The Milepost
End of the School Year
May 2015

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Greeting to everyone from: Jen Sletten, MDTSEA President

Spring is here and soon summer will arrive. It is that time of year when many of us begin to see an increasing number of student driver vehicles on the road. I am very excited to see what the next two years brings to me as your president. In assuming the presidency I am very thankful for the supporting people around me. Pat Irsfeld did a wonderful job as the president and has left me with a high set of expectations to meet. A big thank you to Pat for all that he did to help our organization become better during his time as our leader.

Thank you to all who attended the State Conference in St. Cloud. It was a nice turn out with good information, good food, and excellent networking with our colleagues. It is always nice to get together and share information, as well as see everyone again. Bea Kehr did a nice job in getting the registration and the paperwork prepared. Joe Christianson did a wonderful job in planning the conference and his hard work at preparing leads to a good conference every year. We had some great speakers this year including Teresa Tuner from LifeSource, Tom Dixon from TZD and Dr. Erin Van Tassel who spoke on the teenage brain. We also had many panels to inform and answer our questions. Overall it was a good conference and I hope to see everyone next year in Duluth.

There are a few upcoming events to put on your calendar. The first is the ADTSEA National Convention. The dates for this are July 12th-15th in Raleigh North Carolina. I went 2 years ago to the convention in Portland Maine. I learned a lot of new information as well as updated my current information. In addition, I met a lot of fun and interesting people. I loved going and I am excited to go again this year.   If you have time I would strongly suggest taking a trip to Raleigh. There is more information available on the MDTSEA and ADTSEA website. The second event is closer to home. The Toward Zero Deaths (TZD) conference is scheduled for October 29th and 30th at the St. Cloud Convention Center. MDTSEA will be giving a presentation on Driver and Traffic Safety at the convention.

In the next two years, as we navigate our way through the ever changing field of driver education, I hope you'll send your questions or concerns to either myself or a board of director you know. We are here to help each other become better teachers for our students as well looking out for the safety of everyone else. Jen

Pedestrians Represent an Increasing Percent of Traffic Fatalities

In the last decade pedestrians as a percent of traffic fatalities has increased by nearly a quarter. In 2004 11% of traffic fatalities were pedestrians and in the most recent year where data is available (2013) pedestrians represented 14% of the traffic fatalities. This change in the composition of traffic fatalities reflects reductions in non pesdestrian fatalities and not much of a change in the annual number of pedestrian fatalities. Pedestrians 14 years old or younger represent 21% of pedestrian fatalities with most of these crashes happening outside of intersections, in the dark, and in urban areas. For more information go to: http://www-nrd.nhtsa.dot.gov/Pubs/812124.pdf

RESEARCH REPORT
The Key to Crossing the Street Safely: Eye Contact

March 30, 2015 12:50 p.m. ET
By ANN LUKITS
Wall Street Journal

Drivers stopped more often if pedestrians looked directly into their eyes as the car approached the crosswalk than when they didn't make eye contact, according to the study, published in the June issue of Safety Science. Men were more likely than women to stop if the pedestrian staring at them was a man. Eye contact has been shown to enhance the perception of a person's status and dominance and it may be seen as an implicit order to stop, the researchers said.

Another possible explanation is that staring may trigger a desire in drivers to make a good impression on the pedestrian by stopping, they said. Previous research has found drivers also were more likely to stop for hitchhikers who looked them in the face.

About 5,000 pedestrians die and 76,000 are injured in traffic collisions in the U.S. each year, according to the Centers for Disease Control and Prevention. In the latest study, conducted in Vannes, France, four students tested 2,560 drivers, nearly 60% of whom were men, at four pedestrian crosswalks. The students, two men and two women, ages 19 to 21, either fixed their gaze on the face of an oncoming driver until the driver stopped or drove on, or they looked in the general direction of the car, but not at the driver.

Overall, about two-thirds of drivers stopped for women compared with 58% for men. But when eye contact was made with drivers, 68% stopped for the pedestrians, compared with 55% of drivers who stopped without eye contact.

Free Distrated Driving Tool for Your School

Hi fellow ADTSEA member! April was National Distracted Driving Awareness Month. Here's a great way to remind your students to stay distraction-free behind the wheel. Here is our latest co-brandable flyer describing the LifeSaver:

http://lifesaver-app.us3.list-manage.com/track/click?u=ecc546f96d4a6294d701d8f7c&id=fa514608a6&e=119103444

Our Android and iPhone apps deter you from using your phone behind the wheel. The Driver Portalallows for visibility into your loved one's distracted driving behavior and provide rewards to help them break the habit.

Our solution is FREE to ADTSEA members and your respective student drivers.

Why?

- Drivers aged 15-19 are most likely to be involved in a distracted driving crash.

- Drivers with LifeSaver drove without unlocking the phone in 98.5% of their drives.

We can co-brand this flyer with your logo, so you can distribute to your students and get them safer on the road. Click on my email below to send me your logo.

