

Aligning Iowa Driver Education Curriculum and Standards Toward a Zero Fatalities Vision

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**Final Report
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EXECUTIVE SUMMARY

Although young drivers log fewer miles than any age group except the elderly, the number of crashes and fatalities they experience is disproportionately high. Driver education is an important part of helping young drivers learn the basic skills of driving, but current requirements for driver education in Iowa do not take a comprehensive or data-driven approach to identifying and addressing novice needs.

The main goal of this research was to enhance Iowa's driver education curriculum and ensure that it addresses both Iowa-specific and general safety issues to prepare novice drivers for a rapidly changing driving environment. Best practices in driver education and teaching trends in Iowa, in other states, and nationally were identified; a crash analysis was carried out; and driver education instructors and parents were surveyed to determine problem areas that could be addressed by the driver education curriculum. A series of informational videos was then developed to supplement driver education curriculums, and the research team drafted recommendations for changes to the Iowa driver education curriculum, the Iowa Code, and Iowa Administrative Rules.

1. INTRODUCTION

1.1. Background

According to the National Highway Traffic Safety Administration (NHTSA), over 2,000 young drivers died and over 180,000 were injured in motor vehicle crashes. Young drivers (ages 15 to 20) make up 5.0% of licensed drivers but account for 8.1% of fatalities. From 2013 to 2022, the fatality rate for young drivers increased by 20% (NHTSA 2024). As a result, crashes are one of the leading causes of death for this age group (NCIPC 2019). Although young drivers log fewer miles than any age group except the elderly, the number of crashes and fatalities they experience is disproportionately high. The crash rate per mile and the fatality rate for teen drivers are nearly 4 times and about 3 times, respectively, the rates for drivers 20 and older. Risk is highest at age 16, with a crash rate that is nearly 1.5 times the rate for 18- to 19-year-olds (NHTS 2021).

To the general public, alcohol and high speeds perhaps immediately come to mind as causing the crashes of newly licensed drivers. However, during the first six months of driving, the percentage of newly licensed drivers who crash while under the influence of alcohol or while traveling at very high speeds is relatively small. Analyses of police crash reports indicate that failures of visual scanning (ahead, to the sides, and to the rear), attention maintenance, and speed management are responsible, respectively, for 43.6%, 23.0%, and 20.8% of the crashes (the causes overlap) among drivers between 16 and 19 years old. A review of drive cam video indicated that distraction was a contributing factor in 58% of teen driver crashes (AAA 2015). The presence of other teenagers in the vehicle also contributes to teen crash risk, with a four-fold increase in crash risk when three or more younger passengers are in the vehicle (Tefft et al. 2012).

Graduated licensing reduces teens' driving risk; it allows teens to practice driving with supervision before getting their license and restricts driving after they are licensed. Programs involving parents and police have shown some potential in increasing compliance with graduated licensing restrictions.

Driver education is an important part of helping young drivers learn the basic skills of driving. Teen drivers who do not complete a driver education program are 75% more likely to receive a traffic ticket and 24% more likely to be involved in a fatal or injury crash (NHTSA n.d.).

1.2. Problem Statement

Current requirements for driver education in Iowa (Iowa Code 321.178/Iowa Administrative Rules 761.634) do not take a comprehensive or data-driven approach to identifying and addressing novice needs. In particular, the curriculum lacks a focus on helping novice drivers understand traffic safety and acquire the skills that will enable them to develop good lifelong driving habits. Addressing Vision Zero and other state-focused safety goals requires a different approach to educating novice drivers.

1.3. Scope of Work

The main goal of this work was to enhance Iowa's driver education curriculum to ensure that it addresses both Iowa-specific and general safety issues to prepare novice drivers for a rapidly changing driving environment. Trends in both classroom and driving instruction were also addressed. Specific objectives included the following:

- Identify best practices in national driver education trends as well as those for Iowa and similar states
- Identify best practices in teaching methods that can be used to provide equivalent instructional opportunities for novice drivers located across the state and to address trends in parent instructor, virtual classroom, and changing instructor demographics
- Identify national and Iowa-specific novice driver safety issues to provide insight into problem areas that should be addressed in the curriculum
- Draft language that could be used to obtain approval at the legislative level
- Develop classroom curriculum and training materials

2. CHARACTERISTICS OF TEEN CRASHES

This chapter summarizes known information about teen driver crashes. First, national studies were identified and summarized. Next, Iowa crash data were evaluated to determine the crash types most common among young drivers. Both were used to guide the additional information developed for the Iowa driver education curriculum.

2.1. National Studies on Teen Driver Safety

Crashes involving teen drivers have been investigated through a variety of studies to determine how environmental, roadway, and driver characteristics impact crash risk. The latest data available from the NHTSA traffic safety fact sheet for young drivers (NHTSA 2022) includes crashes from 2020 and found that while young drivers (ages 15 to 20) made up 5.1% of licensed drivers, they were involved in 8.5% of fatal crashes. In Iowa, 16.6% of traffic fatalities were crashes involving young drivers. This was the second highest percentage among states across the country, only behind Idaho, which had a rate of 17.8%. Young drivers were slightly more likely to be unbelted in fatal crashes compared to the rest of the traveling public (52% versus 51%), and younger males were twice as likely to be involved in a fatal crash compared to younger females. It was also found that fatal crashes that involved a younger driver and a non-occupant fatality increased by 24% from 2011 to 2020. Younger drivers in fatal crashes were also more likely to be speeding compared to the rest of the population.

In another NHTSA document, *Risk Factors for Young Drivers in Fatal Crashes* (Watson 2022), 1,603 fatal crashes involving drivers ages 15 to 20 that occurred in 2019 were used to determine high-risk situations for young drivers using quasi-induced exposure analysis. This analysis found that while all young drivers were over-involved in fatal crashes, this involvement was more pronounced for drivers 18 years old and under. Two-lane roads, stop sign presence, and situations that result in impacts that occur on the right side of the vehicle were all found to be risk factors of fatal crashes in younger drivers.

Past studies have commonly identified various roadway, environmental, and driver characteristics as contributing factors in crashes involving younger drivers. These studies have often relied on police-reported crashes and utilized descriptive statistics and forms of logistic regression to analyze the data. In a more recent study, Hossain et al. (2021) used machine learning, joint corresponding analysis, and association rule mining to investigate factors in at-fault crashes involving younger drivers (ages 15 to 19) in Louisiana. These analysis methods allowed the researchers to evaluate the complicated nature of correlations between crashes and to determine which combined factors were correlated with fatal or severe crashes. The overall analysis found that teen drivers were less likely to wear seat belts and more likely to use their cell phone while driving, have a blood alcohol content (BAC) above the legal limit, and break other rules of driving. The researchers also found that curved segments, rural two-lane highways, and roadways with a speed limit of 50 to 55 mph were correlated with fatal crashes.

2.1.1. Other Passengers

Using data from 1994 to 1996, Aldridge et al. (1999) used quasi-induced exposure analysis to determine the likelihood of young drivers (ages 16 to 20) being at fault in a crash in Kentucky involving one or two vehicles based on presence and type of passengers. Relative accident involvement ratios (RAIRs) were used to analyze the data, with a RAIR greater than 1.0 indicating increased risk. Passengers were grouped into three categories: solo (no passengers), peers, and adult/child. In addition, driver and passenger genders, age of the vehicle, time of day (day/night), day of the week, type of highway, and use of safety restraints were taken into account for any potential interactions with the passenger age category. When young drivers were traveling alone, the RAIR were close to 1.0. The likelihood of a single-vehicle accident for young drivers with peers in the vehicle increased with the number of people in the vehicle. When traveling with an adult or a child, young men had a lower accident propensity than young women. The study found an increased crash propensity when traveling with their peers.

Villavicencio et al. (2022) also examined fatal crash risk among teenage drivers based on the number and ages of passengers using a cross-sectional analysis of the NHTSA's Fatality Analysis Reporting System (FARS) and Crash Report Sampling System (CRSS) databases. The researchers found that teen drivers were twice as likely to be involved in a fatal crash when carrying two teen passengers and seven times more likely to be involved in a fatal crash when carrying a mix of teen and young adult passengers compared to when driving alone. The lowest likelihood of a fatal crash for teen drivers was when driving with a passenger aged 35 to 64 years. The researchers also found that having one teen passenger increased the crash risk for male teen drivers but not for females.

Mitran et al. (2021) used multinomial logistic regression to identify contributing factors that increased crash risk among younger drivers in Louisiana based on crashes that occurred from 2014 to 2018. The researchers grouped younger drivers into three categories: novice teen (15 to 16), young teen (17 to 19), and young adult (20 to 24). They found that younger drivers' crashes were more likely to include passengers.

2.1.2. Distraction

Gershon et al. (2017) used a supervised practice driving cohort study to evaluate the prevalence of distracted driving behavior in teens. The researchers found that 58% of evaluated traces involved young drivers engaging in a secondary task such as interacting with a passenger, talking/signing, manually using a cell phone, eating/drinking, and so on. Moreover, the researchers found no change in the rate at which young drivers engaged in secondary tasks even with variations in environmental characteristics (e.g., wet/dry, day/night, divided/not divided) or the cognitive demand of the environment (e.g., straight/curve, free-flow/congested). It was found, however, that engaging in secondary tasks occurred at twice the frequency when young drivers were driving alone compared to when they had passengers. Primary ownership of the vehicle, higher susceptibility to peer pressure, and fewer parentally imposed driving limitations were all associated with an increase in secondary task engagement among young drivers.

In a related study, Gershon et al, (2017) evaluated the relationship between secondary tasks and the length of time the driver's eyes were off the road by modeling crashes and baseline events using mixed-effects logistic regression models and linear regression. They found that engagement in certain secondary tasks (e.g., manual cellphone use and reaching for/handling objects) increased crash risk for younger drivers.

Using the Strategic Highway Research Program (SHRP2) naturalistic driving study (NDS) data, including crashes, near-crashes, and baseline events from 540 young drivers aged 16 to 19, Bharadwaj et al. (2023) performed a random-effects logistics regression analysis to identify factors associated with an increased crash/near-crash risk. It was found that engagement in secondary tasks, especially cell phone use, external distraction, eating/drinking, or other tasks that took the driver's eyes off the road, such as reaching for or handling objects, increased the risk of crashes. It was also found that if drivers were impaired, including by drugs, alcohol, or their emotional state, they were 5 to 6 times more likely to be involved in a crash.

Mitran et al. (2021) found that younger drivers' crashes were more likely to involve the use of cellphones or other electronic devices.

Hossain et al. (2021) used machine learning joint corresponding analysis and association rule mining to investigate factors in at-fault crashes involving younger drivers (ages 15 to 19) in Louisiana. The researchers found that teen drivers were more likely to use their cell phone while driving.

2.1.3. Rural Versus Urban

Peek-Asa et al. (2010) reviewed seven years of Iowa crash data (2002 to 2008) to analyze the crash rates for drivers aged 10 to 18. The distributions of driver and crash characteristics were compared between rural and urban crashes. Logistic regression was used to identify characteristics associated with increased odds of fatal or severe injury. Crash rates were found to be higher in more rural areas for teen drivers aged 10 through 15 but were lower overall in rural areas for teen drivers aged 16 through 18. It was also found that rural teen crashes were nearly five times more likely to lead to a fatal or severe injury than urban teen crashes. Rural teen crashes were more likely to involve single vehicles, occur late at night, involve a failure to yield the right-of-way (ROW), and involve crossing the center line.

Peek-Asa et al. (2010) also found that crashes involving younger drivers, some of whom were unable to obtain their license (ages 10 to 15), were higher in suburban, rural, and remote rural areas. Drivers aged 16 to 18 saw a higher rate of crashes in urban areas. When looking at fatal and severe crashes, however, rates in non-urban areas were higher for all young drivers and were twice as high as in urban areas for drivers aged 10 to 15. The study also looked at driver characteristics in fatal and severe crashes and found similar characteristics in these crashes in rural and urban areas, including being unbelted, being tested for alcohol use, and being ejected from the vehicle.

2.1.4. Other Risky Behaviors

Mitran et al. (2021) found that younger drivers' crashes were more likely to be on high-speed highways and on a curve alignment.

The NHTSA traffic safety fact sheet for young drivers (NHTSA 2022) includes crashes from 2020 and found that while young drivers (ages 15 to 20) made up 5.1% of licensed drivers, they were involved in 8.5% of fatal crashes. In Iowa, 16.6% of traffic fatalities were crashes involving young drivers. This was the second highest percentage among states across the country, only behind Idaho, which had a rate of 17.8%. Young drivers were slightly more likely to be unbelted in fatal crashes compared to the rest of the traveling public (52% versus 51%), and younger males were twice as likely to be involved in a fatal crash compared to younger females. It was also found that fatal crashes that involved a younger driver and a non-occupant fatality increased by 24% from 2011 to 2020.

A review of 2020 FARS data indicated that younger drivers (ages 15 to 20) involved in fatal crashes were more likely to be speeding compared to the rest of the population (NHTSA 2022).

In a recent study, Hossain et al. (2021) used machine learning, joint corresponding analysis, and association rule mining to investigate factors in at-fault crashes involving younger drivers (ages 15 to 19) in Louisiana. These analysis methods allowed the researchers to evaluate the complicated nature of correlations between crashes and to determine which combined factors were correlated with fatal or severe crashes. The overall analysis found that teen drivers were less likely to wear seat belts and more likely to use their cell phone while driving, have a BAC above the legal limit, and break other rules of driving. The researchers also found that curved segments, rural two-lane highways, and roadways with a speed limit of 50 to 55 mph were correlated with fatal crashes.

2.1.5. Roadway/Traffic Factors

Mitran et al. (2021) found that younger drivers' crashes were more likely to include violations such as failure to yield, following closely, and careless operation. Younger drivers were also more likely to be unrestrained, and crashes were more likely to occur between 12:00 p.m. and 12:00 a.m.

Watson (2022) evaluated 1,603 fatal crashes involving drivers ages 15 to 20 to determine high-risk situations for young drivers using quasi-induced exposure analysis. The researchers found that two-lane roads and stop sign locations were risk factors for fatal crashes in younger drivers.

2.1.6. Parental Driving Behavior

Wilson et al. (2006) evaluated the impact of parental driving behavior on teen drivers. Young drivers between the ages of 16 and 24 who had three full years of driving experience after obtaining their driver's license and who had at least two parents were selected for the study. The

driving records of the parents in the four years prior to the child’s full-privilege licensing date were examined, and each parent’s offenses were grouped into speeding violations and other moving violations. Poisson regression models were developed to predict at-fault collisions of young drivers based on their parents’ offenses. The study’s findings revealed that both mothers’ and fathers’ at-fault collisions were linked to an increased risk of at-fault collisions for young male and female drivers. Speeding offenses by both mothers and fathers were associated with an increased relative risk of at-fault collisions for both sons and daughters, whereas other moving offenses by fathers increased collision risks for sons but not daughters.

