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**The National Surface Transportation Safety
Center for Excellence**

**A Survey of Light-Vehicle Driver Education
Programs to Determine the Prevalence of
Curriculum on Sharing the Road with
Heavy Vehicles**

Final Report

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Lighting	Technology
Fatigue	Aging

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LIST OF ABBREVIATIONS AND SYMBOLS

AAA	American Automobile Association
ADTSEA	American Driver and Traffic Safety Education Association
BTW	Behind-the-wheel
CD	Compact Disc
CDL	Commercial Driver's License
CMV	Commercial Motor Vehicle
CVSA	Commercial Vehicle Safety Alliance
DETA	Driver Education and Training Administrators
DMV	Department of Motor Vehicles
DOE	Department of Education
DOT	Department of Transportation
DVD	Digital Versatile Disc
FHWA	Federal Highway Administration
GDL	Graduated Driver's Licensing
IRB	Institutional Review Board
NSTSCE	National Surface Transportation Safety Center for Excellence
VHS	Video Home System
VTTI	Virginia Tech Transportation Institute

CHAPTER 1. INTRODUCTION

The National Surface Transportation Safety Center for Excellence (NSTSCE) was formally awarded to the Virginia Tech Transportation Institute (VTTI) in 2006 through the Federal Highway Administration (FHWA).⁽¹⁾ The mission of NSTSCE is to use "...state-of-the-art facilities, including the Virginia Smart Road, to develop and test transportation devices and techniques that enhance driver performance, examine advanced roadway delineation and lighting systems, and address age-related and fatigued driver issues."⁽¹⁾ One of the primary goals of NSTSCE is to develop a greater understanding of driver decision making and performance. Recent research investigated light-vehicle/heavy-vehicle near-crashes and crashes (critical incidents) and found that 78 percent were initiated by the light-vehicle driver.⁽²⁾ The most common incident type involved the light vehicle changing lanes without sufficient gap to the heavy vehicle. This larger proportion of light-vehicle, at-fault incidents may result from inadequate training about heavy-vehicle dynamics during light-vehicle driver education programs. The purpose of this project was to survey curricula of light-vehicle driver education programs and assess any information that is relevant to heavy-vehicle characteristics and procedures for light-vehicle drivers safely driving around heavy vehicles (sharing the road).

BACKGROUND

In the U.S., driver's licensing and education requirements are managed on a state-by-state basis. The largest national improvement to driver's licensing, which began in the 1990s, has been the state-by-state adoption of Graduated Driver's Licensing (GDL) programs for novice teen drivers. This method delays full licensure while allowing beginners to move through driving stages (e.g., supervised learner's period, intermediate/provisional license, and full-privilege driver's license). States that use GDL programs do vary in restrictions and stages, but the adoption of GDL programs has shown a national reduction in teen drivers' high crash risks. A meta-analysis comprising 27 studies about GDL effectiveness was performed and found a reduction by 20 to 40 percent in national teen drivers' high crash risk.⁽³⁾ A recent and thorough meta-analysis of all GDL-related scientific literature found similar results indicating an average crash reduction of 31 percent.⁽⁴⁾ Although some driver education programs (e.g., GDL programs) have been shown to be beneficial, some researchers have found that driver education programs consistently fail to meet safety objectives despite the fact that driving on the nation's roadways requires more knowledge and skill than ever.⁽⁵⁾

It is unclear as to which states currently have light-vehicle driver education programs that contain information and recommended procedures about how to share the road with heavy vehicles. However, national organizations have developed training programs with specific content regarding the prevention of light-vehicle/heavy-vehicle interactions. For example, the Commercial Vehicle Safety Alliance (CVSA) in cooperation with other partners recently announced a new education program called *Teens & Trucks*. This is a training program focused on educating teens about safe driving practices around heavy vehicles. In a recent CVSA press release describing the program, Executive Director Steve Keppler said:

“While truck and bus drivers do contribute to some traffic crashes, research shows that too many drivers of passenger cars, especially young people ages 16 to 24 years old,

unnecessarily endanger themselves and others by failing to recognize that large CMVs [commercial motor vehicles] and cars differ in their handling characteristics.”⁽⁶⁾

Mr. Keppler also said, “As a result of these unsafe actions, behaviors of the passenger vehicle driver are the critical reason behind most traffic crashes involving large CMVs and passenger vehicles.”⁽⁶⁾ In addition, the American Automotive Association (AAA) has developed similar education programs (e.g., *Share with Care*) that contain recommended procedures for light vehicles sharing the road with heavy vehicles.⁽⁷⁾

PURPOSE OF THE STUDY

Light-vehicle driver education programs such as those aforementioned that contain content about heavy-vehicle operation may be helpful in reducing light-vehicle/heavy-vehicle interactions. However, it is unclear as to the extent of current state curricula requirements, content, and perceived effectiveness (for both public and private programs) regarding heavy-vehicle operation and associated light-vehicle driving recommended procedures. This project involved the development of an online survey targeted at instructors and/or administrators of individual state driver education programs to identify current curricula addressing heavy vehicles (or lack thereof) and perceived effectiveness. Also, an attempt was made to locate driver education curricula and/or manuals from every state. The project identified information gaps that can be built upon during future efforts.

CHAPTER 2. METHODS

PARTICIPANTS

Driver education instructors and administrators in all 51 states (District of Columbia is being considered a state for the purposes of this report) were targeted for this study. Eligibility requirements for participation included being at least 18 years of age and currently involved in teaching and/or administering driver education in the United States. NSTSCE researchers contacted at least three types of participants involved with driver education in each state. These contacts included an administrator from an agency (e.g., Department of Education [DOE], Department of Transportation [DOT], Department of Motor Vehicles [DMV], etc.), an instructor and/or administrator from a public school, and an instructor and/or administrator from a private/for-profit school. In some states, driver education associations were also contacted if initial efforts to recruit participants for the survey were not successful.