Thanks for being a Hero,

Rachel Gervolino
The LifeSaver Team
email: rachelgerv@gmail.com

Our mailing address is:
Life Apps LLC
1461 Hollidale Ct, Los Altos, CA 94024

Merging Behavior at Lane Drops Driver Behaviors to be avoided

A previous study by Hallmark et al. (2011) evaluated which driver behaviors result in the greatest reduction of capacity with work-zone lane closures. Data were collected at work zones for six days to identify behaviors that affected work-zone safety and operations, including forced and late merges, lane straddling, and queue jumping.

Queue jumping occurs when a driver already in the open lane decides to jockey for a better position by moving to the closing lane and passes one or more vehicles before merging back to the open lane.
A total of 30 vehicles queue jumped during the study period. However, drivers only improved their position in most cases by one vehicle. The queue jumping also resulted in four forced merges, eight late merges, and four late forced merges, indicating that queue jumping has an impact on operations. In addition, queue jumping appeared to evoke aggressive behavior by other drivers, which was manifested by lane straddling and, in some cases, vehicles physically trying to block queue jumpers.

Lane straddling occurs when drivers move to straddle the lane line separating the open and closing lanes with their vehicles. Drivers who lane straddle attempt to prevent vehicles behind them from late merging or moving ahead of them in the queue. The lane straddling incidents observed in this study often involved several vehicles. Of the 51 incidents that were documented, lane straddling resulted in one forced merge, two late merges, and 14 forced late merges. The main operation impact is that lane straddling creates forced merges that may not have otherwise occurred. In addition, in several cases, drivers who engaged in lane straddling in this study ended up slowing down the entire queue behind them, as they attempted to prevent a driver behind them from using the space they left when they moved over to lane straddle.

This study identified behaviors that compromise safety in work zones. Forced merges, which are discussed as operational problems, are also safety problems, because a driver behind a forced merge has to slow or, in some cases, take some evasive action to avoid colliding with the merging vehicle. Queue jumping also compromises safety, because it creates forced merges and often resulted, in this study, in aggressive actions by other drivers.

Lane straddling can also compromise safety by creating forced merges that may not have otherwise occurred. Lane straddling also resulted in several other safety-compromising behaviors: drivers using the shoulder to pass lane-straddling vehicles, drivers attempting to merge into the space previously occupied by the lane-straddling vehicle and resulting in the lane-straddling driver attempting to physically block the merging vehicle, and, in one case, drivers racing abreast until reaching the arrow board, where a forced merge occurred. Another common disruptive behavior is not using all available lanes leading up to the actual merge point.

http://www.intrans.iastate.edu/smartwz/documents/project_reports/2015-merging_behavior_at_lane_drops_w_cvr.pdf

Analysis of Naturalistic Driving Study Data: Safer Glances, Driver Inattention, and Crash Risk

SHRP 2 Report S2-S08A-RW-1
http://www.trb.org/Publications/Blurbs/171327.aspx

Research Questions
The current research aims to determine the relationship between driver inattention and crash risk in Lead-vehicle precrash scenarios (corresponding to rear-end crashes). It aims to develop *inattention-risk relationships,* describing how an increase in inattention performance variables combines with context in Lead-vehicle precrash scenarios to increase risk. The inattention-risk relationships are intended to show which glance behaviors are safer than others and pinpoint the most dangerous glances away from the road. A *glance* is the time from the moment the eyes move toward an area of interest (such as the radio, rearview mirror, or forward path) to the moment they move away from it. The results aim to (1) support distraction policy, regulation, and guidelines; (2) improve intelligent vehicle safety systems; and (3) teach safe glance behaviors.

The main research question is this: *What is the relationship between driver inattention and crash risk in Lead-Vehicle Precrash Scenarios?*

Key Result

Risk from Distracting Activities (Secondary Tasks)
The analysis started by replicating previous findings. The analysis shows generally similar results that are consistent with previous findings regarding distracting activities and glance metrics. In general, distracting activities occurred frequently—much more frequently in crashes, near crashes, and baselines than impairments such as drowsiness. In line with previous naturalistic driving studies (e.g., Fitch et al. 2013; Klauer et al. 2006, 2010, 2014; Olson et al. 2009), visually demanding tasks were associated with the highest risk. When considering crash and near-crash situations combined (CNC), the results showed that the aggregate category of Portable Electronics Visual-Manual [odds ratio (OR) 2.7, confidence interval (CI) 1.4–5.2] and, in particular, one individual activity in that category, Texting (OR 5.6, CI 2.2–14.5), had the highest odds ratios, suggesting a substantial risk.

Talking/Listening on Cell Phone was found to decrease crash/near-crash risk significantly compared with not engaging in a phone conversation (OR 0.1, CI 0.01–0.7), representing an estimated 10-fold reduction in risk compared with the baseline (OR 10 if the sign of the coefficient is reversed). There were no crashes when drivers were Talking/Listening on Cell Phone.

