

# **Institute of Transportation Engineers Safety Action Plan**

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## **ITE Safety Action Plan Introduction**

Motor vehicle travel is a necessity of modern life, but exacts a high toll in terms of deaths, injuries, and property damage. Gradual improvements in roadway design, traffic technology, and in management strategy and in the crash worthiness of automobiles combined with positive changes in human factors such as increased seatbelt use and reduced incidence of alcohol-impaired driving have contributed to steady declines in the nation's motor vehicle fatality rate. However, achieving still further reductions in motor vehicle crashes and injuries remains a core mission of the transportation engineering profession.

The purpose of the Institute of Transportation Engineers is to enable transportation engineers, planners, and other professionals with knowledge and competence in transportation and traffic engineering to contribute individually and collectively toward meeting the human needs for mobility and safety. The Safety Action Plan is intended to identify possible future activities related to highway safety that the Institute would consider undertaking or supporting in the years ahead. Changes in motor vehicle crash patterns, available technology, innovative thinking, and transportation safety priorities may elevate the importance of certain actions, as well as generate new strategies and specific technical products. Therefore, the purpose of this document is to promote high levels of attention of transportation professionals to actions, strategies, and specific technical products that are currently deemed of considerable importance, and to encourage continued development of technical activity in response to the changing transportation environment.

## **Intersection Crashes**

A substantial proportion of motor vehicle crash losses result from collisions at intersections. For example, in the United States, about half of all motor vehicle collisions and 25 percent of fatal crashes occur at intersections or are intersection related. Also, the majority of pedestrian crashes occur at intersections. Intersection crashes are more prevalent in urban areas. Most intersections at which crashes occur are controlled by traffic signals or stop signs. Efforts to reduce motor vehicle crashes and injuries, especially in urban areas, must include emphasis on safety enhancements at intersections. Because of limited resources, prioritization should be given to the most effective safety measures. The following actions for improving intersection safety are priorities for ITE members:

### **General Strategies:**

- Promote best practices for selection, design, installation, operation, and maintenance of traffic control devices as they relate to safety and efficiency.
- Promote best practices for geometric design and illumination of intersections.
- Promote the use of crash data to identify crash-prone locations and implement countermeasures.
- Evaluate and promote the use of innovative traffic control devices.
- Promote the safety benefits of modern roundabouts and the use of FHWA roundabout design standards.
- Promote the safety benefits of red light camera enforcement.
- Document safety and efficiency effects of various methods of traffic control at low-volume intersections.
- Promote systematic implementation of best practices for low cost improvements to signalized and stop controlled intersections.
- Identify and promote new technologies to improve intersection safety, including in-vehicle cooperative (vehicle-highway) and infrastructure-based approaches.
- Identify safety research needs.

### **Potential Products and Actions:**

- Publish ITE automated enforcement informational report.
- Develop model red light camera legislation

## **Keep Vehicles on the Road**

Roadway departure crashes are a major cause of injuries and fatalities. In the United States and other large western countries such as Australia and Canada, about one-third of motor vehicle deaths involve vehicles leaving the roadway and hitting fixed objects such as trees or utility poles alongside the road. More than one third of roadside crashes involve a vehicle that rolls over. Alcohol, excessive speed, and fatigue are frequent contributing factors in these crashes. The following actions for keeping vehicles on the road are priorities for ITE members:

### **General Strategies:**

- Promote best practices for selection, design, installation, and maintenance of traffic control devices, highway design features, and lighting.
- Promote the use of crash data and other means to identify potential crash-prone locations and implement countermeasures.
- Support efforts to reduce alcohol impaired driving and driving while fatigued.
- Promote development of innovative traffic control devices, including variable speed limit technology, and enforcement techniques to help control excessive traffic speeds, especially on horizontal and vertical curves.
- Promote the use of shoulder rumble strips on freeways and bicycle-friendly shoulder rumble strips on rural arterials having a propensity for run-off-road crashes.
- Promote the systematic application of best practices for roadway delineation.
- Identify and promote new technologies including in-vehicle and cooperative (vehicle-highway) systems through the Intelligent Vehicle Initiative.
- Promote adequate skid resistance in pavement design and maintenance activities.

### **Potential Products and Actions:**

- Creation of a Geometric Design Task Force to determine how ITE can increase its activities in this area.

