdictional coordination and information sharing within each State and within contiguous jurisdictions.
- Establish safety contacts and references in each State.
- Develop a Memorandum of Agreement/Charter between relevant organizations and advocates specifying specific actions each organization will undertake for intersection safety.



STRATEGY S-3

3.2 Hold a safety forum with partners as a precursor for the preparation of the action plan for Intersection Safety.

3.3 Incorporate safety in the planning process. Institutionalize the involvement of safety organizations in the development and review of safety plans and metropolitan planning organization products.

3.4 Integrate transportation safety and operations activities. They have common themes such as:

- Create multi-agency-jurisdictional partnerships,
- Provide training,
- Inform the public and decision makers, and
- Increase funding.

3.5 Organizations should incorporate an intersection safety theme for their local, regional and national meetings. Keynote and/or plenary presentations should address intersection safety.

STRATEGY S-4

RESEARCH

AASHTO STRATEGIC HIGHWAY SAFETY PLAN EMPHASIS AREA 21:

"Improving information and decision support systems."

Issues Addressed:

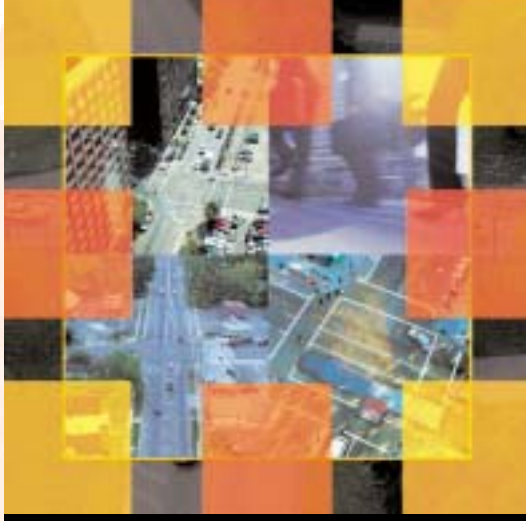
1. There is a lack of reliable data on the effectiveness of safety countermeasures.
2. There is a lack of focused research on the intersection problem.
3. There is a need to incorporate in-vehicle data capture ("black box").
4. There is a lack of ITS knowledge.
5. Advanced vehicle and traffic technologies are making drivers less astute/aware. Truckers do not have to think because of rollover devices. Other emerging technologies such as collision avoidance have similar effects.
6. There is a lack of sophisticated crash notification systems.
7. We need a better understanding of the failure mechanisms in the driver decision-making process.

Possible Strategies:

4.1 Identify gaps and conduct research that will assist safety professionals to identify intersections that can benefit from cost-effective safety improvements.

4.2 Conduct Research on Driver Information Countermeasures

- Prepare a synthesis report on driver information countermeasures. Include a literature review and a survey. In addition, topics to be addressed include: dynamic signing, advisory speed signs/beacons, advance street name signs, larger/brighter warning signs, advance advisory flashing beacons, strobe light in signals, roadway illumination, how to accommodate high-risk road users and human factors/information overload.
- Identify and prioritize gaps in the state of the art; prepare research problem statements to address the most critical knowledge gaps.



