



Mission Not Accomplished: Teen Safe Driving, the Next Chapter



CONTENTS

Executive Summary.....	1
Introduction.....	3
What the Data Reveal	4
Comparing Younger and Older Teens, Male and Female Teens.....	5
Seat Belt Use by Teen Drivers.....	7
Alcohol-Impaired Teen Drivers.....	8
Distracted Teen Drivers	9
Speeding Teen Drivers.....	11
Addressing the Findings/Recommendations.....	13
Expand GDL to include all teen drivers under 21 years of age	13
Require all novice drivers to complete driver education and training.....	16
Actively promote the benefits of older teen drivers completing a defensive driving and/or behind the wheel program	17
Provide relatable and relevant impaired driving information to older teens during license transactions.....	19
Send an early warning letter when an older teen receives his/her first moving violation	20
Enact a primary seat belt law that covers all motor vehicle occupants in all seating positions.....	21
Educate parents about the importance of continuing to coach and monitor their older teen drivers.....	22
Partner With Colleges to Promote Safe Driving.....	25
Partner with graduating high school peer leaders to help them continue their traffic safety outreach in college	29
Partner with law enforcement to conduct high visibility enforcement coupled with school-based education and earned/paid media	30
Capitalize on the popularity of music and sports with teens to disseminate safe driving information/ messages	32
Conclusion.....	34
References.....	35
Endnotes.....	38

ACKNOWLEDGMENTS

Pam Fischer, Principal,
Pam Fischer Consulting,
researched and wrote the report.

Richard Retting, Sam Schwartz
Transportation Consultants,
conducted the data analysis.

Amadie Hart, Hart Strategic
Marketing, LLC, and Madison
Forker, GHSA, edited the report.

Jonathan Adkins, Executive
Director, GHSA, and Kara Macek,
Communications Director, GHSA,
oversaw the report.

Creative by Winking Fish.

The views and recommendations
in this publication do not necessarily
reflect those of the Ford Motor
Company Fund or GHSA.

Executive Summary



GHSA analyzed 10 years of fatal crash data (2005–2014) involving teen drivers 15 to 20 years of age from the National Highway Traffic Safety Administration’s (NHTSA) Fatality Analysis Reporting System (FARS) for the purpose of answering the following questions:

- How have the characteristics of fatal crashes involving a teen driver changed over this time period?
- Are there differences in fatal crash characteristics between young teen drivers (ages 15 to 17) and older teen drivers (18 to 20 years of age)?
- Are there differences in crash characteristics between male and female teen drivers?

The data revealed that teen driver involvement in fatal crashes fell 48 percent from 7,500 in 2005 to 3,885 in 2014. This, in turn, resulted in a 51 percent decrease in teen driver deaths, as well as declines of 59 and 44 percent, respectively, in teen driver serious and minor injuries. When comparing fatal crashes per 100,000 licensed drivers, the rate for teens fell 44 percent, whereas it fell 27 percent for a comparison group of adult drivers 35 to 40 years of age. The difference in fatal crash rates between these two subsets of drivers has narrowed considerably, from 27.1 per 100,000 drivers in 2005 to 9.5 in 2014 – a 65 percent decline. However, taking into account licensing rates for teens and the adult comparison group, teens are still 1.6 times more likely to be involved in a fatal crash.

When the teen crash data is segmented by young and older teen drivers, the decline in fatal crashes is larger for younger (56%) than older teens (44%). The fatal crash rates per 100,000 licensed drivers

When the teen crash data is segmented by young and older teen drivers, the decline in fatal crashes is larger for younger (56%) than older teens (44%).

for the two groups also showed better improvement for young versus older teens, at 51 percent and 40 percent, respectively. For both teen driver age groups, the rate is twice as high for males as it is for females. A closer examination of the data by age also revealed that 19-year-olds accounted for the greatest number of teen drivers killed during this 10-year period, followed by 20- and 18-year-olds.

There is a disparity among young and older teen drivers as to the time of day when fatal crashes occur, with older teens twice as likely as their younger counterparts to be involved in a fatal crash between midnight and 6 a.m. This is likely due to states enacting graduated driver licensing (GDL) laws, which ban young teens from late night driving. When it comes to seat belt use, all female teen drivers had seat belt use rates that were an average of 15 percent higher than for all male teen drivers. However, female teens were more likely than

male teens to be reported as being distracted at the time of the fatal crash, but less likely than males to be speeding.

While most teen drivers involved in fatal crashes were either not tested for alcohol or had no alcohol in their system, nearly 10 percent of the young teens and 20 percent of the older teens involved in fatal crashes had blood alcohol concentration (BAC) levels of 0.01% or higher. The percentage of males in both the young and older teen driver age groups that had BAC test results of 0.08% (the legal limit for drivers over 21) or higher was roughly double that of their female counterparts.

Recognizing the impact GDL has had on reducing crashes involving young teen drivers (overall reductions of 10 to 30 percent), states should expand GDL laws to include all novice drivers under 21 years of age. Currently, New Jersey is the only state where its GDL provisions apply to all new drivers under 21 years of age. Since teens in nearly every state age out of GDL at 18, and many wait to obtain a license until reaching that age or older, it is critical to ensure they receive the lifesaving benefits of this proven countermeasure.

Unfortunately, the recent decline in fatal teen crashes may be coming to an end. Data released by NHTSA in August indicate that fatalities in crashes involving teen drivers increased 10 percent in 2015 (overall motor vehicle deaths increased 7.2%), the first uptick since 2006. While this year over year change is concerning and bears monitoring by the states and teen driving advocates, it is too early to suggest that the downward trend line has fully reversed course.

Based on the results of this latest data analysis and the 2015 FARS data, GHSA recommends the following:

- Expand GDL requirements to include all teens under 21 years of age.
- Require all novice drivers to complete driver education and training.
- Actively promote the benefits of older teen drivers completing a defensive driving and/or behind-the-wheel program.
- Send an early warning letter addressing the impact of engaging in unsafe driving behaviors to an older teen following receipt of his/her first moving violation.
- Enact a primary seat belt law that covers all motor vehicle occupants in all seating positions.
- Educate parents about the importance of continuing to coach and monitor their older teen (18-20-year-old) drivers.
- Partner with colleges to promote safe driving.
- Partner with graduating high school peer leaders to help them continue their traffic safety outreach in college.
- Partner with law enforcement to conduct high visibility enforcement coupled with high school- and college-based education and earned/paid media.
- Capitalize on the popularity of music and sports with teens to disseminate safe driving information/messages.

Introduction

Teens today have never licked a postage stamp, the Internet has always existed, and if you say *around the turn of the century*, they may ask, *which one?* Despite growing up in a world that is far different from that of previous generations, there is one constant – a heightened risk of being involved in a car crash. Certainly, advances in vehicle technology coupled with policies that put limits on the youngest novice drivers are driving down fatalities. But mile for mile, teens continue to have the highest crash risk of any age group on the road (Insurance Institute for Highway Safety [IIHS], 2012).

Why? It's not that teens are necessarily bad drivers; they simply do not have the skills or experience to anticipate or recognize a hazard and take corrective action. While it is common for people to assume that teen crashes are caused by risk-taking behaviors, driver error (e.g., inadequate scanning, driving too fast for conditions) accounts for more than half of these incidents (Curry et al., 2011). At the same time, the part of the brain that controls impulse inhibition, decision making and judgment is not fully developed until the early to mid-20s (Paus, as cited in Shope, 2006). That may explain why teens and young adults are more likely than their older counterparts to be impulsive and not consider the costs of engaging in a potentially dangerous behavior behind the wheel (Atchley & Warden, 2012, & Hayashi et al., 2015, as cited in Delgado et al., 2016).

Unfortunately, that need for instant gratification can prove deadly. Just how deadly, which teens are most likely to be involved, and what states and others working in teen driver safety can do to mitigate that risk is the focus of this report. Using the National Highway Traffic Safety Administration's (NHTSA) Fatality Analysis Reporting System (FARS), which provides a consistent and complete national perspective on drivers involved in the most serious crashes, this report examines 10 years of fatal crash data (2005-2014) involving teen drivers¹ between the ages of 15 to 20 to answer three questions:

- How have the characteristics of fatal crashes involving a teen driver changed over this time period?

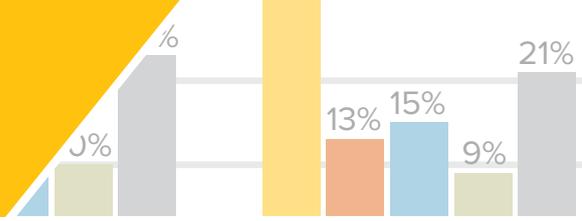
- Are there differences in fatal crash characteristics between young teen drivers (ages 15 to 17) and older teen drivers (18 to 20 years of age)?
- Are there differences in crash characteristics between male and female teen drivers?

The analysis, which was conducted by Richard Retting of Sam Schwartz Transportation Consultants, also examined injury severity among teen drivers, when the crash occurred, crash characteristics with a particular focus on causation factors (e.g., impairment, speeding), seat belt use, and environmental conditions. To allow for identification of trends specific to teen drivers, rather than the potential influence of external factors that impacted the crash population as a whole, a comparison group of adult drivers 35 to 40 years of age was included in the analysis.

Following this analysis, the Governors Highway Safety Association (GHSA) surveyed State Highway Safety Offices (SHSOs) to identify safe driving initiatives expressly targeted at older teen drivers and/or their parents. (GHSA has previously surveyed states to learn about teen safe driving initiatives, but not those focusing on older teens.) Input was received from 10 states and telephone interviews were subsequently conducted with select state officials and program providers along with online research. These findings are discussed in the recommendations section of this report.

Funding for this report was provided by the Ford Motor Company Fund. Working in partnership with GHSA and its members since 2003, the Ford Motor Company Fund's *Driving Skills for Life* (Ford DSFL) program is positively influencing thousands of teen drivers throughout the U.S. By the end of 2016, Ford DSFL will have reached more than one million teens and their parents through its free, behind-the-wheel training programs, online education, school-based programs, and safe driving campaigns in all 50 states and 33 countries.

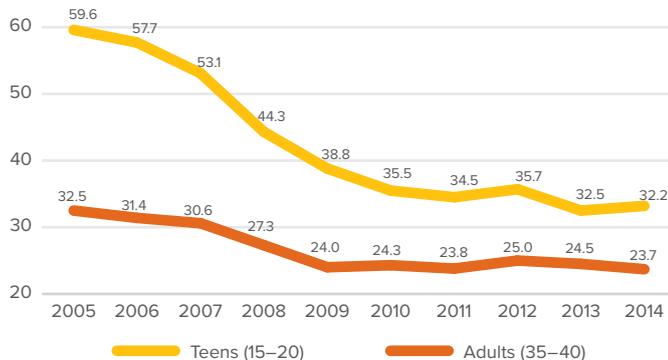
What the Data Reveal



When it comes to teen driving, the dominant headline for years has been “car crashes are the leading cause of death for U.S. teens” (Centers for Disease Control, [CDC], 2015). But the storyline has taken a dramatic turn over the past decade. GHSA’s analysis of FARS data found that from 2005 to 2014, fatalities among 15 to 20-year-olds declined 51 percent, while serious and minor injuries fell 59 percent and 54 percent respectively. This positive change is the result of teen-involved fatal crashes decreasing 48 percent, from 7,500 in 2005 to 3,885 in 2014.

When comparing the fatal crash rates per 100,000 licensed drivers, the decrease is greater for teen drivers (44%) than for drivers 35 to 40 years of age (27%).

FIGURE 1: Rate of Teen Drivers in Fatal Crashes per 100,000 Licensed Drivers



A closer look reveals even more good news – the difference in the fatal crash rate between these two subsets of drivers has narrowed considerably, from 27.1 per 100,000 licensed drivers in 2005 to 9.5 in 2014. That equates to a 65 percent decline. However, taking into account licensing rates for teens and the older driver comparison group, teens are still 1.6 times more likely than 35- to 40-year-olds to be involved in a fatal crash. That rate is down from 1.8 in 2005, but up slightly from 1.3 in 2013.

What is driving the downward trend in fatal teen crashes and the resulting injuries and fatalities? Graduated driver licensing (GDL) is credited with reducing crashes among young teens by 10 to 30 percent (McCart et al., 2010). The three-stage licensing system is designed to delay full licensure while allowing teen drivers to gain experience under lower risk conditions. The crash reductions prompted by GDL are even higher when key provisions of state laws – namely the nighttime driving and passenger restrictions – are taken into account.

This decline can also be attributed to the fact that fewer teens are getting a driver’s license (Shults et al., 2015). The drop in teen licensure, however, has not been influenced by stricter licensing laws or the ability to interact with friends via social media, which has been reported by some media outlets. Instead, it’s economics, pure and simple. Numerous studies confirm that teens were negatively impacted by the recession, making the cost of owning and operating a vehicle a hardship. Additionally, if a teen’s parents were impacted by the economic downturn, it was unlikely they were able or willing to subsidize these costs, further de-incentivizing teen licensure (Highway Loss Data Institute [HLDI], 2013).