2.2. Iowa Teen Crash Data

Iowa crash data for 2018, 2019, and 2022 were reviewed to determine the types of crashes in which teen drivers were overrepresented and the characteristics that were overrepresented in crashes involving teen drivers. Crash data for 2020 and 2021 were excluded from the analysis due to the potential effect of the COVID-19 pandemic and its impact on driving rates and behaviors.

For each crash, the number of drivers 16 and under and the number of drivers 18 and under were calculated. A variable was then created that identified whether the crash involved a driver 16 and under, and another variable was created that identified whether the crash involved a driver 18 and under. Variables of interest from the crash reports were extracted, and the percentages of drivers 16 and under and 18 and under that were involved in crashes that featured those variables were calculated and compared to the percentages of drivers over 16 and over 18, respectively. The percentages were then compared, and in those instances when the percentage was higher for the younger drivers compared to the older drivers, that feature and those percentages were extracted. Next, a test of proportions was conducted to determine which differences were statistically significant. This process was completed for all crashes as well as for fatal and injury (KAB) crashes. The number of crashes identified for each crash type and age group is summarized in Table 2.1. As seen in the table, younger drivers make up a slightly higher percentage of KAB crashes compared to all crashes.

Table 2.1. Summary of crashes by age group and crash severity

Category	All Crashes	All Crash Percentage	KAB Crashes	KAB Crash Percentage
16 and Under	9,504	5.69%	1,244	6.46%
18 and Under	23,613	14.14%	2,924	15.18%
All Crashes	166,945	100%	19,262	100%

The subsections below summarize and discuss the environmental and temporal, roadway, and crash characteristics that are overrepresented in crashes involving younger drivers (drivers 16 and under as well as drivers 18 and under) compared to crashes involving older drivers (drivers above those age groups).

2.2.1. Environmental and Temporal Characteristics

A variety of environmental and temporal characteristics were found to be overrepresented in crashes involving younger drivers. A summary of those characteristics can be found in Table 2.2 for all crashes and Table 2.3 for KAB crashes. For instance, younger drivers are more likely to be involved in a crash in the late summer/early fall. August and September saw younger drivers involved in a larger percentage of crashes compared to older drivers. The largest difference was seen in September for all crashes, when drivers 16 and under were in 2.5% more crashes and drivers 18 and under were in 1.5% more crashes than older drivers. September was the only month in which younger drivers were overrepresented in KAB crashes, with drivers 16 and under involved in 2.5% more KAB crashes and drivers 18 and under involved in 1.1% more KAB crashes than older drivers.

When looking at time of day, younger drivers were most overrepresented in crashes during the 2:00 p.m. to 4:00 p.m. time slot, when students are getting out of school, regardless of age group (16 and under or 18 and under) or crash severity (all versus KAB). Younger drivers were involved in 4.4% to 7.6% more crashes during this time slot compared to drivers over these age groups. Younger drivers were also more likely to be involved in crashes during daylight hours and in rural areas, with the exception of KAB crashes for drivers 18 and under, where no statistically significant difference was found.

With respect to weather conditions, younger drivers were more likely to be involved in crashes during clear weather, cloudy weather, rain events, and blowing sand, soil, or dirt. For KAB crashes involving younger drivers, clear weather and blowing sand, soil, and dirt were the only weather conditions that were overrepresented. Clear weather was the most overrepresented factor in crashes involving younger drivers compared to crashes involving older drivers. Dry and wet pavement were present in a larger percentage of crashes involving younger drivers compared to crashes involving older drivers, with dry pavement being the condition that was more often present in crashes involving younger drivers. The same pattern was found for KAB crashes involving drivers 16 and under, though the results were not significant for drivers 18 and under. Drivers 18 and under were slightly (i.e., 0.8%) more likely to be involved in crashes when the pavement was covered in snow compared to older drivers.

Table 2.2. Summary of environmental and temporal factors overrepresented in crashes involving younger drivers – all crashes

Variable	Factor	16 and Under	Over 16	Difference (16 and Under)	P-Value	18 and Under	Over 18	Difference (18 and Under)	P-Value
Month	April	-	-	-	-	7.5%	7.1%	0.4%	0.01357
	August	8.8%	7.6%	1.2%	<0.0001	8.5%	7.6%	0.9%	<0.0001
	September	10.4%	7.9%	2.5%	<0.0001	9.3%	7.8%	1.5%	<0.0001
	October	10.3%	9.4%	0.9%	0.00179	-	-	-	-
Time Bin	6 to 8 a.m.	12.1%	9.3%	2.8%	<0.0001	-	-	-	-
	8 to 10 a.m.	9.8%	8.7%	1.1%	0.00012	-	-	-	-
	2 to 4 p.m.	20.7%	13.1%	7.6%	<0.0001	18.2%	12.8%	5.4%	<0.0001
	4 to 6 p.m.	17.7%	15.8%	1.9%	<0.0001	17.5%	15.7%	1.8%	<0.0001
	6 to 8 p.m.	-	-	-	-	10.5%	10.0%	0.5%	0.00900
	8 to 10 p.m.	-	-	-	-	8.4%	7.6%	0.8%	<0.0001
Lighting	Daylight	77.6%	66.5%	11.1%	<0.0001	74.5%	65.9%	8.6%	<0.0001
Rural/Urban	Rural	51.2%	48.0%	3.2%	<0.0001	52.6%	47.5%	5.1%	<0.0001
Weather	Clear	65.6%	56.6%	9.0%	<0.0001	63.1%	56.2%	6.9%	<0.0001
	Cloudy	17.2%	16.1%	1.1%	0.00233	17.5%	15.9%	1.6%	<0.0001
	Rain	6.6%	5.7%	0.9%	0.00013	6.8%	5.6%	1.2%	<0.0001
	Blowing Sand, Soil, Dirt	0.1%	0.0%	0.1%	<0.0001	0.1%	0.0%	0.1%	<0.0001
Surface Condition	Dry	74.3%	60.9%	13.4%	<0.0001	70.8%	60.2%	10.6%	<0.0001
	Wet	3.3%	2.2%	1.1%	<0.0001	2.9%	2.2%	0.7%	<0.0001
	Snow	-	-	-	-	13.5%	12.7%	0.8%	0.00033

Table 2.3. Summary of environmental and temporal factors overrepresented in crashes involving younger drivers – KAB crashes

Variable	Factor	16 and Under	Over 16	Difference (16 and Under)	P-Value	18 and Under	Over 18	Difference (18 and Under)	P-Value
Month	September	11.9%	9.4%	2.5%	0.00187	10.5%	9.4%	1.1%	0.03127
Time Bin	6 to 8 a.m.	9.8%	7.7%	2.1%	0.00384	-	-	-	-
	8 to 10 a.m.	9.0%	7.7%	1.3%	0.04894	-	-	-	-
	2 to 4 p.m.	18.1%	13.7%	4.4%	<0.0001	18.2%	12.8%	5.4%	<0.0001
	4 to 6 p.m.	18.5%	15.7%	2.8%	0.00448	17.6%	15.7%	1.9%	0.00492
	6 to 8 p.m.	13.8%	10.2%	3.6%	<0.0001	-	-	-	-
Lighting	Daylight	76.6%	68.1%	8.5%	<0.0001	72.0%	68.1%	3.9%	<0.0001
Rural/Urban	Rural	62.9%	60.3%	2.6%	0.03484	-	-	-	-
Weather	Clear	72.6%	69.2%	3.4%	0.00591	-	-	-	-
	Blowing Sand, Soil, Dirt	0.2%	0.0%	0.1%	<0.0001	0.1%	0.0%	0.1%	<0.0001
Surface Condition	Dry	72.1%	64.7%	7.4%	<0.0001	68.2%	64.6%	3.6%	<0.0001
	Wet	4.2%	3.0%	1.2%	0.00889	-	-	-	-

2.2.2. Roadway Characteristics

Roadway characteristics such as roadway classification, road type, surface type, horizontal and vertical alignment, traffic control, and speed limit were found to be overrepresented in crashes involving younger drivers. A summary of these characteristics can be found in Table 2.4 for all crashes and Table 2.5 for KAB crashes. Municipal roads and secondary roads were overrepresented in crashes involving both of the younger driver age groups for all crashes. Iowa routes were slightly overrepresented (0.4%) in KAB crashes involving drivers 16 and under, while secondary roads were overrepresented (0.3%) in KAB crashes involving drivers 18 and under. This may be due to the fact that younger drivers are less likely to drive on Interstates and US highways.

All crashes involving younger drivers were more likely to occur on nine different roadway types, and KAB crashes involving younger drivers were more likely to occur on six different roadway types, with four-way and T-intersections being overrepresented more in crashes involving younger drivers compared to crashes involving older drivers. For all crashes and KAB crashes and for both of the younger driver groups, crashes involving younger drivers were more likely to occur on unpaved roads compared to crashes involving older drivers, suggesting that younger drivers need more experience on unpaved roads.

With respect to curvature, it was found that younger drivers were almost 10% more likely to be involved in crashes on straight roadway sections compared to older drivers. For all crashes, younger drivers were slightly more likely than older drivers to be involved in crashes on horizontal curves to the left. When looking at vertical curvature, younger drivers were about 8.5% more likely to be involved in crashes occurring on level ground compared to older drivers.

Traffic control factors that were overrepresented in all crashes involving both sets of younger drivers included the presence of stop signs and yield signs and the absence of traffic control. For KAB crashes, both sets of younger drivers were more likely to be involved in crashes featuring stop signs or that occurred within school zones, and drivers 16 and under were more likely to be involved in crashes where a traffic director was present. Traffic signals, flashing traffic control devices, and school zone signs were overrepresented in all crashes involving drivers 18 and under but not drivers 16 and under. Crashes near stop signs have been identified commonly in the literature (Watson 2022), so this is not surprising to see.

Younger drivers were more likely to be involved in crashes on roads with lower speed limits compared to older drivers. For all crashes, younger drivers were overrepresented in crashes on roads with speed limits of 15 to 55 mph, with the exception of crashes on roads with a speed limit of 40 mph for drivers 16 and under. The speed limits that were most overrepresented in all crashes involving younger drivers were 25 and 35 mph. For KAB crashes, younger drivers were overrepresented in crashes on roads with lower speed limits, including 15 mph (for drivers 16 and under only) and 25 mph, as well as on roads with 50 and 55 mph speed limits. This suggests, similarly to the results of the road classification analysis, that younger drivers likely are not driving as often on higher speed facilities such as US highways and Interstates.

Table 2.4. Summary of roadway factors overrepresented in crashes involving younger drivers – all crashes

Variable	Factor	16 and Under	Over 16	Difference (16 and Under)	P-Value	18 and Under	Over 18	Difference (18 and Under)	P-Value
Road Classification	Secondary Road	11.7%	10.1%	1.6%	<0.0001	10.9%	10.1%	0.8%	<0.0001
	Municipal Road	37.3%	30.3%	7.0%	<0.0001	36.1%	29.8%	6.3%	<0.0001
	Unknown	33.0%	29.3%	3.7%	<0.0001	30.9%	29.3%	1.6%	<0.0001
Road Type	Driveway (Within)	1.2%	1.0%	0.2%	0.02922	-	-	-	-
	Driveway (Related, not in)	4.6%	3.4%	1.2%	<0.0001	4.3%	3.4%	0.9%	<0.0001
	Roundabout	0.5%	0.3%	0.2%	0.00034	0.4%	0.3%	0.1%	0.00547
	4-Way Intersection	29.8%	22.9%	6.9%	<0.0001	29.1%	22.3%	6.8%	<0.0001
	T-Intersection	9.6%	6.0%	3.6%	<0.0001	8.6%	5.8%	2.8%	<0.0001
	Y-Intersection	0.3%	0.2%	0.1%	0.01833	0.3%	0.2%	0.1%	0.00103
	5 Points or More Intersection	0.3%	0.1%	0.2%	<0.0001	0.2%	0.1%	0.1%	<0.0001
	L-Intersection	0.2%	0.1%	0.1%	0.00179	0.2%	0.1%	0.1%	<0.0001
Surface	Other Intersection	1.9%	1.2%	0.7%	<0.0001	1.6%	1.2%	0.4%	<0.0001
	Unpaved	5.6%	2.8%	2.8%	<0.0001	4.6%	2.7%	1.9%	<0.0001
Horizontal Alignment	Not Listed	33.0%	29.3%	3.7%	<0.0001	30.9%	29.3%	1.6%	<0.0001
	Straight	88.4%	78.5%	9.9%	<0.0001	87.3%	77.8%	9.5%	<0.0001
	Traversing Curve to Left	3.6%	3.1%	0.5%	0.00327	3.5%	3.0%	0.5%	<0.0001
Vertical Alignment	Level	80.2%	71.8%	8.4%	<0.0001	79.6%	71.1%	8.5%	<0.0001
	At Crest	1.7%	1.3%	0.4%	0.00046	1.6%	1.3%	0.3%	0.00010
	Traversing Downhill	7.6%	6.1%	1.5%	<0.0001	7.1%	6.0%	1.1%	<0.0001
	At Sag	-	-	-	-	0.8%	0.7%	0.1%	0.04543
Traffic Control	No Control Present	59.7%	56.4%	3.3%	<0.0001	58.6%	56.3%	2.3%	<0.0001
	Traffic Signals	-	-	-	-	19.0%	16.7%	2.3%	<0.0001
	Flashing Traffic Control Signs	-	-	-	-	0.4%	0.3%	0.1%	<0.0001
	Stop Signs	17.3%	11.2%	5.1%	<0.0001	15.7%	10.8%	4.9%	<0.0001
	Yield Signs	1.3%	0.9%	0.4%	<0.0001	1.1%	0.9%	0.2%	0.00149
	School Zone Signs	-	-	-	-	0.1%	0.0%	0.1%	<0.0001
Speed Limit	15	1.0%	0.8%	0.2%	0.01740	-	-	-	-
	20	1.4%	1.0%	0.4%	<0.0001	1.2%	1.0%	0.2%	0.00238
	25	30.8%	22.5%	8.3%	<0.0001	27.7%	22.2%	5.5%	<0.0001
	30	8.6%	7.7%	0.9%	0.00072	8.9%	7.5%	1.4%	<0.0001
	35	20.9%	17.8%	3.1%	<0.0001	21.9%	17.3%	4.6%	<0.0001
	40	-	-	-	-	2.6%	2.0%	0.6%	<0.0001
	45	6.9%	6.2%	0.7%	0.00307	7.5%	6.1%	1.4%	<0.0001
	50	2.9%	1.9%	1.0%	<0.0001	2.7%	1.9%	0.8%	<0.0001
55	17.7%	14.4%	3.3%	<0.0001	15.8%	14.4%	1.4%	<0.0001	

Table 2.5. Summary of roadway factors overrepresented in crashes involving younger drivers – KAB crashes

