

CHAPTER 3

Preventing Drowsy and Distracted Driving

GOALS

- Reduce the incidence of crashes caused by inattentive drivers.
- Improve the quantity and quality of data available regarding the role driver inattentiveness plays in crashes.
- Decrease drowsy driving by commercial vehicle operators.
- Improve driver awareness and responsibility for preventing driving while distracted or drowsy.
- Encourage the development of new technologies that improve the safety and security of travelers without detracting from the task of driving.
- Provide a roadway that is forgiving to inattentive drivers.
- Reduce the dangers of drivers operating cellular telephones while driving through three approaches:
 - o Educating drivers regarding safe practices to follow when using a cellular phone.
 - o Passing regulations mandating where and how long a phone can be used.
 - o Designing cellular telephones to minimize the effort needed for the driver to complete a call.

KEY TOPICS

- cell phones and other distractions
- drowsiness and fatigue
- high-risk groups
- multitasking

BACKGROUND

Although difficult to quantify, driver inattention is a contributing factor in between 1 million and 2.5 million crashes per year—15% to 50% of all crashes. The two primary categories of inattentiveness are drowsiness/fatigue and distraction.

Drowsiness/fatigue occurs when a driver is incapable of providing full *mental and physical attention* to the task of driving because of his/her body's physiological need for sleep. Drowsiness/fatigue can be caused by medications, sleep disorders, prolonged driving without breaks, or a general lack of sleep. Drowsiness/fatigue impairs driving skills by decreasing awareness, blurring focus, and increasing reaction times. Drowsiness/fatigue can lead

3. Preventing Drowsy and Distracted Driving

to poor judgment, tunnel vision, wandering thoughts, and a shortened attention span. The effects of drowsy/fatigued driving have often been compared to those of driving while intoxicated.

Distraction occurs when a driver is not dedicating their full *mental and physical* attention to the task of driving. Typical “multitasking” distractions include using a telephone, observing an external event not related to the roadway ahead, having a conversation with a passenger, adjusting a radio, eating, drinking, reading (books, newspapers, maps, etc.), shaving, applying makeup, writing, tending to a pet, tending to a child, lighting or smoking a cigarette, cleaning a spill, watching television, operating electronic devices, or performing any other nondriving task while operating a motor vehicle.



An inattentive driver can be as dangerous as an impaired driver. However, with no method of testing for fatigue or distraction after a crash, it is very difficult to quantify the role of fatigued and distracted drivers in crashes. Nationally, drowsy and distracted drivers are known to be involved in four percent of all fatal crashes, and possibly as many as one-third.

The challenge is teaching drivers to recognize when their driving abilities are decreased due to drowsiness/fatigue or distraction, and to convince them to stop driving or eliminate the distraction before they create an unsafe roadway condition.

NATIONWIDE

Drowsy/Fatigued Driving

Although current understanding of the problem and its causes largely comes from inferential evidence, a typical crash related to drowsiness/fatigue has the following characteristics: it occurs during late night/early morning or late afternoon, is likely to be serious, involves a single vehicle leaving the roadway with no passengers, occurs on a high-speed road, and shows no signs that the driver attempted to avoid the crash.

3. Preventing Drowsy and Distracted Driving

At-Risk Driver Characteristics

- Sleep-deprived
- Drives long distances without rest breaks
- Drives through the night
- Takes medication that causes drowsiness (researchers report in the *Annals of Internal Medicine* that sedating antihistamines can impair driving ability more than alcohol, even if users do not feel drowsy)
- Drives alone
- Drives on long rural roads
- Travels frequently

High-Risk Groups

- Young people—This group tends to stay up late, sleep too little, and drive frequently at night. In one North Carolina study, 55% of fall-asleep crashes involved drivers 25 years old or younger. Seventy-eight percent were male.
- Shift workers—25 million Americans are rotating shift workers who often work at night. Studies suggest that 20% to 30% of shift workers have had a fatigue-related driving mishap within the last year.
- Commercial drivers—This group is at risk because of their prolonged driving times and frequent late night hours of operation. Hours of service regulations are being studied at the national level to better reflect current commercial driving conditions.
- People with undiagnosed sleep disorders—Chronic insomnia, sleep apnea, and narcolepsy affect approximately 30 million Americans. Most people with sleep disorders remain undiagnosed and untreated.

