

CHAPTER 23

Implementing Road Safety Audits

KEY TOPICS

- crash analysis
- proactive design
- roadway features
- road safety audits

GOALS

- Initiate a systematic method of inventory throughout the Iowa highway system to identify and address road conditions and design features that could be improved for safety, based on the most current data, design, and technology available.
- Build and maintain information resources and analysis procedures to monitor roadside safety.

BACKGROUND

Highway crashes occur when something goes wrong. It could be a mechanical failure, roadway deficiency, driver error, or a combination of these factors. Addressing the roadside safety problem requires addressing all of these elements as a system. Each element is subject to variables and change—the system is in a constant state of flux. The roadway geometry, traffic control devices, pavement, and traffic conditions all affect the driver's ability to maintain control of the vehicle. Road safety audits provide a systematic method for monitoring the roadway system and the wide range of changing elements, data available, and applicable technology improvements.

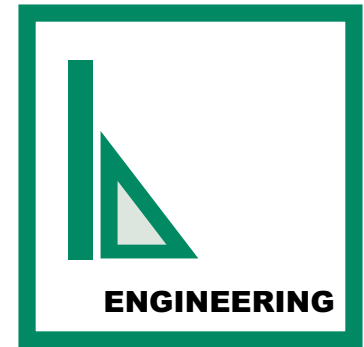
Most transportation authorities have active programs concerned with crash reduction (the development of crash remedial measures for high-crash-frequency sites). Some are now also focusing on crash prevention (ensuring that the design of new road and traffic schemes will provide a high level of safety), attempting to prevent crashes from happening, or at least to ensure that any crash effects are minimized through a road safety audit process.



23. Implementing Road Safety Audits

While the main objective of a road safety audit is to ensure a high level of safety for all new highway designs, there are other secondary objectives:

- Reducing the whole-life costs of a design (unsatisfactory designs are expensive to correct after they are built)
- Minimizing the risk of crashes on the adjacent road network (particularly at intersections) as well as on the new road scheme
- Enhancing the importance and relevance of road safety engineering in highway design work and to enhance consideration of the safety of all road users in all new and existing schemes



Road safety audits work in two ways to ensure that safety is improved:

- By removing preventable crash producing elements (such as inappropriate intersection layouts) at the design stages
- By mitigating the effects of remaining problems by the inclusion of suitable crash-reducing elements (such as anti-skid surfacing and crash barriers)

NATIONWIDE

The Federal Highway Administration (FHWA) is working with states and local jurisdictions to determine the feasibility of integrating road safety audits into the process of roadway project development, construction, and operation. Several states have pilot tested safety audits in select locations. Other interested state and local transportation departments are invited to participate in this effort.

IOWA

Iowa has developed extensive databases that identify roadway characteristics, sign inventory, crash data, and other key data that assist in roadway project development, construction, and operation—as well as road audits and safety analysis. With the increased use of geographic information systems (GIS) and cross-platform analysis tools, Iowa Department of Transportation (Iowa DOT) and other roadway officials can effectively conduct safety audit analysis of roadway segments. More information about these data is discussed in Chapter 25, Improving Information and Decision Support Systems.

Iowa has proven success in improving roadway safety through specific safety improvement projects. The Iowa DOT maintains a comprehensive list of over 17,000 crash locations and regularly identifies and mitigates problems at the highest crash locations. The *Effectiveness of Roadway Safety Improvements* study (conducted by the Center for Transportation Research and Education [CTRE] at Iowa State University) 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 road safety audit approach is a proactive process that can use data from known crash sites to correct similar conditions elsewhere, even before crashes occur.



POTENTIAL STRATEGIES

Legislation, Policy, and Enforcement

- Develop and implement a road safety audit program within the Iowa DOT for new and reconstruction projects.
- Incorporate safety audits on Iowa DOT resurfacing projects.

Education and Public Awareness

- Provide safety audit training to Iowa DOT design and district staff.
- Encourage local agencies to adopt road safety audit programs.

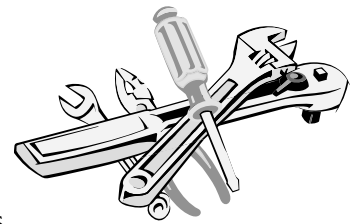
Design and Technology

- Study the effectiveness of Iowa's completed traffic safety improvement projects (see Successes and Strategies Implemented section in this chapter).
- Start with major corridor design projects.
- Review FHWA pilot safety audit projects prior to implementation in Iowa.
- Monitor changes affecting safety.
- Support research to address yet unanswered roadside safety questions.

23. Implementing Road Safety Audits

SUCCESSSES 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.
- In February 2001, the Iowa DOT Office of Traffic and Safety held a peer exchange with New York Department of Transportation officials, who have an active safety audit program for resurfacing projects.
- The Iowa DOT has recently implemented safety audits on resurfacing projects.



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. **Contributor:** Tom Welch (primary).

Center for Transportation Research and Education, Iowa State University

www.ctre.iastate.edu/index.html

Effectiveness of Roadway Safety Improvements:

www.ctre.iastate.edu/Research/detail.cfm?projectID=386

Federal Highway Administration

safety.fhwa.dot.gov

Road Safety Audits Program:

safety.fhwa.dot.gov/programs/rsa.htm

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

Traffic and Safety (“TAS”) Manual (Jan. 2002)

Institute of Transportation Engineers (ITE) and the Federal Highway Administration

ITE and FHWA developed a two-day seminar for transportation professionals for informational purposes on road safety audits and reviews. The intended audience for these materials is professionals working within a state department of transportation.

www.roadwaysafetyaudits.org/

Iowa Department of Transportation

www.dot.state.ia.us

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