Variable	Factor	16 and Under	Over 16	Difference (16 and Under)	P-Value	18 and Under	Over 18	Difference (18 and Under)	P-Value
Road Classification	Iowa Route	0.7%	0.3%	0.4%	0.000083	-	-	-	-
	Secondary Route	-	-	-	-	0.6%	0.3%	0.3%	0.00545
Road Type	Driveway (Within)	1.5%	1.0%	0.5%	0.04576	-	-	-	-
	Traffic Circle	0.1%	0.0%	0.1%	<0.0001	-	-	-	-
	4-Way Intersection	29.0%	25.2%	3.8%	0.00146	28.9%	24.8%	4.1%	<0.0001
	T-Intersection	8.8%	7.1%	1.7%	0.01248	8.5%	7.0%	1.5%	0.00196
	Y-Intersection	-	-	-	-	0.5%	0.3%	0.2%	0.0413
	Shared Use Path or Trail	0.2%	0.0%	0.2%	<0.0001	0.1%	0.0%	0.1%	<0.0001
	Other Intersection	2.9%	1.4%	1.5%	<0.0001	2.3%	1.4%	0.9%	0.00013
Pavement	Unpaved	11.7%	5.2%	6.5%	<0.0001	9.7%	4.8%	4.9%	<0.0001
	Not Listed	35.4%	31.7%	3.7%	0.00339	-	-	-	-
Horizontal Alignment	Straight	-	-	-	-	87.5%	85.4%	2.1%	0.0014
Vertical Alignment	Other	0.6%	0.3%	0.3%	0.03486	-	-	-	-
Traffic Control	Stop Signs	16.7%	13.1%	3.6%	0.00015	16.3%	12.8%	3.5%	<0.0001
	School Zone Signs	0.1%	0.0%	0.1%	<0.0001	0.1%	0.0%	0.1%	<0.0001
	Traffic Director (Person)	0.1%	0.0%	0.1%	<0.0001	-	-	-	-
Speed Limit	15	0.9%	0.5%	0.4%	0.02960	-	-	-	-
	25	22.8%	17.3%	5.5%	<0.0001	20.6%	17.2%	3.4%	<0.0001
	50	5.9%	3.3%	2.6%	<0.0001	5.3%	3.2%	2.1%	<0.0001
	55	35.2%	30.0%	5.2%	<0.0001	32.3%	29.9%	2.4%	0.00464

2.2.3. Crash Characteristics

Certain values of several variables were found to be overrepresented in crashes involving young drivers. These characteristics included crash severity, manner of collision, major cause, location of first harmful event, first sequence of events, most harmful event, fixed object struck, non-motorist related, work zone related, drug and alcohol related, and number of occupants, were found to be overrepresented in crashes involving young drivers. A summary of these values, which were significantly different for younger drivers compared to older drivers, is presented in Table 2.6 for all crashes and Table 2.7 for KAB crashes.

When looking at both all crashes and KAB crashes, it was found that younger drivers are more likely to be involved in minor injury crashes compared to older drivers. Younger drivers are also more likely to be involved in head-on, rear-end, angle, and broadside crashes compared to older drivers. When looking at KAB crashes, younger drivers are overrepresented in head-on, angle, and broadside crashes. A variety of major causes are overrepresented in crashes involving younger drivers when looking at all crashes, with failure to yield right-of-way (FTYROW) at stop signs and when making left turns especially prevalent. Additionally, driving too fast for conditions, following too close, and operator inexperience are overrepresented by at least 1% in crashes involving younger drivers compared to crashes involving older drivers. When looking at KAB crashes, FTYROW when making left turns, driving too fast for conditions, and exceeding the authorized speed limit are overrepresented in crashes involving both age groups of young drivers by at least 1%. This suggests that focusing on speed with younger drivers could reduce the number of injury and fatal crashes.

The first harmful event in crashes involving younger drivers was found to be about 10% and 5% more likely to occur on the roadway for all crashes and for KAB crashes, respectively, compared to crashes involving older drivers. It was found that the first event in crashes involving younger drivers is more likely to be a collision with a vehicle in traffic. KAB crashes involving younger drivers are also more likely than KAB crashes involving older drivers to involve a loss of traction. Eleven events under the Most Harmful Event variable were overrepresented in crashes involving younger drivers for both all crashes and KAB crashes, with collision with a vehicle in traffic being the most overrepresented event for both crash types. Additionally, overturn/rollover and collision with or striking of an object, cargo, or a person from another vehicle were both overrepresented in crashes involving younger drivers by at least 1%.

When looking at the fixed objects that were struck more frequently by younger drivers compared to older drivers, ditches were overrepresented for all crashes. Overall, however, younger drivers were less likely to strike a fixed object compared to older drivers, which, given that younger drivers' crashes are more likely to occur on the roadway, is not surprising. Additionally, it was found that crashes involving younger drivers were more likely not to involve non-motorists, not to occur in a work zone, and not to involve drugs or alcohol compared to crashes involving older drivers. Crashes involving younger drivers were more likely to occur when their vehicles had more than one total occupant. While most total occupant values above 1 were overrepresented, it was found that total occupants ranging from 3 to 5 were overrepresented by at least 2% in crashes involving younger drivers compared to crashes involving older drivers.

Table 2.6. Summary of crash characteristics overrepresented in crashes involving younger drivers – all crashes

Variable	Factor	16 and Under	Over 16	Difference (16 and Under)	P-Value	18 and Under	Over 18	Difference (18 and Under)	P-Value
Crash Severity	Minor Injury	10.9%	8.9%	2.0%	<0.0001	10.4%	8.8%	1.6%	<0.0001
Manner of Collision	Head-On	2.9%	2.2%	0.7%	<0.0001	2.7%	2.2%	0.5%	<0.0001
	Rear-End	29.3%	23.0%	6.3%	<0.0001	30.3%	22.2%	8.1%	<0.0001
	Angle, Oncoming Left Turn	5.8%	3.6%	2.2%	<0.0001	-	-	-	-
	Broadside	25.1%	17.2%	7.9%	<0.0001	23.9%	16.6%	7.3%	<0.0001
Major Cause	Ran Stop Sign	3.8%	2.8%	1.0%	<0.0001	3.6%	2.7%	0.9%	<0.0001
	FTYROW at Uncontrolled Intersection	1.4%	0.7%	0.7%	<0.0001	1.4%	0.6%	0.8%	<0.0001
	FTYROW Making Right Turn on Red Signal	0.3%	0.2%	0.1%	<0.0001	0.3%	0.2%	0.1%	0.00103
	FTYROW from Stop Sign	9.5%	4.9%	4.6%	<0.0001	8.1%	4.7%	3.4%	<0.0001
	FTYROW from Yield Sign	0.9%	0.6%	0.3%	0.0001	0.8%	0.5%	0.3%	<0.0001
	FTYROW Making Left Turn	7.0%	4.1%	2.9%	<0.0001	6.5%	3.8%	2.7%	<0.0001
	FTYROW from Driveway	1.7%	1.4%	0.3%	0.0081	1.9%	1.4%	0.5%	<0.0001
	Drive too Fast for Conditions	7.6%	6.1%	1.5%	<0.0001	7.9%	5.9%	2.0%	<0.0001
	Exceeded Authorized Speed	1.5%	1.0%	0.5%	<0.0001	1.5%	1.0%	0.5%	<0.0001
	Followed too Close	13.2%	10.0%	3.2%	<0.0001	14.0%	9.5%	4.5%	<0.0001
	Passing: Through/Around Barrier	0.2%	0.1%	0.1%	0.0018	-	-	-	-
	Driver Distraction: Manual Operation of an Electronic Communication Device	0.4%	0.3%	0.1%	0.0432	0.4%	0.3%	0.1%	0.00547
	Driver Distraction: Adjusting In-Vehicle Controls	0.7%	0.3%	0.4%	<0.0001	0.6%	0.2%	0.4%	<0.0001
	Driver Distraction: Other Electronic Device Activity	0.3%	0.2%	0.1%	0.0183	0.4%	0.2%	0.2%	<0.0001
	Driver Distraction: Passenger	0.3%	0.2%	0.1%	0.0183	0.3%	0.2%	0.1%	0.00103
	Driver Distraction: Reaching for Object(s)	0.7%	0.4%	0.3%	<0.0001	0.6%	0.4%	0.2%	<0.0001
	Driver Distraction: Inattentive/Lost in Thought	1.4%	1.0%	0.4%	<0.0001	1.3%	1.0%	0.3%	<0.0001
	Driver Distraction: Other Internal Distraction	-	-	-	-	2.9%	2.6%	0.3%	0.00387
	Driver Distraction: External Distraction	1.2%	0.9%	0.3%	0.0014	1.1%	0.9%	0.2%	0.00149
	Lost Control	-	-	-	-	6.7%	6.3%	0.4%	0.00979
Failure to Signal Intentions	0.1%	0.0%	0.1%	<0.0001	-	-	-	-	
Other: Vision Obscured	0.5%	0.3%	0.2%	0.0003	0.4%	0.3%	0.1%	0.00547	
Operator Inexperience	1.6%	0.2%	1.4%	<0.0001	1.0%	0.1%	0.9%	<0.0001	
Location of First Harmful Event	On Roadway	88.0%	78.0%	10.0%	<0.0001	87.3%	77.2%	10.1%	<0.0001

Variable	Factor	16 and Under	Over 16	Difference (16 and Under)	P-Value	18 and Under	Over 18	Difference (18 and Under)	P-Value
Sequence of Events	Pre-crash Event: Evasive Action	2.9%	2.4%	0.5%	0.0011	2.8%	2.3%	0.5%	<0.0001
	Pre-crash Event: Loss of Traction	4.8%	4.1%	0.7%	0.0004	4.6%	4.1%	0.5%	0.00019
	Pre-crash Event: Avoid Hitting Animal	-	-	-	-	0.7%	0.6%	0.1%	0.03419
	Collision with Vehicle in Traffic	66.4%	52.0%	14.4%	<0.0001	66.3%	50.6%	15.7%	<0.0001
	Collision with Re-entering Roadway	1.4%	1.1%	0.3%	0.0034	1.4%	1.0%	0.4%	<0.0001
	Collision with/Struck/Struck by Object/Cargo/Person from Other Vehicle	0.8%	0.6%	0.2%	0.0076	0.7%	0.6%	0.1%	0.03419
	Collision with Mailbox	0.1%	0.0%	0.1%	<0.0001	0.1%	0.0%	0.1%	<0.0001
	Other	2.2%	1.6%	0.6%	<0.0001	1.9%	1.6%	0.3%	0.00039
Most Harmful Event	Pre-crash Event: Crossed Centerline (Undivided)	0.4%	0.3%	0.1%	0.0432	0.4%	0.3%	0.1%	0.00547
	Pre-crash Events: Evasive Action	-	-	-	-	0.5%	0.4%	0.1%	0.01331
	Pre-crash Event: Loss of Traction	0.7%	0.5%	0.2%	0.004	0.6%	0.5%	0.1%	0.02325
	Non-collision Events: Overturn/Rollover	6.1%	4.3%	1.8%	<0.0001	5.0%	4.3%	0.7%	<0.0001
	Collision with Vehicle in Traffic	64.6%	51.3%	13.3%	<0.0001	64.7%	50.0%	14.7%	<0.0001
	Collision with Re-entering Roadway	0.9%	0.7%	0.2%	0.0121	0.9%	0.7%	0.2%	0.00041
	Collision with/Struck/Struck by Object/Cargo/Person from Other Vehicle	3.7%	2.2%	1.5%	<0.0001	3.3%	2.1%	1.2%	<0.0001
	Collision with Utility Pole/Light Support	2.0%	1.7%	0.3%	0.0144	-	-	-	-
	Collision with Mailbox	0.2%	0.1%	0.1%	0.0018	0.2%	0.1%	0.1%	<0.0001
	Pre-crash Event: Other	0.2%	0.1%	0.1%	0.0018	-	-	-	-
	Other	3.0%	2.1%	0.9%	<0.0001	2.8%	2.1%	0.7%	<0.0001
Fixed Object Struck	Ditch	6.1%	5.0%	1.1%	<0.0001	5.6%	5.0%	0.6%	0.02325
	Embankment	-	-	-	-	0.6%	0.5%	0.1%	<0.0001
	Culvert/Pipe opening	0.3%	0.2%	0.1%	0.0183	-	-	-	-
	Fire Hydrant	0.3%	0.2%	0.1%	0.0183	-	-	-	-
	No Fixed Object Struck	85.6%	83.7%	1.9%	<0.0001	85.7%	83.5%	2.2%	<0.0001
Non-Motorist Related	No	99.2%	98.6%	0.6%	<0.0001	99.3%	98.5%	0.8%	<0.0001
Work Zone Related	Not WZ Related	99.4%	98.8%	0.6%	<0.0001	99.2%	98.8%	0.4%	<0.0001
Drug and Alcohol Related	None Indicated	98.6%	95.2%	3.4%	<0.0001	98.0%	94.9%	3.1%	<0.0001

Variable	Factor	16 and Under	Over 16	Difference (16 and Under)	P-Value	18 and Under	Over 18	Difference (18 and Under)	P-Value
Total Occupants	2	-	-	-	-	36.9%	36.1%	0.8%	0.00889
	3	24.2%	17.4%	6.8%	<0.0001	23.5%	16.8%	6.7%	<0.0001
	4	11.7%	7.5%	4.2%	<0.0001	11.2%	7.2%	4.0%	<0.0001
	5	5.8%	3.3%	2.5%	<0.0001	5.5%	3.1%	2.4%	<0.0001
	6	2.5%	1.5%	1.0%	<0.0001	2.4%	1.4%	1.0%	<0.0001
	7	1.1%	0.6%	0.5%	<0.0001	1.0%	0.5%	0.5%	<0.0001
	8	0.5%	0.3%	0.2%	0.0003	0.5%	0.2%	0.3%	<0.0001
	9	0.2%	0.1%	0.1%	0.0018	0.2%	0.1%	0.1%	<0.0001
	10	0.1%	0.0%	0.1%	<0.0001	0.1%	0.0%	0.1%	<0.0001
	11	0.1%	0.0%	0.1%	<0.0001	0.1%	0.0%	0.1%	<0.0001
	12	0.1%	0.0%	0.1%	<0.0001	-	-	-	-

Table 2.7. Summary of crash characteristics overrepresented in crashes involving younger drivers – KAB crashes

Variable	Factor	16 and Under	Over 16	Difference (16 and Under)	P-Value	18 and Under	Over 18	Difference (18 and Under)	P-Value
Crash Severity	Minor Injury	83.0%	77.5%	5.5%	<0.0001	84.0%	76.8%	7.2%	<0.0001
Manner of Collision	Head-On	7.3%	4.8%	2.5%	<0.0001	6.5%	4.7%	1.8%	<0.0001
	Rear-End	-	-	-	-	18.2%	16.4%	1.8%	0.00809
	Angle, Oncoming Left Turn	5.9%	4.0%	1.9%	0.00056	5.9%	3.8%	2.1%	<0.0001
	Broadside	25.2%	20.6%	4.6%	<0.0001	25.7%	20.1%	5.6%	<0.0001