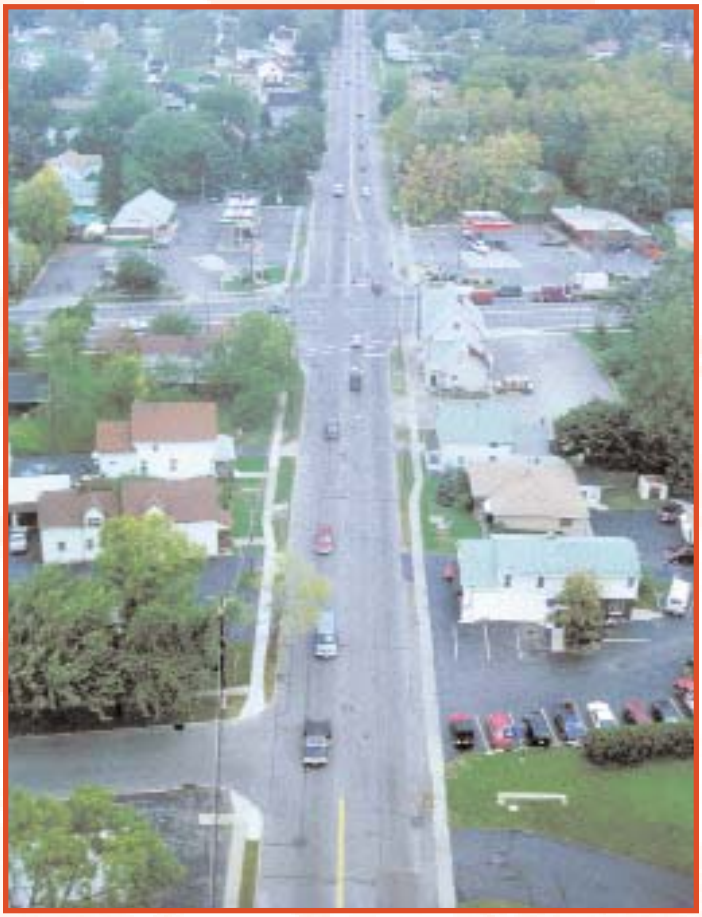
STRATEGY S-4

4.3 Perform research on the benefits and costs of intersection safety countermeasures.

4.4 Conduct research and evaluation of advanced technologies for intersection safety, including advanced collision avoidance systems and invehicle components. Researchers must work with traffic engineers. There is a need for demonstration and field operational tests for these technolo - gies.

4.5 Conduct human factors research related to intersection safety. There is a need to identify drivers' thinking and perceptions as they approach an intersection, and the types of mental limitations that exist (information overload, complexity of information, etc.).

4.6 Conduct research to determine the safety impacts and countermeasures of stopped or parked traffic. The research would include urban goods movement, vehicular parking and transit issues, including bus stop location requirements.



STRATEGY S-5

Traffic Crash Record Systems Possible Strategies

AASHTO Strategic Highway Safety Plan Emphasis area 21:

"Improving information and decision support systems."

Issues Addressed:

1. Inadequate quality (e.g., coding, narratives, completeness and accuracy) and quantity (e.g., property damage only crashes beneath reporting threshold) of crash reports.

2. Crash reports lack standardized formats and data.

3. There is a need to acquire crash data from other sources (insurance companies) to supplement existing crash data.

4. There is a need to achieve cross-jurisdictional cooperation in incident management, arterial operations and enforcement.

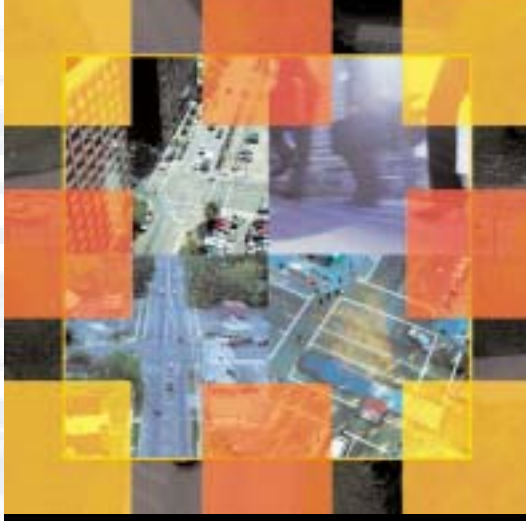
5. There is inadequate crash location identification.

6. There is little information on the state of the "environment" at crash locations. For example, information on signal operation and design, and intersection layout are needed to assist in determining the causes of crashes.

Possible Strategies:

5.1 Develop a dialogue between users and collectors of crash data.

- Ensure stakeholder participation at meetings.
- Obtain various points of view regarding needed changes in the accident report form.
- Obtain better understanding of training needs.
- Provide training and education on the uses and functions of crash data to the safety agencies, including enforcement personnel.