Participant Protection

Several steps were taken to protect participant privacy. The survey instrument, consent information, and recruitment approach were reviewed and approved by the Virginia Tech Institutional Review Board (IRB). The research team did not collect any personally identifying information, and participant contact information was stored on password-protected computers only accessible to NSTSCE researchers. Potential participants were provided informed consent information in emails and/or over the phone during recruitment and at the start of the survey prior to data collection. The consent information provided at the start of the survey can be found in Appendix A.

Recruitment

Instructors and administrators were identified using publicly available websites. Two primary sources were used to identify administrative contacts in each state: the Driver Education and Training Administrators (DETA) website (<http://www.detaonline.org/>) and a report prepared by the American Driver and Traffic Safety Education Association (ADTSEA). The ADTSEA report included a table listing the agencies in charge of driver education by state.⁽⁸⁾ Not all states were represented in the table; therefore, the research team visited these state agency websites and searched for driver education contacts.

In cases where an instructor's or administrator's information could not be found on a website, NSTSCE researchers contacted the school or agency to locate the correct individual's contact information. For example, if a high school website did not list the name and contact information of the driver education instructor, a researcher called the school and requested the information. Once a prospective participant was identified, he/she was provided information about the study and the survey link via email or phone. NSTSCE researchers also asked the participant to share information about the study, including the survey link, with other instructors and/or administrators who might be interested in participating. Also, state-level administrators and driver education association administrators assisted NSTSCE researchers by distributing the link to a wider group of potential participants.

NSTSCE researchers aimed to obtain a minimum of two completed surveys per state. In order to reach this goal, the link to the survey was distributed to a minimum of five individuals in each state. There were a few exceptions to this distribution quota. NSTSCE researchers stopped contacting potential participants in a particular state if:

- An administrator agreed to distribute the survey link to teachers in his/her state, or
- An administrator informed the research team that driver education is not being taught by the public schools or that it is being taught at a community college instead of a public school.

In cases where driver education was not being taught by a public school, only an administrator and instructor from the private school and/or community college where driver education was being taught were provided with the survey link.

Recruitment and data collection for the online survey took place during an approximately two-month period. An estimated 638 calls and emails were made during recruitment. Of the 638 calls/emails, 384 potential participants received the link to the survey.

APPARATUS

An online survey was developed and used for data collection during this study. The online survey provided instructors and administrators with an opportunity to share their opinions regarding aspects of their curriculum containing information about how to share the road with commercial trucks/heavy vehicles. Prior to finalizing the survey, a draft of the survey questions was developed and reviewed by a group of three subject-matter experts. These subject-matter experts included representatives from different state and national agencies/associations with hands-on experience in developing and delivering driver education on how to safely share the road with heavy vehicles. These participating subject-matter experts formed the Subject-Matter Expert Committee. Committee members provided feedback via email on recommended changes and/or additions that would help to provide new insight into the current state of driver education curriculum and/or instruction in the U.S. with regard to material containing information about sharing the road with heavy vehicles.

The final survey included a total of seven brief questions. Five of these were restricted-item questions, one was an open-ended item question, and one was a partially open-ended item question (included items to choose from in addition to an open-ended “other” category).⁽⁹⁾ These survey questions are provided in Appendix A and below:

1. In what state do you administer and/or teach driver education? (Note: If you teach in more than one state, please select the one you are currently teaching in the most.)
 - List of States

2. How many years have you been administering and/or teaching driver education? (Select one)
- Less than 1 year
 - 1 to 4 years
 - 5 to 9 years
 - 10 to 14 years
 - 15 to 19 years
 - 20 or more years
3. Does the driver education curriculum you administer and/or teach include a component dealing with how to safely share the road with commercial trucks/heavy vehicles? (Select one)
- Yes
 - No
 - Not Sure
4. If the driver education curriculum you administer and/or teach includes a component on safely sharing the road with commercial trucks/heavy vehicles, how are students taught this information? (Select all that apply)
- Students are taught in a classroom setting
 - Students are taught via pamphlet
 - Students are taught via textbook
 - Students are taught via CD (compact disc)
 - Student are taught via DVD (digital versatile disc)
 - Students are taught via VHS (video home system)
 - Students are taught via online coursework
 - Students are taught in a driving simulator
 - Students are taught via on-road training
 - Not Sure
 - The driver education curriculum I administer and/or teach does not include a component on safely sharing the road with commercial trucks/heavy vehicles
 - Other teaching method (Open-ended)
5. Please indicate your level of agreement with the following statement: The driver education curriculum I administer and/or teach is effective at showing students how to safely share the road with commercial trucks/heavy vehicles. (Select one)
- Strongly Agree
 - Agree
 - Undecided
 - Disagree
 - Strongly Disagree
 - The driver education curriculum I administer and/or teach does not include a component on safely sharing the road with commercial trucks/heavy vehicles

6. Does your state require that the driver education curriculum you administer and/or teach include information on how to safely share the road with commercial trucks/heavy vehicles? (Select one)
 - Yes
 - No
 - Not Sure

7. Is there anything you would like to share with us regarding how your state teaches drivers to safely share the road with commercial trucks/heavy vehicles? (Open-ended)

For the survey the research team used software available to Virginia Tech students, faculty, and staff through Virginia Tech's survey website (www.survey.vt.edu). This software was free of charge, simple to use, and also hosted the survey and supplied a database of results. Prior to implementation, the survey instrument was pre-tested by NSTSCE researchers to ensure that the survey questions were clear and the software functioned properly.