Other individual categories, such as Locating/Reaching/Answering a Cell Phone or Adjusting/Monitoring the Radio, or other aggregate categories, such as Original Equipment or Vehicle External Distraction, were not significantly risky.

Most Sensitive Glance Risk Metrics

To determine whether risk from distracting activities (secondary tasks) can be explained by glance behavior, it was necessary to first find the most predictive glance metrics. We found that many Eyes-off-Path glance behavior metrics were powerful drivers of risk, much more so than the type of distracting activity (secondary task). The finding that glance behavior has a key contributing role in crashes and near crashes is in line with existing research (e.g., Klauer et al. 2006, 2010, 2014).

However, our analyses of single glance metrics quantified this risk more strongly. In general, the greatest risk estimates were shown when crashes were analyzed separately from near crashes.

Although very strong Eyes-off-Path–risk relationships were shown in separate glance metrics, the relationship between glance behavior and risk cannot be reduced to a single metric, as there is no separate metric that fully accounts for risk on its own. The relationship is analogous to accounting for discomfort associated with heat.

Temperature is a good metric that accounts for much of the variance, but including humidity would result in better predictions, as would including wind speed. Each glance metric helps inform the risk estimates. The most sensitive glance metric model was a linear combination of three-glance metrics because it was most predictive of crashes and near crashes. The first glance metric, Off3to1, denotes the proportion of time the eyes were off path from 3 seconds until 1 second before the crash or minimum time to collision. The second glance metric is the mean duration of off-path glances, mean.off. The third metric, mean uncertainty, is the mean value of a composite measure based on the Senders et al. (1967) uncertainty model of the driving situation. Of the three metrics, the Off3to1 metric is the strongest individual risk-predicting metric.

Timing of Eyes off Path Relative to Situation

This analysis revealed a distinct mechanism for many of the crashes. In line with Tijerina et al. (2004), we found that drivers in most cases did not start to look away when lead vehicle was closing. Rather, drivers who crashed typically looked away just before the lead vehicle started closing and did not look back until collision was unavoidable. The criticality when looking back, and hence the crash risk, is largely determined by an interaction between last glance duration and the rate at which the situation changed during the glance. The event outcome is also determined by the vehicle's braking capacity and the driver's time to react.

What are the most dangerous glances away from the road, and what are safer glances? The team's initial answer to this question was that the most dangerous and safest glances are quantified by a three-metric glance model. The model combines a metric of inopportune glance, mean glance duration, and a composite measure estimating the driver's uncertainty of the driving situation.

Can risk from distracting activities (secondary tasks) be explained by glance behavior? The three metric glance model and many of the individual glance behavior metrics were substantially more predictive than the models based on distracting activities.

How does the timing of lead-vehicle closing kinematics in relation to off-road glances influence crash risk? A key finding in this report was a distinct mechanism for many of the crashes. The mismatch depends on the joint probability distributions of glance durations and situation kinematics. Thus, an important finding of the present analysis is that glances that lead to crashes may not necessarily have to be long. This key finding motivates reconsideration of the first question: What are the most dangerous glances away from the road, and what are safer glances? Under normal conditions (e.g., a dry road surface, normal braking capacity, normal visibility conditions), glances can be regarded as safe by examining the interaction of glance duration and kinematics change rate. Thus, the answer to the first part of the question can be reformulated like this: Dangerous glances are those during which the driver gets exposed to the risk of a rapidly changing situation. This answer is naturally partly related to the glance duration: the longer the glance, the greater the probability that the kinematics will develop in such a way that the perfect mismatch occurs. However, the second part of the equation is the natural variability in vehicle-following situation kinematics. Drivers are normally successful in controlling this variability by means of anticipation. However, as shown in the present analysis, the safety margins adopted by drivers when looking away are often insufficient to protect them from rapid changes in situation kinematics. For a given glance duration, a certain minimum change rate is needed to produce a crash.

Conversely, for a given change rate, the glance has to be sufficiently long for a crash to happen. A reformulated answer to the second part of Question 1 is thus as follows: *An off-road glance is only perfectly safe when the safety margins adopted are sufficient to protect the driver if the situation changes rapidly during the glance.* Further, driver reactions were found to be strongly coupled to situation kinematics and not notably affected by lead-vehicle brake lights

The answer to the main research question—*What is the relationship between driver inattention and crash risk in Lead-Vehicle Precrash Scenarios?*—can be found in the general pattern of our results. In line with previous naturalistic driving studies, the results show that some activity types significantly increase risk (such as Texting and the aggregate category of Portable Electronics Visual-Manual). However, for Talking/Listening on Cell Phone, a strong significant decrease in risk was found. Notably, there were no crashes while talking/listening on the phone.