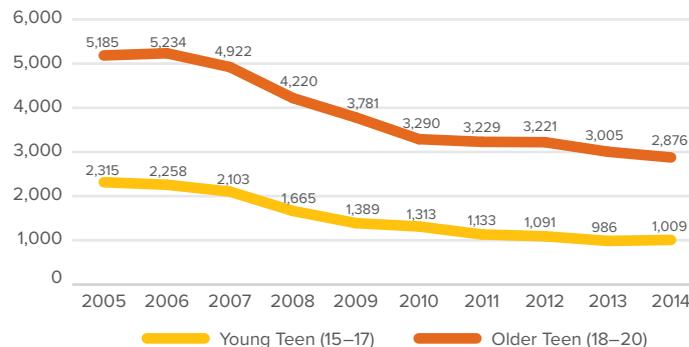
The decrease in fatal teen crashes, however, may be coming to an end. Data released by NHTSA in August indicate that fatalities in crashes involving teen drivers increased 10 percent in 2015 (overall motor vehicle deaths increased 7.2%), the first uptick since 2006 (NHTSA, 2016a; NHTSA, 2016b). While this year over year change is concerning and bears monitoring by the states and teen driving advocates, it is too early to suggest that the long-term downward trend has fully reversed course.

What may be sparking the jump in fatal crashes is an increase in the number of teens who are driving. A July 2016(a) Insurance Institute for Highway Safety/Highway Loss Data Institute (IIHS/HLDI) analysis of teen and adult drivers found that while teens, as a proportion of all insured drivers, dropped during the recession and bottomed out at 3.8% in 2012, that rate is once again on the rise, climbing to 4.1% at the end of 2014. (The adult insured rate also dropped during the same time period, but the drop was significantly less than that of teens.)

Comparing Younger and Older Teens, Male and Female Teens

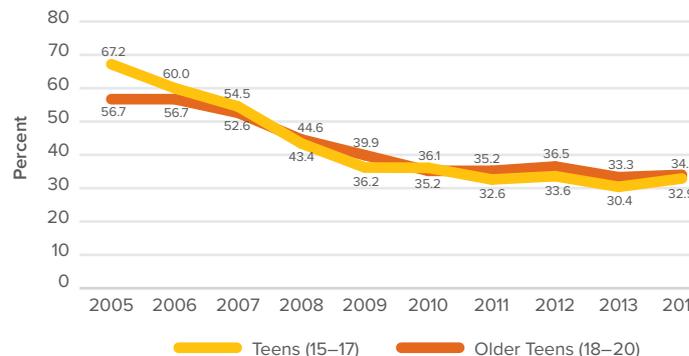
The recent increase in teen driver fatal crashes is troubling, and states and teen safe driving advocates are keeping a watchful eye on the data. But also troubling is what the GHSA analysis uncovered regarding younger (15- to 17-year-old) and older (18- to 20-year-old) teen drivers, as well as male and female teen drivers. While fatal crashes involving young teen drivers fell 56 percent from 2005 to 2014, the decline was actually 11 percent lower (45%) for their older counterparts during this same time period (see Figure 2).

FIGURE 2: Teen Drivers in Fatal Crashes by Age Group



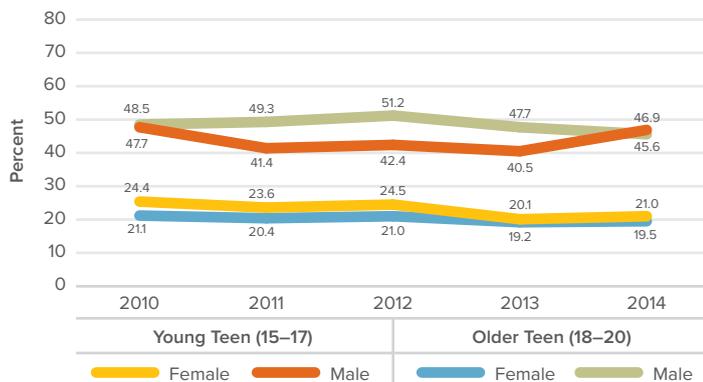
Comparing the rate of fatal crashes per 100,000 licensed teen drivers, there is less distinction between the two age groups. Even so, the decline over the 10-year period was still steeper for young teens (51%) than for older teens (40%), as illustrated in Figure 3.

FIGURE 3: Rate of Teen Drivers in Fatal Crashes per 100,000 Licensed Drivers by Age Group



When the fatal crash data is segmented by sex, the rate of involvement in fatal crashes per 100,000 licensed drivers is twice as high for males as it is for females for both young and older teens (see Figure 4).

FIGURE 4: Rate of Teen Drivers in Fatal Crashes per 100,000 Licensed Drivers by Sex & Age Group



Teen drivers in both age groups were also more likely to suffer fatal injuries (as compared to older drivers 35 to 40 years of age), but older teens accounted for a greater proportion of those deaths from 2010 through 2014. Both young and older teen males were slightly more likely to suffer fatal injuries than their female counterparts (see Figure 5).

FIGURE 5: Teen Drivers in Fatal Crashes by Driver Injury Severity, 2010-2014

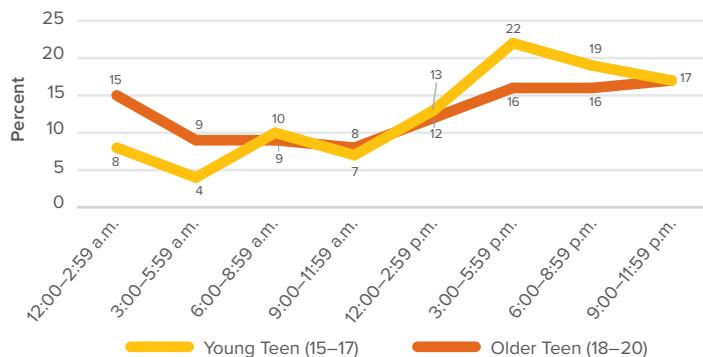


This last finding is not surprising, since male drivers of all ages are involved in more fatal crashes than females and more die on U.S. roadways as a result of collisions. For every year from 1975 to 2014, more than twice as many men died in motor vehicle crashes than women, with males accounting for 71 percent of all passenger vehicle driver deaths in 2014. Females, however, are starting to catch up, as male deaths have declined 29 percent since 1975 (IIHS, 2016b). Why? Even though men typically drive more miles than women and are more likely to engage in risky behaviors, female drivers are traveling 89 percent farther than they did four decades ago. Men, on the other hand, are going only 33 percent farther. Regardless, men are still likely to be on the road more often than women (Sivak, as cited in University of Michigan News, 2012). The GHSA analysis of teen-involved fatal crashes found that the gap between male and female drivers has remained relatively constant over the past decade, with males accounting for an average of 70 percent of the crashes and females 30 percent.

The time of day when teen-involved fatal crashes occur is also noteworthy. The 10-year data analysis found that for each time block, the trend generally follows that of teen driver involvement in fatal crashes overall, with crashes falling an average of 47.5%. The greatest decline occurred during the 12:00-3:00 a.m. time block (57%), followed by 12:00-3:00 p.m. (50%) and 3:00-6:00 a.m. and 3:00-6:00 p.m. (which both declined 49%)

This decline during the late night/early morning hours is likely due to states enacting GDL laws that include nighttime driving restrictions or strengthening an existing late night provision for young drivers. However, a closer look at the data for 2010 through 2014 found that older teen drivers – who are not impacted by GDL in all but one state (New Jersey) – were twice as likely as young teen drivers to be involved in fatal crashes during the hours between midnight and 6:00 a.m. (see Figure 6).

FIGURE 6: Teen Drivers in Fatal Crashes by Time of Day, 2010-2014



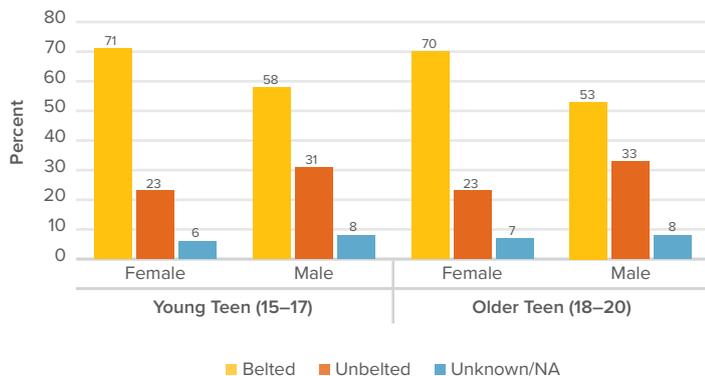
Seat Belt Use by Teen Drivers

Seat belt use in the U.S. reached 88.5% (for all ages) in 2015, continuing a slow but steady climb since 2000 (NHTSA, 2016b). States with primary seat belt laws that allow law enforcement officers to ticket a driver or passenger for not wearing a seat belt without any other traffic offense taking place (currently 35) continue to have higher use rates than states with secondary or no seat belt laws, at 91.2% versus 78.6%, respectively. At the same time, the rate of unrestrained passenger vehicle occupant fatalities (all ages) declined from 51.6% in 2000 to 40.3% in 2014 (2015 rates are not yet available) (NHTSA, 2016b).

While teens have historically had lower seat belt use rates than adults, the number of teens who rarely or never buckle up has declined 20 percent since 1991 (CDC, 2016). According to NHTSA (2016c), of the teen drivers involved in fatal crashes in 2014, 54 percent who died were restrained, which compares to 53 percent of all drivers who died. However, of the teen drivers that survived a fatal crash, 84 percent were restrained, compared to 90 percent of all surviving drivers.

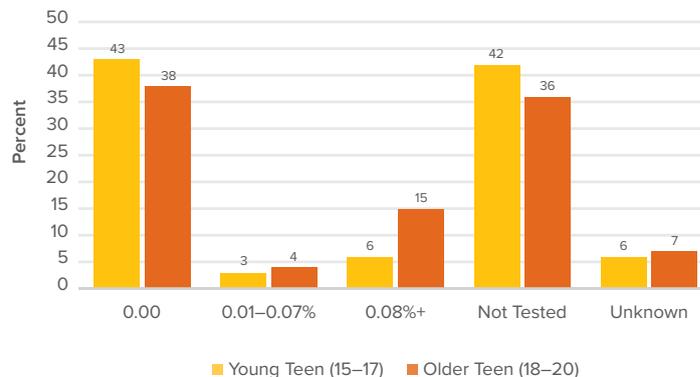
When segmenting teen drivers involved in fatal crashes by age and sex for this study, the GHSA analysis found that from 2010 to 2014, seat belt use by females in both the 15- to 17-year-old and 18- to 19-year-old age groups was 15 percent and 20 percent higher, respectively, than that of their male counterparts (see Figure 7).

FIGURE 7: Teen Drivers in Fatal Crashes by Restraint Use, 2010-2014



GHSA's analysis of FARS data for teen drivers involved in fatal crashes found that a majority were either not tested for BAC or had a BAC of 0.00%. Among teens who were tested, however, nearly 10 percent of the young teens and 20 percent of the older teens involved in fatal crashes had BAC test results of 0.01% or higher (see Figure 8).

FIGURE 8: Teen Drivers in Fatal Crashes by BAC Test Result, 2010-2014



Alcohol-Impaired Teen Drivers

All states and the District of Columbia (D.C.) have 21-year-old minimum drinking age laws, which are credited with saving 30,323 lives (all ages) since 1975. While the number of teen drivers involved in fatal crashes who had blood alcohol concentration (BAC) levels of 0.01 grams per deciliter (or 0.01%) dropped 48 percent between 2005 and 2014, the rate of teen drivers with a 0.01% BAC or higher remained the same, at 22 percent (NHTSA, 2016b).

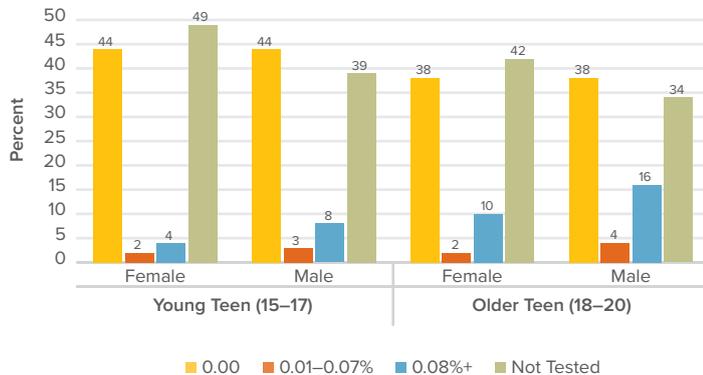
A closer look at the teen-involved fatal crash data by age for the most recent year for which complete FARS data is available (2014), indicates that 19-year-olds accounted for the greatest number of teen drivers killed and that 29 percent of those drivers had alcohol in their system at the time of the crash. As Table 1 (see next page) illustrates, alcohol involvement among teens killed in fatal teen crashes increases with age (NHTSA, 2016b).