PROCEDURE

The research team distributed the online survey and conducted a review of state driver education curricula and/or manuals to determine if sharing the road with heavy vehicles was part of the driver education curricula and included in teaching materials being used across the country. Each of these data collection procedures is described below.

Online Survey

The driver education survey was designed to take no more than five minutes to complete. The survey began with an introduction describing the goal of the survey, the eligibility requirements, the risks and benefits of taking the survey, confidentiality, and participant rights (i.e., the participant may end the survey at any time). The detailed information presented to participants during the survey introduction can be found in Appendix A.

Driver Education Curriculum and Manual Review

NSTSCE researchers made an effort to identify a driver education curriculum and/or manual for each state. The report published by the ADTSEA was used as a guide for identifying which state agency websites (e.g., DOE, DMV, etc.) to visit.⁽⁸⁾ In some cases, a driver education manual or handbook (but not a curriculum) could be found on the state agency websites. Future investigation should be conducted about the use of official state driver education curricula/manuals and the contents of each.

CHAPTER 3. RESULTS

The results are presented in three separate sections. The first section presents results found from the quantitative data analysis. The second section presents results found from the qualitative data analysis. The third section describes results found from the state-by-state investigation of driver education curricula and/or manuals.

QUANTITATIVE DATA ANALYSIS

As previously mentioned, the research team set a goal of obtaining at least two completed surveys from each state. This stratified sampling technique was selected in order to secure a representative sample from the United States. This goal was met with at least two participants from each state and an overall total of 555 participants completing the survey. After further consideration, it was decided that a limit of surveys per state should be implemented prior to analysis to minimize any over-representation of the data toward a state that had a greater number of completed surveys. For example, the state of Michigan resulted in a total of 180 completed surveys, which could have skewed the results and findings. A limit of 10 completed surveys per state was selected and implemented for all quantitative analyses. If more than 10 surveys were completed by a state, the first 10 completed were selected based on date and time submitted. This revision to the original stratified sampling technique created a somewhat more proportional data set.⁽⁹⁾ Due to the difficulty involved with obtaining more than two completed surveys in some states, it was not feasible for the purposes of this study to obtain a truly proportional sample based on state populations. After this limit was implemented, the total survey count used for quantitative analysis was 237. The final counts of completed surveys included in the quantitative analysis for each state are presented in Figure 1.



Figure 1. Diagram. Number of completed surveys used in quantitative analysis by state.

Driver Education Experience

Instructors and administrators were asked how many years of experience they had in administering and/or teaching driver education. Of the 237 completed surveys used for quantitative analysis, 236 participants responded to this question. Results are provided in Table 1. As shown, more than 34 percent of the responses were collected from instructors and/or administrators with 20 or more years of experience.

Table 1. Driver education experience response counts and percentages.

Response Category	Response Count	Percentage
Less Than 1 Year	7	2.97
1 to 4 Years	35	14.83
5 to 9 Years	55	23.31
10 to 14 Years	30	12.71
15 to 19 Years	28	11.86
20 or More Years	81	34.32

Heavy-Vehicle Component in Driver Education Curriculum

The remainder of the survey focused on investigating the prevalence of driver education curriculum and instruction containing components about how to share the road with heavy vehicles. The first question in this category asked each participant if the driver education

curriculum being administered and/or taught in his/her state included a component dealing with how to safely share the road with commercial trucks/heavy vehicles. Of the 237 completed surveys used for quantitative analysis, 235 participants responded to this question. Results are provided in Figure 2. As shown, approximately 91 percent of total respondents indicated that the driver education curriculum and/or instruction they provide includes a component about how to safely share the road with heavy vehicles.

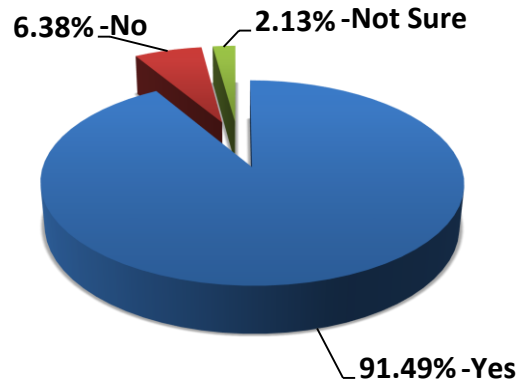


Figure 2. Chart. Percentages of curricula containing a heavy-vehicle component.

The next question in the survey inquired as to how information on safely sharing the road with heavy vehicles is taught to the students. Participants were allowed to select as many forms of instruction from the list provided and to include supplemental methods in an open-ended item near the end of the question. (Supplemental methods provided during this question are described in the Qualitative Data Analysis section.) The final counts of responses for each instruction method are presented in Table 2. As expected, the top two instructional methods used for teaching students how to safely share the road with heavy vehicles are in a classroom setting or during on-road training (also referred to as behind-the-wheel [BTW]).

Table 2. Response frequency of instruction methods used for teaching students how to safely share the road with heavy vehicles.

Category	Count
Classroom Setting	196
On-road Training (BTW)	124
DVD	111
Textbook	102
VHS	36
Pamphlet	25
Simulator	25
CD	21
Online Coursework	17
Other Teaching Method	17
No Component	11
Not Sure	1

Further analysis was performed with regard to instruction method results. The research team constructed a list of the combinations of teaching methods reportedly being used to educate students how to safely share the road with heavy vehicles. Counts of the repeated combinations reported by participants were then tallied. In total, there were 81 unique combinations reported by the 237 participants. Of the 81 unique combinations, the top 20 most used by instructors and administrators are presented in Table 3. As expected, results show that the classroom setting instructional method was included in 19 of the top 20 of the most commonly used instructional method combinations. In addition, on-road training (BTW) was included in 13 of the top 20. It is important to note that each instructional method may not be mutually exclusive from one another, which could explain why classroom setting is included in all but one instructional method combination.