## **Minimize Consequences When Vehicles Leave the Road**

Efforts to keep drivers from inadvertently leaving the road due to fatigue, alcohol impairment, excessive speed, and other factors are only somewhat effective, so it's important to shield or remove stationary objects where reasonable, and avoid placing them along roads in the first place. Wherever possible and practical, drivers should be provided with adequate roadside recovery areas (clear zones), recognizing limitations in funding and right-of-way. Breakaway supports can be used for sign posts, luminaries, and utility poles located close to the roadway in the desirable clear zone. Roadside barriers should be installed where needed and adequately maintained. The following actions for minimizing injury consequences when vehicles leave the road are priorities for ITE members:

### **General Strategies:**

- Promote best practices for roadside design and maintenance.
- Promote best practices for selection, design, installation, and maintenance of roadside safety hardware.
- Increase awareness of roadside safety issues among staff involved in all phases of road engineering, road maintenance, and traffic law enforcement.
- Promote establishment of systematic processes to improve roadside safety, including the elimination/shielding of fixed objects.
- Promote the implementation of automatic crash notification systems that provide improved emergency response.

### **Potential Products and Actions:**

- Publish an *ITE Journal* article on roadside safety issues.

## **School Crossing Safety**

Children are the most vulnerable road users. Their lack of street crossing experience, short attention span, and immaturity place children at high risk. The highest pedestrian crash rates are experienced with children ages 5 - 15. In addition to parental supervision and use of adult crossing guards in school zones, substantial traffic engineering efforts are needed to ensure the safety of children in school zones. The following actions for improving school crossing safety are priorities for ITE members:

### **General Strategies:**

- Encourage use of ITE *Traffic Circulation and Safety at School Sites* informational report.
- Evaluate adequacy of ITE *School Trip Safety Program* recommended practice.
- Encourage police enforcement of school zone speed limits.
- Promote school use of effective pedestrian safety education films and curriculum.

### **Potential Products and Actions:**

- Publish *School Zone Speed Limits* informational report.
- Update ITE School Trip Safety Program Recommended Practice.

## **Work Zone Traffic Control**

A significant and growing share of motor vehicle crashes occur in work zones. Road construction and maintenance activities can disrupt traffic flow and pose safety concerns for motorists, pedestrians, and workers. The following actions for improving work zone safety are priorities for ITE members:

### **General Strategies:**

- Promote compliance with work zone guidelines and adequate maintenance of traffic control devices.
- Encourage adequate training and/or certification for employees involved in all phases of work zone traffic control.
- Promote adequate enforcement of speed limits in work zones, including the use of automated enforcement technologies
- Develop and promote effective applications of ITS technologies for work zone safety applications.
- Promote contract provisions that minimize traffic disruption and reduce the frequency/duration of work zones.
- Promote activities to ensure improved safety during night work operations.
- Develop a seminar on Work Zone Traffic Control Plans.

### **Potential Products and Actions:**

- Update ITE Flashing & Steady Burn Warning Lights standard.
- Development of urban guidelines for work zone and maintenance traffic controls.

## **Railroad Grade Crossing Safety**

Collisions at railroad grade crossings between motor vehicles and trains tend to be catastrophic. Compared with other types of collisions, train-motor vehicle crashes are 40 times more likely to result in a fatality. Such crashes usually result from errors in driver judgement, and in some cases, from drivers taking a dangerous risk by attempting to beat the train to the crossing. Construction of overpasses to achieve grade separation is a highly effective solution, but far too costly to apply to every railroad grade crossing. The following actions for improving grade crossing safety are priorities for ITE members:

### **General Strategies:**

- Partner with Operation Lifesaver to produce a technical article regarding effective safety improvements at railroad grade crossings.
- Identify effective low-cost warning devices and promote their use.
- Encourage adoption of advanced technologies for enforcement and crash prevention.
- Develop standards and guidelines for selection of traffic control devices at railroad grade crossings.
- Encourage the use of low profile crossings to reduce the risk of trucks getting caught on train tracks.
- Identify and promote countermeasures for grade crossings with limited storage space.
- Encourage signing programs for installation of Keep Off Tracks for grade crossings in the immediate downstream vicinity of stop sign and traffic signal controlled intersections.

