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Countermeasures That Work – Drowsy Driving

The National Highway Traffic Safety Administration (NHTSA) has published its 10th edition of *Countermeasures That Work*, a basic reference to assist State Highway Safety Offices and other highway safety professionals in selecting effective, evidence-based countermeasures for traffic safety problem areas. This Traffic Tech highlights the effective countermeasures from Chapter 10, “Drowsy Driving.”

Background

Sleepiness is an inescapable biological phenomenon with profound effects on the mind and body. Whether sleepiness is caused by sleep restriction due to a baby crying all night, a late shift at work, staying up with friends, or a long, fatiguing drive to a relative’s house for the holidays, the negative ramifications include impaired cognition and task performance that increase the risk of motor vehicle crashes. Most important, the longer someone remains awake, especially during the night and early morning, the more likely negative outcomes occur.

Drowsy driving contributes to motor vehicle crashes in two ways. The first, and most obvious, is a driver falling asleep and running off the road or into another vehicle or object. Even a brief intrusion of sleep while driving can lead to serious consequences. The second involves the decrements in driving performance that occur because being sleepy affects your ability to drive safely even if you do not fall asleep. Drowsiness makes drivers less able to pay attention to the road, slows reaction times if you must suddenly brake or steer, and affects drivers’ abilities to make good driving decisions (NHTSA, 2017).

NHTSA’s Fatality Analysis Reporting System (FARS) database reports that 703 of the 33,919 fatal crashes, or 2.1%, were drowsy-driving-related in 2018. These crashes resulted in 785 fatalities. Reported fatalities (and drowsy-driving crashes overall) have slightly declined in recent years. Based on FARS data from 2014 to 2018, there was an annual average of 822 traffic fatalities (in an average of 730 fatal crashes) related to drowsy driving. However, the involvement of drowsy driving in crashes is likely underreported for several reasons, including difficulty in defining and reporting drowsy-driving incidents (NCSA, 2017).

FARS data are based on police reports and investigations that are conducted after the event has occurred. Drowsy driving involvement in FARS is among factors that may have played a role in the crash, as reported by law enforcement. As such, there are inherent limitations with respect to determining the presence of drowsy driving. Police crash reports vary across jurisdictions, as do reporting practices for citing driver drowsiness both within States as well as between them. The Model Minimum Uniform Crash Criteria guidelines recommend

fatigue be coded as a physical condition of the driver. Some States, however, include fatigue as an attribute of distraction, whereas NHTSA does not identify fatigue or drowsiness as a distraction. Additionally, underreporting of the occurrence of drowsy driving is likely due to many factors:

- Lack of firm evidence of involvement since investigation is done after the crash,
- Drivers unaware of the role that drowsiness played in the crash,
- Drivers reluctant to disclose that they fell asleep or were tired, and
- Fatality of the involved driver who may have been asleep or fatigued.

Precise counts of crashes caused by drowsy driving are not possible. Law enforcement can look for clues that drowsiness was likely to have contributed to the crash, but the clues are not always identifiable or conclusive. In lieu of consistent and conclusive evidence, researchers have inferred the number of drowsy-driving crashes by looking for correlations with related factors such as the number of passengers in the vehicle, crash time and day of week, and crash type. Tefft (2012) analyzed data from NHTSA’s National Automotive Sampling System - Crashworthiness Data System. Using a multiple imputation methodology, the study estimated 21% of fatal crashes involved drowsy driving.

According to the AAA Foundation for Traffic Safety’s 2019 *Traffic Safety Culture Index*, 96% of drivers identify drowsy driving as a very or extremely dangerous activity, and over 97% of drivers socially disapprove of it. However, about 24% of drivers admit to driving so drowsy that they had a difficult time keeping their eyes open, at least once in the past 30 days.

As described in Higgins et al. (2017), other surveys have asked about falling asleep at the wheel and examined whether some groups are more likely to report drowsy driving than others. An estimated 4% of drivers admit to falling asleep at the wheel in the past 30 days. These drivers come from every race and ethnicity, gender, age, income, education level, and employment status. However, male drivers were more likely to report drowsy driving than female drivers, younger drivers more likely than older drivers, and Hispanic and non-white drivers more likely than white drivers.

Many lifestyle and work factors influence drowsy driving incidence. Working long and irregular hours, especially at night, or having multiple jobs substantially increase the risk

of crashes related to drowsiness. Shift workers, particularly those who work the night shift or long shifts, and commercial drivers who operate vehicles such as tow trucks, tractor trailers, and buses are more likely to experience drowsy driving. Drowsy driving may also be related to health conditions. Drivers with untreated sleep disorders such as sleep apnea (where breathing repeatedly stops and starts during sleep) and drivers who use medications that make them sleepy are more likely to experience drowsy driving. In many cases, however, it is simply drivers who did not get enough sleep – either the night before or accumulated over several previous nights.

Effective Drowsy Driving Countermeasure

The following section discusses behavioral countermeasures for preventing drowsy driving that are supported by research as consistently effective across situations (★★★★★), effective in certain situations (★★★★), or promising/likely effective (★★★). In the case of drowsy driving, CMTW identified only one countermeasure that met these criteria. For more information on this countermeasure, its effectiveness, cost, use, and time to implement, see the full *Countermeasures That Work* report.

Countermeasure	Effectiveness
1.1 Graduated Driver Licensing Requirements for Beginning Drivers	★★★★★

Research shows a host of negative effects of sleep curtailment in adolescents, including a greater risk for motor vehicle crashes. The **nighttime restrictions that are typically a part of Graduated Driver Licensing (GDL) requirements** for beginning drivers are effective at reducing crashes at times when drowsy driving is likely to occur. These restrictions help reduce exposure to this risk for teens beginning to drive independently. Although nearly all States restrict intermediate licensed drivers from driving during specified nighttime hours, the restricted hours vary widely, from 6 p.m. to 6 a.m. in the most restrictive to 1 a.m. to 5 a.m. in the least restrictive. And while nighttime restrictions starting at or before 10 p.m. yield greater reductions in crash rates, the most common start times across States are 11 p.m. and midnight. One factor that may undermine the effectiveness of GDL restrictions in teen drivers is the perception that the risk of penalty from not complying with the law is low. While parents are in the best position to enforce GDL requirements, law enforcement support for GDL restrictions may also be useful to emphasize that the requirements are important.

Conclusion

As indicated by the relative lack of effective, evidence-based countermeasures to reduce drowsy driving, addressing drowsy driving can be difficult, especially for SHSOs. Once a drowsy driver is on the road, the most effective strategy is for the driver

to pull over to a safe place and take a short (15- to 20-minute) nap or change drivers. Roadway infrastructure such as rest areas and rumble strips also reduce drowsy-driving crashes.

Given the link between employment and drowsy driving, one promising countermeasure is employer-based drowsy-driving prevention programs. There are many ways States can work with employers to address drowsy driving. Changes in work culture, adherence to hours of service rules, and other employer-provided interventions and education can help address drowsy driving. The National Institute for Occupational Safety and Health provides tips for employers and workers to prevent drowsy driving (driver fatigue) on the job at its website (www.cdc.gov/niosh/motorvehicle/topics/driverfatigue/). The tips for employers range from training employees on sleep health and encouraging self-reporting, to fatigue risk management systems that can help reduce risk through improved scheduling.

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