Variable	Factor	16 and Under	Over 16	Difference (16 and Under)	P-Value	18 and Under	Over 18	Difference (18 and Under)	P-Value
Major Cause	Ran Stop Sign	-	-	-	-	6.1%	4.5%	1.6%	<0.0001
	FTYROW at Uncontrolled Intersection	1.7%	0.9%	0.8%	0.0025	1.6%	0.8%	0.8%	<0.0001
	FTYROW Making Left Turn	8.3%	5.4%	2.9%	<0.0001	7.9%	5.2%	2.7%	<0.0001
	FTYROW from Driveway	1.4%	0.9%	0.5%	0.038	-	-	-	-
	Drive too Fast for Conditions	8.0%	6.6%	1.4%	0.028	8.0%	6.4%	1.6%	0.00069
	Exceeded Authorized Speed	4.5%	3.3%	1.2%	0.0117	4.2%	3.2%	1.0%	0.00283
	Followed too Close	-	-	-	-	7.9%	6.3%	1.6%	0.00064
	Passing on Wrong Side	0.2%	0.0%	0.2%	<0.0001	0.1%	0.0%	0.1%	<0.0001
	Driver Distraction: Talking on a Hands-Free Device	-	-	-	-	0.1%	0.0%	0.1%	<0.0001
	Driver Distraction: Adjusting In-Vehicle Controls	0.8%	0.3%	0.5%	0.0015	0.6%	0.3%	0.3%	0.00545
	Driver Distraction: Other Electronic Device Activity	-	-	-	-	0.5%	0.3%	0.2%	0.04130
	Driver Distraction: Reaching for Object(s)	0.9%	0.5%	0.4%	0.0296	-	-	-	-
	Traveling on Prohibited Traffic Way	0.1%	0.0%	0.1%	<0.0001	-	-	-	-
	Failure to Dim Lights/Have Lights on	0.2%	0.0%	0.2%	<0.0001	0.1%	0.0%	0.1%	<0.0001
	Driving Less than the Posted Speed Limit	-	-	-	-	0.1%	0.0%	0.1%	<0.0001
Operator Inexperience	0.6%	0.1%	0.5%	<0.0001	0.5%	0.1%	0.4%	<0.0001	
Location of First Harmful Event	On Roadway	86.2%	81.2%	5.0%	<0.0001	85.6%	80.8%	4.8%	<0.0001
First Sequence of Events	Pre-crash Event: Evasive Action	5.8%	4.4%	1.4%	0.0106	5.2%	4.4%	0.8%	0.02759
	Pre-crash Event: Loss of Traction	8.4%	5.5%	2.9%	<0.0001	6.7%	5.5%	1.2%	0.00492
	Collision with Vehicle in Traffic	50.8%	43.3%	7.5%	<0.0001	52.5%	42.3%	10.2%	<0.0001
	Collision with Re-entering Roadway	1.2%	0.6%	0.6%	0.0051	1.1%	0.6%	0.5%	0.00119
	Collision with/Struck/Struck by Object/Cargo/Person from Other Vehicle	1.2%	0.7%	0.5%	0.0227	1.0%	0.6%	0.4%	0.00697
	Collision With Other Post/Pole/Support	0.1%	0.0%	0.1%	<0.0001	0.1%	0.0%	0.1%	<0.0001
	Collision with Mailbox	0.2%	0.0%	0.2%	<0.0001	0.1%	0.0%	0.1%	<0.0001
	Miscellaneous Events: Fire/Explosion	0.1%	0.0%	0.1%	<0.0001	-	-	-	-
Other	3.2%	2.4%	0.8%	0.0388	-	-	-	-	

Variable	Factor	16 and Under	Over 16	Difference (16 and Under)	P-Value	18 and Under	Over 18	Difference (18 and Under)	P-Value
Most Harmful Event	Pre-crash Event: Crossed Centerline (Undivided)	1.2%	0.6%	0.6%	0.0051	1.0%	0.5%	0.5%	0.0005
	Pre-crash Events: Downhill Runaway	0.1%	0.0%	0.1%	<0.0001	-	-	-	-
	Pre-crash Event: Cargo/Equipment Loss or Shift	0.1%	0.0%	0.1%	<0.0001	-	-	-	-
	Non-collision Events: Overturn/Rollover	16.4%	13.6%	2.8%	0.0028	-	-	-	-
	Collision with Thrown or Falling Object	0.1%	0.0%	0.1%	<0.0001	0.1%	0.0%	0.1%	<0.0001
	Collision with Vehicle in Traffic	51.1%	44.2%	6.9%	<0.0001	52.6%	43.2%	9.4%	<0.0001
	Collision with Re-entering Roadway	0.9%	0.4%	0.5%	0.0047	0.7%	0.4%	0.3%	0.01244
	Collision with/Struck/Struck by Object/Cargo/Person From Other Vehicle	3.9%	2.6%	1.3%	0.003	3.7%	2.5%	1.2%	0.00011
	Collision with Fire Hydrant	0.1%	0.0%	0.1%	<0.0001	-	-	-	-
	Collison with Mailbox	0.1%	0.0%	0.1%	<0.0001	0.1%	0.0%	0.1%	<0.0001
Other	3.9%	2.8%	1.1%	0.0123	3.7%	2.7%	1.0%	0.00139	
Fixed Object Struck	No Fixed Object Struck	75.6%	71.6%	4.0%	0.0012	75.2%	71.3%	3.9%	<0.0001
Non-Motorist Related	No	96.5%	92.0%	4.5%	<0.0001	96.2%	91.5%	4.7%	<0.0001
Work Zone Related	Not WZ Related	99.7%	98.6%	1.1%	0.0005	99.4%	98.5%	0.9%	<0.0001
Drug and Alcohol Related	None Indicated	95.4%	87.0%	8.4%	<0.0001	94.0%	86.4%	7.6%	<0.0001
Total Occupants	3	23.3%	16.7%	6.6%	<0.0001	22.0%	16.3%	5.7%	<0.0001
	4	12.1%	7.8%	4.3%	<0.0001	11.9%	7.4%	4.5%	<0.0001
	5	6.5%	3.7%	2.8%	<0.0001	6.4%	3.5%	2.9%	<0.0001
	6	3.1%	2.0%	1.1%	0.0042	2.7%	2.0%	0.7%	0.0076
	7	1.8%	0.7%	1.1%	<0.0001	1.6%	0.8%	0.8%	<0.0001
	12	0.1%	0.0%	0.1%	<0.0001	-	-	-	-
	13	0.1%	0.0%	0.1%	<0.0001	0.1%	0.0%	0.1%	<0.0001
	17	0.1%	0.0%	0.1%	<0.0001	-	-	-	-
	44	0.1%	0.0%	0.1%	<0.0001	-	-	-	-
45	0.1%	0.0%	0.1%	<0.0001	-	-	-	-	

Summary

A review of the national literature and an evaluation of Iowa crashes indicated the following major safety concerns for young drivers:

- **Distraction**
 - An increased crash risk was found with the use of a cell phone/other electronic device, external distraction, eating/drinking, and eyes away from the road.
 - Iowa crash data showed that teen drivers were overrepresented in crashes involving the use of a hands-free device or other electronic device.
- **Seat Belt Use**
 - Younger drivers were slightly more likely to be unbelted in fatal crashes.
 - Teen drivers in Iowa were not overrepresented in crashes where seat belts were a factor.
- **Yielding ROW**
 - Iowa crash data showed that teen drivers were overrepresented in crashes involving failure to yield at uncontrolled intersections, stop signs, yield signs, and left turns.
- **Risky Behaviors**
 - National studies showed that following too closely and speeding were problematic for young drivers.
 - Iowa crash data showed that teen drivers were overrepresented in crashes involving speeding, following too closely, and passing on the wrong side.
- **Situational Awareness**
 - Iowa crash data showed that teen drivers were overrepresented in crashes involving a lack of situational awareness.
 - Crashes in school zones indicate that young drivers may not understand how to adjust driving for changing road conditions.
 - Crashes involving failure to dim lights or have lights on indicate that young drivers may not understand how to drive at night.
 - Crashes involving a lack of friction may indicate that young drivers lack experience on gravel roads or during weather conditions that impact the road surface.
- **Impaired Driving**
 - National data showed that younger drivers that were impaired were five to six times more likely to be in a crash.
 - Iowa crash data showed that teen drivers were not overrepresented in crashes involving impaired driving.
- **Passengers**
 - National literature showed that drivers with younger passengers have a two to seven times higher crash risk.
 - Iowa crash data showed that teen drivers with two to four passengers were overrepresented in crashes.
- **Challenging Roadways**
 - National literature showed that crash rates are higher in rural areas for young drivers and that crashes are more likely to be on high-speed roadways and curves.

3. SELECTION OF TOPICS

This chapter describes how a set of topics was identified for which additional curriculum material would be developed. The team first reviewed the types of crashes most common to teen drivers, as outlined in Chapter 2. The subsequent steps entailed comparing the curriculums for several Iowa driver education courses against national standards and the curriculums used in other states (Section 3.1), conducting a survey of professional and parent driving education instructors in Iowa (Section 3.2), and developing a set of recommended topics that was presented to a panel of stakeholders (Section 3.3).

3.1. Review of Iowa Driver Education Curriculum

The team reviewed several Iowa driver education curriculums and other state/national curriculums to identify gaps in the Iowa curriculums. The Iowa curriculums are not identified because the intent was to identify gaps rather than critique vendors' content. The team reviewed the several national and state-level curriculums in the following sources:

- AAA Foundation for Traffic Safety (AAAFTS) How to Drive
- Novice Teen Driver Education and Training Administrative Standards (NTDETAS)
- Evaluating Driver Education Programs by AAAFTS (Lonerio and Clinton 2006)
- Driver Education Practices in Selected States (Chaudhary et al. 2011)
- Evaluation of New Jersey's Graduated Driver Licensing Program (Williams et al. 2010)
- National Overview of Driver Education (NHTSA n.d.)
- Driver License Testing of Young Novice Drivers (Haire et al. 2011)
- A Fresh Look at Driver Education in America (Thomas et al. 2012a)
- State of Idaho Technical Assessment of the Driver Education Program (Fife et al. 2013)
- State of Vermont Technical Assessment of the Driver Education Program (Costales et al. 2011)
- State of Maryland Technical Assessment of the Driver Education Program (Costales et al. 2010)
- Examination of Supplemental Driver Training and Online Basic Driver Education (Thomas et al. 2012b)
- State of North Carolina Technical Assessment of the Driver Education Program (Hanson et al. 2015)
- State of North Dakota Technical Assessment of the Driver Education Program (Hanson et al. 2014)
- State of Oregon Technical Assessment of the Driver Education Program (Lewis et al. 2010)
- State of Washington Technical Assessment of the Driver Education Program (Calvin et al. 2016)

The modules for each state and national curriculum that were reviewed were compared against the Iowa curriculums, and gaps were noted. Due to the large amount of information that was summarized, it is not included in this report.

3.2. Survey of Instructors

Needs and best practices were obtained from Iowa-based driver education instructors and parents who have served as instructors for their own novice drivers. A separate survey was developed for each group. The survey was developed in Qualtrics so that it could be completed online. The Iowa Department of Transportation (DOT) maintains a list of driver education instructors within the state. It also has access to a list of parents who have served as instructors. Emails for each group were made available to the team. A short description of the project and a link to the survey was sent to each group by email.

3.2.1. Responses from Driver Education Instructors

Instructors were asked about student behaviors that they felt should be addressed in the curriculum that are not currently addressed or that should be addressed in more detail. Figure 3.1 illustrates the instructor responses. The most common responses were having parents be more involved in the driver education and driving experience with their teen and addressing texting while driving. The next most common responses were addressing distraction and helping teens learn to anticipate and think through driving situations in order to make correct driving decisions. Driver education instructors also noted that they thought the driver education curriculum could benefit from coordinating the driving and online portions of driver education, although this was not a specific topic. The last set of topics noted in Figure 3.1 include addressing speeding, cell phone use, use of prescription medication while driving, strategies to say no, and managing anxiety while driving.

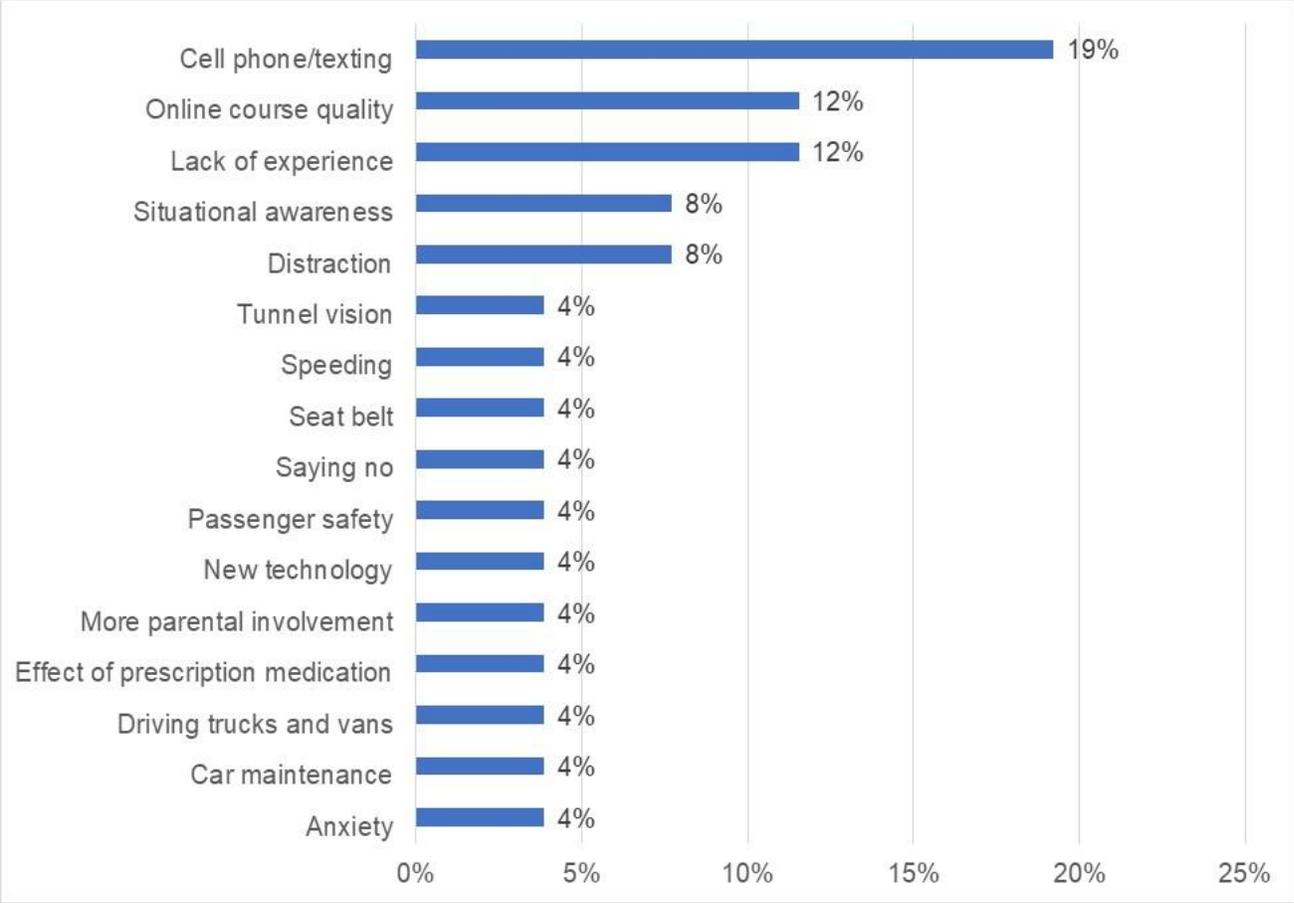


Figure 3.1. Topics driver education instructors felt should be addressed

Instructors were asked whether they had adjusted the curriculum based on behaviors they have noticed. Responses are shown in Figure 3.2. Driver educators noted that parking was the topic that was most commonly added, followed by additional information about texting, cell phone laws, and distraction. Driver educators also added information about engaging parents in the learning process, prescription drugs, managing anxiety, and intersection negotiation.