Table 3. Top 20 most-used instructional method combinations reported.

Rank	Combination of Components	Count	Rank	Combination of Components	Count
1	Classroom Setting	22			
2	Classroom Setting Textbook DVD On-road Training (BTW)	20	12	Classroom Setting Simulator On-road Training (BTW)	4
3	Classroom Setting Textbook DVD	13	13	Classroom Setting CD On-road Training (BTW)	4
4	Classroom Setting On-road Training (BTW)	13	14	Classroom Setting Textbook	4
5	On-road Training (BTW)	12	15	Classroom Setting Textbook DVD Simulator On-road Training (BTW)	3
6	Classroom Setting DVD On-road Training (BTW)	10	16	Classroom Setting Textbook VHS On-road Training (BTW)	3
7	Classroom Setting DVD	10	17	Classroom Setting Pamphlet DVD On-road Training (BTW)	3
8	Classroom Setting Textbook DVD VHS On-road Training (BTW)	6	18	Classroom Setting Textbook VHS	3
9	Classroom Setting Textbook On-road Training (BTW)	5	19	Classroom Setting VHS	3
10	Classroom Setting VHS On-road Training (BTW)	5	20	Classroom Setting Textbook DVD VHS	3
11	Classroom Setting Textbook CD On-road Training (BTW)	5			

Participants were next asked if the instructional method used for showing students how to safely share the road with heavy vehicles was perceived as effective. Of the 237 completed surveys used for quantitative analysis, 236 responses were received for this question. Results are provided in Figure 3. Results show that approximately 82 percent of respondents strongly agree or agree that the instructional method (or combination of methods) used is effective.

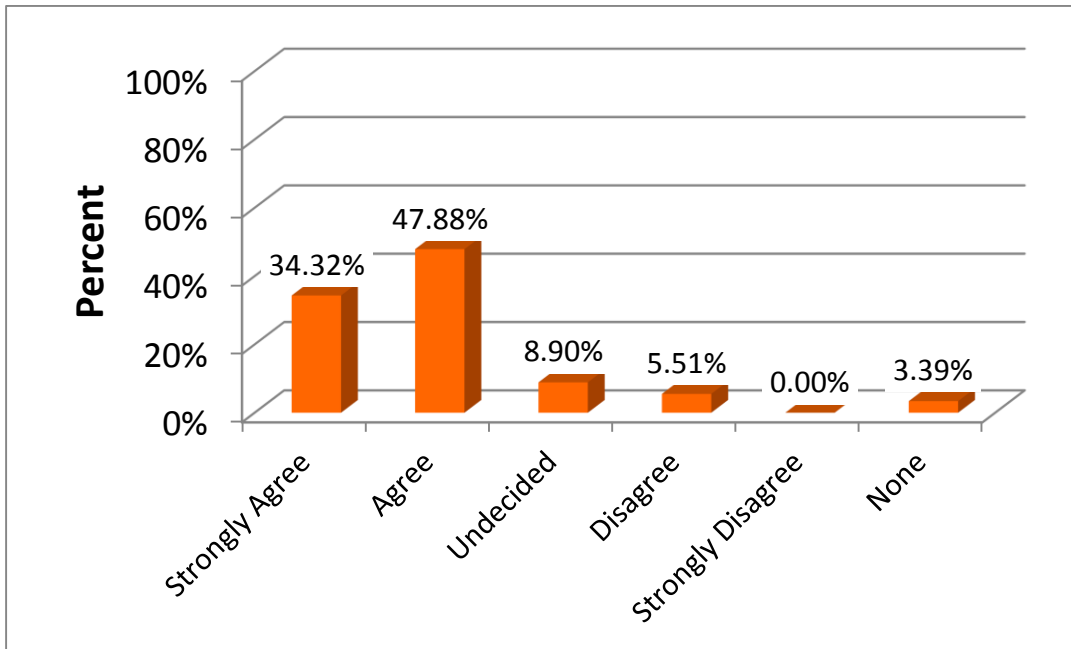


Figure 3. Bar Graph. Percent of responses for perceived effectiveness level of agreement.

The final restricted-item question in the survey asked participants if their states required a heavy-vehicle component be included in the driver education curriculum. More than 20 percent of participants were unsure if their states required a heavy-vehicle component in the driver education curriculum. Results are shown in Figure 4.

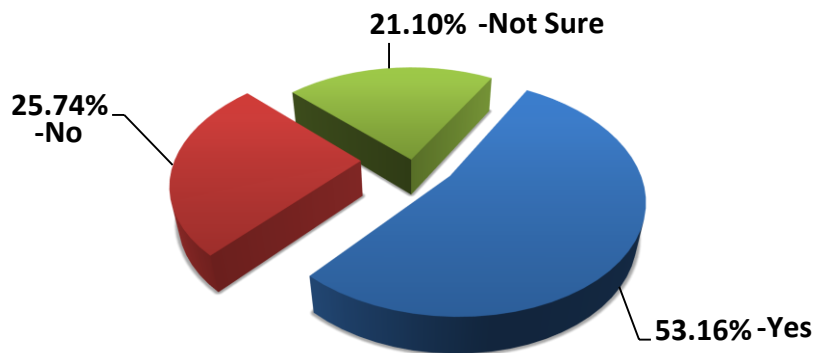


Figure 4. Chart. Percentages of responses to heavy-vehicle component state requirements.