STRATEGY 5-5

5.2 Develop/promote a standardized crash reporting system that:

- Uses GIS/GPS.
- Minimizes duplication of efforts across levels.
- Includes user-friendly applications.
- Uses hardware and software to increase accuracy of data location.
- Allows laptop data entry with logic checks (automated).
- Has street name data base with logic check.
- Integrates software/hardware to other police duties.
- Develops reliability/other quality control measures.
- Surveys users of improved standardized crash reporting systems.
- Develops feedback loop and incorporates comments into revised systems.
- Identifies high crash locations.
- Consolidates crash data into a clearinghouse.
- Updates standardized crash data on an annual basis.

5.3 Maintain strong support and funding for development of an area-wide collision database and associated support and maintenance.

- Develop data "Records Czar" (e.g., Traffic Records Coordinator).

5.4 Develop a data warehouse that would provide for linkages among common databases.

STRATEGY S-6

ENGINEERING

AASHTO STRATEGIC HIGHWAY SAFETY PLAN EMPHASIS AREA 17:

"Improving the design and operation of highway intersections"

Issues Addressed:

1. Proper signal timing has not been universally achieved or maintained.

2. Engineers do not conduct field reviews as often as they should.

Possible Strategies:

6.1 Inform safety and transportation professionals on the benefits of signal retiming.

6.2 Develop and deliver signal timing training courses, including a signal timing tools CD.

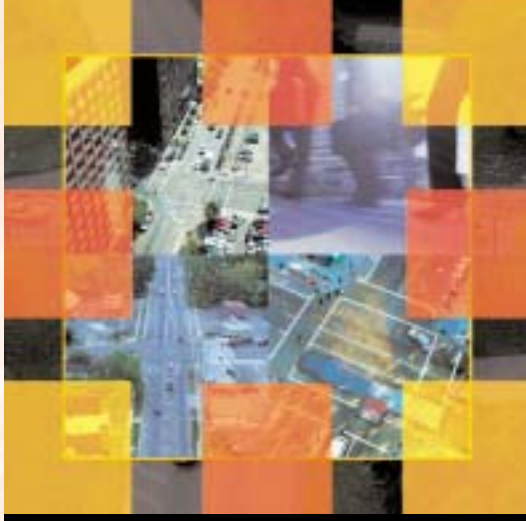
6.3 Establish grant programs or funding mechanisms for regular signal timing reviews and implementation.

- Implement a signal timing grant program similar to the bridge inspection program whereby every "x" years, a jurisdiction would inspect signals. Information would be provided to a national data base. This would be a requirement to qualify for the grant program.
- Establish a program to review, evaluate operations and retime, if necessary, all signalized intersections on an agency defined schedule (not to exceed "x" years).
- Provide funding for signal timing data collection such as traffic counts, lane geometry, signal equipment, speeds and school safe walking routes.
- Establish a preventive maintenance program for equipment and communication systems.

6.4 Convert signal indicators to LED.

6.5 Promote the safety benefits of roundabouts.

INTERSECTION SAFETY AUDITS



STRATEGY S-7

AASHTO STRATEGIC HIGHWAY SAFETY PLAN EMPHASIS AREA 17:

"Improving the design and operation of highway intersections"

AASHTO STRATEGIC HIGHWAY SAFETY PLAN EMPHASIS AREA: 22:

"Creating more effective processes and safety management systems"

Issues Addressed:

1. How do we get good information to the local level where intersection safety can be addressed?

2. There is a lack of knowledge and understanding when considering bicycles, pedestrians and the disabled in intersection design.

Possible Strategies:

7.1 Develop a training program for Intersection Safety Audits. Steps to include:

- Develop a process/national practice.
- Include separate processes for both urban and rural intersections.
- Identify required types of multi-disciplinary team members.
- Develop checklist.
- Develop intersection selection criteria where an audit would take place for existing intersections based on such items as volume, school zones, pedestrians, access control, crashes, complaints and planned projects.