Three types of glance metrics showed the largest odds ratios: (1) the proportion of time the eyes were off path between 3 seconds and 1 second before the crash or minimum time to collision, (2) mean duration of off-path glances, and (3) the mean value of a composite measure estimating the driver’s uncertainty of the driving situation. However, it was when these three-glance metrics were combined in a model that they were most predictive of crashes and near crashes.

Analyses of the timing of off-path glances with lead-vehicle closing kinematics and visual cues revealed a distinct mechanism behind most of the crashes that can be understood in terms of a "perfect mismatch" between last glance duration and the change rate of the lead vehicle closing. Crashes occur with short glances and high closure rates, just as crashes occur with long glances with slow closure rates. These mismatches can be understood in terms of a joint probability distribution for glance durations and closure rates in which the most likely combinations will show up in a crash sample like the present one. Since long glances are rare, many crashes occur due to the combination of a relatively short glance and a high change rate.

How can we change glance behavior to be safer, and how do the results of this research translate into countermeasures? The findings from this project have clear implications for countermeasures, as summarized below.

Regarding human-machine interaction design, distraction guidelines, and other regulatory agency countermeasures, the results emphasize the need to tackle the distraction problem as a joint probability problem. Risk can most effectively be reduced by removing the timing mismatch of eyes off road and lead-vehicle closure rates (inverse TTC change rate). A reduction of both sides of the equation—reducing eyes-off-road occurrence and reducing closure rates—is recommended.

The results point to the importance of designing interfaces that minimize the need for visual interaction, particularly in portable electronic devices. They also indicate that eliminating long glances (e.g., glances above a limit of 2 seconds) will not eliminate the distraction problem, because inopportune glances of normal short duration with the wrong timing relative to high lead-vehicle closure rates often produce rear-end crashes. Further, the results support the potential for nonvisual interfaces because Talking/Listening on a Cell Phone significantly reduced risk. In other words, reduction of off-road glances alone will not solve the problem; a reduction of lead-vehicle closure rates is needed. The results provide strong support for vehicle design and driving support countermeasures, in particular active safety systems such as autonomous emergency braking (AEB) systems, forward collision warning (FCW), and autonomous cruise control (ACC). Active safety systems provide the safety margins needed to protect the driver if the situation changes rapidly during an off-path glance by creating more time headway, issuing warnings to alert the driver to rapid closure rates, and actively braking.

For education and behavioral change, it is recommended that the public be made aware of the inopportune glance mismatch mechanism, that the importance of adopting safe headways be emphasized (particularly for ages 16–17 and 76+), and that usage-based insurance be encouraged (e.g., rewarding longer time headways).

Regarding road and infrastructure design, emphasis should be placed on creating smooth flowing traffic, reducing the occurrence of sudden, unexpected kinematic changes. Further, improving road surfaces to decrease stopping distances and developing self-explaining roads to reduce unexpected situations are also needed.

Evaluation of Intersection Confirmation Lights in Medium to Large Communities in Iowa to Reduce Red Light Running Violations

http://publications.iowa.gov/19042/1/IADOT_UK_TR_657_Fitzsimmons_Eval_Intersection_Confirmation_Lights_Reduce_Red_Light_Running_2015.pdf

Abstract

Red light running continues to be a serious safety concern for many communities in the United States. The Federal Highway Administration reported that in 2011, red light running accounted for 676 fatalities nationwide. Red light running crashes at a signalized intersections are more serious, especially in high speed corridors where speeds are above 35 mph. Many communities have invested in red light countermeasures including low-cost strategies (e.g. signal backplates, targeted enforcement, signal timing adjustments and improvement with signage) to high-cost strategies (e.g. automated enforcement and intersection geometric improvements). This research study investigated intersection confirmation lights as a low-cost strategy to reduce red light running violations. Two intersections in Altoona and Waterloo, Iowa were equipped with confirmation lights which targeted the through and left turning movements. Confirmation lights enable a single police officer to monitor a specific lane of traffic downstream of the intersection. A before-after analysis was conducted in which a change in red light running violations prior to- and 1 and 3 months after installation were evaluated. A test of proportions was used to determine if the change in red light running violation rates were statistically significant at the 90 and 95 percent levels of confidence. The two treatment intersections were then compared to the changes of red light running violation rates at spillover intersections (directly adjacent to the treatment intersections) and control intersections. The results of the analysis indicated a 10 percent reduction of red light running violations in Altoona and a 299 percent increase in Waterloo at the treatment locations. Finally, the research team investigated the time into red for each observed red light running violation. The analysis indicated that many of the violations occurred less than one second into the red phase and that most of the violation occurred during or shortly after the red phase.