### **Potential Products and Actions:**

- Publish guidelines for selection of traffic control devices at railroad grade crossings.
- Publish informational report on effective low-cost warning devices for rail grade crossings.
- Develop a signing and driver information strategy that informs drivers of low ground clearance and large wheel base vehicles of problem crossings and appropriate detour routes.



## **Road Safety Audits**

Safety Audit is a term used to describe an independent review of roadway safety design and operational features. Safety aspects of roads are audited during all phases of planning, design, construction, operation, and maintenance. The objectives of safety audits are to identify potential safety problems affected by a road project and to ensure that measures to mitigate the problems are considered fully. Road safety audits can be a highly useful and cost effective tool for reducing the risk and severity of motor vehicle crashes. The following actions are intended to foster development and implementation of the road safety audit process:

### **General Strategies:**

- Promote the use of road safety audits by state and local governments through seminars, sessions, articles.
- Promote skills needed to perform road safety audits through a comprehensive program of training workshops.
- Develop an international level of certification/accreditation in road safety audits.
- Support the work of the ITE Developing Programs in Road Safety Audit committee.

### **Potential Products and Actions:**

- Publish *Implementing Road Safety Audits in the U.S.* informational report.
- Establish a Road Safety Audit Web site.

## **Pedestrians and Bicyclists**

Pedestrians and bicyclists are vulnerable road users, and constitute a considerable share of those injured in motor vehicle crashes. Worldwide, approximately half of all motor vehicle crash fatalities are pedestrians. In the United States, more than 5,000 pedestrians and 700 bicyclists are killed each year (about 15 percent of all motor vehicle crash fatalities). The following actions for improving pedestrian and bicycle safety are priorities for ITE members:

### **General Strategies:**

- Promote best practices for accommodation of pedestrian and bicycle access, recognizing that at some locations on the road network, the needs of motorized traffic should be secondary to those of pedestrians and bicyclists.
- Promote best practices for improving pedestrian and bicycle safety through design and operation of traffic control devices, highway geometrics, and illumination.
- Encourage police enforcement of drivers that fail to yield the right-of-way to pedestrians.
- Encourage adequate police enforcement of speed limits on urban arterials.
- Identify opportunities to modify traffic control devices to improve the walking and biking environments when street work is done.
- Promote retroreflective clothing and protective gear for pedestrians and bicyclists.
- Promote effective traffic calming designs to address pedestrian safety on residential streets.
- Promote the development and application of advanced pedestrian detection devices, both infrastructure-based and vehicle-based.
- Promote effective pedestrian and bicyclist safety education programs.
- Identify research needs.

### **Potential Products and Actions:**

- Creation of a Pedestrian and Bicycle Task Force to determine how ITE can increase its activities in this area.

## **Crash Reporting Systems**

The accuracy, completeness, and timeliness of motor vehicle crash data are essential elements of crash reporting systems. Crash records are employed by traffic engineers for many important highway safety applications, including identification of potential crash-prone locations, evaluation of potential countermeasure effectiveness, and monitoring of motor vehicle crash patterns. The following actions for improving the quality and timeliness of crash reporting systems are priorities for ITE members:

### **General Strategies:**

- Identify crash data needs.
- Explore opportunities to improve timeliness and accuracy of crash data, including “TEA 21” incentives.
- Support implementation of NHTSA’s Minimum Uniform Crash Criteria.
- Participate in development of the ITS National Archive Data User Service (ADUS) to ensure safety needs are adequately addressed.
- Support development and implementation of TSIMS crash data records management project.

### **Potential Products and Actions:**

- Sponsor a technical session at an ITE Annual Meeting or International Conference.

## **Young Drivers**

Teenagers have the highest crash involvement rates per mile driven. The seriousness of this problem has been recognized for decades, and many public policies have had little impact on the problem. Immaturity and lack of driving experience are the main reasons. Compared with older drivers, teenagers as a group are more willing to take risks and less likely to use safety belts. They are also more likely than older drivers to underestimate the dangers associated with hazardous situations and less able to cope with such dangers. The most effective policies are those that limit teenagers' driving exposure. Graduated driver licensing systems are designed to phase in beginning drivers to full driving privileges as they mature and develop their driving skills. Graduated licensing ensures that initial experience is accumulated under lower-risk conditions. Evaluations indicate graduated licensing systems successfully reduce teenage crashes. The following actions for improving young driver safety are priorities for ITE members:

### **General Strategies:**

- Promote graduated driver licensing laws and their enforcement.
- Promote education of roadway hazards and consequences, including work zones and rail grade crossings.