7.2 Gain management support for use of the intersection safety audit program.

- Inform practitioners of process.
- Obtain support/buy-in by elected or appointed officials.

7.3 Develop and provide training for ISAs

- Identify 12 instructors/train 600 students immediately.
- Delivery in 50 pilot cities in Year 1 and then broader distribution.
- Evaluate benefits of using ISA process.

STRATEGY S-8

RED LIGHT RUNNING

AASHTO STRATEGIC HIGHWAY SAFETY PLAN EMPHASIS AREA 17:

"Improving the design and operation of highway intersections"

Issues Addressed:

1. Dispel the myth that the primary function of red-light cameras is revenue generation.

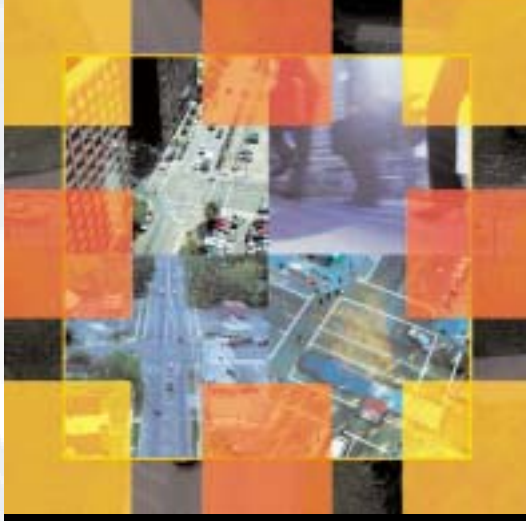
2. Identify appropriate amber time and address privacy challenges associated with red-light cameras.

3. Identify methods to supplement ineffective traditional enforcement of red-light violations.

Possible Strategies:

8.1 Develop a red-light running/photo enforcement "Best practices manual" to show successful strategies, avoid pitfalls and build support. The best practices manual could:

- Include a decision tree process whereby cameras might be recommended when other solutions or modifications will not resolve the red-light running problem.
- Show how to undertake a safety engineering review of target intersections before using cameras.
- Include case studies and program operation criteria. Model programs could be showcased. Examples of poor program implementation could also be identified to show elements of programs that should be used.
- Identify areas where agency oversight is critical.
- Identify needed interagency support and involvement for successful programs.
- Evaluate contracting issues and current case law that would have an impact on program operations.
- Suggest that signs are visible and widely used as a concomitant to the red-light camera program.



STRATEGY S-8

8.2 Develop a companion video and non-technical handouts for decision makers and the general public.

8.3 Create a "train the trainer" course with national experts to train state/local trainers. Distribute this course at the local, grassroots level.

8.4 Share model legislation in the Uniform Vehicle Code.

8.5 Encourage enforcement, including the use of cameras where engineering and education efforts and solutions have not worked. Elements of a sucessful red-light camera program include:

- Recognition of safety benefits;
- Grass roots support;
- Willing sponsors;
- Use home rule opportunities;
- Police manpower savings; and
- Surplus funds for traffic safety.

8.6 Provide funding for red-light camera programs

- Allow federal funding through NHTSA Grants.
- Seek to establish programmatic support from the insurance industry through seed funding.
- Create pilot program in FHWA reauthorization for 50 cities with populations greater than 50,000.

8.7 Proactively communicate, demonstrate and substantiate red-light running issues and potential solutions through the media.

- Hold press conferences regularly to inform the public about the red light camera program.
- Demonstrate program results.
- Show how the program works.
- Ensure the red-light camera program conveys a safety purpose.
- Highlight tragic events.
- Use victims advocates

STRATEGY S-9

TOOLS AND BEST PRACTICES

AASHTO STRATEGIC HIGHWAY SAFETY PLAN EMPHASIS AREA 17:

"Improving the design and operation of highway intersections"

AASHTO STRATEGIC HIGHWAY SAFETY PLAN EMPHASIS AREA: 21:

"Improving information and decision support systems."