DRUG-IMPAIRED DRIVING Support Needed for Public Awareness

What GAO Found Various state and national-level data sources—including surveys, arrest data, drug-testing results, and crash data—provide limited information on the extent of drugged and drug-impaired driving in the United States. For example, based on preliminary results from a representative sample of weekend-nighttime and Friday daytime drivers, the National Highway Traffic Safety Administration's (NHTSA) *2013-2014 National Roadside Survey of Alcohol and Drug Use by Drivers* (*NRS*) estimated that 20 percent of drivers would have tested positive for at least one drug, with marijuana being the most common drug. However, the survey does not capture the extent to which drivers were impaired by drugs. Arrest data and drug-testing results provide some information on drug-impaired driving, but these data are limited. For example, data for drug impairment may not be separated from that for alcohol impairment and drug testing is not standardized. According to NHTSA officials, currently available data on drug involvement in crashes are generally unreliable due to variances in reporting and testing.

The lack of a clear link between impairment and drug concentrations in the body makes it difficult to define drug impairment, which, in turn, exacerbates challenges related to enforcement and public awareness. Compared to alcohol, defining and identifying impairment due to drugs is more complicated due to the large number of available drugs and their unpredictable effects. For example, the *NRS* includes tests for 75 illegal prescriptions, and over-the-counter (OTC) drugs identified as potentially impairing. Additionally, law enforcement processes for obtaining samples for drug testing can be time consuming and result in a loss of evidence. For example, there is no validated device for roadside drug testing, and obtaining a search warrant to collect a blood sample to confirm the presence of drugs in a driver's system could take several hours, during which time the concentration of the drug in the driver's system could dissipate. Further, state officials identified limited public awareness about the dangers of drugged driving as a challenge. As a result, members of the public may drive while impaired without knowing the risks, potentially leading to collisions, injuries, and fatalities.

Federal and state agencies—including NHTSA, the White House Office of National Drug Control Policy (ONDCP), and the Department of Health and Human Services (HHS)—are taking actions to address drug-impaired driving, including improvements in the areas of research and data, education for police officers, evidence gathering, and legal changes. For example, NHTSA is currently conducting research to assess the crash risk associated with drug use (including illegal, prescription, and OTC drugs) by collecting samples from more than 10,000 drivers. However, public awareness of the dangers of drug-impaired driving is an area in which state officials told us that NHTSA could do more to support their efforts. As part of its mission to support state safety efforts, NHTSA has provided media and other materials to states for impaired-driving awareness programs, but these materials are focused on alcohol-impaired driving. While NHTSA plans to improve public awareness through initiatives to conduct surveys on drug-impaired-driving behaviors and attitudes as well as training for medical professionals, these plans could take several years to implement. Additional efforts, such as general messaging reminding the public about the impairing effects of drugs, could help improve public awareness in the near term.
http://www.gao.gov/products/GAO-15-293

Seat Belt Use in 2014—Overall Results

Seat belt use in 2014 remained at 87 percent, unchanged from 2013. This result is from the National Occupant Protection Use Survey (NOPUS), which is the only survey that provides nationwide probability-based observed data on seat belt use in the United States. The NOPUS is conducted annually by the National Center for Statistics and

Analysis of the National Highway Traffic Safety Administration.

Seat belt use has shown an increasing trend since 1995, accompanied by a steady decline in the percentage[1] of unrestrained passenger vehicle occupant fatalities during daytime. www-nrd.nhtsa.dot.gov/Pubs/812113.pdf

Study questions value of law that exempts speeding violations from driver records

In 2012 the Minnesota legislature modified a law—often called the Dimler Amendment—that exempts certain speeding violations from a motorist's driving record. The modifications increased the qualifying range for the exemption from 5 mph to 10 mph in 60-mph speed zones during a roughly two-year test period that ended in the summer of 2014.

The legislation also requested a joint report from the Minnesota Department of Transportation (MnDOT) and the Department of Public Safety to learn the impacts of the modifications in terms of safety, travel reliability and efficiency, and data privacy. The U of M's State and Local Policy Program (SLPP) at the Humphrey School of Public Affairs provided policy and data analyses for this report.

The research team, led by SLPP associate director Frank Douma, found that the impacts of the 2012 modifications were small, or even negligible. There was no consistent increase or decrease in the proportion of drivers who exceeded the speed limit, and no significant change in speed-related crash rates. "More significantly, however, our findings led us to question the effectiveness of the Dimler amendment itself," he says.

One concern relates to the Dimler amendment's scope and coverage. Since its passage in 1986, the law has been amended to apply to a substantially limited portion of the state's roads—9,000 total miles. "This limited scope can create confusion regarding how the law is applied and enforced, and therefore limit its effectiveness and perceived fairness," Douma says.

In addition, the Dimler amendment offers negligible protection for drivers' personal information. Data vendors are still allowed to access driving records for several reasons (including resale to insurance companies), and conviction records are publicly available through the State Courts record system.

One impact the Dimler amendment does have, however, is to allow habitual speeders to stay on the road. Minnesota law states that a person's license can be suspended for 30 days if the person is convicted of four traffic offenses within a 12-month period or five traffic offenses in a 24-month period. "Since Dimler prevents some of these convictions from appearing on a driver's record, certain drivers are able to violate repeatedly without risking suspension," Douma says. "This loophole is detrimental to public safety."