Quantitative Data Analysis Summary

To summarize, the quantitative data analysis provided a positive overall glimpse of the current state of driver education curriculum and/or instruction in the U.S. with regard to material containing information about sharing the road with heavy vehicles. Of the 237 completed surveys used for analysis, approximately 58 percent of respondents had 10 or more years of

experience in teaching and/or administering driver education (of which more than 34 percent had 20 or more years of experience). Approximately 91 percent of total respondents indicated that the driver education curriculum and/or instruction they provided included one or more components about how to safely share the road with heavy vehicles. In addition, approximately 82 percent of total respondents agreed or strongly agreed that the heavy-vehicle component(s) used was effective. Respondents were also asked if their states required that the driver education curriculum include information about how to safely share the road with heavy vehicles, and results indicated that approximately 53 percent responded, “Yes,” 26 percent responded, “No,” and 21 percent responded “Not Sure.” All of these results indicate that although a large proportion of light-vehicle driver education programs include a component about how to safely share the road with heavy vehicles, there may be room for improvement with regard to the content of these programs (82 percent perceived effectiveness) and room for improvement to state requirements (21 percent unsure of state requirements).

QUALITATIVE DATA ANALYSIS

The survey comprised seven brief questions, two of which had either an open-ended item or a partially open-ended item. This section will describe the qualitative analysis performed and results found for the two open-ended item responses. As previously mentioned, a total of 555 participants completed the survey. For the quantitative analysis, a limit of surveys per state was implemented in order to minimize any over-representation of the data toward a state that had a greater number of completed surveys. As a result, 237 surveys were used for quantitative analysis. However, for the qualitative analysis, a limit was not introduced. A limit was not considered necessary because the qualitative analysis performed was not intended to provide a representative depiction of methods used but was instead intended to add detail about supplemental methods used when teaching students how to safely share the road with heavy vehicles.

Question 4: Partially Open-ended Question

Question 4 of the survey asked: *“If the driver education curriculum you administer and/or teach includes a component on safely sharing the road with commercial trucks/heavy vehicles, how are students taught this information?”* The last answer option for this question was open-ended and provided participants the opportunity to share with the research team any other methods they were using to teach students. The research team received 39 responses to this option resulting in a total of 40 “other” methods (one of the 39 responses contained two “other” methods). The research team grouped similarly reported methods, and results are provided in Table 4.

Table 4. “Other” instructional methods reported.

Other Instructional Methods	Number of Responses
Hands-on experience with a truck	11
Guest speaker	11
Guest speaker with a truck	10
Power-point presentation	3
Discussion/commentary	2
Teacher sharing experience as truck driver	1
Student’s parent is a truck driver	1
Experience around truck stops	1
Total Responses	40

As shown in the table, 21 participants said they bring in guest speakers from state DOTs, state trucking associations, or private companies to talk to students. A few participants reported that discussions or demonstrations about a heavy vehicle’s no-zone were part of the guest speaker’s presentation. Ten of the 21 participants who used guest speakers as an instructional method also mentioned use of a heavy truck so that students could gain valuable hands-on experience. As one survey participant said: *The [STATE NAME REDACTED] Road Team member will attend class, give a presentation on sharing the road, and then take the students out to the truck - reinforce the blind spots and other noteworthy areas of the semi. Students will also sit behind the wheel of the semi to see what the truck driver sees. . .*”

Question 7: Open-ended Question

Of the 555 surveys completed, 148 participants answered the final open-ended question (i.e., “*Is there anything you would like to share with us regarding how your state teaches drivers to safely share the road with commercial trucks/heavy vehicles?*”). The approach used to analyze the results of Question 7 was an adaptation of framework analysis, a methodology developed during the 1980s at the National Centre for Social Research in Britain.⁽¹⁰⁾ The steps taken by the research team to conduct the framework analysis were as follows:

1. **Determining Analysis Focus:** NSTSCE researchers determined that the focus of the framework analysis for Question 7 would be participant comments related to three key themes: Supplemental Practices, Concerns, and Suggestions related to the educational component of sharing the road.
2. **Familiarization:** Each of the open-ended responses was read in an effort to become familiar with the data set.
3. **Identifying Thematic Framework:** A review of the data set was conducted, and a list of key subthemes for each theme was identified. For instance, under the theme of Concerns, several subthemes emerged (e.g., Curriculum Issues, Sharing-the-Road Materials, etc.).
4. **Indexing:** The themes and subthemes were arranged in a logical order to create an index. The index was systematically applied to the data set, and relevant comments were identified and highlighted.

5. Charting: All of the indexed comments were arranged into Microsoft[®] Excel[®] spreadsheets based on key themes and were sorted by subtheme.
6. Interpretation: The themes and subthemes captured and detailed in the charts were used to better understand participant perspectives. Some participant comments are included in the results section of this report to illustrate participant perspectives.

Participant comments relating to the three themes (i.e., Supplemental Practices, Concerns, and Suggestions) were analyzed and are described below. All comments included in each theme section were mentioned by at least two participants. Issues raised by only one participant may be explored during future research efforts. It should be noted that because participants were not asked specifically to provide Supplemental Practices, Concerns, and Suggestions, the list of subthemes may not be exhaustive. Rather, the subthemes identified during the participant comments may serve as a starting point for future research exploring what can be done to improve driver education about sharing the road with heavy vehicles.

Supplemental Practices

For the Supplemental Practices analysis, a member of the research team read through all open-ended responses and extracted comments where instructors and/or administrators mentioned supplementing their driver education course/curriculum with sharing-the-road materials, programs, and/or experiences that were used to help students learn to share the road with heavy vehicles.