TABLE 1: Teen Drivers Killed by Age and Percentage with BAC=0.01 or Higher, 2014

Age (Years)	Total Number of Drivers Killed	Percentage of Drivers With BAC = .01 + g/dL	Percentage of Drivers With BAC = .08 + g/dL
15	39	8%	8%
16	142	13%	8%
17	239	22%	18%
18	383	24%	19%
19	472	29%	24%
20	442	33%	28%

When the data is segmented by sex, the percentage of males in both the young and older teen driver age groups that had BAC test results of 0.08% or higher was roughly double that of their female counterparts (Figure 9).

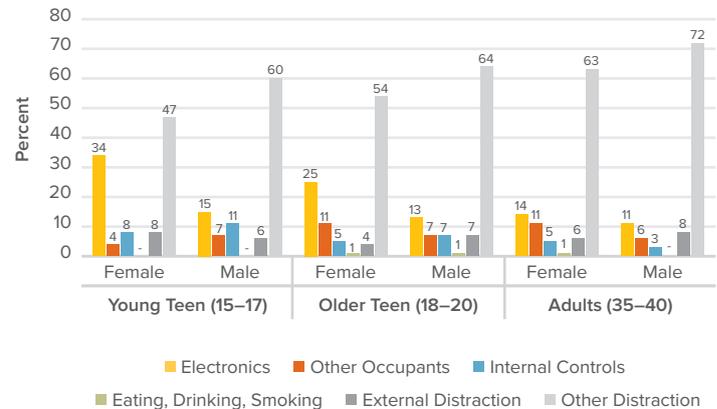
FIGURE 9: Teen Drivers in Fatal Crashes by BAC Test Result by Sex, 2010-2014



Distracted Teen Drivers

Distraction caused by cell phones, passengers and other things (e.g., inattention, mind wandering, eating/drinking) negatively impacts all drivers, but particularly teens. To ensure that the teen driver was distracted and not the non-teen driver of another vehicle involved in the fatal crash, the GHSA analysis considered only single vehicle crashes. From 2010 through 2014, nearly two-thirds of both young and older teen drivers as well as the adult comparison age group were not distracted at the time of the fatal crash. The remaining drivers – approximately 10 percent in each age group – were distracted, as shown in Figure 10.

FIGURE 10: Drivers in Single Vehicle Fatal Crashes by Distraction, 2010-2014



This is consistent with the most recent NHTSA analysis of FARS data (2014) that indicate that 10 percent of the youngest drivers (15- to 19-year-olds)² involved in fatal crashes were distracted at the time of the crash.

However, among all age groups, teens had the largest proportion of distracted drivers, followed by 20- to 29-year-olds (NHTSA, 2016d).

Figure 10 also illustrates that between half and three-quarters of distractions for each age group and sex were categorized as *Other Distractions*, which include eight distractions such as *lost in thought/day dreaming, inattention, and details unknown*. Distraction by electronics (cell phones) was two times higher for all female teen drivers than for all male teen drivers, but highest among the young female drivers when comparing them to their older teen counterparts. Meanwhile, young

and older teen female drivers, respectively, were 2.5 and two times more likely to be distracted by an electronic device than 35- to 40-year-old female drivers.

Changes in the rate of driver distraction from 2010 to 2014 were also considered in the GHSA analysis. There was no significant change for any of the distraction categories for any age group, as shown in Table 2. Distraction categories were grouped based on the common focus of teen driver education and outreach programs – electronics (cell phones), other occupants and other distractions.

TABLE 2: Distraction in Fatal Crashes by Age and Distraction Type, 2010-2014

Age Group	Crash Year	Distraction				
		Not Distracted	Electronics	Other Occupants	Other Distraction	Unknown/ Not Reported
Young Teen (15–17)	2010	66%	2%	1%	9%	22%
	2011	68%	4%	1%	5%	22%
	2012	65%	2%	1%	9%	23%
	2013	62%	2%	0%	9%	26%
	2014	60%	3%	1%	5%	31%
Older Teen (18–20)	2010	65%	2%	1%	7%	26%
	2011	68%	2%	1%	8%	21%
	2012	66%	2%	1%	7%	23%
	2013	65%	2%	1%	7%	26%
	2014	61%	2%	1%	7%	30%
Adult (35–40)	2010	68%	1%	1%	6%	25%
	2011	69%	1%	0%	6%	24%
	2012	65%	1%	1%	7%	26%
	2013	65%	1%	1%	6%	27%
	2014	65%	1%	1%	6%	27%

Safety experts believe the prevalence of crashes caused by driver distraction is both underestimated and underreported. A review by the AAA Foundation for Traffic Safety of naturalistic crash data³ captured between 2007 and 2015 for teen drivers 15 to 19 years of age found that an average of 58.5% involved a potentially distracting behavior, validating this assumption (Cher et al., 2016). The most common distractions were attending to passengers (14.6%), cell phone use (11.9%) and attending to something inside the vehicle (10.8%).

A closer look at these findings reveals that passengers were present in 34 percent of all of the crashes (84 percent of the passengers were between 16 and 19 years of age) and the teen driver was talking or interacting with these passengers in 15 percent of the crashes. In crashes involving a cell phone, the teen driver was either operating or looking at the device (9% of crashes) or talking or listening to it (3% of crashes) (Cher et al, 2016).

The AAA Foundation study also examined how teen cell phone use varied based on crash type. Twenty-eight percent of road-departure crashes involved the teen driver operating or looking at the phone and 4.4% talking or listening, while 19 percent of rear-end crashes involved the teen operating or looking at the phone and 1 percent talking or listening. The researchers also examined the change from 2008 to 2014 in the average time teens took their eyes off the road (2 seconds in 2008, versus 3.1 seconds in 2014) and the duration of the longest glance (1.5 seconds in 2008, versus 2.1 seconds in 2014) in rear-end crashes, as well as the percent of crashes where the driver had no reaction prior to the crash (13 percent in 2008, versus 25 percent in 2014) (Cher et al., 2016). The findings are troubling and merit increased focus by parents, educators and advocates.

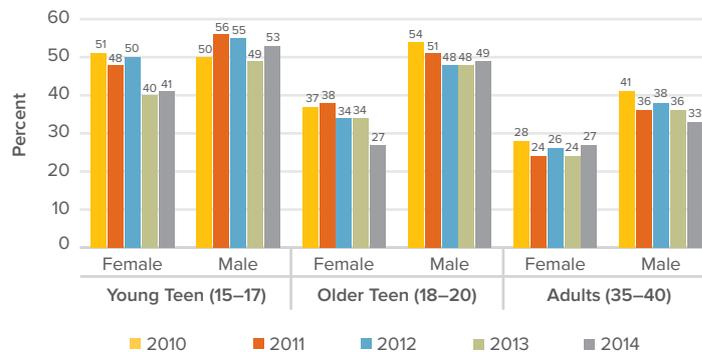
Speeding Teen Drivers

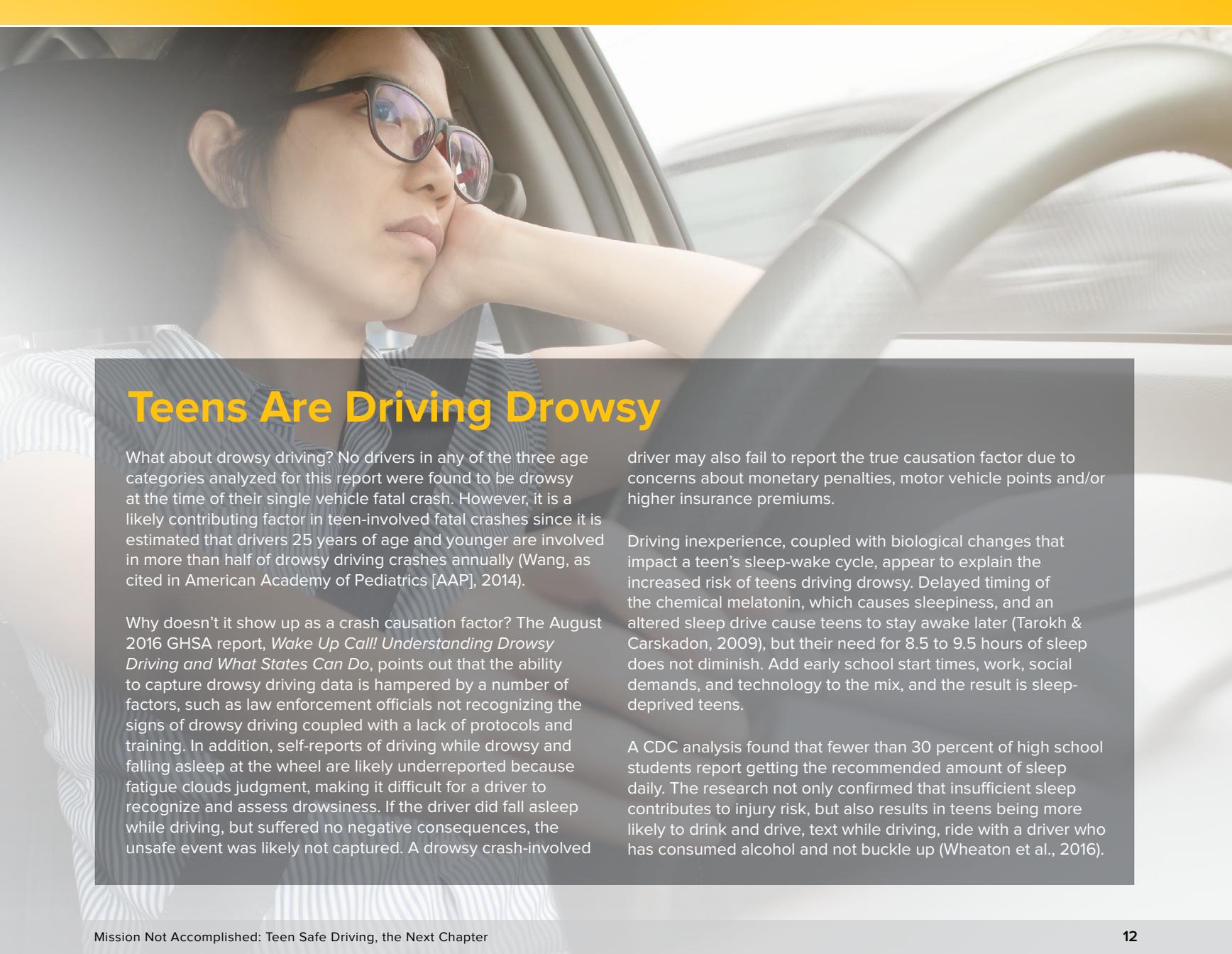
According to a 2013 GHSA report, speeding was a contributing factor in more than one-third of teen-involved fatal crashes in 2011 (Ferguson, 2013). Teens are more likely than older drivers to speed and allow shorter following distances between their vehicle and others on the road. The presence of male teen passengers also increases the likelihood of speeding (Simons-Morton et al., 2005).

To ensure that the teen driver and not the non-teen driver of another vehicle involved in the fatal crash was speeding, this latest GHSA analysis of teen driver-involved fatal crash data considered only single vehicle crashes. The analysis found that females in all age groups were less likely than males to be speeding at the time of the fatal crash.

From 2010 to 2014, speeding-related fatal crashes involving young and older female teen drivers declined 10 percent, while they increased 3 percent for young male teen drivers. A pleasant surprise is the decline in the rate of speeding among older male teen drivers (5%) and 35- to 40-year-old male drivers (8%) during this same time period (see Figure 11).

FIGURE 11: Drivers in Speeding-Related Single Vehicle Crashes, 2010-2014





Teens Are Driving Drowsy

What about drowsy driving? No drivers in any of the three age categories analyzed for this report were found to be drowsy at the time of their single vehicle fatal crash. However, it is a likely contributing factor in teen-involved fatal crashes since it is estimated that drivers 25 years of age and younger are involved in more than half of drowsy driving crashes annually (Wang, as cited in American Academy of Pediatrics [AAP], 2014).

Why doesn't it show up as a crash causation factor? The August 2016 GHSA report, *Wake Up Call! Understanding Drowsy Driving and What States Can Do*, points out that the ability to capture drowsy driving data is hampered by a number of factors, such as law enforcement officials not recognizing the signs of drowsy driving coupled with a lack of protocols and training. In addition, self-reports of driving while drowsy and falling asleep at the wheel are likely underreported because fatigue clouds judgment, making it difficult for a driver to recognize and assess drowsiness. If the driver did fall asleep while driving, but suffered no negative consequences, the unsafe event was likely not captured. A drowsy crash-involved

driver may also fail to report the true causation factor due to concerns about monetary penalties, motor vehicle points and/or higher insurance premiums.

Driving inexperience, coupled with biological changes that impact a teen's sleep-wake cycle, appear to explain the increased risk of teens driving drowsy. Delayed timing of the chemical melatonin, which causes sleepiness, and an altered sleep drive cause teens to stay awake later (Tarokh & Carskadon, 2009), but their need for 8.5 to 9.5 hours of sleep does not diminish. Add early school start times, work, social demands, and technology to the mix, and the result is sleep-deprived teens.