The amendment also allows habitual offenders to remain eligible to apply for a commercial driver's license. If the statute remains in effect, Minnesota may become out of compliance with new federal regulations for commercial vehicle learner permits that take effect in July 2015, he says. This would place Minnesota at risk of having up to 5 percent of federal-aid highway funds withheld.

Also because of the amendment, Douma says, habitual offenders may avoid paying higher insurance premiums that accurately reflect the public impact of their behavior—costs that are instead passed on to all other drivers in the form of higher insurance rates.

"The analyses and corresponding report provided by Frank and his team were pivotal to fulfilling the legislative requirement," says Katie Fleming, senior research analyst with MnDOT's Office of Traffic, Safety and Technology.
http://www.cts.umn.edu/publications/catalyst/2015/march/questions

Summary The National Motor Vehicle Crash Causation Survey (NMVCCS), conducted from 2005 to 2007, was aimed at collecting on-scene information about the events and associated factors leading up to crashes involving light vehicles. Several facets of crash occurrence were investigated during data collection, namely the pre-crash movement, critical pre-crash event, critical reason, and the associated factors. A weighted sample of 5,470 crashes was investigated over a period of two and a half years, which represents an estimated 2,189,000 crashes nationwide. About 4,031,000 vehicles, 3,945,000 drivers, and 1,982,000 passengers were estimated to have been involved in these crashes. The critical reason, which is the last event in the crash causal chain, was assigned to the driver in 94 percent (±2.2%)[†] of the crashes. In about 2 percent (±0.7%) of the crashes, the critical reason was assigned to a vehicle component's failure or degradation, and in 2 percent (±1.3%) of crashes, it was attributed to the environment (slick roads, weather, etc.). Among an estimated 2,046,000 drivers who were assigned critical reasons, recognition errors accounted for about 41 percent (±2.1%), decision errors 33 percent (±3.7%), and performance errors 11 percent (±2.7%) of the crashes. For more information: http://www-nrd.nhtsa.dot.gov/Pubs/812115.pdf

A New GDL Framework: Evidence Base to Integrate Novice Driver Strategies

Dan Mayhew1, Allan Williams2, and Charlotte Pashley1

1 Traffic Injury Research Foundation Full report at:
http://bit.ly/GDLframework

Purpose

This report describes a comprehensive Graduated Driver Licensing (GDL) framework that has been developed to better address the elevated crash risk of young and new drivers. This new GDL framework is unique in that it proposes that driver education, licensing and testing requirements, as well as in-vehicle monitoring technology be integrated into an enhanced GDL program.

The discussion is focused on the U.S. situation, but this GDL framework is intended to be applicable and adaptable to GDL programs worldwide. The goal of the present project is to identify internationally, current approaches and research on GDL, driver education, license testing/assessment, and in-vehicle monitoring technologies that have the potential to increase the safety outcomes of young and novice drivers. These best practices are consolidated into a new comprehensive framework in which all of these safety initiatives are better integrated to reinforce an optimal GDL program. As well, this GDL framework is presented as a formalized representation of best practices that have the potential to be efficiently and effectively incorporated into existing GDL programs worldwide.

Method

The major tasks of this project include:

a literature review of academic journals and published materials from various traffic safety organizations and resources of research related to the effectiveness and implementation of GDL, driver education, license testing/assessment, and, in-vehicle monitoring technology for young and novice drivers across the globe;

an environmental scan of contacts in relevant agencies in North America and internationally to identify the most recent advancements in young and novice driver programs throughout the world that may not have otherwise been captured through a literature review alone;

a 1½ day international expert panel discussion to describe, discuss, and augment a proposed GDL framework; and,

the application of the information obtained from these sources to develop and refine the final comprehensive GDL framework contained in this report.

GDL framework

The review of the scientific evidence, the environmental scan of current and best practices, and the international expert panel discussion provided guidance regarding ways to enhance GDL and better integrate safety measures for young and novice drivers, including driver education and training, license testing, and in-vehicle monitoring technologies, within a comprehensive GDL framework. The GDL framework described below comprises evidence-based initiatives along with those that are largely unproven but make sense on logical grounds and are supported by expert opinion. This is similar to the situation several decades ago when the concept of GDL was initially developed and promoted. At that time, there was limited or no research on the safety effects of GDL and most of its components, with the exception of a night driving restriction which early studies had shown to have safety benefits. However, the concept of a GDL system that introduced beginners into the traffic environment while protecting them as they gained experience made sense on logical grounds. As jurisdictions implemented GDL and evaluated it, GDL emerged as a popular and successful policy with proven safety benefits.

The description of the GDL framework is followed by an illustration of it. Since the strength of the evidence in support of a specific component being recommended varies from strong to lesser or insufficient evidence, the illustration uses a gold star to denote components with a strong empirical base. Other components are based on expert opinion having a solid logical basis for consideration. Although these lack strong empirical evidence they are recommended as part of the GDL framework since they may reinforce GDL principles and operation but further research is needed to determine their safety effectiveness and/or the extent to which they contribute to the overall benefits of GDL.