Student Experience with Commercial Trucks: Numerous participants from several states reported providing students the opportunity to receive hands-on experience with a commercial truck during the course of their driver education training. Participants further described how truck drivers are invited to attend driver education classes to give presentations. As one participant said of the truck drivers, *“They thoroughly go over the no zones and other hazards related to following distances, passing, drafting, sight distance, etc. It’s good from the point that the driver can relate his personal experiences to situations he talks about. Student interest is always high.”*

Participants also reported truck drivers visiting from a variety of organizations and allowing students to sit in the truck cab to view the environment from the truck driver’s perspective. One participant said, *“Each student sits in the truck with vehicles stationed around the truck so that they can see what the driver sees and cannot see.”* These organizations included private companies, state agencies, and trucking associations.

Sharing-the-Road Materials: Several participants mentioned supplementing their driver education courses with sharing-the-road materials. The materials mentioned were developed by various organizations (e.g., national associations, state agencies, etc.). As one participant said, *“Our state supplies excellent videos on the subject as well.”* These additional materials, as one participant explained, serve to reaffirm what the students have been taught.

A few participants mentioned taking part in a driver education association-sponsored conference or convention to learn more about sharing the road and/or to obtain new sharing-the-road

materials. At the conference/convention participants described attending a sharing-the-road workshop and receiving special sharing-the-road materials (e.g., CD) that were then integrated into his/her driver education course. One participant said he/she used in the classroom “...a CD that I got attending the [NAME REDACTED] convention.”

No-Zone Program: Taking part in a specific No-Zone Program was mentioned by several participants. As one participant said, “*We participate in the ‘no zone’ [sic] program provided by the state. Each schools driver education program schedules this program during their semester driving courses.*” The No-Zone Program may involve a truck driver bringing a commercial truck to the school for students to sit in and view the no zones.

On-road Training: A Supplemental Practice raised by several participants was placing emphasis during on-road training on how to safely share the road with heavy vehicles. Participants described providing students with experience on interstates, freeways, and/or expressways where they were likely to see and/or interact with commercial trucks. One participant explained, “*I use a variety of methods but when we are on the highway or any place we view large truck[s] I re-teach about how far back to drive safely and effectively. Where the driver of the truck can see your car the best etc.*” Another participant described how he/she drives all of his/her students on the interstate and that they excel once the initial shock of being on the interstate settles. The participant said, “*By the completion of the interstate driving lesson, students have a much better understanding of the dangers involved with driving on roadways with larger vehicles.*”

Teacher Experience with Commercial Trucks: Another related Supplemental Practice reported by a few participants was the benefit of the instructor having experience as a commercial driver. It was reported that during this situation the instructor is able to share firsthand knowledge of how to safely share the road with heavy vehicles. As one participant said, “*Along with the study guide, I cover three other safety programs that I have learned throughout my career as a professional driver, and how to safely share the road with commercial vehicles is one of them.*”

Concerns

As part of the qualitative analysis, comments raised by participants that seemed to indicate a concern were also analyzed. The most common concern mentioned by participants related to sharing-the-road materials.

Sharing-the-Road Materials: Several participants indicated there was a need for better materials about sharing the road with heavy vehicles. Participants said they needed detailed and/or up-to-date materials about sharing the road. As one participant said, “*Up-to-date DVDs and other media would be very beneficial for students and teachers.*” Another participant mentioned not having any materials. He/she said, “*I would teach shared roadway safety dealing with heavy trucks if I had the information to teach.*”

Curriculum Issues: Curriculum issues were mentioned by several participants. The issues raised included: no consistent curriculum statewide, less-than-thorough coverage of sharing the road, a lack of guidance about what needs to be taught, and no state assessment of what is being taught.

As one participant said, *“Our state wants us to teach about sharing the road with other vehicles but does not give us the information it wants us to teach.”* A few participants mentioned students being unreceptive to the curriculum. One participant mentioned that the curriculum materials required by his/her state do not sustain the interest of the students. He/she explained, *“Unfortunately, the material is out-of-date and as a result the students don’t pay attention.”*

Time Allocation: One concern mentioned by several participants was the lack of time allotted to teach students how to share the road with heavy vehicles. The lack of time allocated cut across classroom and on-road training. As one participant said, *“We have 30 class days to teach so much material. I’d like to include an actual truck display with students physically experiencing blind spot areas, etc. but there is not enough time to devote an entire class period to do so.”* Another participant described how new drivers in his/her state spend 5 to 10 minutes during driver education reviewing large trucks and are given three questions on a test regarding the topic. This participant said, *“I believe it is unacceptable, a lot of times these kids have no idea what they are getting into when they are around these types of vehicles.”*

Participants also mentioned that their students need more time for on-road training. One participant shared the concern that six hours of on-road training is not enough time to teach students an action as complex as driving. In particular the importance of training on freeways/interstates was described. As one participant said, *“I would like to drive on an interstate to do more intense training with semis and how to enter and merge on and off interstate highways.”*

Student Experience with Commercial Trucks: A few participants described how their students do not receive hands-on experience with heavy vehicles. One participant described how someone from a state agency used to attend his/her class with a truck and demonstrate the blind spots. He/she said, *“The student would be able to sit in the driver seat and experience the blind spot as people walked around the truck. His [the state agency representative’s] funding was eliminated and we no longer have that component in the class.”* Another participant described how a private company sent tractor trailers to the public schools in his/her area for students to sit in, but that this component was not being conducted at the private schools. The participant said he/she wished that companies would bring a tractor trailer to the private schools.

Suggestions

Participant suggestions were taken from the open-ended comments. The suggestion raised most often was to include more information in the driver education course about sharing the road with heavy vehicles. Participants want to teach more on this important topic.