National Facts

- The National Highway Traffic Safety Administration (NHTSA) released data in July 1998 indicating that in recent years there have been about 56,000 crashes annually in which drowsiness/fatigue was cited by the investigating officer. These crashes led to roughly 40,000 nonfatal injuries and 1,550 fatalities annually. It is widely recognized that these statistics are underreported.
- A Gallup poll conducted for the National Sleep Foundation reported that 31% of adults said they had fallen asleep at the wheel and 4% had had a crash they attributed to fatigue. Sleepiness increases the likelihood of such lapses. Such polls also indicate crash reports may significantly underreport the extent of fatigue-related crashes.

3. Preventing Drowsy and Distracted Driving

Program to Combat Drowsy Driving

In March 1999, NHTSA and the National Center on Sleep Disorders Research cited the following in their *Program to Combat Drowsy Driving—Report to the House and Senate Appropriations Committees*: “About a quarter of the drivers in sleep crashes said that they had driven while sleepy more than ten times in the past year,” said co-investigator Dr. Jean Wilkins, associate professor of psychiatry. “They think they can handle it, that they can force themselves to stay awake. Many of us would never think about driving drunk, but by driving when we’re sleep-deprived, we put ourselves and others at risk of a crash as severe as an alcohol-related crash.”

Distracted Driving

When driver attention is not on the road, drivers, passengers, other vehicles, and pedestrians are at risk. Two of the distractions drivers cited most frequently as reasons for their road traffic accidents include spilling food or beverages and dropping something on the floor, according to a recent study done by the Network of Employers for Traffic Safety (NETS). Adjusting a radio or climate control system is the next most-cited distraction. Many commuters also reported that they regularly read the newspaper, shave, or apply make-up on their way to work.

A 2000 NHTSA and NETS survey indicated that Americans consider distracted drivers the fourth most serious traffic safety issue—after impaired driving, aggressive driving, and speeding. NHTSA and NETS sponsored a Driver Distraction Internet Forum in July and August of 2000 to increase public awareness and generate comments on the topic.

Cell Phones and Onboard Technology

A 1991 National Public Service Research Institute study addressed the degree of distraction from primary driving tasks. The study, sponsored by the American Automobile Association (AAA), concluded that (1) all forms of cell phone usage increase driver response time, (2) complex, intense conversations with passengers or by cell phone are the most distracting of the elements studied, and (3) cell phone use has a greater distracting effect on drivers over age 50.

Enhanced vehicle features and communication devices continue to change the range of driving tasks associated with road-related professions and the general driving public. Law enforcement officers, truck drivers, and road-

3. Preventing Drowsy and Distracted Driving

way maintenance workers are not exempt from technology distractions. Addressing all the emerging technologies and diversity of drivers will continue to complicate the analysis of risk and appropriate remedies.

National Facts

- The University of North Carolina Highway Safety Research Center released findings in May 2001: “We found that 15% of drivers in the study were not paying attention and just over half of these (8.3%) were distracted by something inside or outside the vehicle” (Dr. Jane Studts, manager of epidemiological studies and author of the study).
- According to a survey by *Prevention* magazine, more than 85% of the 100 million cell phone subscribers regularly talk on the phone while driving.
- According to a report published in the *New England Journal of Medicine*, the risk of collision is four times greater when a driver is making a call on a cellular telephone.
- A 1997 Insurance Research Council public opinion survey reported that people recognize there is increased risk for crashes when talking on cell phones while driving but most do not avoid phone use while driving:
 - o 84% believe using a phone while driving is a distraction.
 - o 61% use phones while driving.
 - o 30% reported “frequent” phone use while driving.
- The Japan Automobile Manufacturers Association (JAMA) reports that there has been a “61% drop in the number of cell phone related traffic deaths following” a new ban on cell phone use while driving. In the six months before the ban went into effect there were 1,473 cell-phone related accidents compared to 580 during the six months following the start of the enforcement.”

National Advanced Driving Simulator

NHTSA has recently opened the \$60 million National Advanced Driving Simulator (NADS) at the University of Iowa. NADS will test the distraction levels of drivers confronted with in-car electronic devices such as computers, navigation systems, and cellular phones. (The unit will also be used for studying aggressive driving, driver fatigue, headlight glare, and the effects of prescription drugs and alcohol.)