A CDC analysis found that fewer than 30 percent of high school students report getting the recommended amount of sleep daily. The research not only confirmed that insufficient sleep contributes to injury risk, but also results in teens being more likely to drink and drive, text while driving, ride with a driver who has consumed alcohol and not buckle up (Wheaton et al., 2016).

Addressing the Findings/ Recommendations



The GHSA analysis clearly indicates that while crashes involving 15- to 20-year-old teen drivers have declined significantly over the past decade, the gains are not as strong for 18- to 20-year-old teens. Additionally, male teens are twice as likely as female teens to be involved in fatal crashes, less likely to buckle up, and more likely to be speeding and/or impaired at the time of the crash. What can be done to address this disparity?

The following policy and programmatic recommendations are provided to guide the work of State Highway Safety Offices (SHSOs) and others involved in teen driver safety. The rationale for each is drawn from research, best practice and information provided by SHSOs and/or gathered from other sources. Before implementing any of these recommendations (or other countermeasures not addressed in this report), SHSOs should carefully analyze all available data sources (e.g., licensing, crash, violation, driver education and training) to gain a full understanding of their respective state's teen driver problem.

Expand GDL to include all teen drivers under 21 years of age.

Graduated driver licensing laws are intended to target the youngest novice drivers given their high crash risk. With the exception of New Jersey, where the provisions of its GDL law apply to all driver license applicants younger than 21 years of age,⁴ teens in nearly all other states are either exempt from and/or age out of GDL at 18 (GHSA, 2016). Why 18? For most states it is the *age of majority* – when a child ceases to be a minor and is no longer under the legal control and

responsibility of a parent or guardian. This minimum or *bright-line* standard, however, is not based on science. Drivers who begin the licensing process at age 18, 19 or 20 still have a high crash risk due to inexperience and brain development (as discussed previously in this report). Put another way, emancipation at age 18 does not necessarily equate to mental and/or physical maturity.

This is concerning since research suggests that 20 to 30 percent of teens 18 years of age or older do not yet have a driver's license (Shults et al., 2015; The Children's Hospital of Philadelphia [CHOP], 2015). While the economic downturn of the previous decade has impacted the overall rate of teen licensure, the rate has historically been consistently lower for low-income teens – 25 percent in households earning less than \$20,000 per year versus 72 percent in households with annual incomes of \$60,000 or more. When comparing minority teens to their white counterparts, 67 percent of Non-Hispanic whites are licensed by age 18 compared to 37 percent of Non-Hispanic black teens and 29 percent of Hispanic teens (Tefft et al., 2013). This means that teens who wait until age 18 or older to obtain a license are not getting the benefits of GDL.

Some argue that restrictions on novice drivers are not a benefit and actually compel teens to delay licensure. However, less than one in four teens cite GDL requirements as the reason for waiting (CHOP, 2015). Despite the recession and changes to its GDL law (a more stringent limit on passengers, an earlier nighttime driving restriction, decal requirement to aid with enforcement), teen licensure rates in New Jersey remained constant from 2006 to 2011, mirroring responses to a survey of high school students conducted 30 years ago (CHOP, 2015).

The impact of New Jersey's GDL law on older teens is significant. According to research conducted by the AAA Foundation for Traffic Safety, crash rates among teens licensed at age 18 are 33 percent lower after 12 months of driving when compared to one month of driving. Teens licensed at 17 who had been driving for a year had crash rates 25 to 36 percent lower than the initial rates for newly licensed 18-year-old drivers. And when compared to adult drivers, the crash rates for 17- and 18-year-old teen drivers fell dramatically after the state's GDL law took effect in 2001 (Tefft et al., 2014).

New Jersey is not the only state that has benefitted from expanded GDL requirements. In Maryland, researchers found that possible-injury and property damage-only crashes involving 18-year-olds fell 6.9% after the state expanded its GDL law (*Rookie Driver* program) to include all novice drivers regardless of age.⁵ In contrast, 18-year-olds in Michigan experienced a 3.6% increase in these types of crashes and there was no change for the same age group in Florida, both states with GDL laws that apply only to new drivers younger than 18. This led the researchers to conclude that in states where GDL applies only to the youngest novice drivers, crash rates for 18-year-olds may increase (Ehsani et al., 2013).

Research examining crash rates for 16-, 17- and 18-year-old novice drivers in California found that the crash rates during the months just prior to licensure were higher for 18-year-olds than for their younger counterparts. This may be the result of trying to learn to drive in a much shorter time period (Chapman et al., 2014). Under California's GDL law, a teen under 18 must hold a permit for at least six months, complete classroom and behind the wheel training, and log at least 50 hours of supervised practice driving before obtaining a provisional (intermediate) license. Once they begin that stage of GDL, teens must comply with a nighttime driving and passenger restriction for 12 months or until they turn 18. New license applicants

When compared to adult drivers, the crash rates for 17- and 18-year-old teen drivers in New Jersey fell dramatically after the state's GDL law took effect in 2001.

18 years of age or older, on the other hand, must pass a knowledge test to obtain a permit (the document is valid for 12 months), but there is no minimum holding period or driver education, training or practice requirements. Once these older teens pass a behind the wheel test, they are fully licensed.

Capitalizing on this research, California teen safe driving advocates and traffic safety officials are calling for passage of legislation that would expand the GDL to include older teen drivers. Meanwhile, a measure to establish a permit-holding period for novice older drivers – 12 months for 18- to 20-year-olds and one month for novice drivers over 21 – is also expected to be introduced in Washington State in 2017. (The state's current GDL law applies only to novice drivers under 18.) Supporters point to a 47 percent increase in the number of older teens waiting to obtain a license, coupled with a significantly slower decline in the rate of fatal crashes for this age group when compared to 16- and 17-year-olds, as justification for the change (Bush, 2016; Washington Department of Transportation [WDOT], 2013).

Will these bills gain traction? While GDL fatigue is a common problem in many state legislatures, there is support among both teens and parents for extending the age requirements for licensure. For example, more than two-thirds of New Jersey 17-, 18- and 19-year-olds approve of their state's GDL age requirements (Williams & McCartt, 2014). As for U.S. teens, more than half (58%) said 17 or older is the appropriate minimum age for obtaining an intermediate (restricted) license under a GDL system. When it came to full, unrestricted licensure, 87 percent selected at least age 17, with 61 percent of those teens saying 18 or older (Tefft, et al., 2013). Meanwhile, more than half of parents nationwide, said that the minimum full licensing age should be 17 or older (Williams et al., 2011).

The U.S. is not the only country to have multi-stage licensing programs that apply to all novice drivers. New Zealand adopted the first all-novice driver GDL system more than three decades ago and has demonstrated both its success in reducing crashes and achieving public acceptance (Begg & Stevenson as cited in Williams et al., 2010). Closer to home, Canada introduced an all-novice driver GDL law similar to that in the U.S. in 1994 that is in effect in every province and territory today.

A Personal GDL Plan for Older Novice Drivers

It is estimated that one in three teens are not licensed at age 18 due predominantly to economic and/or motivational reasons (CHOP, 2016). Teens who decide to wait to get their driver's license until they turn 18 or older can still reap the benefits of graduated driver licensing by creating a [Personal GDL Plan](#), suggest researchers at The Children's Hospital of Philadelphia. Citing the continued high risk for novice drivers regardless of age, older teens can take ownership of the learning-to-drive process and reduce their crash risk by doing the following:

- Prepare as if they are getting a learner's permit by reading up on their state's motor vehicle laws and the stages of GDL.
- Obtain behind the wheel training from a professional through a state-approved driving school.
- Designate an experienced licensed adult driver to supervise their early driving until both the teen and the supervising driver feel comfortable. CHOP's [TeenDrivingPlan](#), which includes [practice](#) and [goal](#) guides, and a [logging and rating tool](#), can be downloaded at no cost.
- Gradually transition from supervised driving to independent driving under less risky situations to driving in high risk conditions. Continue to enlist an experienced adult to ride along as a passenger to provide guidance in complex driving situations.

Require all novice drivers to complete driver education and training.

The results of a more than three decade-old study that examined the effectiveness of driver education and training in DeKalb County, Georgia, resulted in many states cutting funding and/or eliminating programs for novice driver education and training. Currently, fewer than half (23) require the completion of driver education by all drivers under 18 years of age, while an additional six states require teens under 18 to complete a pre-licensing course or drug and alcohol awareness program (Thomas, Blomberg & Fisher, 2012).

Recent research, however, suggests driver education and training is, in fact, a sound investment and one that states should consider for all novice teen drivers at a minimum. For example, Oregon teens who completed a Department of Transportation-approved driver education course were found to have fewer crashes, convictions and suspensions compared to their peers who do not opt for training (Raymond et al., 2007). A study of Nebraska teens that completed driver education revealed similar findings that included not only lower crash and violation rates as compared to their peers who did not complete formal training, but also reductions in convictions involving alcohol during the first two years of licensure (Shell et al., 2015).

An Oregon SHSO official indicated that the state is now engaged in the second year of studying the impact of driver education on teens who did and did not complete training as they enter their third, fourth and fifth year of licensure. “These findings [which are not yet available] will be instructive to other states that are wrestling with the value of driver education,” he pointed out.

Michigan is also undertaking research to determine the impact of driver education, which is required under the state’s GDL program. In 2015, the Department of State (DOS) identified drivers between 16 and 25 years of age who did and did not complete GDL/driver education going back to 2003. This information, along with crash records from 2011 to 2014, is being uploaded into a newly built database that will enable DOS to conduct segmented queries for the two groups (Governors Traffic Safety Advisory Commission [GTSAC], 2016). The findings should prove helpful to those working to advance the objective in the *Michigan Drivers Age 24 and Younger Action Plan*, which calls for developing new or enhancing current educational programs to reach drivers 18 and older.

Meanwhile, in Washington State, a work group tasked with studying driver education has recommended that older teens 18 to 20 years of age be required to complete driver education and training. Currently, only teens under 18 years of age are required to complete a 30 and 6 driver education and training program (30 hours in the classroom and 6 hours behind the wheel) as a pre-requisite for obtaining an intermediate driver’s license (IDL). While the task force report cautions that “driver education on its own is not likely to reduce crashes,” it points out the positive impact the IDL program as a whole is having on reducing teen crashes, down 22 percent for 16-year-olds and 6 percent for 17-year-olds (Washington State Legislature [WSL], 2014, 2014).

Recognizing that mandatory driver education for older teens may be met with resistance, the Washington Department of Licensing (WDOL) recently rolled out an expanded knowledge test that includes 40 questions, rather than 25, and more complex scenarios. According to the WDOL, “passing this test will require thorough study of the new driver guide and solid knowledge of how to be safe on the road” (Washington Department of Licensing, 2016a). The driver education curriculum, guide and test have also added more emphasis and information on the risks associated with marijuana and distraction.

One state that has embraced novice driver education and training for all is Maryland. Under its *Rookie Driver* (GDL) program, all new drivers, regardless of age, must complete a three-stage licensing process that includes 30 hours of in-class and six hours of behind-the-wheel instruction. Novice drivers younger than 25 must hold a learner's permit for nine months and log 60 hours of practice driving (10 at night), while those 25 or older must hold a learner's permit for at least 45 days and log 14 hours of practice driving (three at night). The provisional phase lasts 18 months and novice drivers under 18 are required to comply with the nighttime driving, passenger, seat belt, and hand-held/hands-free device requirements. During both the permit and provisional phase, the rookie driver must remain conviction- or violation-free. Failure to do so restarts the 18-month provisional phase and requires attendance at a driver improvement program for the first conviction, license suspension and additional training for second and third offenses, and license revocation for the fourth offense (Maryland Motor Vehicle Administration, 2016).



When asked about the financial hardship mandatory driver education may pose for new applicants, Maryland licensing officials pointed out that “the competitive nature of the business” drives the cost. “Due to demand, there are driving schools serving virtually every neighborhood in the state. The prices they charge are influenced not only by the cost of the services they provide, but also what the market will bear. [The state] does not regulate or attempt to influence pricing, but all licensed driving schools are required to provide assistance to persons claiming financial hardship.”

Recognizing that cost may stymie the effort to mandate driver education in Washington State, there is discussion of establishing a low-income subsidy program. Oregon, which has a constitutionally dedicated funding source for driver education, has a subsidy program that was expanded in 2013, resulting in an increase in the number of teens enrolling in driver education.

Actively promote the benefits of older teen drivers completing a defensive driving and/or behind the wheel program.

Most insurance companies provide a discount to teen drivers under 21 years of age who complete an approved driver education and training program. Some carriers also offer an insurance premium discount to adult and mature drivers who complete a defensive driving course. (The extent of the discount varies by company and/or state.) In states where novice drivers are not required to complete driver education as a pre-requisite for licensure, a defensive driving program can help fill that void. However, enticing teens, particularly older teens, to enroll in a program could prove challenging.