More on Sharing the Road: Several participants suggested that more information needs to be taught about sharing the road with heavy vehicles. Some of the suggestions included: more emphasis on sharing the road with school buses; more stories and situations about sharing the road; and more information about space-area management with commercial trucks, courtesy, and no zones. As one participants said, *“I know we cover sharing the road, however it would not be a bad thing to do more if you have an effective or creative way to cover this material.”*

Updated Sharing-the-Road Materials: Providing to teachers updated materials (e.g., DVDs, VHSs, and CDs) about sharing the road with commercial trucks was suggested by a few participants. As one participant said, *“We can always use updated information and videos.”* Another participant indicated that offering the materials for free would be helpful.

Student Experience with Heavy Vehicles: A few participants suggested that providing students experience with a heavy vehicle and interacting with a truck driver would be helpful. One participant explained that he/she thought interactions with truck drivers or commercial driver’s license (CDL) training schools might be beneficial for students. He/she said, *“Many students are scared when in close proximity to large trucks. Some discussion from the truck drivers on how they have trouble on the road with smaller vehicles and what smaller vehicles should know might be helpful.”*

Qualitative Data Analysis Summary

In summary, the qualitative data analysis revealed numerous, substantial supplemental methods, concerns, and suggestions. Supplemental methods used by respondents included providing hands-on experience with heavy vehicles and their drivers, inviting guest speakers to participate in classroom lectures, and acquiring from national associations and state agencies additional materials about sharing the road. Some concerns presented included the need for updated materials, a lack of consistency in the curriculum within each state, not enough time to actually implement supplemental methods, and the need for providing students hands-on experience with heavy vehicles. Lastly, some final suggestions were provided such as an increase in availability of updated materials and heavy vehicles for students to increase their knowledge and obtain hands-on experience.

DRIVER EDUCATION CURRICULUM AND MANUAL REVIEW FINDINGS

Online searches of state government agency websites (e.g., DOE, DOT, DMV, etc.) were used to locate the driver education curricula and/or manuals for all 51 states (including the District of Columbia). Curricula were located for 19 states; 18 of these included information about sharing the road with heavy vehicles. While one state’s curriculum did not include information about sharing the road with heavy vehicles, its manual did. Driver education manuals were located in all 51 states; 50 of these included information about sharing the road with heavy vehicles. While one state’s manual did not include information about sharing the road with heavy vehicles, its curriculum did. In summary, all states either had a driver education curriculum, driver education manual, or both that included information about sharing the road with heavy vehicles. The content of the driver education curriculum/manual was not analyzed to determine how suitably the information was covered; the research team only noted if sharing the road with commercial trucks/heavy vehicles was included. Future research efforts may explore the depth and quality of sharing-the-road content included in driver education curricula/manuals.

CHAPTER 4. DISCUSSION AND CONCLUSIONS

Overall, this study was successful in meeting its primary objective of the development of an online survey targeted at instructors and/or administrators of individual state driver education programs to identify current curricula addressing heavy vehicles (or lack thereof) and perceived effectiveness. Results indicated that of the U.S. light-vehicle driver education programs surveyed during this study, approximately 91 percent include at least one component dealing with how to safely share the road with heavy vehicles. When asked if respondents perceived that this component was effective in teaching students how to safely share the road with heavy vehicles, approximately 82 percent agreed or strongly agreed. Respondents were also asked if their states required that the driver education curriculum include information about how to safely share the road with heavy vehicles, and results found that approximately 53 percent responded, “Yes,” 26 percent responded, “No,” and 21 percent responded, “Not Sure.” All of these results indicate that although a large proportion of light-vehicle driver education programs include a component about how to safely share the road with heavy vehicles, there may be room for improvement with regard to the content of these programs (82 percent perceived effectiveness) and room for improvement to state requirements (21 percent unsure of state requirements).

Furthermore, the qualitative data analysis performed using the open-ended survey questions revealed two major issues, or subthemes, that cross-cut all three thematic categories (i.e., Supplemental Practices, Concerns, and Suggestions). These major issues/subthemes were:

- Students need hands-on experience with heavy vehicles as part of their driver education coursework, and
- Instructors need up-to-date materials they can use while teaching students how to share the road with heavy vehicles.

While other important issues were raised during the qualitative analysis, these two issues in particular arose throughout the qualitative analysis and should be considered during future research efforts examining how to improve driver education related to sharing the road with heavy vehicles.

FUTURE WORK

Results from this study indicated that a large proportion of the light-vehicle driver education programs surveyed during this study do currently use at least one instructional method of sharing the road with heavy vehicles. This is a positive result indicating that these programs do understand the importance of educating light-vehicle drivers about sharing the road with heavy vehicles. Other results indicate that although heavy-vehicle components are being adopted within these programs and by states, there may be room for improvement with regard to the content of these programs. In addition, it may be beneficial to make a best practices document available for potential improvement to states that currently do not require their driver education curriculum and/or manual to include a component about safely sharing the road with heavy vehicles. As one participant indicated during the survey, *“I would teach shared roadway safety dealing with heavy trucks if we had the information to teach.”*

Based on these results as a whole, it is recommended that future work be performed to further analyze the data received from this study's surveys and contacts made in order to develop a best practices document. In addition, a case study could be performed during a classroom setting with a light-vehicle driver education program that currently only uses basic materials about sharing the road. Based on the best practices investigation, one or more sharing-the-road programs that are deemed the strongest (or one developed by VTTI based on best practices found) could be implemented during this driver education program's classroom setting. A group of students who participated in the driver education program prior to the implementation of this new component and one or more groups who participated with the new component could then be interviewed three to six months later, and knowledge retention of key sharing-the-road information (e.g., heavy-vehicle no zones) could be measured. It is also recommended that further work be performed in exploring the depth and quality of sharing-the-road content included in state driver education curricula/manuals.