In the framework, young and novice drivers move through two restricted phases of licensing, including a learner and intermediate stage, before progressing to full licensure. The specific components of each of these license stages are detailed below.

Learner Stage

Eligibility age.GDL should apply to all beginners, regardless of age, although some rules could be relaxed for adult learners and novices.

Minimum entry age. The minimum entry age should be no younger than 16.

Minimum length in learner stage. The minimum length required to remain in the learner stage should be no less than 12 months.

Entry requirements. To obtain a learner license, applicants must pass knowledge and vision tests, which should include items relating to GDL requirements.

Supervised driving. The minimum number of supervised driving hours that should be a requirement to progress through GDL should be greater than 50 hours, optimally 80-120, and should span all seasons of driving. Log books should be required to increase knowledge and promote compliance with the required number of supervised hours. Also, log books could provide evidence of requirement fulfillment. In-vehicle monitoring could be used as a method to more accurately monitor practice driving hours.

Restrictions. Seatbelt use should be required for drivers and passengers. Supervisors should be restricted to a low or zero BAC. Phone/electronic device use by learners should be prohibited. Vehicle decals, designed to help police enforce GDL and encourage compliance with GDL restrictions, should be required for all drivers in this stage. Although not shown in the framework illustration, if GDL is extended to older novice drivers, a zero alcohol limit should be applied.

Driver education. Jurisdictions should regulate driver education to meet Novice Teen Driver Education and Training Administrative Standards (NTDETAS) in a multi-phased approach, including an initial phase of driver education (Phase 1), which would include in-vehicle and theoretical instruction that teaches basic vehicle handling skills and rules of the road to learners. Phase 1 driver education for young learners should: be teenoriented; include a mandatory parent orientation course and encourage parental involvement throughout the GDL process; include GDL rationale and requirements in the curriculum; provide end of course reports/debriefings to parents that include recommendations for areas that need improvement; and, provide information about available in-vehicle technologies that can enhance the safety of young and novice drivers. The completion of driver education should not result in a reduced length of time spent in the learner stage. Driver education in-vehicle hours could be applied to reduce the mandatory minimum supervised driving hours if they are set at 120 hours or more.

Intermediate Stage

Minimum entry age. The minimum entry age should be no younger than 17, and should not include exemptions for drivers who have completed driver education courses.

Minimum length in intermediate stage. The minimum length required to remain in the intermediate stage should be no less than 12 months, regardless of age at the time of entry. This ultimately means that the minimum possible age to progress to full licensure should be 18 years old.

Entry requirements. Requirements for obtaining an intermediate license should include passing an on-road, standardized entry-test. This test should include hazard perception skills. In-vehicle monitoring technology is encouraged as a means of objectively assessing driving skills and abilities. The completion of a second phase of driver education (Phase 2) which would involve advanced instruction to teach safe driving procedures including perceptual and decision-making skills (could include hazard perception training and incorporation of driving in high-risk situations, such as highway driving) should be jurisdiction-regulated and encouraged. Phase 2 driver education should be delivered just prior to the on-road test, or alternatively or in addition, in the first few months after the road test when teens are driving independently for the first time and experiencing their highest crash risk.

Restrictions. Unsupervised nighttime driving restrictions beginning at 9-10 pm and ending no earlier than 5 am should be required for all intermediate drivers. With the exception of a supervising driver and family members, intermediate license holders should be restricted to have no more than one teenage passenger in the vehicle at all times. Seatbelt use should be required for drivers and passengers. Phone/electronic device use by intermediate drivers should be prohibited. Vehicle decals, designed to help police enforce GDL laws and encourage compliance with GDL restrictions, should be required for all intermediate license holders. Although not shown in the framework illustration, if GDL is extended to older novice drivers, a zero alcohol limit should be applied.

Exit requirements. In order to progress to a full, unrestricted license, intermediate license holders should be required to pass an advanced on-road or computer-based exit test that includes measures of higher-order driving skills such as hazard perception, situational awareness, and decision-making. This test provides incentive for novice drivers to obtain additional driving instruction (in the form of Phase 3 driver education) and practice during the intermediate stage, in order to attempt the exit test and obtain a full license. In addition, or as an alternative to testing, graduating from this stage to a full license could be contingent on having a clean driver record.

Additional features. Technology, such as Smart Keys, in-vehicle feedback systems and other resources and tools, including on-line safety-oriented programs, should be promoted by licensing and insurance agencies, as well as driver education programs to help: enforce seat belt use; limit speeding; provide warnings of dangerous driving behaviors (e.g., lane deviation); and, reduce distractions (e.g., vehicle stereo volume) to novice drivers. As well, this stage should encourage continued parental involvement through in-vehicle monitoring technologies that automatically alert parents of risky driving behaviors. This could include a 'two-strike system', where teens are given the opportunity to correct an unsafe behavior before their parents are alerted.