Since insurance rates for drivers under 25 years of age are substantially higher than for more experienced drivers, appealing to teens' and parents' pocketbooks by extolling the monetary benefits of completing a defensive driving program (e.g., lower insurance rates, forgiveness of motor vehicle penalty points) may be a motivator. Finding the sweet spot is key. Other ideas for bolstering attendance include:

- Allowing completion of a defensive driving program in lieu of license suspension and/or fines and penalties.
- Requiring licensed high school students who want to drive to school and park on campus to attend a program before receiving a permit/sticker.
- Requiring college/university commuter or resident students who want to park their vehicles on campus to attend a program before receiving a permit/sticker. (This could be done in conjunction with new student orientation.)
- Applying the program hours to high school or college community service hour requirements.
- Awarding college credit for course completion.
- Mandating completion of a driving program as a condition of employment for teens who drive an employer-owned vehicle or his/her personal vehicle for business.

One of the most widely delivered classroom teen defensive driving programs is [Alive at 25](#). Developed and administered by the National Safety Council (NSC), the interactive, four-hour course teaches young drivers there are consequences for their driving actions and provides tools to help them make positive change and choices. It was built based on Choice Theory, which addresses four fundamental psychological needs – belonging, power, freedom, and fun. A certified instructor facilitates the program using media, group discussion, role-playing and workbook exercises (available in

English and Spanish) to appeal to all learning styles and emotional intelligence levels (National Safety Council [NSC], 2014).

An estimated 1.2 million teens and young adults have completed the *Alive at 25* program since 1995. The average participant age is 19. Available in 42 states, providers include police agencies, the courts, school districts, colleges, driving schools, hospitals, municipalities, state/federal agencies, bar associations, trauma centers and the U.S. military. The latter integrated *Alive at 25* into its driver safety training program after estimating that more military members died in motor vehicle crashes on U.S. highways than in combat (NSC, 2014).

The Kentucky State Police (KSP) began offering *Alive at 25* in 2004 to address the high death toll among 16- to 19-year-old teen drivers in that state. Since then, fatalities involving this age group have decreased 60 percent. While this decline cannot be directly attributed to *Alive at 25*, a KSP official pointed out that counties where it is not taught “have experienced the most teen driver deaths” (Hunsaker, 2015). The North Dakota Department of Transportation partnered with NSC to conduct a comprehensive review of fatal crashes involving students who completed *Alive at 25* since 2008. While the fatal and injury crash rates for all age groups and categories in the state increased – in some cases more than 100 percent – the rates for *Alive at 25* participants were 34 percent below the national average for fatal crash involvement (NSC, 2014).

In addition to *Alive at 25*, NSC also offers the Defensive Driving Course (DDC) *Attitudinal Dynamics of Driving* (ADD), a cognitive behavior program designed for habitual offenders or more serious offenses. (The course is also based on Choice Theory and is the platform upon which *Alive at 25* was built.) In Massachusetts, drivers subject to license suspension or revocation as a result of accumulating three surchargeable violations within the past two years must complete the approved DDC-ADD course in lieu of

suspension or as a condition of license reinstatement. An analysis of the driver license records of the nearly 50,000 participants who took NSC's DDC-ADD course in 2012 found that all had significantly fewer violations in the 12 months after completing it than in the 12 months before regardless of age group or sex. For the 5,299 participants under 21 years of age, recidivism rates fell 78 percent for minor traffic violations (80 percent for females, 77 percent for males), 77 percent for major traffic violations (81.1% for females, 76.6% for males) and 80 percent for surchargeable violations (82 percent for females, 79 percent for males) (NSC, 2015).

Driver improvement programs also include behind the wheel offerings. These ride and drive activities, which include the GHSA and [Ford Driving Skills for Life \(DSFL\)](#) program, the Tire Rack [Street Survival](#) school, North Carolina-based [StreetSafe](#), Kia's [B.R.A.K.E.S.](#) (Be Responsible And Keep Everyone Safe) program and others, typically pair one or two teens with an adult professional who guides the novice driver through a series of driving maneuvers on a closed course. Driving their own or a provider-supplied vehicle, teens receive instruction that is designed to help build skills, such as hazard recognition, vehicle handling, and speed and space management.

While teens in the permit or intermediate license stage of GDL are the primary audience of and participants in these programs, the skills taught and information imparted is beneficial to older teens who are either just beginning licensure or continuing to build their driving skills. Ride and drive providers are encouraged to work with colleges and universities to bring these events to older teens. Greek and other student-run organizations are natural potential teen driver safety partners, as are student activity, health and wellness, and/or public safety departments.

Provide relatable and relevant impaired driving information to older teens during license transactions.

Every state issues driver's licenses to minors – those under 18 and 21 – that are distinctly different from those issued to drivers 21 years of age and older. The majority use a vertical format, while many states indicate the holder is *Under* or *Not 21 or 18 Until*, in addition to the holder's actual birth date. When a teen must visit an agency to obtain a new license after completing the intermediate licensing phase of GDL and/or upon turning 21, states are presented with an opportunity to educate this high-risk age group about the impacts of impaired driving.

In Washington State, where an 18-year-old is issued a vertical driver's license that is valid for six years, each year an estimated 75,000 young adults visit the Department of Licensing (WDOL) within three months of their 21st birthday. They are under the impression, explained a Washington Traffic Safety Commission (WTSC) official, that drinking establishments will require them to show a horizontal license if they want to be served alcohol. WTSC awarded a \$35,000 grant to the WDOL to pilot an agency outreach program. The grant will be used to develop collateral material, such as a birthday card that includes a taxi voucher, which can help spark a conversation during the licensing transaction.

The key is to ensure that what is presented to teens is relatable and relevant, pointed out a group of college students interviewed for this report. A free ride may grab teens' attention along with short and succinct information that points out not only the danger of driving impaired, but also the legal, financial and societal impacts of their actions. Real stories of local teens who were killed and/

or injured or responsible for injuring or killing others as a result of driving impaired, added the college students, will resonate with novice drivers.

Send an early warning letter when an older teen receives his/her first moving violation.

Some states such as Illinois, Michigan and New York notify parents when there is an action on their young teens' driving record (e.g., moving violation conviction, crash, suspension or revocation). Another tactic is to send an Early Warning Letter (EWL) to a teen upon receipt of his/her first moving violation. Endorsed by the American Association of Motor Vehicle Administrators (AAMVA), an EWL is an effective tool that is inexpensive to initiate and maintain and does not require a statutory or regulatory change.

In March 2011, the Washington Department of Licensing (WDOL) expanded its EWL program to include not only 16- and 17-year-olds (who are operating under the state's Intermediate Driver License or IDL program), but also all 18- to 21-year-old drivers. The decision to include older novice drivers was prompted by research that indicated a driver's chances of being involved in a crash doubled after receiving a first violation. Even more compelling were the findings of an analysis of the violation rates of newly licensed 16- to 25-year-old Washington drivers during their first four years of licensure. Forty percent of newly licensed 18- and 19-year-olds received a violation in their first two years of driving, compared to 34.4% for 20- and 21-year-olds and 29.7% for 16- and 17-year-olds. While the 18- and 19-year-old violation rate dropped to 34 percent in the second year of licensure, it was still highest among all age groups (Washington Department of Transportation [WDOT], 2013).

Washington's EWL does not impose sanctions or include a harsh verbal warning. Instead, it takes a caring tone pointing out the risks to the teen violator, and others on the road, if he or she continues to engage in unsafe driving behaviors. The letter also includes a postscript calling attention to Washington's cell phone law and a 19-year-old who lost her life in a distracted driving crash.

Is the EWL program reducing recidivism among first-time older teen violators? A 22-month analysis of the driving records of 18- to 21-year-olds who did and did not receive an EWL after their first violation, showed a 13 percent reduction in second violations among the EWL recipients. That equates to 15,126 fewer infractions for these teen drivers (WDOL, 2016b).

The research also segmented teens by age and sex in both the EWL and non-EWL comparison groups. Not surprisingly, males accounted for roughly 60 percent of violations in all age groups. However, the recidivism rate for males in the EWL group (all ages) was lower than that of the comparison group's females. While the overall and injury collision rates showed no notable difference between the EWL and comparison groups, the fatal crash involvement for EWL recipients was half that of those in the comparison group (WA DOL, 2016).

In 2016, officials at the Pennsylvania Department of Transportation (PennDOT) began sending an EWL to 16- to 20-year-old drivers who are cited for a driving infraction. This builds on the state's program in which 16- and 17-year-old drivers and their parents are notified by letter when a teen is guilty of a motor vehicle violation that results in penalty points or a license suspension. Signed by PennDOT Secretary Leslie Richards (the mother of three children), the personal letter reminds teens of the importance of obeying the law, the consequences of engaging in unsafe habits early in their driving careers, and that they are responsible for their personal safety and that of others on the road.

STOPPED Program Keeps Older Teens' Parents Informed

STOPPED – Sheriffs Telling Our Parents & Promoting Educated Drivers – is a parental notification system that involves affixing a small decal to the upper left side of the windshield of each registered vehicle operated by a driver under 21 years of age. While the program got its start in upstate New York, it is most active in Michigan (76 counties), where it is administered by the state Sheriffs' Association. If a teen is stopped by law enforcement, the Sheriffs' Association is notified and an email or letter is sent to his or her parents detailing why, when and where the stop occurred, if a citation was issued, and who was in the vehicle.

The program's aim is to get teens to stop and think and to help parents enforce their rules of the road. While STOPPED is voluntary, some high schools are requiring students who want to park on campus to enroll in the program. Since the STOPPED decals are provided free of charge, this eliminates the expense of schools having to produce and distribute parking permits or stickers. It seems expansion of the program to college campuses – especially those with a large population of commuter students – is a logical next step.

Enact a primary seat belt law that covers all motor vehicle occupants in all seating positions.

While seat belts do not prevent crashes, they reduce the risk of fatal injury to front seat car occupants by 45 percent and up to 65 percent for front seat occupants in SUVs, vans and pick-ups (NHTSA, 2011). Ensuring that teens buckle up every trip is essential. Currently, 34 states and D.C. have a primary seat belt law for front seat occupants.

In the 15 states where the law is secondary (a law enforcement officer may issue a ticket for not wearing a seat belt only when there is another citable traffic infraction), seat belt use by teen drivers and/or their passengers is a primary provision under graduated driver licensing. New Hampshire is the only state that has not enacted a primary or secondary seat belt law for adults, but it does have a primary law covering all drivers and passengers under 18 years of age. Meanwhile, seat belt use in the back seat is primary in 17 of the 28 states with a rear seat belt law (GHSA, 2016b).

Recognizing the lifesaving value of seat belts, it is essential to ensure that all teens buckle up every trip. Research confirms that teens who live in states with primary enforcement seat belt laws are 12 percent more likely to buckle up as drivers and 15 percent more likely to buckle up as passengers compared to teens who reside in states with weaker secondary enforcement laws. As teens move through the stages of GDL, those who live in primary enforcement states are more likely to keep buckling up as compared to their secondary state counterparts (Garcia-Espana, 2012).

Changing seat belt laws from secondary to primary enforcement is the most effective way to increase seat belt use, prompting gains between 10 and 12 percent (IIHS, 2011). The change from secondary to primary enforcement also positively impacts nighttime seat belt use and, in some states, it has increased belt use more among low belt-use groups (both demographically and behaviorally) than for all vehicle occupants (Shults et al. and UNC Highway Safety Research Center, as cited in CDC, 2015a).

Educate parents about the importance of continuing to coach and monitor their older teen drivers.

Once a teen is licensed, he or she is not risk-free, as evidenced by the crash data discussed in this report. While crash risk begins to decrease as teens log more miles, it can take three to five years for novice drivers to be exposed to the myriad of driving situations they will encounter on the road. Building the muscle memory needed to help a driver react quickly and appropriately in a variety of situations takes time.

Driving, however, is not just about being able to competently and tactically operate a vehicle. It also requires strategic skill, the third and final level of the driving hierarchy (Barkley, as cited in Huang, 2013). In other words, is a teen able to think critically when it comes making decisions such as: *Is this the best time of day to take a trip? Is it okay to drive now that it's snowing? Am I too tired to drive?* As discussed previously in this report, the human brain does not fully develop until the early to mid-20s, which means that while a teen may appear physically ready to drive, that does not mean he or she is emotionally prepared for the task.

Parents need to understand this and be encouraged to seek out opportunities to continue to drive with their teens throughout the intermediate stage of licensure and beyond. This continued coaching is particularly important for teens who go off to college and do not have access to a car. Tossing the keys to a teen who has not driven in several months could be a recipe for disaster, particularly if he or she is running out the door to meet up with friends. According to a fatal accident reconstructionist who has responded to scores of crashes, Thanksgiving is one of the “deadliest times on the road for older teen drivers. Many are driving for the first time since leaving home in August.”

Teens welcome parental input and say their parents are their number one influencer when it comes to driving (The Allstate Foundation, 2015). The latest research from Safe Kids Worldwide confirms that parents who demonstrate good behavior (e.g., do not drink and drive, buckle up every trip) positively impact their teens’ driving habits (McKay et al., 2016). But what about older teens? Contrary to what some parents may think, they still wield influence over their 18-, 19- or 20-year-old. Reminding parents of that fact and giving them the tools to help them use it can pay dividends.