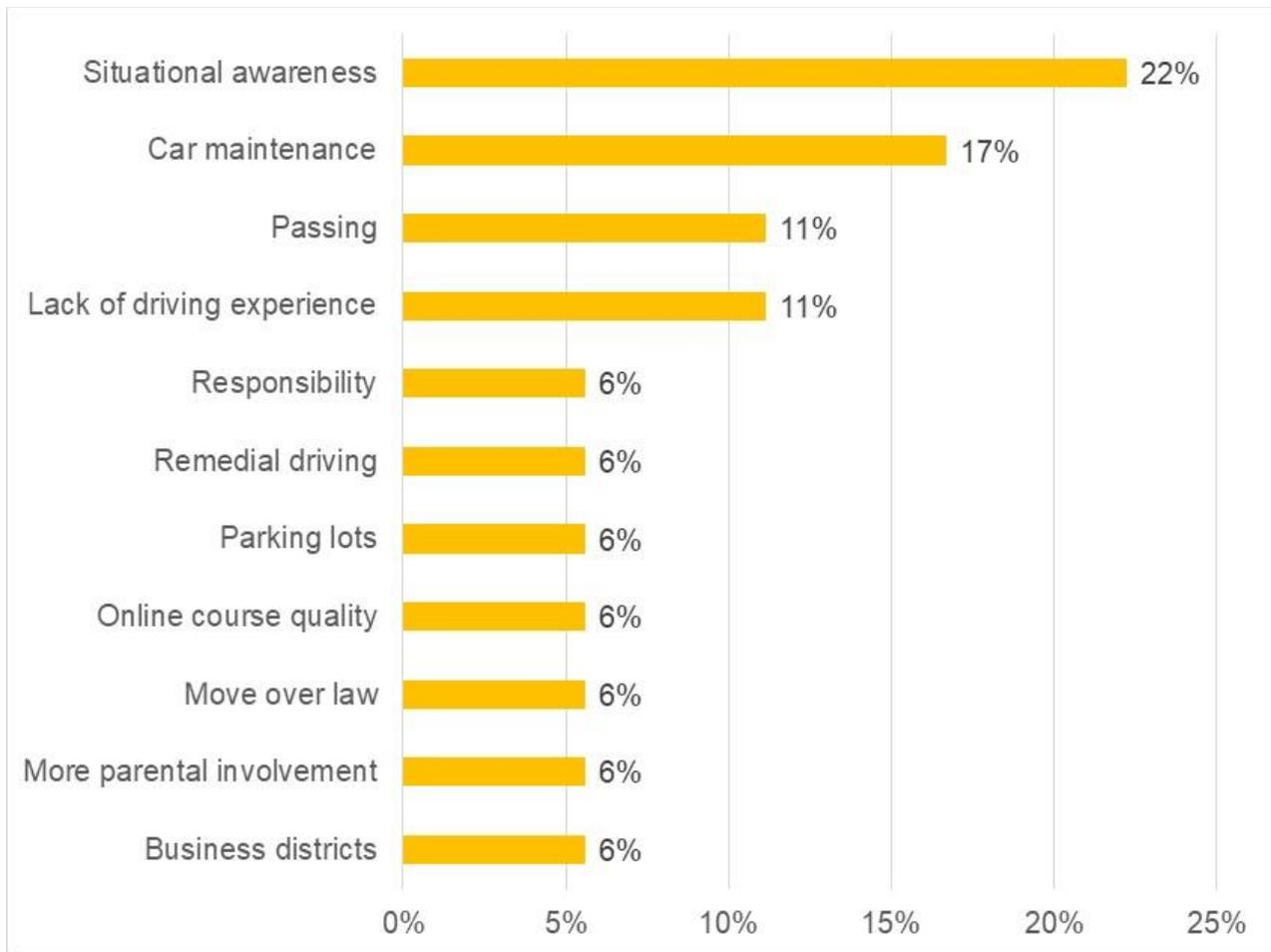


Figure 3.2. Topics driver education instructors added to the curriculum

Instructors were also asked about any specific topics that they felt were not relevant or that too much time was spent on in the curriculum. Four instructors indicated that while they thought learning about alcohol and drugs was important, too much time was spent on that topic. Several instructors noted that there was a good balance between topics, while several noted the topics in general did not translate to actual driving.

Table 3.1. Topics driver educators thought were overcovered

Response	Percent
Already good balance	53%
Less time on alcohol and drug topics (felt it was overkill)	21%
Less time on topics overall	11%
Too much time in class/too little time on road	5%
Transferability between class and online	5%
More time in general on topics	5%

3.2.2. Responses from Parent Instructors

Parents who had served as instructors for their child's driver education within the last year were also questioned about their experiences. A total of 104 parent instructors responded to the survey. Not all responded to all questions.

Parent instructors were asked if there were any topics that they felt were missing from the course. Two parent instructors listed the following topics as missing:

- Distraction
- Gravel/rural roads
- Low-friction scenarios (black ice, standing water)
- Protocol when involved in vehicle malfunction or crash

One parent instructor listed each of the following:

- Adverse weather
- Cell phone use
- Driving in parking lots
- High-speed driving
- Occupants
- Overcorrecting
- Parallel parking
- Soft shoulders
- Stopping for school buses
- Understanding traffic signs

Parent instructors were also asked if there were any topics that were not covered sufficiently, with the following responses:

- Distraction
- Understanding traffic signs
- Protocol when involved in vehicle malfunction or crash
- Low-friction scenarios (black ice, standing water)
- Cell phone use

Parent instructors were also asked about topics that they thought were redundant or not important, with the following responses:

- Not parking on railroad tracks
- How to secure a baby carrier
- Basic vehicle usage

- Introduction on driving
- Insurance
- Alcohol and drugs
- Pitch and yaw
- Excessive rules about driving at uncontrolled speeds that were not helpful

Parent instructors were also asked whether they provided any supplemental information, with the following responses:

- Avoiding vehicles
- Crossing a highway
- Distracted driving
- Driving in bad weather
- Driving on gravel
- General road hazards
- Maintaining lane position
- Parallel parking
- Right turn on red
- Situational awareness
- Vehicle maintenance

3.3. Stakeholder Workshop

The next step was to hold several workshops with driver education stakeholders. The intent was to discuss the various topics identified through the literature review and the responses from driver educators and parent instructors and to select a set of final topics. An initial list of topics was selected based on which crashes were overrepresented for teen drivers, which issues were identified by driving instructors or parent instructors, and which topics were suggested in the national curriculum. A matrix was developed for the various topics, as shown in Table 3.2.

Table 3.2. Matrix of topics and sources

Topic	Literature (Number of References)	Iowa Crash Data	Driving Instructor			Parents Additional Topics
			Behaviors	Additional Topics	Extra Curriculum	
Roadway/Environment						
September		X				
Time	Midnight to noon	2:00 p.m. to 4:00 p.m.				
Two-Lane Roads	3					
Stop Sign	1					
Four- or Three-Leg Intersection		X			Intersection negotiation	
Curves	2					
50 to 55 mph	2					High-speed driving
Loss of Traction		X				
Adverse Conditions						X
Rural	1	X				X
Unpaved						X
Soft Shoulders						X
Vehicle/Other						
Head-On, Angle Oncoming Left, Broadside		X				
Driving Vehicles with High Center of Gravity				X		
Basic Maintenance (Oil, Flat Tires)			X			
Driving in Specific Locations			Business district, parking lot			
Parking					X	Parallel parking
Engaging Parents					X	
What to Do in a Crash						X
Parental Role Model	1					

Invitations were sent to 55 individuals from various agencies and groups, including the Technical Advisory Committee (TAC) for this project, the Iowa State Patrol, Iowa counties, the Iowa Governor's Traffic Safety Bureau (GTSB), trucking agencies, emergency medical services, advocacy groups, driver educators who participated in the survey, and parent instructors who participated in the survey.

Two different workshops were held. Nineteen stakeholders attended one of the two meetings that were held in August of 2023 at the Institute for Transportation (InTrans) in Ames, Iowa. The team conducted a short presentation on the project objectives and how the set of topics for discussion was selected, which included the following:

- Distraction
- Seat belt use
- Yielding ROW
- Risky behaviors
- Situational awareness
- Decision-making
- Impaired driving
- Vehicle occupants
- Challenging roadways

The workshop participants discussed what they felt should or should not be included in each topic. At the conclusion of the two workshops, information was summarized for each topic, and the team developed content as described in the following chapter.

4. DEVELOPMENT OF ADDITIONAL CURRICULUM

4.1. Development of Modules

Module topics were identified as described in Chapter 3 and included the following:

- Challenging roadways
- Distraction
- Impairment
- Intersection/Right of way
- Risky behavior
- Speeding
- Situational awareness
- Passengers

Each module included statistics about teen crashes in Iowa (as relevant), and content was developed to include information that was important based on national driver education standards, input from the stakeholders, and team expertise. Information was developed using PowerPoint, with one PowerPoint presentation per topic. The presentations were developed so that instructors could use the entire presentation or pick out slides and information relevant to their needs. Notes were provided for each slide as an instructor guide and included sources and other information that may be useful for each particular topic. Learning objectives were also developed for each topic, along with a set of questions and answers that could be utilized by instructors. A Word document was also prepared for each topic that provided a set of additional resources. The TAC was invited to review each module, and changes were made as requested. A communications team developed a PowerPoint template that was used to ensure consistency across presentations. The communications team also provided technical editing and developed a web page to initially host the material.

4.2. Development of Videos

4.2.1. Introduction

This section of the report outlines the key stages in the process of creating a series of video tutorials aimed at improving teen driver education. Video tutorials offer a chance for creative expression, as they allow the combination of various elements like scripting, visuals, sound, and editing. This effort was a collaboration between the InTrans research team, the TAC, and the InTrans communications team. The goal was to develop an engaging and informative video series to address common struggles that teen drivers face while learning to drive and to provide instructional support for educators.

4.2.2. Selection of Content

The first step in the creation of these video tutorials was identifying the key topics that would be most beneficial for the teen audience. The tutorials selected were designed around the driver education topics discussed throughout this report.

To ensure relevance and effectiveness, the InTrans team worked closely with the TAC to determine which topics teens often struggle with the most during their driver education courses.

Thorough discussions were conducted, reviewing project content thus far and providing feedback loops from both educators and teens in the community to highlight key areas of difficulty. The TAC's expertise in driver safety education played a crucial role in identifying the content that would have the greatest impact on teen drivers. Some of the critical areas chosen included understanding road signs, handling difficult driving conditions, and navigating high-risk driving scenarios such as nighttime driving and distracted driving.

The list of selected topics was refined to form a coherent structure for the video tutorials, ensuring that each subject addressed real-world challenges that teens may face while behind the wheel.

4.2.3. Identifying Speakers

The next step was selecting qualified speakers to present the content in the video tutorials. The InTrans team and TAC members collaborated to identify individuals who had a proven track record in educating teen drivers. After receiving guidance from the TAC on who they thought should be contacted for video interviews, the researchers narrowed the selection down to three professionals. This included professionals who have previously offered driver education instruction during their careers.

The selected instructors included the following:

- Trooper Paul R. Gardner, Iowa State Patrol, Public Resource Officer for District 7, Fort Dodge, Iowa
- Ed Jennings, Personnel Manager at Streetsmarts Driver Education, West Des Moines, Iowa
- Andy Nelson, Lead Instructor and Driver Rehabilitation Professional, President of the Iowa Association of Safety Education, and President of the Driving with Disabilities Foundation

The speakers were primarily chosen based on their previous experience with driver education in Iowa. The selected professionals have extensive background in delivering driver education courses and have a deep understanding of the challenges that teens often encounter during their learning process. These speakers are also adept at presenting complex topics in a clear, engaging manner, making them ideal candidates for delivering content that would resonate with a teen audience.

Selecting speakers with a history of successfully educating teens ensured that the video tutorials would be both informative and engaging, reinforcing key lessons in a way that would hold the attention of young learners.

4.2.4. Development of Videos

Once the topics and speakers were finalized, the next step was the development of the video tutorials. The InTrans technical team worked closely with the InTrans communications team to create a structured list of topics that would be covered in the video series. This predefined list of topics was tailored specifically to address the needs of teen drivers, as well as instructors who would be using these resources in their own teaching.

Scripting and storyboarding were conducted for each tutorial to ensure that the instructions were clear, were concise, and covered all necessary steps. Additionally, other supporting material was gathered to create and help visualize the flow of each video, identifying key actions, visual cues, and where screen recording would be needed. The communications team also gathered statistics from Iowa to include in the instructional videos to keep students engaged.

The videos were developed in a format that would appeal to both teens and driving instructors. Each video included clear explanations, practical demonstrations, and visual aids to enhance understanding. For example, topics such as parallel parking were broken down into step-by-step instructions, accompanied by on-screen demonstrations to help teens visualize the process.

In addition to the general tutorials aimed at teen drivers, a separate set of videos specifically for instructors was also created. These instructional videos were designed to help educators use the teen driver tutorials effectively in their own teaching environments. The instructor-specific videos included tips on how to facilitate discussions, promote safe driving behaviors, and address common challenges faced by teens in driver education.