STUDY LIMITATIONS

There are several limitations to the current study, and all should be kept in mind when drawing general conclusions from these results: 1) All respondents to the survey were volunteers; therefore, there exists the possibility of a voluntary response bias in the data. In addition, all data collected were confidential, yet some participants may have been reluctant to provide honest responses to questions in fear of some type of reprisal by upper management. 2) As with any survey resulting in self-reported data, results found may be less accurate than an actual investigation of program curriculum by NSTSCE researchers and/or direct observation of these programs. As previously mentioned, an effort to examine each state's driver education curriculum and/or manual was conducted in order to compare against survey data received; however, targeted content analysis was not performed in depth and is recommended for future work. 3) This study did not involve an exhaustive sample of every light-vehicle driver education program. A stratified and somewhat proportional sample was used to survey each state, resulting in as little as two and at most 180 completed surveys per state. Therefore, any results from this study are somewhat constrained to the number of participants sampled. 4) Efforts to protect participant privacy, to gather input from as many instructors/administrators as possible, and to keep the survey short resulted in a data set that was not as detailed as it could have been. For instance, to protect participant privacy, NSTSCE researchers did not ask participants to indicate if they were an administrator or instructor. For this reason, the results provide an overall snapshot versus a detailed comparison of responses by participant type (e.g., instructor versus administrator, private versus public/for-profit school). The specific information, while interesting, was not as important to the research team as ensuring participant privacy.

APPENDIX A. DRIVER EDUCATION SURVEY

Driver Education Survey

This survey is being conducted by the Virginia Tech Transportation Institute. The goal of the survey is to learn more about driver education across the country, specifically curricula about how light/passenger vehicles can safely share the road with commercial trucks/heavy vehicles. The survey should take no more than 5 minutes to complete.

To participate, you must be at least 18 years old and administering and/or teaching driver education in the United States. There are no direct benefits or compensation to you, though you may enjoy sharing your opinions and helping guide future research on driver education. The risks associated with this survey include possible discomfort at sharing your experience and opinions in a survey. Please be assured that your responses will be kept confidential. The survey does not ask for your name or any other directly identifying information. Completing this survey is voluntary. You may choose to not answer any question and you may end the survey at any time.

If you have any questions prior to starting this survey, you may contact investigators, Andy Schaudt (ASchaudt@vti.vt.edu or 540-231-1591) or JC Rice (JRice@vti.vt.edu or 540-231-1507).

If you should have any questions about the protection of human research participants regarding this study, you may contact Dr. David Moore, Chair, Virginia Tech Institutional Review Board for the Protection of Human Subjects (Moored@vt.edu or 540-231-4991).

By continuing with the survey you acknowledge that you are at least 18 and currently administering and/or teaching driver education in the United States. In addition, you give your voluntary consent to participate in this survey.

As background and for the purposes of this survey, examples of commercial trucks/heavy vehicles include, but are not limited to, tractor trailers, tank trucks, delivery trucks, and motorcoaches.

Thank you for taking the time to complete this survey. We value your expertise and your opinion matters to us!

1. In what state do you administer and/or teach driver education? (Note: If you teach in more than one state, please select the one you are currently teaching in the most.)
 - List of States and District of Columbia
2. How many years have you been administering and/or teaching driver education? (Select one)
 - Less than 1 year
 - 1 to 4 years
 - 5 to 9 years
 - 10 to 14 years
 - 15 to 19 years

- 20 or more years
3. Does the driver education curriculum you administer and/or teach include a component dealing with how to safely share the road with commercial trucks/heavy vehicles? (Select one)
- Yes
 - No
 - Not Sure
4. If the driver education curriculum you administer and/or teach includes a component on safely sharing the road with commercial trucks/heavy vehicles, how are students taught this information? (Select all that apply)
- Students are taught in a classroom setting
 - Students are taught via pamphlet
 - Students are taught via textbook
 - Students are taught via CD
 - Student are taught via DVD
 - Students are taught via VHS
 - Students are taught via online coursework
 - Students are taught in a driving simulator
 - Students are taught via on-road training
 - Not Sure
 - The driver education curriculum I administer and/or teach does not include a component on safely sharing the road with commercial trucks/heavy vehicles
 - Other teaching method (Open-ended)
5. Please indicate your level of agreement with the following statement: The driver education curriculum I administer and/or teach is effective at showing students how to safely share the road with commercial trucks/heavy vehicles? (Select one)
- Strongly Agree
 - Agree
 - Undecided
 - Disagree
 - Strongly Disagree
 - The driver education curriculum I administer and/or teach does not include a component on safely sharing the road with commercial trucks/heavy vehicles
6. Does your state require that the driver education curriculum you administer and/or teach include information on how to safely share the road with commercial trucks/heavy vehicles? (Select one)
- Yes
 - No
 - Not Sure
7. Is there anything you would like to share with us regarding how your state teaches drivers to safely share the road with commercial trucks/heavy vehicles? (Open-ended)

Thank you for your feedback!

All of your responses will be kept confidential. The information you provided will help us better understand how drivers are learning to share the road with commercial trucks/heavy vehicles. Please feel free to share the survey link (www.drived.vtti.vt.edu) with others you know who administer and/or teach driver education.

If you should have any questions about the protection of human research participants regarding this study, you may contact Dr. David Moore, Chair, Virginia Tech Institutional Review Board for the Protection of Human Subjects (Moored@vt.edu or 540-231-4991).

If you have any questions about the survey, you may contact investigators, Andy Schaudt (ASchaudt@vti.vt.edu or 540-231-1591) or JC Rice (JRice@vti.vt.edu or 540-231-1507).

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