3. Preventing Drowsy and Distracted Driving

IOWA

Iowa is experiencing an increase in crashes associated with running stop signs and straying across the centerline associated with distracted and inattentive driving. It is understood that drowsiness and distractions are underreported as contributing factors in crashes. However, reliable base data are needed to quantify the problem and justify the expenditure of resources to prevent fatigued and drowsy driving.

Motor carrier organizations, the Iowa Department of Transportation, and the Federal Highway Administration are challenged to stay current on this issue and actively emphasize safety in any future regulatory or enforcement changes.

Drowsy/Fatigued Driving

All drivers could benefit from better understanding how and why to avoid driving drowsy. Recent research has led to an increased understanding of sleep and fatigue. This information can be helpful to drivers of all ages if distributed through driver education and public service announcements.

Iowa Facts

- Current statistics show that 18 fatal crashes in Iowa in 1994 and 1995 involved fatigued drivers.
- Iowa drowsy driver trends show that males age 16 to 25 are most likely to be involved and that the incidence of crashes involving drowsy drivers increases at night and peaks around 2 a.m.

Distracted Driving

Cell Phones and Onboard Technology

Many local jurisdictions in other states have passed ordinances prohibiting the use of telephones while driving, and most states have considered similar measures in committee or session debates. Some of the bans enacted have been successfully challenged in courts. Iowa traffic safety officials continue to monitor these developments for an appropriate Iowa approach that would balance public safety and personal freedom. New technology applications continue to both add potential distractions and provide solutions that simplify driver tasks and use of dashboard technology.

3. Preventing Drowsy and Distracted Driving

Iowa Public Opinion

Iowa SMS Public Opinion Survey

The 1999 Iowa Safety Management System (Iowa SMS) *Iowa Strategic Highway Safety Plan* included a number of potential strategies for dealing with drowsy and distracted driving. The Iowa SMS public opinion survey asked over 1,000 Iowans whether they would support these strategies.

Goals:

- 61% of respondents identified promoting “focused driving” for high emphasis over the next five years.

Strategies:

- 74% support the strategy of prohibiting cell phone use while driving.
- 70% support adding more paved shoulders with rumble strips.



POTENTIAL STRATEGIES

Legislation, Policy, and Enforcement

- Support the December 1999 recommendations of the Iowa Rest Area Task Force.
- Prohibit the use of cellular telephones while driving except for emergencies.
- Prohibit all but “hands-free” cell phone use in moving vehicles.
- Monitor and support the U.S. Department of Transportation’s commercial driver hours of service regulations.
- Make policymakers aware of the prevalence of crashes involving inattentive drivers and promote the benefits of selected roadway features such as rumble strips (see Successes and Strategies Implemented section in this chapter).
- Emphasize driver alertness in officer training at the Iowa Law Enforcement Academy.
- Initiate a “no cell phone use in state vehicles while moving” policy and encourage private businesses to do the same for their employees.
- Use benefit/cost analysis including both driver distraction and improved emergency response times when considering cell phone use legislation.
- Provide policymakers with current information regarding human factors related to cell phone use and operation of phone features.
- Use and enforce current Iowa laws.

3. Preventing Drowsy and Distracted Driving

Education and Public Awareness

- Educate drivers about the warning signs and dangers of drowsy driving.
- Prepare drowsy driving public service announcements and brochures.
- Raise public awareness about drowsy driving risks and how to increase self-awareness and reduce fatigue.
- Include distracted and drowsy driver concerns in driver education curriculum.
- Educate high-risk audience (males ages 16 to 24) about drowsy driving and how to reduce lifestyle-related risks.
- Educate shift workers about the risks of drowsy driving and how to reduce such risks.
- Educate the public on the dangers of distractions such as using a telephone, observing an external event not related to the roadway ahead, having a conversation with a passenger, adjusting a radio, eating, drinking, reading, shaving, applying makeup, writing, tending to a pet, tending to a child, lighting or smoking a cigarette, cleaning a spill, watching television, and operating electronic devices.