The creation of the video tutorials was a collaborative effort that involved careful planning, the selection of relevant content, and the identification of skilled speakers. The combination of a well-curated list of topics, expert presenters, and the support of the InTrans communications team allowed the researchers to create a comprehensive and engaging series of videos that cater to the needs of both teen drivers and their instructors. Through this project, the aim was to enhance driver education by providing accessible, high-quality resources that promote safe driving practices for Iowa's teen drivers.

4.2.5. Video Descriptions

The developed videos included the following:

- Five videos with Paul Gardner that focused on the following:
 - Seat belts
 - Impaired driving

- Distracted driving
- Excess speed
- Move over, slow down
- Two videos with Ed Jennings that focused on the following:
 - Communication
 - In the vehicle as a driver education instructor
- Three videos with Andy Nelson that focused on setting expectations for the following groups:
 - Students
 - Parents
 - Instructors

A short description of each video is provided below.

4.2.5.1 Seat Belts

The video, presented by Paul Gardner, focuses on the Iowa State Patrol’s initiative to reduce traffic deaths and promote safety through the Seat Belts, Impaired Driving, Distracted Driving, and Excessive Speed (SIDE) campaign, as well as the importance of seat belt use.

Iowa State Patrol’s Seat Belt Initiative. Gardner introduces the Iowa State Patrol’s annual “below 300 initiative,” also known as SIDE. This initiative aims to reduce traffic fatalities in Iowa to under 300 each year. However, the state has not achieved this goal since 1925, highlighting the ongoing challenge of reducing traffic deaths.

Seat Belt Importance. Gardner emphasizes the importance of seat belts in reducing fatalities. While seat belts do not prevent accidents, they are crucial for survival, as between 40% to 50% of people killed in traffic accidents in Iowa are not wearing seat belts. The video emphasizes that wearing a seat belt is one of the most effective ways to protect oneself in the event of a crash.

Legal Requirements and Proper Usage. Gardner explains the legal requirements around seat belt use in Iowa. Everyone in the front seat is required to wear a seat belt, and depending on their age, people in the back seat must also be buckled in. Specifically, anyone under 18 is required by law to wear a seat belt, and failure to do so can result in a traffic ticket. The video also encourages people to wear the seat belt properly, over the shoulder and lap, not under the arm or behind the back. The video reminds drivers that improper use of a seat belt can lead to a ticket.

Common Misconceptions. Gardner addresses a common misconception that people will only put on their seat belt right before a crash or when they see a police officer. The video warns against this attitude and stresses that the seat belt should be put on as soon as the driver gets into the vehicle, before starting the car. It takes only a few seconds, and wearing it correctly could be the difference between life and death in the event of a crash.

Proximity to Home and Crash Impact. The video reminds viewers that most crashes occur close to home, emphasizing the importance of wearing a seat belt even for short trips. It compares the impact of a crash at 30 mph to jumping from a third-story window, illustrating how dangerous even low-speed collisions can be. The seat belt significantly increases the chances of surviving a traffic crash.

Key Takeaway. The video focuses on promoting the SIDE initiative, aiming to reduce traffic deaths in Iowa, and emphasizes the life-saving importance of wearing a seat belt. It explains the legal requirements for seat belt use, correct seat belt usage, and addresses common misconceptions about when to wear one. The video concludes by highlighting the importance of wearing a seat belt for every trip, regardless of distance, as a simple yet crucial safety measure.

4.2.5.2 Impaired Driving

The video, presented by Paul Gardner, covers key points related to impaired driving.

Preventability of Crashes. Gardner starts by emphasizing that crashes caused by impaired driving are entirely preventable. The focus is on responsible decision-making before going out, particularly ensuring that someone who has been drinking has a sober, designated driver or an alternative means of transportation, like an Uber, taxi, or ride from a friend or family member.

Consequences of Impaired Driving. Gardner explains the serious consequences of driving under the influence (DUI), including the likelihood of arrest, losing one's driver's license, and the potential for life-altering impacts such as job loss or the loss of scholarships. The video then warns about the more severe consequences of causing an accident while impaired, such as injury or death to others, and the legal ramifications of these actions.

Field Sobriety Tests and Implied Consent. In the video, Gardner addresses the legal aspects of impaired driving. He notes that field sobriety tests are not mandatory but clarifies that if a driver refuses to take a chemical test (like a breathalyzer test) after being pulled over and read the implied consent advisory, there will be more severe consequences. Implied consent means that, by law, drivers are assumed to agree to chemical testing if an officer has reasonable grounds to suspect impairment.

Message of Responsibility. The main takeaway from this section of the video is a call for responsibility when celebrating. Viewers are urged to plan ahead for a safe way home if they are consuming alcohol, highlighting the importance of not making the decision to drive impaired.

Key Takeaway. Plan ahead, be responsible, and ensure a sober ride home to avoid the life-altering consequences of impaired driving.

4.2.5.3 Distracted Driving

The video, presented by Paul Gardner, addresses issues related to distracted driving, specifically focusing on how law enforcement officers can tell when someone is using a phone while driving.

Identifying Phone Use. Gardner explains how an officer might determine whether a driver is using a phone. He notes that while sometimes phone use is obvious, like when a person is texting or scrolling through social media, other times it is more difficult to identify. An officer who suspects texting while driving can still issue a ticket but would need to explain the reasoning in court. An officer might identify phone use if the screen of the phone does not appear to be showing navigation, suggesting that the driver might be using the phone in a way that distracts from the driving task.

Teenage Drivers and Hands-Free Laws. The video highlights that teenage drivers (those with instruction permits, school permits, or intermediate licenses) are not allowed to hold a phone at all while driving. They must use hands-free technology like Bluetooth if they want to make calls.

Distracted Driving Beyond Phones. Gardner points out that distractions while driving are not limited to phones. Anything that takes the driver's attention off the road—like changing the radio or talking to passengers—can be dangerous. The core message is that driving requires full attention at all times.

Legal Changes Around Distracted Driving. Gardner explains a shift in the law regarding distracted driving. He explains that a few years ago, texting while driving was a secondary violation (meaning that an officer could only issue a ticket for this offense if the officer had stopped the driver for another reason). Now, distracted driving can be a primary violation, so if an officer sees a driver obviously using a phone in a distracting way (like texting or using social media), the officer can pull over the driver and issue a ticket.

Key Takeaway. The video addresses how law enforcement detects phone use while driving, the restrictions on teenage drivers, the broader issue of distracted driving, and the legal evolution of distracted driving violations. The message encourages drivers to stay fully focused on the road, especially given the legal implications of using a phone behind the wheel.

4.2.5.4 Excess Speed

This video addresses the dangers of speeding and the importance of driving at safe speeds.

Speeding and Its Consequences. The video explains that people often speed when they are running late, thinking that driving faster will help them get to their destination sooner. However, this is a misconception, as speeding increases the risk of accidents and getting pulled over by law enforcement, which could add more time to the trip. The video also emphasizes that getting comfortable with speeding—starting with a few miles per hour over the limit—can lead to more dangerous driving behaviors, like regularly exceeding the speed limit by 10, 15, or even 20 mph.

Common Misconception About Speeding. The video answers the common question officers get about how much over the speed limit is acceptable (e.g., “Can I go 5 or 10 mph over?”). The answer is clear: No, you cannot go over the speed limit at all. Even 1 mph over the posted speed limit can result in a ticket.

Safe Driving Practices. The video emphasizes that driving at a safe speed is the best practice, highlighting that sometimes even the posted speed limit is not safe, particularly in adverse conditions like winter storms. It urges drivers to adjust their speed according to the road conditions, not just the posted speed limit.

Key Takeaway. The video focuses on the dangers of speeding, explaining that speeding does not help drivers arrive faster and can lead to accidents or traffic tickets. It clears up the misconception that driving slightly over the speed limit is acceptable and stresses the importance for drivers to adjust their speed to match road and weather conditions to ensure safety. The key message is that driving at a safe speed is crucial for avoiding consequences and protecting all drivers on the road.

4.2.5.5 Move Over, Slow Down

This video, presented by Paul Gardner, covers Iowa’s Move Over, Slow Down law, which emphasizes the importance of giving space to emergency vehicles. The video covers several key aspects of road safety and driving laws, focusing on the need to move over for emergency vehicles, school bus laws, and the importance of staying alert for slow-moving vehicles.

Move Over Law for Emergency and Maintenance Vehicles. The video emphasizes the importance of slowing down and moving over when approaching a vehicle with flashing lights, whether it is a police car on a traffic stop, emergency vehicles at a crash scene, or maintenance vehicles on the side of the road. Drivers must move over into another lane when possible and slow down to a speed that allows them to stop if needed. This law also applies to drivers with flat tires or any vehicle with flashing hazard lights, as it is important to provide these vehicles space to work safely.

Exceptions for Divided Highways. Gardner explains that drivers do not need to pull over for an emergency vehicle when traveling in the opposite direction on a four-lane divided highway, as this traffic does not affect the emergency vehicle’s work. However, on two-lane roads or city streets, drivers must pull over to the right and let emergency or maintenance vehicles pass.

School Bus Laws. Gardner notes that there are laws regarding school buses that must be adhered to in order to keep school children safe. The video discusses the importance of stopping for school buses. Drivers must stop when approaching a school bus from the opposite direction and are not allowed to pass when behind a bus whose red lights are flashing. This rule is in place to protect children who are crossing the street. The exception is on divided highways with more than two lanes, where traffic in the opposite direction does not need to stop.

Spring and Fall Driving Caution. Gardner discusses the impact that weather may have on the driving experience. The video advises extra attention when driving in spring and fall, as slow-moving vehicles like tractors are more common on the road during these times. Drivers should stay alert and be prepared to slow down if they encounter one of these vehicles unexpectedly, especially if they crest a hill and suddenly find a vehicle in front of them.

Key Takeaway. The video stresses the importance of safety when encountering emergency vehicles, school buses, and slow-moving vehicles. Drivers must follow the Move Over, Slow Down law, stop for school buses when necessary, and remain extra cautious during spring and fall due to unpredictable slow-moving traffic. The key message is to stay alert, move over for emergency vehicles, and follow all laws to keep everyone on the road safe.

4.2.5.6 Student Communication

The video, presented by Ed Jennings, focuses on communication between instructors and students. Addressing driving instructors, Jennings explains that many students are hesitant to ask questions because they fear being judged for not knowing something. As a result, Jennings stresses the importance of instructors asking the students questions and creating an open, supportive learning environment. He explains that it is the instructor's responsibility to ensure that students gain the knowledge and confidence needed to drive safely.

The video outlines strategies for effective teaching during student driver training, focusing on communication, consistency, and the importance of involving parents in the learning process.

Encouraging Student Communication. The video highlights the importance of asking students questions to help them feel comfortable discussing their driving experiences and concerns. This approach helps build a rapport and allows instructors to understand what makes students nervous or the situations they find intimidating. By asking students about their driving habits, who they drive with, and the challenges they face, instructors can tailor lessons to meet the students' specific needs.

Verbalizing Driving Decisions. Jennings explains the importance of students verbalizing their thoughts and decisions while driving. For example, before making a left turn at a green light, the instructor might ask, "What are we going to do when the light turns green?" This encourages students to actively think through their actions and helps them develop the habit of verbalizing their decision-making process, making it more natural and instinctive.

Consistency in Terminology. Jennings stresses the need for consistency in teaching driving terminology. Using clear and consistent terms is important for the students' understanding, but instructors should also be aware that students might hear different terms from their parents or others. For example, the turn signal can be referred to as an "indicator," "directional," or "blinker," but all of these terms mean the same thing. Discussing these variations helps avoid confusion and ensures that students can understand terms from various sources.

Reviewing Previous Lessons. Jennings explains that instructors should review what was learned in the previous session at the start of each new driving lesson. This helps reinforce the students' memory and understanding, making it easier for them to retain information. It also allows instructors to assess how much the students have learned and ensure that they are ready to move on to more advanced topics.

Setting Clear Expectations. Establishing clear expectations with both the student and their parents is emphasized as crucial. By making sure that everyone is on the same page, instructors can help ensure that students receive consistent reinforcement at home and during driving lessons, which leads to better learning outcomes.

Involving Parents in the Learning Process. Jennings stresses the importance of involving parents in the student's driving education. Parental involvement is key to reinforcing the lessons learned during driving sessions and supporting the student's progress. This partnership between the instructor, student, and parents helps maximize the effectiveness of the learning process.

Key Takeaway. The video highlights the importance of communication, consistency, and collaboration in teaching student drivers. By encouraging students to verbalize their thoughts, using consistent terminology, reviewing past lessons, setting clear expectations, and involving parents, instructors can create an effective and supportive learning environment that enhances the student's driving skills and confidence.

4.2.5.7 Inside the Vehicle

This video, presented by Ed Jennings, focuses on key principles for effective driver education, particularly regarding how to approach teaching students about vehicle controls, steering, and driving fundamentals.

Pre-Drive Checks and Adjustments. The video emphasizes the importance of demonstrating pre-drive checks and adjustments, such as how to properly adjust the seat, mirrors, and steering wheel. The instructor should not assume that the student already knows how to do these things, as there are different methods and techniques for each task. This step is crucial for identifying what the student already knows and for clearing up any misunderstandings or misconceptions before hitting the road.

Non-Moving Drills. Jennings highlights the value of conducting non-moving drills while the vehicle is parked. For example, practicing steering wheel control while the car is stationary helps the student become comfortable with the car's controls without the added stress of being in motion. This is a safer and more focused way to ensure that the student is ready before taking the car into traffic. It also boosts the student's confidence and allows for better learning.

Avoiding Preset Expectations. Jennings advises against having preset expectations about what students already know when they enter the car. Even if some students have prior experience, for example, if they have practiced with their parents, it is important to avoid assuming that they

have a certain level of knowledge. Instead, instructors should treat all students as if they are coming in with no prior experience, ensuring that all necessary basics are covered thoroughly.

Exposure to Different Techniques. Jennings encourages exposing students to multiple ways of performing tasks or solving driving challenges. This allows students to understand that there is often more than one correct way to handle a situation. While some methods may be safer than others, the goal is to give students options so they can make informed decisions when driving on their own.

Efficiency in Teaching. Jennings stresses the importance of using the limited time available in driver education efficiently. Since the instructor only has so many hours with each student, it is crucial to make every lesson count by focusing on practical teaching methods that reinforce learning and build the student's driving skills effectively.

Key Takeaway. The video focuses on foundational teaching techniques in driver education. Key points include demonstrating essential vehicle controls, conducting non-moving drills to build confidence, avoiding assumptions about a student's prior knowledge, offering different approaches to driving tasks, and prioritizing efficiency in the teaching process. The overall goal is to provide a well-rounded, practical, and confidence-building learning experience for the student driver.

4.2.5.8 Setting Expectations: Students

This video, presented by Andy Nelson, outlines key strategies for driving instructors to establish a positive and effective teaching environment while ensuring safety and trust between the instructor and student.