For example, parents who were educated about the dangers of binge drinking and how to talk to their college-bound teens had teens that consumed less alcohol and experienced fewer negative alcohol-related consequences once on campus (Turrisi et al., as cited in Abar et al., 2008). Additionally, positive parent modeling and monitoring were linked to lower alcohol use, problems and peer influence (Wood et al. as cited in Abar et al., 2000). These findings suggest that parents continue to directly influence their teens’ decision-making about alcohol use and alcohol-related behaviors as they enter college “through communication of expectations, limit setting, transmission of values, and the examples [they] set regarding alcohol use” (Abar et al., 2008).

What can parents do and say to help their older teen drivers? Being a positive role model is critical since teens continue to observe and mimic parental behaviors. Parents should also discuss and regularly reinforce the following proven safety practices with their older teens:

- always buckle up regardless of seating position;
- never exceed a vehicle's passenger limit (one passenger per seat belt);
- never drive after consuming any amount of drugs or alcohol or ride with a driver who has done so (the legal drinking age is 21 in every state);
- stow all cell phones to limit driver distraction;
- get plenty of sleep, never take the wheel when tired or ride with a drowsy driver, and avoid late night driving;
- observe the posted speed limit; and
- speak up if the driver or passenger is doing something unsafe.

It is especially important that parents know that failure to get adequate sleep and alcohol consumption can be particularly problematic for teens heading off to college for the first time. Sleep will help teens perform better in the classroom, on the field and behind the wheel. But a study of college freshmen found that they go to sleep approximately 75 minutes later than they did as high school seniors and pull all-nighters at least once a week. The researchers noted that "students experienced a social jet lag – the difference between week and weekend sleep schedules – equivalent to flying from New York to Denver and back every weekend" (Hartmann & Prichard, 2014). The problem is acute on college campuses nationwide. More than two-thirds of students report experiencing excessive drowsiness, more than a third fall asleep in class at least once a week and more than half (56.8%) get enough sleep to feel rested at most only three nights a week (Center for College Sleep/ University of St. Thomas [CCS], 2014).

As for alcohol, anecdotal evidence suggests that the first six weeks of a teen's freshman year are vital for academic success. It is also the time when many students engage in binge drinking (defined as consuming five or more drinks on an occasion) or heavy drinking (defined as binge drinking on five or more occasions per month), which can negatively impact how they adapt to campus life. A survey of full-time college students ages 18 to 22 found that nearly 60 percent drank in the past month, more than a third (37.9%) engaged in binge drinking and 12.2% admitted to heavy drinking. These rates are higher than for their peers not attending college, and the consequences can be devastating. Alcohol consumption by college students 18 to 24 years of age contributes to an estimated 1,825 deaths (including those caused by motor vehicle crashes), 696,000 assaults and 97,000 cases of sexual assault or date rape annually (National Institute on Alcohol Abuse and Alcoholism, 2015).

It is important to point out that this generation of teens is less likely than their parents to drink and then get behind the wheel, opting instead to designate a driver, use mass transit or a ride sharing service, or spend the night. Even so, roughly 2.7 million college students drive drunk annually, and 8.5% of students are arrested or had an encounter with law enforcement due to drinking (Hingston et al., 2009; Presely & Pimentel, 2006).

A photograph of a young man with dark, curly hair looking slightly to the right, and an older man with a shaved head looking towards him. They appear to be in an outdoor setting with trees in the background. The image is partially obscured by a dark grey text box at the bottom.

College Drinking 101: Resources for Parents

Parents seeking help discussing the consequences of drinking with their college-bound teens can find resources at [CollegeDrinkingPrevention](#). The parents' guide features evidence-based information, advice on choosing the right college, tips for staying involved with teens during their freshman year, and how to get assistance in the event of an alcohol-related crisis. The website also provides links to college alcohol policies, an interactive diagram of how alcohol affects the body, and alcohol cost and calorie consumption calculators.

The website [College Parents Matter](#) is another source for tools and scripts to help parents improve communication with their college-age children. Developed by the Maryland Collaborative to Reduce College Drinking and Related Problems, the website was built by scientists who “believe that scientific evidence

rather than anecdote or opinion should guide decision-making,” (The Maryland Collaborative, 2016). They are also parents who recognize how hard it can be to talk to teens about common situations that increase the chances of high-risk driving, such as a 21st birthday, spring break, and roommates who may exert peer pressure and/or encourage unsafe behaviors. Do’s and don’ts for these and more are discussed to help parents help their teens make smart decisions.

At the Washington State Healthy Youth Coalition’s [StartTalkingNow](#) website, parents can get help jump starting and maintaining a dialogue about alcohol and other drugs, including marijuana, with their middle school, high school or college-bound teens. The website features tip sheets and videos along with links to other resources.

Partner With Colleges to Promote Safe Driving

Approximately 20.2 million students are enrolled in two- and four-year colleges and universities in the U.S. (Institute for Education Services, 2016), making institutions of higher learning an ideal place to reach older teen drivers about safe driving. While it is unknown how many schools address safe driving, alcohol and drug use are typically covered as part of new student orientation and through campus-related initiatives.

SHSO officials and others working in teen safe driving are encouraged to meet with local college and university officials to educate them about the risks for students and identify ways to partner. The logical way to get in the door is to reach out to the campus public safety or police department, health/wellness center, or student activity or resident life coordinator. Suggesting they include safe driving tips in new student orientation materials and/or presentations is an easy ask – particularly if those tips are provided as an infographic or in an easy-to-reproduce format. Another idea is to require students who bring vehicles on campus to complete a defensive driving workshop before receiving a parking sticker/permit. Taking it a step further, working with the school to develop and deliver a *Driving 101* course that explores why young adult drivers are crashing and what they can do to protect themselves may entice students to get educated, particularly if they earn college credits for the course.

Community colleges are a natural place not only to test out these ideas, but also to reach older teens who are commuting to and from campus daily – many in their personal vehicles. When queried about reaching teens with safe driving information, one community college official admitted, “we require employees who drive school-owned vehicles to take a defensive driving course and offer it to the community through our continuing education program, but we

don’t address this with our own students, who drive to get here. That seems like something we should be doing.”

Working with Greek life and other student-run organizations is another way to engage teens on college and university campuses. These groups are often seeking dynamic speakers, interactive activities (e.g., distraction obstacle course, Fatal Vision® goggles) or educational materials they can share with their peers. The *Huffington Post*, for example, conducted sleep fairs on 16 college campuses and helped 35 other institutions organize sleep-related events that were led by student groups and staff through its *Sleep Revolution College Tour* in the spring of 2016. Tools were provided to help students educate their peers about the importance of sleep and how to get it, and the danger of getting behind the wheel when their mental faculties are impacted by lack of sleep or any other impairment. The goal is to expand the program to other campuses through dissemination of a *Sleep Revolution* party-in-a-box that includes a discussion guide, sample giveaways, activity idea starters, a list of potential partners, and more.

At Bowling Green State University, the Greek organizations regularly reach out to the [Safe Communities of Wood County \(SCWC\)](#) Coordinator, whose office is located in the Student Recreation and Wellness Center. Funded through a grant from the Ohio Highway Safety Office, SCWC partners with sororities and fraternities to help them address impaired driving. Students man the phones during *Swallow Your Pride*, *Call for a Ride* events, which provide free rides back to campus for those who have been drinking (vans are driven by SCWC volunteers). SCWC also shines the spotlight on impaired and distracted driving and the importance of sleep at quarterly late night events designed to give students an alternative to drinking. The first is held in conjunction with freshman move-in and attendance is mandatory.

■ Maryland

The Substance Abuse Education Office and peer educators at Anne Arundel Community College sponsor *Safe Break* events in support of the *Buzzed Driving is Drunk Driving* campaign to educate students about how to safely navigate the social opportunities they are likely to encounter when on holiday/school break. Interactive activities such as the Smash Match Impairment Challenge (students place traffic safety shapes on a mat while wearing Fatal Vision® goggles) and Intoxilock (touch-screen application into which students input alcohol use information and receive feedback on the impact based on their gender and weight) are designed to not only increase student awareness of the social, health and legal consequences of drinking and driving, but also lead to the adoption of self-protective behaviors.

■ Iowa

In Iowa, the [Governor's Traffic Safety Bureau's](#) (GTSB) Impaired Driving Coordinator has been partnering with junior colleges and universities to reach 18- to 22-year-olds with safe driving and traffic safety information for the past five years. Using a simulator equipped with a steering wheel, pedals and three monitors, the Impaired Driving Coordinator invites students to try driving distracted or impaired. To ensure no one is standing idly by, another GTSB staff member administers and explains the Standard Field Sobriety Test to waiting student drivers (approximately 85 to 100 are engaged per visit). GTSB credits the success of the program to its network of college contacts, which include not only campus law enforcement, but also admission counselors, professors, student organizations, and administrators.

■ New York

At the State University of New York Oswego, the campus [police department](#) has worked with the Governor's Traffic Safety Committee for the past three years to host an annual traffic safety event. The program features a victim advocate whose story relates directly to older teens, as well as a safety fair during which students participate in hands-on activities and demonstrations, and interact with safety professionals. Student interns are tapped to come up with new ideas for engaging their peers and bolstering attendance (the event averages 250), while Greek organizations also lend a hand. The event is promoted through social media, the campus newspaper, faculty (attendance at the event is assigned or a chance to earn extra credit), and student groups. In addition to the traffic safety event, a member of the campus police department also staffs a table in the student center once a week or biweekly to share safety information. The 21-member police department, which has been recognized in the International Association of Chiefs of Police Chiefs Challenge, also sponsors a safety belt awareness program before the end of the spring semester and participates in new student orientation.

Tapping Into Higher Education Consortiums to Address Drugged Driving

Many states have higher education consortiums or collectives designed to foster collaboration, information and best practice sharing, and/or the development and implementation of cost saving and quality improvement ideas. The 53-institution Ohio College Initiative (OCI), for example, was established in 1996 to reduce high-risk drinking and increase students' wellness through campus and community collaborations and the implementation of strategies to promote healthy campus environments. That scope has been expanded to include not only high-risk alcohol use, but also other substance misuse, as well as mental health issues.

To call attention to the dangers of drugged driving, RADD, the Higher Education Center for Alcohol and Drug Misuse Prevention and Recovery and OCI developed a college intervention that uses the tagline *Drugged Driving = DONE Driving (DD=DD)*. Activated in September on OCI college campuses, including The Ohio State University, college wellness centers and health education departments are working with the campus pharmacy or partnering with nearby drug stores to prompt students to discuss the effect of their medications on driving. Small, colorful *Ask Your Pharmacist* stickers, buttons and posters were created to call attention to the program through in-store promotion and social media. Campus partners are encouraged to download the material for distribution at safety fairs, dorm move-ins, athletic/Greek orientation meetings and other events. Beginning in 2017, RADD will begin expanding DD=DD outreach to colleges nationwide.



Partner with graduating high school peer leaders to help them continue their traffic safety outreach in college.

While adults may think they are the best teachers and role models when it comes to safe driving, research confirms that giving teens some of the responsibility for developing and delivering the message is essential for sparking greater interest, understanding and acceptance among this age group. SHSOs recognize the power of peer-to-peer programs and many provide grants to fund high school and community-based programs. But each year thousands of teens who lead these school and community-based interventions graduate and head off to college. Which begs the question: are SHSOs tapping into these energetic, enthusiastic and passionate advocates to help reach older teen drivers?

In Texas, home of the junior high and high school versions of the evidence-based [Teens in the Driver Seat](#) (TDS) program, teens led the effort to expand the program to colleges and universities. “We had high school students that participated in TDS move on to pursue their college education and then reach out to let us know they enjoyed being involved. They felt it made a difference in their schools and communities, and that there is a real need for something similar at the college level,” said the TDS Director, who is an engineer at Texas A&M Transportation Institute. Today, [U in the Driver Seat](#) (UDS) is operating at 20 college/university campuses across Texas and reaching approximately 267,000 students.

While UDS is heavily focused on preventing alcohol- and drug-impaired driving, work is underway to expand the scope to include other risk factors for this age group, including distraction and drowsy driving. Like the high school version, UDS provides teen leaders (typically peer health educators and/or students pursuing health and wellness degrees) a base set of education-outreach resources designed to help facilitate



student-led activities on their campus. They can also borrow pedal cars, Fatal Vision® goggles, banner stands, and other items at no cost from regional TDS staff.

Adult advisors (most are affiliated with the Student Health & Wellness Department) offer guidance to student outreach teams, which have had success attracting student athletes and members of the Greek community. This, pointed out the TDS Director, is by design since they are particularly high-risk members of this age group. UDS has also synced well with student-based organizations that already exist within the college framework and culture, and are inclined – and often required – to conduct community service activities.