Issues Addressed:

1. There is a lack of simple analysis system to identify unsafe intersections.

2. There is a lack of knowledge on effective safety improvements.

3. There are dual and conflicting objectives of operational efficiency versus safety.

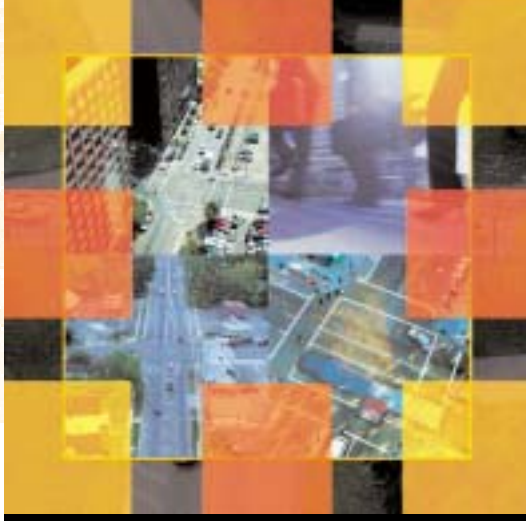
Possible Strategies:

9.1 Conduct an inventory and analysis of existing intersection safety analysis tools. Steps include:

- Identify user needs (vehicle, pedestrians, bicycles).
- Determine available analysis tools.
- Determine shortfalls between needs and available tools.
- Reach consensus on critical tools that needs to be developed.

9.2 Develop Toolbox (Design and Operations Manual/Handbook)

- Determine the "best" of the best practices that integrates the requirements of vehicles, pedestrians, bicyclists and other users.
- Synthesize, organize and identify tradeoffs.
- Develop case studies.
- We have intersection safety tools today; we have to tell people and the disciplines how to use them.
- Disseminate the practices (e.g., through ITE, LTAP, AASHTO) through "one stop shopping."
- Use Web-based training, checklists and decision trees.
- Focus analysis tools through the use of LTAP and other distribution mechanisms.



STRATEGY 9-9

- Develop implementation guidelines to address signalized and unsignalized intersections accidents (NCHRP 17-18- 03).

9.3 Evaluate international tools and best practices. Target countries that have dramatic reductions in intersection crashes.

9.4 Institutionalize the use of tools in the safety planning process (e.g., crash prediction models).

9.5 Improve safety management processes by developing intersection inventory files. Keep records on each intersection, including location, geometrics, equipment and traffic control. This needs to be done on a system-wide basis. We need to promote the importance of intersection safety management processes for use by states or local communities.

9.6 Better Access Control is needed.

- Compile and synthesize state and local design standards.
- Develop Model ordinances and laws.
- Hold Conferences on access management. Nationalize the "Florida DOT" access management conference. Hold regional and local access management conferences; develop proceedings and best practices. Disseminate via the Internet.
- Develop a best management handbook. Provide tools that local governments can give to developers and business owners. The handbook should be a "living document" and should be distributed via the Internet.
- Institutionalize the use of Traffic Impact Analysis (TIA's).
- Provide Intersection Safety Briefing Sheet on Access Control.
- Conduct access control education.
- Target education to elected officials, zoning officials, planning personnel that grant access and property owners. Conduct education at all levels. We must demonstrate why access control is important.
- Develop training video. We need to show what happens with and without proper access control.
- Develop public education campaign.
- Make presentations to planning commissions before access control is a problem.
- We must convey the concept of carrying capacity and potential safety impacts.

9.7 Develop a Highway Safety Manual that addresses intersection safety in the same manner that the Highway Capacity Manual addresses traffic operations (under development).