### **Potential Products and Actions:**

- Prepare technical background for development of an ITE policy regarding graduated driver licensing laws.
- Publish an *ITE Journal* article on young driver safety issues and effective policies for addressing them.

## **Older Drivers**

As more people live longer, the number of older drivers continues to increase. Advancing age is generally associated with declines in physical functions necessary for safe driving, such as vision, hearing, and reaction time. Older drivers as a group experience above average risk of motor vehicle injury and fatality. The driving environment can have a strong influence on the mobility and safety of older drivers. The following actions for improving older driver safety are priorities for ITE members:

### **General Strategies:**

- Identify and promote methods to enhance the driving environment for the older road users, including traffic control devices, highway geometric features, and illumination.
- Promote FHWA Older Driver Handbook and Workshop.
- Promote the application of FHWA's Older Driver Handbook in the design, operation, construction, and maintenance of road facilities.
- Promote the development of new in-vehicle technologies that address older driver needs.
- Support the practice of periodic retesting, of drivers of all ages, in recognition that highway safety depends on safe driver operations in the driver-vehicle-roadway systems.

### **Potential Products and Actions:**

- Sponsorship of a FHWA workshop at an ITE International Conference or Annual Meeting.

## **Occupant Restraints**

Safety belts are among the most effective devices for reducing occupant injuries in motor vehicle crashes. Although safety belt use has increased markedly in recent years, still nearly a third of vehicle occupants in the United States, and higher percentages in some developing countries, do not use safety belts. Safety belt use rates tend to be lower among higher-risk groups, including young drivers. The following actions for increasing the use and effectiveness of occupant restraints are priorities for ITE members:

### **General Strategies:**

- Promote primary safety belt use laws, including sufficient penalties.
- Promote adequate enforcement of safety belt use laws.
- Increase awareness among transportation professionals of the importance of safety belt use.

### **Potential Products and Actions:**

- Prepare technical background for development of an ITE policy regarding primary safety belt use laws.
- Publish an *ITE Journal* article on safety belt use.

## **SAFETY IN TRANSPORTATION PLANNING**

International research has shown that there is significant scope for providing a “safer” transportation network through safety-conscious transportation planning. However, safety is seldom considered as an explicit planning priority, and there are limited guidelines or models for “safety planning.” Incorporating safety in transportation planning activities can occur across the range of planning detail, from site access to corridor plans to metropolitan regional plans. The following actions for building safety into the urban planning process are a priority for ITE members:

### **General Strategies**

- Compile international state-of-the-art safety planning practices into an ITE publication.
- Adapt these for application in North America, initially focussing on corridor level planning.
- Conduct a pilot application of the adapted practice, and refine.
- Present, discuss and refine these practices through discussions with planning practitioners.
- Formulate a plan of action for promoting the use of safety conscious planning practices.
- Encourage regional transportation planning agencies to include safety considerations, such as goals and objectives, in long-range transportation plans, as well as corridor-level planning studies.

### **Specific Product**

- Publish informational report on “Making Safety an Explicit Priority in Urban Planning.”

## **Ensure Adequate Knowledge and Awareness of Critical Highway Safety Issues Among Transportation Professionals**

Knowledge is the key to technical progress and advancement. Awareness of critical highway safety issues can encourage transportation professionals and the public to develop solutions to common safety hazards, and motivate constructive change. Ensuring knowledge and awareness of critical transportation issues is a cornerstone of the Institute of Transportation Engineers. The following actions are priorities for promoting knowledge and awareness of critical highway safety issues:

### **General Strategies:**

- Explore the feasibility of developing a specialized training and certification program in road safety engineering (blackspot investigation, road safety audit, etc).
- Develop and promote road safety curriculum in transportation education.
- Encourage and support coverage of highway safety issues in other professional and lay publications.
- Promote development of a comprehensive traffic safety education program for all motorists.

### **Potential Products and Actions:**

- Revise and update the *ITE Traffic Safety Toolbox*.
- Publish *ITE Statistical Evaluation of Traffic Engineering Safety Studies* informational report.
- Dedicate specific issues of *ITE Journal* to highway safety topics.
- Incorporate critical safety-related materials in the Professional Traffic Operations Engineer (PTOE) and practitioners examinations and training curriculum.