From the April 2015 CTS Catalyst

Can video games change attitudes toward distracted driving?

http://www.cts.umn.edu/publications/catalyst/2015/april/videogames

A researcher at the University of Minnesota Duluth (UMD) is experimenting with video games in an attempt to change teens' attitudes toward distracted driving.

Edward Downs, associate professor of communication at UMD, used a PlayStation 3 video game console and a popular racing game to create a simple driving simulator, complete with a steering wheel and gas and brake pedals. His goal was to demonstrate the dangers of cell phone use behind the wheel in a safe, affordable, controlled environment—and ultimately make teen drivers less likely to drive distracted in the real world.

To test the simulator, Downs recruited a group of students from UMD and split them into three groups: a texting while driving group, a talking while driving group, and a control group (with no distractions). Downs then measured how often each group of drivers crashed, crossed the fog line, and engaged in speed violations to determine the effects of distraction.

Results showed that participants in the texting group were significantly more likely to crash or cross the fog line than those in the talking or control conditions, and drivers in the talking group were more likely to engage in speed violations.

To measure the simulator's effect on drivers' attitude toward distracted driving, Downs completed pre- and post-driving surveys. In all groups, participants reported being less likely to drive distracted after they had completed the simulator study, but none showed significantly less intent. According to Downs, this was likely because none of the participants were able to compare their experience of driving distracted to driving without distractions.

To test this theory, Downs conducted a follow-up study that allowed participants to drive in both distracted and non-distracted conditions. "Allowing participants to see both their undistracted scores and their distracted scores resulted in much stronger attitude changes," Downs says. "Participants' intent to drive distracted was significantly reduced."

The study's results have implications for community programs and parents of teen drivers, Downs says. "In a time when financial resources are limited, driver's education programs may be interested in setting up driving simulators of their own to show people how inefficient they are at driving distracted. For less than $500, they could purchase a video game console and accessories to begin changing attitudes toward distracted driving."

For parents, especially those who may already have a video game console in their home, this study could provide guidance on a safe way to demonstrate the negative consequences of distracted driving.

"The added benefit of using video game technology is that, used properly, attitudes can be changed through experiential learning," Downs says. "Allowing young drivers, particularly the youngest drivers with the least amount of driving experience, to reach a conclusion through their own experiences in a safe, controlled environment could be much more powerful than an authority figure telling them what they should or should not do."

Following the initial study, Downs took three driving simulators to the 2014 Minnesota State Fair as part of the U of M's Driven to Discover initiative. Downs and his team collected data from more than 200 participants, with a focus on whether or not the simulator could change attitudes toward texting and driving.

Preliminary analysis indicates that the simulator was successful, with participants reporting that they would be less likely to text and drive in the future. Downs and his research team are continuing to analyze the data to further their understanding of the relationships between technology, learning, and attitude change.

Making SMART Signal even smarter

http://www.cts.umn.edu/publications/catalyst/2015/april/smartsignal

Your drive home may be a few minutes quicker thanks to a team of researchers who are making it easier for Minnesota engineers to retime traffic signals.

Traffic delays typically grow 3 to 5 percent per year due to outdated signal timing. However, most traffic signals in the United States are only retimed every two to five years (or longer), largely due to the expense associated with retiming efforts. It normally costs $3,500 to retime one traffic signal because of the time involved in collecting data and optimizing timings.

But over the past several years, University of Minnesota researchers have developed and refined the SMART Signal system to make it easier and less expensive to retime signals. The system—developed with funding from the Minnesota Department of Transportation (MnDOT)—not only collects traffic and signal-phase data automatically, but it also identifies under-performing traffic signals and generates optimal signal timing plans with minimal human intervention.

MnDOT (along with many cities and counties) embeds loop detectors in roads that notify a traffic signal when a vehicle is present. Staff normally must manually track wait times to determine how signal timing is affecting traffic.

But SMART Signal automates much of this process by recording how long a vehicle waits at an intersection and automatically reporting the data (along with signal timing) to a central server. The data—viewable in real-time on a website—can then be analyzed to determine traffic patterns and optimal signal timing. By reducing the cost of data collection and performance measurement, SMART Signal allows MnDOT to base signal retiming decisions on performance rather than a fixed schedule.

The latest research optimizes the system’s ability to reduce traffic delays by developing a framework to diagnose problems that cause delays at traffic signals and an algorithm that automatically optimizes the signal plan to address these problems.

The enhancements were successfully tested on Highway 13 in Burnsville, reducing vehicle delay there by 5 percent. The benefit could be in the double digits for corridors with worse traffic delays.

The software upgrade has since been integrated into the more than 100 intersections in Minnesota equipped with the SMART Signal system.

(Adapted from an article published on the joint CTS/MnDOT Crossroads *blog)*