Design and Technology

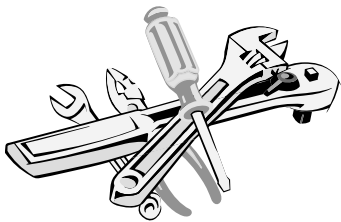
- Accelerate efforts to add paved shoulder rumble strips to all four-lane freeways and expressways in Iowa (see Successes and Strategies Implemented section in this chapter).
- Increase shoulder widths, pave shoulders, and use rumble strips on paved shoulders and centerlines.
- Implement the December 1999 recommendations of the Iowa Rest Area Task Force.
- Increase the availability of rest areas for commercial vehicles, passenger cars, and other vehicles.
- Promote use of rumble strips in advance of rural stop signs (see Successes and Strategies Implemented section in this chapter).
- Use high-intensity signing judiciously to attract driver attention in selected areas.
- Review and support appropriate drowsy driving technology development, intelligent transportation systems (ITS), and other technology developments (e.g., black box data and driver monitoring and stimulation through aroma, sound, or other remedies).
- Periodically review onboard technology developments that potentially distract drivers (e.g., navigation, Internet access, and cell phones).

3. Preventing Drowsy and Distracted Driving

- Consider initiating a statewide emergency number (e.g., *77) to improve the handling of cell phone calls and locations tied to 911 systems. Support NHTSA and others' national efforts to standardize a "star" number for cell phone emergency calls.
- Monitor the development of intelligent "answer phone" technology to assist drivers in diverting calls, recording messages, or interrupting conversations based on the driving conditions.
- Conduct human-factors research to determine workload-reducing phone design features.

Other Initiatives

- Study and report other states and countries' experiences with cell phone legislation and enforcement.
- Assemble a synthesis of current research on cell phone usage and crash involvement.
- Study and confirm whether "inattentive driver" citations are appropriate.



SUCCESSES AND STRATEGIES IMPLEMENTED

- Driver fatigue elements are included in the new Iowa crash report form (effective January 1, 2001).
- Driver distraction elements are included in the new Iowa crash report form (effective January 1, 2001).
- Cell phones are included as a contributing factor in the new Iowa crash report form (effective January 1, 2001).
- A program has been proposed to complete paving of shoulders on Iowa's four-lane divided freeways and expressways.
- Public awareness: The wireless phone industry has recognized safety concerns and established National Wireless Safety Week and VITA Wireless Samaritan Awards. Nationwide radio and television ads were run in the first half of 2001 and promoted the web site www.DriveResponsibly.org.
- Iowa SMS funded Black Box Data Recovery in April 2001.

3. Preventing Drowsy and Distracted Driving

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:** Tim Simodynes (primary), Denny Becker, Jan Goldsmith, Jack Latterell, Craig Markley, Dallas Scott, Bob Thompson, and Daron Van Helden.

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

Annals of Internal Medicine

Weiler, J. M., et al. Effects of Fexofenadine, Diphenhydramine, and Alcohol on Driving Performance: A Randomized, Placebo-Controlled Trial in the Iowa Driving Simulator. 132, 2000, pp. 354–363.

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

Update Report on Speed Limits in Iowa (2001):

www.iowasms.org/speedlimittaskforce/speed2001.pdf

Task Force on Commercial Truck Parking, *Commercial Vehicle Parking*:

www.ctre.iastate.edu/reports/truckpar/pdf

Iowa Rest Area Task Force Recommendations

3. Preventing Drowsy and Distracted Driving

National Highway Traffic Safety Administration and National Center on Sleep Disorders Research

www.nhtsa.dot.gov

Program to Combat Drowsy Driving—Report to the House and Senate Appropriations Committees (Mar. 1999):

In 1996, NHTSA and NCSDR embarked on a congressionally mandated effort to develop educational countermeasures to the effects of fatigue, sleep disorders, and inattention on highway safety.

Drowsy Driving and Automobile Crashes:

This report, sponsored by NHTSA and NCSDR, is designed to provide direction to an NHTSA and NCSDR educational campaign to combat drowsy driving. The report presents the results of a literature review and opinions of the Expert Panel on Driver Fatigue and Sleepiness regarding key issues involved in the problem.

Congressional Testimony—Driver Distraction (May 9, 2001):

Statement of L. Robert Shelton, executive director of NHTSA, before the Transportation Subcommittee of the Committee on Appropriations, U.S. House of Representatives.