Many UDS partner campuses conduct outreach during freshman orientation, hold safety fairs throughout the year (often during the week leading up to spring break) and host information tables in high-traffic areas on campus and/or during large sporting events. To encourage on-campus activities, there is an annual UDS competition where teams earn points for their outreach efforts, along with a social media contest. A student-led College Advisory Board is tapped to provide guidance, and there is a two-day UDS symposium featuring guest speakers and workshops addressing traffic safety, as well as healthy and successful lifestyle issues for college students.

According to the TDS Director, *U in the Driver Seat* is filling a void. “The federal funding that colleges and universities have historically used to fund these types of activities experienced significant budget cuts in recent years, so without UDS it is likely that traffic safety would be getting much less attention, if any, at our partner campuses.” Funding for UDS is provided through the Texas Department of Transportation (TxDOT) Safety Program and State Farm®.

Partner with law enforcement to conduct high visibility enforcement coupled with school-based education and earned/paid media.

High visibility enforcement (HVE) coupled with public outreach/education is a proven countermeasure for deterring unlawful motorist behaviors. Recognizing that October is the deadliest month for Mississippi teen drivers, the Office of Highway Safety (MOHS) partnered with the Public Affairs Division of the Mississippi Highway Patrol (MHP) to pilot an HVE/public outreach campaign in October 2015 and late spring/early summer of 2016 that addressed impaired and distracted driving, occupant protection and speeding with a focus on drivers 16 to 20 years of age.



Dubbed *Pay Attention, Pay a Fine...Stop the Knock* (the latter refers to a police officer delivering the news of a fatal car crash to a teen's family members), the campaign was segmented into four phases: pre-survey, education/public information, enhanced enforcement and paid media, and post-survey. Observational surveys were conducted in the pre-survey phase to establish a baseline for seat belt use, distracted driving behaviors (e.g., cell phone in hand, eating/drinking, grooming) and speeding among teens at high schools and colleges in four counties with the highest teen fatality rates. The same observational survey was conducted at the end of the pilot to gauge impact.

In the second phase, MHP conducted presentations at high schools and colleges addressing the dangers of engaging in unsafe behaviors behind the wheel. Checkpoints and saturation patrols were conducted during the enforcement phase along with a paid media campaign targeting teen drivers (all adult drivers were the secondary audience). The media buy included digital (Facebook, Twitter and YouTube ads), network/cable television (highly-rated prime time shows and sporting events such as *Empire*, *The Voice* and *Undateable*) and outdoor (billboards in high traffic areas, college/high school scoreboard) ads. Throughout the pilot, the media was also kept abreast of education and enforcement activities, including final results of the latter, to generate earned media.

According to MOHS officials, the initial pilot was a success. Not only did law enforcement achieve 100 percent of its enforcement goals, conduct 24 education programs and reach 3,620 students, distracted driving behaviors declined 15 percent after the campaign (when comparing pre- and post-observational data) and teen fatalities during the pilot fell 47 percent when compared to the same time period the previous year. In addition, the campaign also appeared to have a spillover effect – all traffic fatalities in the four counties fell 15 percent when compared to the same time period in 2014.

Capitalize on the popularity of music and sports with teens to disseminate safe driving information/ messages.

Teens are insatiable music consumers, buying more recorded music than any other age group. That makes music a highly effective medium for reaching them with safety information and messages and one that California-based RADD is tapping into. Working with recording artists such as Nate Ruess of fun., and hot emerging acts like The Soft White Sixties and Love & the Zealous, RADD-produced public service announcements (PSAs) are aired on more than 1,000 radio and television stations through a partnership with the California Broadcasters Association (CBA). From May 2015 through June 2016, 23,365 PSAs promoting the importance of making a plan to stay safe and have a good time were seen and heard by teens across the state. The value of that free airtime was just over \$2.5 million.

RADD also sponsors music events such as the KROQ Weenie Roast & Fiesta in Los Angeles, which included an on-air and streaming campaign, display advertising, social media, and an on-site presence (peer educators staffed a photo pledge booth where participants received free sunglasses). More than 1.19 million teens and young adults heard RADD's message at a cost of \$17,300 (a promotional sponsorship), which is less than two cents per impression. In San Francisco, RADD had a high profile presence at several music events that included extensive media campaigns with CBS radio and other local/radio and television stations serving the Bay area. At the three-day, sold-out Outside Lands Festival at Golden Gate Park, for example, RADD reached 200,000 people, including 5,000 onsite daily at the Radio Alice 97.3 FM Tattoo Lounge, where College RADD distributed temporary message tattoos and educational flyers.



RADD has also partnered with the Jam in the Van, an award-winning mobile recording studio. In August, 2015, the Jam in the Van Artist House featured The RADD Zone, an interactive lounge designed to engage artists and guests in promoting road safety and responsible drinking. RADD filmed 19 artist PSAs, in addition to on-camera shout outs and impromptu RADD jams and freestyles that generated social media engagement and more than 4,000 new followers.

Many teens also follow sports. But when it comes to the fan base, sports attract more males than females (60 percent versus 40 percent) (ESPN Sports as cited in Alliance Sport Marketing, 2016), making it a strong channel for conveying safe driving messages to male teen drivers who are more likely to drink and drive, speed and not buckle up. High school, college and professional sports sponsorships provide SHSOs and their partners the opportunity to convey messages through signage, electronic media, public address announcements, schedules, on-site promotions, ticket stubs, and other activities.

The Mississippi Office of Highway Safety's high visibility enforcement/public outreach campaign targeting 16-20 year old drivers included ads on the University of Southern Mississippi's sports app along with sponsorship of two home football games that occurred during the October 2015 pilot (scoreboard signage, public address announcements). MOHS also broadcast its *Pay Attention, Pay the Fine* PSA on a high school stadium scoreboard in one of the counties with the highest teen driver fatalities.

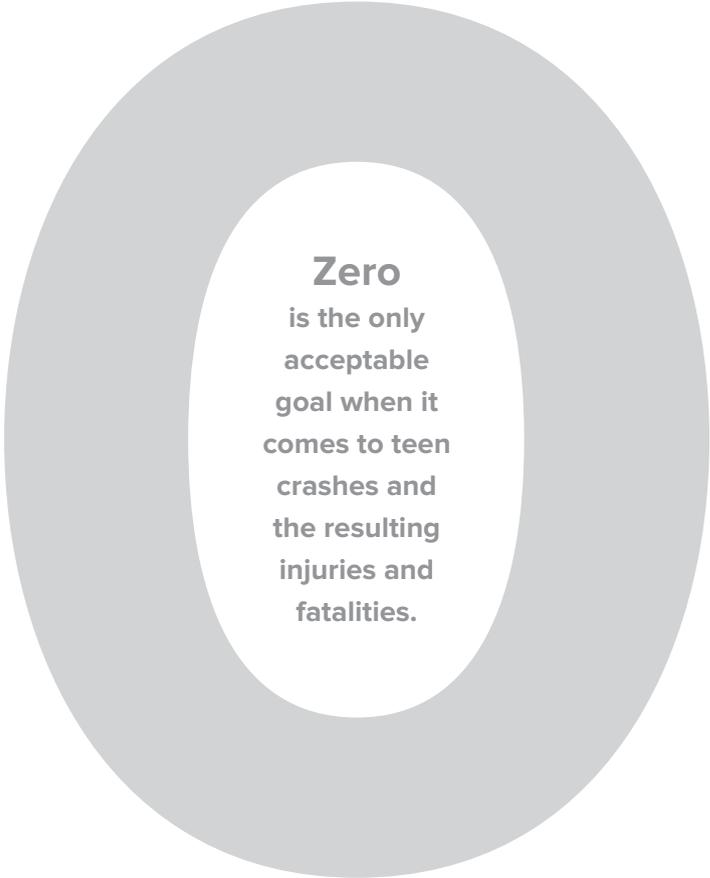
In Maryland, the SHSO partners with the state's minor league baseball teams, racetracks, and high schools to address impaired and distracted driving and seat belt use through onsite activities (e.g., Fatal Vision® goggles, games, driving simulator, designated driver sign-up) that engage and educate patrons. Meanwhile, the Governor's Highway Safety Program (GHSP) in North Carolina conducts safety promotion at eight of the state's nine minor league baseball parks and at football and/or basketball games at eight major universities. The GHSP also has roadway and parking lot signage at Greensboro Coliseum, the site of numerous sporting events and concerts.

Event tickets provide another opportunity to convey safety messages. In both North Carolina and Tennessee, for example, safety messages are printed on millions of high school sporting event tickets which are distributed to teens and parents across each state.

Conclusion

Traffic safety advocates say that zero is the only acceptable goal when it comes to teen crashes and the resulting injuries and fatalities. While the trend line has been moving downward for nearly a decade, a spike in teen-involved fatal crashes in 2015 is cause for concern. This, combined with the fact that the safety gains for older teen drivers are not as significant as their younger counterparts, should prompt states and others working in teen driver safety to carefully analyze teen/young adult crash, violation and other data to identify who is crashing (males/females, young/older teens) and why, and leverage age- and gender-appropriate policies and strategies, such as the ones discussed in this report, to ensure that the numbers continue to move in the right direction.

Garnering public support for expanding existing policies and programs to include older teens may seem difficult, but it is not insurmountable, as evidenced by the examples cited in this report. While 18 may be the age of majority in most states, its arrival does not mean a teen driver is now risk-free. It takes time – as much as three to five years – for a teen driver to gain the experience and the maturity needed to advance from being competent and tactical to strategically skilled. Teens who age out of their states' novice driver licensing, education and training and/or public outreach programs are not reaping the benefits of these proven countermeasures and best practices. Parents, elected officials and, most importantly, teens must understand this and recognize that these initiatives are in place not to delay the latter's entry into adulthood, but to ensure that they survive their most dangerous driving years to get there.



Zero
is the only
acceptable
goal when it
comes to teen
crashes and
the resulting
injuries and
fatalities.

References

- Abar, C., & Turrissi, R. (2008). How important are parents during the college years? A longitudinal perspective of indirect influences parents yield on their college teens' alcohol use. *Addiction Behavior*, 33(10), 1360-1368. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2553886/>
- Alliance Sport Marketing. (2016). Sport marketing and highway safety, a portfolio of our work with highway safety offices [Powerpoint]. Nashville, TN. Retrieved from <http://www.alliancesportmarketing.com/portfolio/highwaysafety/>
- American Academy of Pediatrics. (2014). Let them sleep: AAP recommends delaying start times of middle and high schools to combat teen sleep deprivation [Web article]. Elk Grove, IL. Retrieved from <https://www.aap.org/en-us/about-the-aap/aap-press-room/pages/Let-Them-Sleep-AAP-REcommends-Delaying-Start-Times-of-Middle-and-High-Schools-to-Combat-Teen-Sleep-Deprivation.aspx>
- Berning, A., Compton, R., & Wochinger, K. (2015). Results of the 2013-2014 National Roadside Survey of alcohol and drug use by drivers [DOT HS 812 118]. Washington, DC: National Highway Traffic Safety Administration.
- Bush, E. (2016, February 16). Teens delay getting licenses – and their driving is worse. *The Seattle Times*. Retrieved from <http://www.seattletimes.com/seattle-news/transportation/young-drivers-wait-to-get-licenses-with-dangerous-consequences/>
- Chapman, E. A., Masten, S. V., & Browning, K. K. (2014). Crash and traffic violation rates before and after licensure for novice California drivers subject to different driver licensing requirements. *Journal of Safety Research*, 50, 125-138. Retrieved from <http://dx.doi.org/10.1016.j.jsr.2014.05.005>
- Center for College Sleep/St. Thomas University. (2014). Why sleep matters, facts about college student sleep [Web page]. St. Paul, MN. Retrieved from <http://www.stthomas.edu/collegesleep/whysleepmatters/>
- Centers for Disease Control and Prevention. (2013). Web-based Injury Statistics Query and Reporting System (WISQARS) [Online]. National Center for Injury Prevention and Control, Centers for Disease Control and Prevention (producer). [Cited 2015 Oct 7].
- Centers for Disease Control and Prevention. (2015a). Intervention fact sheets, primary enforcement of seat belt laws [Web page]. Atlanta, GA. Retrieved from <http://www.cdc.gov/motorvehiclesafety/calculator/factsheet/seatbelt.html>
- Centers for Disease Control and Prevention. (2015b). Intervention factsheets, increase fines for seat belt use [Web page]. Atlanta, GA. Retrieved from <http://www.cdc.gov/motorvehiclesafety/calculator/factsheet/increasedfines.html>
- Centers for Disease Control and Prevention. (2016). 2015 youth risk behavior surveillance system. Adolescent and school health. Atlanta, GA. Retrieved from <http://www.cdc.gov/healthyyouth/data/yrbs/index.htm>
- Cher, C., McGehee, D., Harland, K., Weiss, M., & Raby, M. (2016). Using naturalistic driving data to examine teen driver behaviors present in motor vehicle crashes, 2007-2015. Washington, DC: AAA Foundation for Traffic Safety. Retrieved from <https://www.aaafoundation.org/sites/default/files/TeenCrashCausationII.pdf>
- Compton, R. P., & Berning, A. (2016). Traffic safety facts research note: Drugs and alcohol crash risk. Washington, DC: National Highway Traffic Safety Administration. Retrieved from http://www.nhtsa.gov/staticfiles/nti/pdf/812117-Drug_and_Alcohol_Crash_Risk.pdf
- Curry, A. E., Hafetz, J., Kallan, M. J., Winston, F. K., & Durban, D. R. (2011). Prevalence of teen driver errors leading to serious motor vehicle crashes. Philadelphia, PA: The Center for Injury Research and Prevention at The Children's Hospital of Philadelphia.
- Delgado, M. K., Wanner, K. J., & McDonald, C. (2016). Adolescent cell phone use while driving: An overview of the literature and promising future directions for prevention. *Media and Communication*, 4(3), 79-89. doi: 10.17645/mac.v4i3.536
- Ehsani, J. P., Bingham, R. C., & Shope, J. T. (2013). Graduated driver licensing for new drivers: Effects of three states' policies on crash rates among teenagers. *American Journal of Preventive Medicine*, 45(1), 9-18.
- Ferguson, S. A. (2013). Speeding-related fatal crashes among teen drivers and opportunities for reducing the risks. Washington, DC: Governors Highway Safety Association. Retrieved from http://www.ghsa.org/html/files/pubs/sfteens_speed.pdf
- Garcia-Espana, J. F. (2012). Safety belt laws and disparities in safety belt use among U.S. high school drivers. *American Journal of Public Health*.
- Governors Highway Safety Association. (2016a). Graduated driver licensing (GDL) laws [Web page]. Washington, DC. Retrieved from http://www.ghsa.org/html/stateinfo/laws/license_laws.html