Instructor Control and Safety. Nelson stresses that the instructor should always maintain control of the vehicle to ensure the safety of everyone in the car, particularly the student driver. By clearly communicating that the instructor has a brake and gas pedal on his or her side of the vehicle, the instructor reassures the student that safety is the priority. This statement sets clear expectations about the instructor's role in managing the driving experience.

Building Trust with the Student. The video emphasizes the importance of trust in the instructor-student relationship. Instructors are encouraged to avoid negative comments like "You did that wrong" and instead focus on positive reinforcement. When mistakes happen, instructors should shift the conversation to improvement, asking questions like "How can we do better next time?" or "What can we do to scan the intersection more effectively?" This approach helps keep the student motivated and focused on learning rather than feeling discouraged.

Adapting to Local Driving Conditions. The video explains that instructors need to consider the specific driving conditions of their region. For example, in southeast Iowa, there are mostly two-lane highways, few four-lane roads, and no nearby Interstates. In such areas, instructors should discuss the expected driving speed and reassure students that it is okay to drive slower and let

other cars pass, especially for new drivers. The focus should be on safety, and instructors should communicate to both the students and their parents that driving at a slower pace is perfectly acceptable.

Providing Additional Resources. Nelson acknowledges that there is only so much time in a driving lesson but encourages instructors to provide additional resources, like YouTube videos, to help students understand specific driving concepts. For example, videos about how to merge onto an Interstate or navigate roundabouts and new interchanges can be valuable. Although time constraints limit what can be taught in person, providing resources allows students to learn more at their own pace outside of the lessons.

Key Takeaway. The video highlights several key teaching strategies for driving instructors, including maintaining control of the vehicle for safety, building trust through positive reinforcement, adapting lessons to local driving conditions, and providing additional learning resources. The overall approach is focused on creating a safe, supportive, and effective learning environment that encourages improvement and reassures students throughout the learning process.

4.2.5.9 Setting Expectations: Parents

This video covers the essential communication between driving instructors and parents, ensuring that both parties are actively involved in the student's driving progress.

Post-Drive Communication with Parents. The video emphasizes the importance of communicating with the parents after each driving session. The instructor should provide feedback on what the student has worked on during the lesson and suggest specific skills to practice at home. By focusing on one skill at a time, the student can improve before the next lesson. This communication also includes offering to have parents sit in on a session to observe how the instructor works with their child, helping parents understand the teaching tone and methods, which could benefit their own practice at home.

Progress Updates and Parent Accountability. The video highlights the necessity of informing parents if their child is not progressing as expected. If there is no noticeable improvement, the instructor should approach the parents and inquire whether their child is practicing at home. If home practice is not happening, the instructor needs to make it clear that the student has a limited number of lessons remaining before the final exam, emphasizing the urgency of consistent practice.

Considering the Vehicles Used at Home. The instructor should recognize the difference in vehicles that students may drive at home compared to the instructor's car. For example, many students might be driving newer vehicles or vehicles with certain features, while the instructor's car could be older or have different features. The video advises instructors to ask parents about the type of vehicle their child is learning in at home, as vehicle differences (like blind spots) can affect how the student drives. Instructors are encouraged to offer insights about how the

vehicle's design can impact driving and safety, helping parents understand what their child might face on the road.

Key Takeaway. The video emphasizes the importance of strong communication between driving instructors and parents. Instructors should provide feedback after each lesson, guiding parents on how to support their child's practice at home. If the student is not progressing, the instructor should address the issue with the parents and stress the need for home practice. Additionally, instructors should consider the types of vehicles students drive at home and offer advice on how different vehicle characteristics can impact driving, ensuring a comprehensive approach to the student's learning process.

4.2.5.10 Setting Expectations: Instructors

This video, presented by Andy Nelson, focuses on the training and ongoing development of driving instructors, highlighting key aspects of effective instruction and the importance of adaptability.

Structured Learning Plan. Nelson discusses a structured approach to teaching new instructors, emphasizing the core lessons for each drive (first, second, third drive, and so on). These include foundational driving skills like handling four-way stops, intersections, speed control, and right- and left-hand turns. However, the content should be adapted based on local driving environments. For example, lessons might be adjusted for higher or lower traffic areas. It is important that instructors understand these variations and ensure that they are on the same page with the curriculum.

Teachable Moments and Flexibility. Nelson highlights the importance of flexibility during lessons. Instructors are encouraged to seize "teachable moments" that naturally arise during a drive, such as encountering road construction, dealing with a train at a railroad crossing, or moving over for an emergency vehicle. These moments can provide valuable learning experiences. However, the video also acknowledges that every student is different, and if issues arise, it may be necessary to stop and regroup before continuing the lesson.

Ongoing Support and Communication. Nelson stresses that instructors should not hesitate to seek support if challenges arise during lessons. If instructors encounter an issue that they are unsure how to address, they are encouraged to reach out to the classroom instructor or school owner for guidance. This continuous support ensures that instructors have the resources they need to be effective.

Continuous Professional Development. Instructors are reminded that their learning does not stop once they are trained. They are encouraged to seek out professional development opportunities and to reach out for help when needed. Just like in regular education, ongoing development is essential for keeping up with new information and best practices in driver education. The video emphasizes that if instructors stop learning, they risk being unable to

effectively answer students' questions, which can harm their credibility and the trust they have built with students.

Maintaining Expertise and Building Trust. The video concludes by highlighting the importance for instructors to maintain their expertise. Instructors are seen as resources and experts, and students rely on their guidance. If instructors are unprepared or unable to answer questions, it can erode trust and diminish the effectiveness of the learning experience. Therefore, it is crucial for instructors to continuously expand their knowledge and maintain a high level of competence.

Key Takeaway. The video focuses on the key elements of training and supporting driving instructors, including the structured learning plan for each driving session, the importance of flexibility to take advantage of teachable moments, and the ongoing support instructors should seek when they face challenges. The video also stresses the need for continuous professional development to maintain expertise, ensuring that instructors remain credible and reliable resources for their students.

5. BACKGROUND INFORMATION CONSIDERED TO MAKE RECOMMENDATIONS FOR CHANGES TO CURRICULUM AND ADMINISTRATIVE RULES

One of the project objectives was to suggest recommendations for the following:

- Proposed changes to the Iowa Code and Administrative Rules regarding the Iowa driver education curriculum
- Recommendations on how the material can be utilized and applied
- Recommendations on improving driver education for novice drivers in Iowa

In order to develop recommendations, the team took the following steps:

- Reviewed national curriculums, other states' curriculums, crash issues in Iowa, feedback from driver education instructors, and feedback from stakeholders (described in previous chapters)
- Reviewed the Iowa Code and Administrative Rules (relevant rules are described in Section 5.1 below)
- Reviewed recommendations from the NHTSA, which conducted a review of the Iowa driver education program (see Section 5.2)
- Reviewed comments from the Iowa driver education instructors surveyed (as described in Section 3.2) about their experiences and recommendations for improving driver education in Iowa
- Developed a list of recommended state-specific content (see Section 5.1)
- Worked with the TAC to develop a set of recommendations in general

Chapter 5 summarizes the information used to make recommendations, with the recommendations themselves provided in Chapter 6. The relevant State Code and Administrative Rules are outlined below for reference. Other relevant information used to make recommendations follows.

5.1. Summary of State Code and Administrative Rules

The State of Iowa Code and Administrative Rules that discuss what content should be covered in driver education are summarized below. All of the text for a particular section is provided for clarity, with the relevant information highlighted in red.

In summary, the Iowa Code and Administrative Rules only require the following to be included in the curriculum. Additionally, the rules do not provide any specificity about what should be included. Requirements include the following:

- Four hours on substance abuse disorder and distracted driving
- Twenty minutes on railroad crossing safety

- Instruction providing an awareness about sharing the road with pedestrians, bicycles, and motorcycles
- Instruction on routine maintenance of motor vehicles to maximize energy efficiency and safety
- Instruction on operation of motor vehicles to maximize energy efficiency and safety

5.1.1. State of Iowa Code Section 321.178

321.178 Driver education — restricted work license — reciprocity.

1. Approved course.
 - a. An approved driver education course as programmed by the department shall consist of at least thirty clock hours of classroom instruction, of which no more than one hundred eighty minutes shall be provided to a student in a single day, and six or more clock hours of laboratory instruction of which at least three clock hours shall consist of street or highway driving. Classroom instruction shall include all of the following:
 - (1) A minimum of four hours of instruction concerning substance use disorder and distracted driving.
 - (2) A minimum of twenty minutes of instruction concerning railroad crossing safety.
 - (3) Instruction relating to becoming an organ donor under the revised uniform anatomical gift Act as provided in chapter 142C.
 - (4) Instruction providing an awareness about sharing the road with pedestrians, bicycles, and motorcycles. The instruction course shall be first approved by the state department of transportation. Instructional materials creating an awareness about sharing the road with pedestrians, bicycles, and motorcycles shall also be distributed during the course of instruction.

5.1.2. Iowa Administrative Rule 761.634.

761—634.4 (321) Driver education course standards and requirements.

2. **634.4(2)** Course requirements. Driver education courses must comply with the following:
 - a. Schools shall provide for each student a minimum of 1800 minutes in classroom instruction, plus 360 minutes in supervised laboratory instruction, exclusive of observation time, in a dual-control motor vehicle.
 - b. Each student shall be scheduled to receive classroom and laboratory instruction each week of the course but in no case shall laboratory instruction conclude later than 30 days after classroom instruction is completed.
 - c. Behind-the-wheel instruction shall be limited to a maximum of 30 minutes per student per session and a maximum of 60 minutes in a single day.
 - d. Two or more students shall be scheduled for all behind-the-wheel instruction to ensure that appropriate observation time is experienced.
 - e. Routine maintenance of motor vehicles to maximize energy efficiency and safety shall be included in classroom instruction.

- f. **Operation of motor vehicles to maximize energy efficiency and safety shall be included in classroom instruction.**
 - g. Each school district shall provide students who are absent from instruction an opportunity to make up a reasonable amount of time and coursework.
 - h. When driving simulators are used for part of the behind-the-wheel driving experience, four hours of simulator experience shall be considered equal to one hour of behind-the-wheel driving in the car. However, in addition to simulator time, a minimum of three hours of on-street, behind-the-wheel driving must be completed.
 - i. When driving ranges are used in driver education courses, two hours of range experience shall be considered equal to one hour of on-street, behind-the-wheel driving. However, in addition to range time, a minimum of three hours of on-street, behind-the-wheel driving must be completed.
 - j. Motor vehicles which are designed primarily for carrying nine or fewer occupants, excluding motorcycles and mopeds, are the only motor vehicles approved for use in driver education courses, and each shall be equipped with a dual control. In addition, all driver education vehicles shall have an inside rearview mirror and an outside rearview mirror mounted on each side of the vehicle.
 - k. The driver education teacher shall verify at the beginning of each course that each student possesses a valid instruction permit or driver's license. Each student shall be responsible for possessing an instruction permit or driver's license throughout all laboratory instruction and report any suspension, revocation, or cancellation of the instruction permit or driver's license to the driver education teacher prior to attending laboratory instruction.
3. **634.7(5) Instructor preparation requirements.** The department shall develop the curriculum in consultation with the Iowa driver education teacher preparation programs approved by the board of educational examiners and in consultation with the American Driver and Traffic Safety Education Association. Instructor preparation shall meet the following requirements:
- a. Instructor preparation shall consist of 24 clock hours of classroom instruction and 12 clock hours of observed behind-the-wheel instruction.
 - b. **At a minimum, classroom instruction shall focus on topics such as the psychology of the young driver, behind-the-wheel teaching techniques, and route selection.** Classroom instruction shall be delivered by staff from a driver education teacher preparation program approved by the board of educational examiners. The duration of a classroom session shall not exceed four hours. Video conferencing may be used for course delivery.
 - c. Observation of behind-the-wheel instruction shall be provided by a person licensed to teach driver education who is specially trained by a driver education teacher preparation program approved by the board of educational examiners to observe, coach, and evaluate behind-the-wheel instructor candidates. The duration of a behind-the-wheel session shall not exceed four hours. A dual-control motor vehicle must be used.
 - d. The individual seeking a behind-the-wheel certification must apply to the department within 12 months of the completion of the course.

5.2. Summary of NHTSA's Review of the Iowa Driver Education Program

In 2023, the NHTSA conducted a review of the Iowa driver education program (Beckham 2023). An NHTSA assessment is a technical assistance tool offered to states that uses an organized, objective approach with well-defined procedures to (1) provide an overview of the program's current status, (2) note the program's strengths and opportunities, and (3) provide recommendations for improvement. Often, the NHTSA assessments are cooperative efforts among state highway safety offices, the NHTSA's Office of Research and Program Development (NPD), and the NHTSA's Office of Regional Operations and Program Delivery (ROPD).

A Driver Education Program State Assessment is based on the information included in the Novice Teen Driver Education and Training Administrative Standards (NTDETAS). The foundation of the NTDETAS originated from the Uniform Guidelines for State Highway Safety Programs: Highway Safety Program Guideline No. 4, Driver Education 3.

The evaluators listed a number of challenges for the current Iowa driver education program that covered multiple aspects of the program. Challenges that were specific to curriculum and delivery included the following:

- No ongoing review occurs for curriculums. After a provider's course curriculum is initially approved, the providers and instructors are notified of any new laws or policies through email, but no further review occurs.
- No plans exist to evaluate the quality of individual driver education programs. No strategic guidance document, performance measures, research, or data evaluation plan is in place to evaluate the program. No mechanism exists to review programs such as a survey of instructors, students, or parents. Driver education classroom and behind-the-wheel instruction are currently only monitored through complaints.
- The curriculum is dependent on the individual school or instructor, since there are few state requirements for topics.
- The GTSB provides multiple media and education campaigns, offers resource materials, and has an annual safety conference, but driver education course providers do not consistently access materials or attend training events.

The evaluators listed a number of recommendations for the current Iowa driver education program that covered multiple aspects of the program. Recommendations that were specific to curriculum and delivery included the following:

- The NTDETAS and state standards, per the authority granted in existing state law and Administrative Rules through the Motor Vehicle Division and Department of Education, should be implemented, monitored, evaluated, and enforced.
- A driver education and training curriculum that meets or exceeds current nationally recognized curriculum content standards should be required.
- Driver education and training providers should be required to use state-approved formalized curricula as outlined in the NTDETAS.