STRATEGY S-10

Outreach, Education and Training

AASHTO Strategic Highway Safety Plan Emphasis area 17:

"Improving the design and operation of highway intersections"

AASHTO Strategic Highway Safety Plan Emphasis area: 22:

"Creating more effective processes and safety management systems"

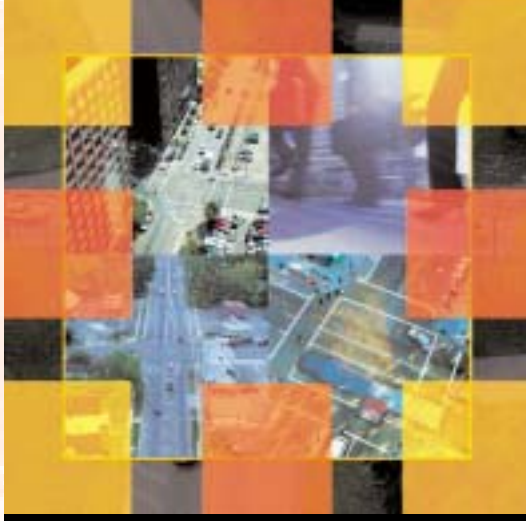
Issues Addressed:

1. There are a limited number of trained professionals, especially at the local level. There is a lack of trained highway and traffic engineers.
2. There is a lack of training opportunities for the design of rural intersections.
3. There is a lack of human factors training.
4. How do we incorporate safety into the university environment?
5. How do we inform the public about commercial vehicle operations and requirements?
6. How do we educate maintenance personnel on the impact of their work on transportation safety (e.g., deterioration of pavement markings and signs)?

Possible Strategies:

10.1 Develop and implement training that relates crash National Agenda for Intersection Safety reductions to the implementation of cost-effective improvements. Implement Intersection Safety Training Program. Potential steps include:

- Select a sponsor/lead agency. Identify partnership organizations, agencies (e.g., FHWA, ITE, AASHTO, NHI and APWA).
- Have partners identify curriculum subject areas based upon customer needs.
- Design curriculum and delivery protocol.
- Conduct pilot courses and obtain feedback.
- Modify course-based feedback.
- Initiate training program.
- Training evaluation.



STRATEGY S-10

10.2 Develop training venues such as e-learning, Webbased education, university graduate and undergraduate education and continuing education, CDs, etc.

10.3 Promote the use of safety peer exchanges (e.g., interagency scans, inter-state scans, multiple agency and multi-state workshops).

10.4 Develop courses, provide training and experience how human factors issues impact complex intersection environments.

10.5 Driver, pedestrian and safety agency education

- Develop materials for driver training instructors use.
- Provide education across the board for drivers, pedestrians and engineers on bicycle-vehicular interaction. Most drivers have never been taught how to maneuver around bicycles. Distribute available publications.
- Develop an education and training program for intersection safety designed for seniors.
- Extend NHTSA's Safe Community program to include intersection safety.

10.6 Develop training opportunities/seminars to help safety professionals gain an understanding of interdisciplinary and inter- and intra-agency needs and viewpoints.

STRATEGY S-11

Marketing and Communication

AASHTO Strategic Highway Safety Plan Emphasis area 22:

"Creating more effective processes and safety management systems"

Issues Addressed:

1. Intersection safety is not accepted nationally as a public problem. Air safety is seen as a much more serious concern.

2. Do we get the message to the public?

Possible Strategies:

11.1 Allocate resources to marketing intersection safety.

11.2 Use communications specialists to:

- Conduct market research.
- Communicate factual (e.g., market the gravity of consequences for violating the law at intersections).
- Support efforts to market safety problems similar to State Farm Insurance Company's programs.

11.3 Develop Media Campaign that:

- Includes a media strategy.
- Creates a traffic safety platform (for or against) and lobbing strategy.
- Increases public awareness through editorials, radio, public service announcement and letters to the editor.
- Uses media to identify high crash locations to the public.
- Uses media to explain how to use new highway improvements
- Uses information on best practices/approaches from states and locals to enhance media campaign materials.

U.S. Department of Transportation
Federal Highway Administration

Publication No. FHWA-SA-02-007