- Governors Highway Safety Association. (2016b). Seat belt laws [Web page]. Washington, DC. Retrieved from http://www.ghsa.org/html/stateinfo/laws/seatbelt_laws.html
- Governor's Traffic Safety Advisory Commission. (2016). Drivers age 24 and younger action plan mid-term activities, 2015 accomplishments. Lansing, MI: Michigan State Police. Retrieved from http://www.michigan.gov/documents/MSP/DA24Y_Action_Plan_Update_May_2015_Final_526640_7.pdf
- Hartmann, J., & Prichard, J. R. (2014). Sleepless in school: Professors examine the price we pay for poor sleep. St. Paul, MN: University of St. Thomas. Retrieved from <http://www.stthomas.edu/news/sleepless-school-professors-examine-price-pay-poor-sleep/>
- Huang, P. (2013). Development disabilities and driving [Blog]. Philadelphia, PA: The Center for Injury Research & Prevention at The Children's Hospital of Philadelphia. Retrieved from <http://injury.research.chop.edu/blog/posts/developmental-disabilities-and-driving#.V5p2l2fruUI>
- Highway Loss Data Institute. (2013, September). Evaluation of changes in teenage driver exposure, *Bulletin*, 30(17). Arlington, VA.
- Hingson, R., Zha, W., & Weitzman, E.R. (2009). Magnitude of and trends in alcohol-related mortality and morbidity among U.S. college students 18-24, 1998-2005. *Journal of Studies on Alcohol and Drugs*, Suppl. 16: 12-20.
- Institute of Education Sciences. (2016). Fast facts, back to school statistics [Web page]. Washington, DC: National Center for Education Statistics. Retrieved from <http://nces.ed.gov/fastfacts/display.asp?id=372>
- Insurance Institute for Highway Safety. (2011). More people buckle up amid higher fines for violations. *Status Report*, 46(2). Arlington, VA. Retrieved from <http://www.iihs.org/iihs/statusreport/article/46/2/3>
- Insurance Institute for Highway Safety. (2012). Fatality facts: Teenagers 2012. Arlington, VA. Retrieved from <http://www.iihs.org/iihs/topics/t/teenagers/fatalityfacts/teenagers>
- Insurance Institute for Highway Safety/Highway Loss Data Institute. (2016a). Comparison of national and teen adult drivers, 2006-14 [Twitter post]. Arlington, VA.
- Insurance Institute for Highway Safety/Highway Loss Data Institute. (2016b). General statistics, gender 2014 [Web page]. Arlington, VA. Retrieved from <http://www.iihs.org/iihs/topics/t/general-statistics/fatalityfacts/gender>
- Maryland Motor Vehicle Administration. (2016). Rookie driver: New driver and coach practice guide. Glen Burnie, MD: Maryland Department of Transportation. Retrieved from http://www.mva.maryland.gov/_resources/docs/RD-006.pdf
- McCartt, A. T., Teoh, E. R., Fields, M., Braitman, K. A., & Hellinga, L. A. (2010). Graduated licensing laws and fatal crashes of teenage drivers: A national study. *Traffic Injury Prevention*, 11(3), 240-248.
- McKay, J.M., Steel, A. & Green, A. (2016) Reducing risks for teen drivers. Washington, DC.: Safe Kids Worldwide. Retrieved from <http://www.safekids.org/research-report/reducing-risks-teen-drivers>
- Morton-Simons, B., Lerner, N., & Singer, J. (2005). The observed effects of teenage passengers on the risky driving behavior of teenage drivers. *Accident Analysis and Prevention*, 37(6), 973-982.
- National Highway Traffic Safety Administration. (2011). Traffic safety facts, 2009: Occupant protection [DOT HS-811-390]. Washington, DC.
- National Highway Traffic Safety Administration. (2016a). Traffic safety facts, early estimate of motor vehicle traffic fatalities in 2015 [DOT HS 812 269]. Washington, DC: National Center for Statistics and Analysis. Retrieved from <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812269>
- National Highway Traffic Safety Administration. (2016b). Traffic safety facts, 2014 data, young drivers [DOT HS 812 278]. Washington, DC: National Center for Statistics and Analysis. Retrieved from <http://www-nrd.nhtsa.dot.gov/Pubs/812278.pdf>
- National Highway Traffic Safety Administration. (2016c). Traffic safety facts research note: Seat belt use in 2015 – Overall results [DOT HS 812 243]. Washington, DC: National Center for Statistics and Analysis.
- National Highway Traffic Safety Administration. (2016d). Traffic safety facts research note: Distracted Driving 2014 [DOT HS 812 260]. Washington, DC: National Center for Statistics and Analysis. Retrieved from
- National Institute on Alcohol Abuse and Alcoholism. (2015). Fall semester – A time for parents to discuss the risks of college drinking. Bethesda, MD: National Institutes of Health. Retrieved from http://pubs.niaaa.nih.gov/publications/CollegeFactSheet/NIAAA_BacktoCollege_Fact_Sheet.pdf
- National Safety Council. (2014). Alive at 25, a National Safety Council defensive driving course designed to teach young adults to drive safely and responsibly [Brochure]. Itasca, IL.
- National Safety Council. (2015, February). Incident experience of Massachusetts drivers before and after participation in the DDC-Attitudinal Dynamics of Driving Course during the period from January 1, 2011 to January 1, 2014. Submitted to the Commonwealth of Massachusetts Registry of Motor Vehicle. Itasca, IL.

Presley, C. A., & Pimentel, E. R. (2006). The introduction of the heavy and frequent drinker: A proposed classification to increase accuracy of alcohol assessments in postsecondary educational settings. *Journal of Studies on Alcohol*, 67(2), 324-331.

Shell, D. F., Newman, I. M., Cordova-Cazar, A. L., & Heese, J. M. (2015, June). Driver education and teen crashes and traffic violations in the first two years of driving in a graduated driver licensing system. *Accident Analysis and Prevention*. Retrieved from <http://dx.doi.org/10.1016/j.aap.2015.05.011>

Shope, J.T. (2006). Influences on youthful driving behavior and their potential for guiding interventions to reduce crashes. *Injury Prevention*, 9-14. doi: 10.1136/ip.2006.011874.

Shults, R. A., Olsen, E., & Williams, A. F. (2015). Driving among high school students – United States, 2013. *Morbidity and Mortality Weekly Report*, 64(12), 313-317. Atlanta, GA: Centers for Disease Control and Prevention. Retrieved from <http://www.cdc.gov/MMWR/pdf/wk/mm6412.pdf>

Tarokhn, L., & Carskadon, M. A. (2009). Sleep in adolescents. In Squire, L.R. (Ed). *Encyclopedia of Neuroscience*, 8: 1015-1022. Oxford, England: Academic Press.

Tefft, B., Williams, A. F., & Grabowski, J. G. (2013). Timing of driver's license acquisition and reasons for delay among young people in the United States. Washington, DC: AAA Foundation for Traffic Safety. Retrieved from <https://www.aaafoundation.org/timing-driver's-license-acquisition-and-reasons-delay-among-young-people-united-states-2012>

Tefft, B. (2016). Teen driver crashes, 1994-2013. Washington, DC: AAA Foundation for Traffic Safety . Retrieved from <https://www.aaafoundation.org/sites/default/files/TeenDriverCrashes1994-2013FS.pdf>

The Allstate Foundation. (2015). Driving change, our journey to safer teen driving [Data summary]. Northbrook, IL. Retrieved from <https://www.allstate.com/resources/allstate/attachments/pdf/2015-chronic-quant-summary.pdf>

The Children's Hospital of Philadelphia. (2014). Boost your state GDL. Philadelphia, PA: Center for Injury Research and Prevention. Retrieved from https://www.teendriversource.org/tools/support_gov/detail/241

The Children's Hospital of Philadelphia. (2016). A personal GDL plan for older teen drivers [Web page]. Philadelphia, PA: Center for Injury Research and Prevention. Retrieved from http://www.teendriversource.org/more_pages/page/personal_gdl_older_novice_drivers/teen

The Maryland Collaborative. (2016). College parents matter [Website]. Retrieved from <http://collegeparentsmatter.org>

University of Michigan News. (2012). Women drivers outnumber men, but still drive less [Press release]. Ann Arbor, MI. Retrieved from <http://www.ns.umich.edu/new/releases/21035-women-drivers-outnumber-men-but-still-drive-less>

Washington State Department of Licensing. (2016a). Fatalities involving young drivers [PowerPoint presentation], Olympia, WA.

Washington State Department of Licensing. (2016b). Early warning letter summary report. Olympia, WA.

Washington State Department of Transportation. (2013). Washington State strategic highway safety plan 2013, target zero. Olympia, WA. Retrieved from <http://www.wsdot.wa.gov/partners/targetzero/PDF2/priorityone.pdf>.

Washington State Legislature. (2014). Driver education: New methods and expanded requirements, Joint Transportation Committee, Final Report, December 11, 2014. Olympia, WA. Retrieved from http://leg.wa.gov/JTC/Documents/Studies/Driver%20Education_Beth/Final_DriverEdReportFULL_Web.pdf

Wheaton, A. G., Olsen, E. O., Miller, G. F., & Croft, J.B. (2016). Sleep duration and injury-related risk behaviors among high school students – United States, 2007-2013. Atlanta, GA: Centers for Disease Control and Prevention. Retrieved from <http://www.cdc.gov/mmwr/volumes/65/wr/mm6513a1.htm>

Williams, A. F., Chaudhary, N. K., & Tison, J. (2010). Evaluation of New Jersey's graduated driver licensing program. Washington, DC: AAA Foundation for Traffic Safety. Retrieved from <https://www.aaafoundation.org/sites/default/files/NJGDLevalFinalReport.pdf>

Williams, A. F., & McCartt, A. T. (2011). Views of parents of teenagers about licensing policies: A national survey. *Traffic Injury Prevention*, 12(1), 1-8.

Williams, A. F., Braitman, K. A., & McCartt, A. T. (2014). Views of New Jersey teenagers about their state's policies for beginning drivers. *Journal of Safety Research*, 48, 1-6.

Endnotes

- 1 The teen driver is not necessarily the individual killed in the crash; his/her inclusion is based on involvement in a crash where someone (an occupant of the teen's vehicle, another vehicle and/or a non-motorist) was killed.
- 2 The NHTSA analysis defined teens as 15- to 19-year-olds; 20-year-olds were included in the age group 20-29.
- 3 Vehicles were fitted with DriveCam in-vehicle video cameras that recorded video, audio and accelerometer data when a crash or other high g-force event (e.g., hard braking, acceleration or impact is detected) occurred. Each video was 12 seconds long and provided data from 8 seconds before to 4 seconds after the event.
- 4 Novice drivers 21 or older are required to hold a learner's permit for a minimum of three months, and an intermediate/probationary license for a minimum of 6 months before obtaining a full, unrestricted license under NJ's GDL law. They are not, however, required to comply with the nighttime driving or passenger restrictions or display the GDL decal, but are banned from using hand-held or hands-free devices and must ensure that all vehicle occupants are properly restrained in seat belts or car seats.
- 5 Maryland's Rookie Driver program applies to all applicants regardless of age, but the provisions for each stage of the program vary by age (e.g., permit holders under 25 must complete 60 hours of practice driving, 10 at night; permit holders 25 or older must complete 14 hours of practice driving, 3 at night). See http://www.mva.maryland.gov/_resources/docs/DL-060.pdf for details.