5.3. Recommendations from Driver Education Instructors and Parent Instructors

As noted in Section 3.2, driver education instructors were surveyed and asked about information that they thought was lacking from the driver education curriculum. One question was about negative driving behaviors that they had noticed in students that they thought should be addressed or addressed in more detail in the curriculum. The behaviors they noted or topics that they thought should be addressed or addressed in more detail included the following:

- Cell phone use and texting (top concern)
- Lack of situational awareness
- Distraction
- Speeding
- Use of prescription medication while driving
- Managing anxiety
- Saying no
- Passenger safety
- Use of new technology

Parent instructors noted several topics that they thought were missing or not well covered in the curriculum, which included the following:

- Distraction
- Gravel/rural roads
- Low-friction scenarios
- Situations where the driver is involved in a vehicle malfunction or crash

Another concern driver education instructors noted was the quality of the online education course. They also noted that there would be a benefit to coordinating between the driving and online portion of the course. Instructors also noted a general lack of driving experience by the students when they arrived in the class.

Driver instructors were also asked about topics that they had included or enhanced in the curriculum because they felt the existing curriculum was lacking. Topics that driver education instructors had added or enhanced included the following:

- Parking
- Additional information about texting, cell phone laws, and distraction
- Engaging parents in the learning process
- Prescription drugs
- Managing anxiety
- Intersection negotiation

Parent instructors noted that they had added information about the following:

- Avoiding vehicles
- Crossing highways
- Distracted driving
- Driving in bad weather
- Maintaining lane position
- Parallel parking
- Right turn on red

6. RECOMMENDATIONS FOR CHANGES TO CURRICULUM AND ADMINISTRATIVE RULES

The following recommendations will be updated based on input from the TAC.

6.1. Suggested State-Specific Content

The main outcome of this project was the development of additional content that could be included in Iowa driver education courses. The content focused on addressing issues that have been shown to be correlated to Iowa teen driver crashes as well as national trends in safety concerns. The content was developed to be used by driver education teachers to supplement driver education course material for the specific topics. It can also be directly incorporated into a driver education course. The topics for which additional content was developed include the following:

- Distraction
- Speeding
- Impaired driving
- General risky behavior
- Seat belt
- Situational awareness
- Driving with passengers
- Intersection/Right of way
- Challenging roadways

As outlined above, in the course of developing the additional material for driver education courses, the team met with driver education, law enforcement, and traffic safety instructors to discuss limitations in Iowa driver education. Additionally, the team reviewed driver education content from national courses as well as requirements from various states. The team also conducted a thorough review of relevant literature about teen crash and safety issues. The team also has significant expertise in traffic safety. This collective knowledge was used to develop recommendations for what should ideally be included in Iowa driver education courses. These recommendations were limited to the nine topics noted above for which additional material was developed.

A detailed outline was created for each topic. The outline provided a high-level overview of subtopics that the team felt should be included. Initially, the team reviewed several of the specific Iowa driver education courses (such as Streets Smarts) and attempted to determine which subtopics were lacking in all of them. However, courses vary in the amount of content and how that content is developed. Additionally, new courses can be accepted by the Iowa DOT that would not be included in this review. As a result, a common set of information that was lacking in all courses could not be identified. It was also not feasible to review each course and provide course-specific recommendations. Instead, the team provided recommendations for content that should be covered in all courses. This information can be used by policymakers to set

requirements for statewide content and by course developers to update content to address top safety concerns for teen drivers.

The suggested content is provided in the sections below for each of the topics listed above. The list includes broad topics rather than specific details or facts that should be included.

6.1.1. Recommended Content for Distraction

This section describes recommended content to educate teen drivers about distraction.

- What is distraction?
 - Visual
 - Manual
 - Cognitive
- Myths of multi-tasking
 - Definition of multi-tasking
 - Discussion on why drivers cannot multi-task
- Distraction statistics
 - Crash statistics (focus on Iowa)
 - Time and distance traveled during distraction
 - Iowa laws on distraction
- Common distractions
 - Examples of visual distractions
 - Examples of manual distractions
 - Examples of cognitive distractions
- Social and emotional pressures to engage in distracting activities
- Strategies to reduce distracted driving
 - Strategies for driver (i.e., use phone apps)
 - Strategies to speak up when drivers are distracted

6.1.2. Recommended Content for Speeding

This section describes recommended content to educate teen drivers about speeding.

- Speed limits
 - Purpose of speed limits
 - What do they mean
 - Iowa penalties for speeding
 - Special situations (school zone, work zone, advisory)
 - Unposted
- What is speeding?
 - Too fast for conditions as well as over speed limit
 - Drag racing
 - Myth of “keeping up with traffic”

- Why speeding is dangerous
 - Increased perception/reaction and stopping distance
 - Field of vision and increased likelihood for loss of control
 - Greater translation of force, increased risk for unprotected road users
 - Scope of the problem (crash statistics)
 - Vehicle stability
- Why are drivers motivated to speed?
 - Lack of judgement
 - Poor planning
 - Social pressure
 - Not paying attention to roadway environment and conditions
 - Thrill seeking
 - Lack of understanding of risks
- Strategies to reduce chances of speeding
 - Plan ahead
 - Be aware of risk
 - Attention to roadway conditions
 - Strategies to handle negative interactions with other drivers

6.1.3. Recommended Content for Impaired Driving

This section describes recommended content to educate teen drivers about impaired driving, which includes the use of alcohol, illicit and legal controlled substances, as well as emotional or other physical conditions that compromise driving.

- What is impaired driving?
 - Crash statistics
 - How does it affect the driver?
 - How does it affect passengers?
 - How to have a conversation with someone who has been drinking
- Alcohol
 - Laws in Iowa
 - How alcohol impacts driving
- Drugs
 - Laws in Iowa
 - Illicit drugs
 - Over-the-counter drugs
 - Prescription drugs
 - Know your body
 - Ask a pharmacist
- General health
 - Driving when sick
 - Allergies
 - Driving with heightened stress or anxiety
 - Yelling and screaming

- Passenger influence
- Drowsiness and fatigue
 - Factors (i.e., lack of sleep, boredom)
 - Tips to overcome drowsiness
 - Getting enough rest
 - Rest stops
- Hearing impairment
- Vision impairment
- Other driver limitations

6.1.4. Recommended Content for General Risky Behavior

This section focuses on general risky behaviors other than speeding, distraction, or impairment, which are covered in other sections.

- Overview
 - Youth and brain development with respect to risk
 - Memory
 - Inhibition control
 - Attention and focus
 - Implications for driving tasks
- Understanding consequences while driving
 - Tickets
 - Crashes
 - Injury
 - Loss of license
 - Financial
- Risky behaviors
 - Failure to yield right of way
 - Failure to signal
 - Aggressive driving: tailgating, improper passing, etc.
 - Road rage
- Other risks
 - Limited driving experience
 - Unfamiliarity/overconfidence
 - Peer pressure (passengers)
- Attitude and emotions
 - Relationship between emotions and unsafe driving behaviors
 - Ways to counteract
 - Avoid driving until calm
 - Practice calming techniques
 - Use alternative routes
- Managing risk
 - General

- Seatbelt use
- Reduce/eliminate distractions
- Limit number of passengers
- Speed management
- Avoid the risk
- Prevent the risk
- Reduce the risk

6.1.5. Recommended Content for Seat Belts

This section describes recommended content to educate teen drivers about seat belts. Although not included in these recommendations, safety equipment such as helmets should be covered in driver education material on motorcycles or scooters.

- Why seatbelts are important
 - Crash statistics
 - Force exerted in a crash
 - Consequences of unbuckled backseat passengers
- Iowa seat belt laws
- Correct use of seat belts
 - How to use
 - Necessary in all vehicles regardless of vehicle size or distance traveled
- Strategies to encourage seat belt use

6.1.6. Recommended Content for Situational Awareness

This section describes recommended content to educate teen drivers about being aware of the roadway environment, traffic conditions, and other situations that can impact driving.

- Overview
 - Other vehicles and road users
 - Pedestrians
 - Bicycles
 - Other traffic
 - Farm use equipment
 - Horse and buggy
- Weather hazards
 - Road surfaces
 - Driving in ice
 - Driving in fog or smoke
- Navigating the use of technology (Global Positioning System [GPS], apps, understanding in-vehicle data)
- How to read the roadway
 - Geometry and roadway design

- Rumble strips
- Temporary signs and traffic control
- Wildlife interactions
 - Large animal collisions (deer, elk, bear)
 - Small animal interactions (fox, rabbit, squirrel)
- Vehicle maneuvers
 - Acceleration and deceleration
 - Entrance and exit ramps
 - Navigating work zones
 - Divided highways
 - What to look for
 - Considerations for hidden vehicles
 - Blind spots (agricultural vehicles)
 - Obstructions
 - Acceptance gap
- Emergency vehicles
 - Flashing lights
 - Stalled vehicle
 - Collisions

6.1.7. Recommended Content for Driving with Passengers

This section describes recommended content to educate teen drivers about the challenges inherent when driving with teen or other passengers.

- Passenger presence and crashes
 - Statistics
- Distractions created by passengers
 - Take driver's attention off the road
 - Noise/disturbances
 - In-vehicle conversation
 - Physical distractions
 - Peer pressure
- Addressing distractions
 - Speaking up as a driver
 - Skills for saying no to peer group passengers
 - Express how others make you feel
 - Blame parents if peer pressured
 - Limit number of passengers
 - Eliminate noise/distractions (radio, phone, etc.)
 - Avoiding multitasking
 - Reduce in-vehicle physical distractions
- Passenger behavior
 - Wear seatbelts
 - Be supportive/helpful to driver

- Avoid causing distractions
- Speak up if needed
 - Express concerns with bad driving behaviors
 - Offer to help with navigation
 - Speak from experience

6.1.8. Recommended Content for Intersection/Right of Way

This section describes recommended content to educate teen drivers about understanding and appropriately yielding ROW.

- Yielding ROW
 - Consequences of failing to yield ROW (crash data)
 - Yielding ROW skills
 - Roadway/intersection scanning tips/methods
 - Gap interpretation
 - Identifying blind spots
 - Defensive driving (e.g., avoiding conflicts/close calls, not assuming, turn signals, eye contact, patience, and situational awareness)
- Yielding ROW to road users rules – basic situations
 - Uncontrolled
 - Two-way stop controlled (including roll outs)
 - All-way stop controlled
 - Signalized intersections (including right on red, signal/yield combinations, high-intensity activated crosswalk [HAWK] pedestrian beacons, or other new equipment)
 - Roundabouts
- Yielding ROW to road user rules – more challenging and/or rare situations
 - Stop- and/or yield-controlled divided highways
 - Blind corners and stopped traffic
 - Railroad crossings
 - School buses
 - Pedestrians/bicyclists on roadways (including working with bike lanes)
 - Slow moving vehicles: agricultural equipment, horse and buggy, etc.
 - Emergency vehicles, flashing light vehicles (including maintenance vehicles/move over law), and funerals
 - Deer

6.1.9 Recommended Content for Challenging Roadways

This section describes recommended content to educate teen drivers about several roadway scenarios which are especially challenging.

- Overview of types of challenging roadways (e.g., gravel, work zones)
 - What the crash data show (national/local)

- Strategies for driving challenging roadways
 - Advance planning
 - Minimizing distractions
 - Speed selection
 - Gaining experience in different settings/traffic
 - Vehicle in good operating condition
- General roadway challenges
 - Work zones
 - Pavement edge drop off
 - Parking
 - Inclement weather
 - Types to be concerned with (rain, snow, ice, etc.)
 - Handling skids
 - Driving around snowplows
 - Not using cruise control
 - Understanding anti-lock brakes (also touched on in unpaved roads section)
 - Uncontrolled intersections (urban and rural)
- Unpaved/gravel road challenges
 - Unique hazards to prepare for
 - Loose gravel
 - Dust
 - Narrower roadways/bridges
 - Wash boarding and soft shoulders
 - Reduced visibility
 - Farm equipment and slow-moving vehicles
 - Steep hills/sharp curves
 - Responding to unpaved/gravel hazards
 - Situational awareness/anticipate challenges
 - Avoiding sudden/overreactions

6.2. Recommendations for Changes to Iowa Curriculum

Several topics were specifically noted as particularly problematic for Iowa teens through a review of Iowa crash data and recommendations from Iowa driver education instructors. The team recommends that the following topics in particular be included in Iowa driver education curriculums:

- Intersection negotiation scenarios, which includes understanding appropriate yielding and stopping behavior and specifically addresses stop signs, uncontrolled intersections, and left turns
- Differences in driving on unpaved roads, which includes understanding how to share the road with other vehicles and maneuvering with less friction (This topic may be better covered in behind-the-wheel instruction.)

- Speeding, which includes authorized speed and driving too fast for conditions and addresses the consequences of speeding (e.g., distance traveled, loss of control)
- Distraction, which covers issues with distraction (distance traveled, mental disengagement) and provides tools to address distraction
- Situational awareness, which includes understanding how to anticipate and manage unexpected and changing road conditions
- Strategies for addressing peer pressure while driving

Curriculum content should also be expanded to include additional discussion on driving within/through work zones. This expanded instruction should focus on proper driving behaviors and the need for greater driver attention when passing through work zones, as well as an overview of the different hazards that are present.

6.3. Recommendations for Changes to Iowa Code or Administrative Rules

The following recommendations are suggested as changes to the Iowa Code. The relevant code sections are shown along with recommended changes (*purple text*).

321.178 Driver education — restricted work license — reciprocity.

1. Approved course.
 - a. An approved driver education course as programmed by the department shall consist of at least thirty clock hours of classroom instruction, of which no more than one hundred eighty minutes shall be provided to a student in a single day, and six or more clock hours of laboratory instruction of which at least three clock hours shall consist of street or highway driving. Classroom instruction shall include all of the following:
 - i. A minimum of four hours of instruction concerning substance use disorder **to include use of prescription drugs** and distracted driving to **include**:
 - **Types of distraction (visual, manual, cognitive)**
 - **Impact of distraction (time and distance traveled while distracted)**
 - **Strategies to reduce distraction**
 - b. A minimum of twenty minutes of instruction concerning railroad crossing safety.
 - c. Instruction relating to becoming an organ donor under the revised uniform anatomical gift Act as provided in chapter 142C.
 - d. Instruction providing an awareness about sharing the road with pedestrians, bicycles, and motorcycles. The instruction course shall be first approved by the state department of transportation. Instructional materials creating an awareness about sharing the road with pedestrians, bicycles, and motorcycles shall also be distributed during the course of instruction.
 - e. **Minimum of 1 hour to address negotiating intersections to include intersection negotiation scenarios, which includes understanding appropriate yielding and**

stopping behavior and specifically addresses stop signs, uncontrolled intersections, and left turns.

- f. Minimum of 30 minutes to address speeding to include: (a) obeying the posted speed limit and traveling too fast for conditions and (b) addressing the consequences of speeding (i.e., distance traveled, loss of control).**

6.4. Other Recommendations

Other recommendations for Iowa driver education include the following:

- Driver education and training curriculum that meets or exceeds current nationally recognized curriculum content standards should be required.
- Driver education and training providers should be required to use state-approved formalized curricula as outlined in the NTDETAS.

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