CHAPTER 18
Reducing Head-On and Across-Median Crashes

KEY TOPICS

- centerlines
- design improvements
- medians
- rumble strips
- shoulders

GOALS

- Reduce cross-centerline collisions.
- Reduce the potential for motorists to over-correct when leaving the right side of the road.
- Reduce the potential for vehicles to travel across medians.
- Increase driver awareness and appropriate driving to reduce head-on crashes.

BACKGROUND

One of the most severe types of crashes occurs when a vehicle shifts into an opposing flow traffic lane and crashes head on with an oncoming vehicle. Severe crashes of this sort can occur on rural two-lane highways, expressways, and freeways with narrow or flat medians. Even highways with wide medians may have incidents of crossover when weather conditions change the effectiveness of medians in stopping a vehicle. The severity of these crashes is compounded because of the additive nature of the vehicle speeds at the time of collision.

Motorists who run off the right side of the roadway onto a granular shoulder often oversteer back to the left and enter the opposing traffic lane. Along roadways with paved shoulders, motorists do not tend to overreact in this manner when leaving the right side of their traffic lane.

IOWA

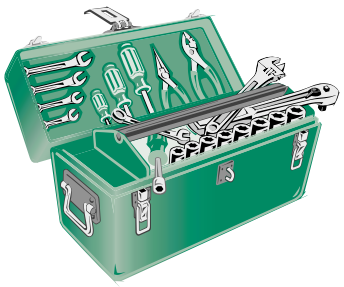
Iowa Facts

Head-on crashes—crashes in which a vehicle crosses the centerline of a two-lane highway or crosses the median of a divided highway—are a major cause of death on Iowa roadways. In Iowa 14.9% of fatal crashes from 1992 to 1996 resulted from nonintersection, head-on or across-median crashes. While nearly 90% of these fatal head-on crashes occurred on rural roads, occurrences were typically dispersed across the state and were not concentrated along specific highway segments. Between 1990 and 1999, only 2.4% of all interstate crashes in Iowa were cross-median crashes, yet these crashes resulted in 32.7% of all interstate fatalities during that time.

Because of the dispersed nature of rural head-on and across-median crashes in Iowa, it is not economically feasible to address this problem on all roadways simultaneously. Iowa's across-median crashes may not be as significant as in states like California or North Carolina because of our lower lane densities. A greater potential benefit may be realized if Iowa's efforts in this area are concentrated on a select number of shorter roadway segments that have a higher frequency of head-on crashes.

Countermeasures

The Iowa Department of Transportation (Iowa DOT) includes new countermeasures in their design of new highways. Partial paved shoulders are being constructed and shoulder rumble strips are installed on selected paved shoulders along four-lane corridors.



POTENTIAL STRATEGIES

Legislation, Policy, and Enforcement

- Consider providing wider paved shoulders on all highways.
- Install shoulder rumble strips where appropriate.
- Enhance centerline pavement markings or apply them more frequently.
- Use centerline rumble strips on selected high-volume, rural, two-lane roadways.

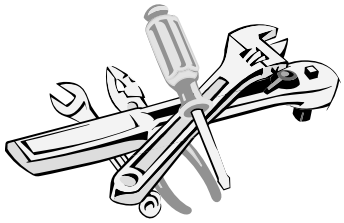
Education and Public Awareness

- Increase public awareness of highway features and design improvements (see Chapter 1, Increasing Driver Safety Awareness).
- Develop a resource for local officials and others to use in answering basic highway safety questions related to engineering decisions (see Successes and Strategies Implemented section in this chapter).
- Continue to use and support the Local Technical Assistance Program (LTAP) library and other cooperative efforts with the Center for Transportation Research and Education (CTRE) at Iowa State University (see Successes and Strategies Implemented section in this chapter).

Design and Technology

- Promote additional analysis to identify roadway segments that may benefit from projects aimed at reducing head-on and across-median crashes.
- Evaluate the head-on design alternatives studied by the federal government and other states to determine which ones are applicable to Iowa.
- Provide wider paved shoulders on all rural highways (see Successes and Strategies Implemented section in this chapter).
- Install shoulder rumble strips where appropriate.
- Monitor research on two-lane median separation.
- Identify location of rural four-lane corridors with high cross-median collisions and install cable guardrail. Consider law enforcement and emergency response needs in design.
- Convert selected urban four-lane undivided roadways to three-lane with two-way left-turn lane roadways.
- Monitor the development of innovative centerline treatments to reduce head-on crashes on two-lane highways.
- Apply strategies for wrong-way interstate and expressway entry (e.g., flashing actuated signs or ramp terminal redesign).
- Replace two-way left-turn lanes with medians in very high volume roadways.

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 DOT has started a complete study of paved shoulder needs on rural freeways, expressways, and Super 2 highway corridors in Iowa.

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), Tim Crouch, Larry Heintz, Becky Hiatt, Dave Little, Andy Loonan, Dave Matulac, Tom McDonald, John Nervig, Dave Plazak, Jaime Reyes, Randy Schlei, Tim Simodynes, and Don Tebben.

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

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

Iowa Department of Public Health
www.idph.state.ia.us/

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)

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