EXAMINATION OF SUPPLEMENTAL DRIVER TRAINING

AND ONLINE BASIC DRIVER EDUCATION

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16. Abstract

This report describes supplemental driver training programs and online basic driver education. It coves supplemental driver training that focused on knowledge and skills beyond those normally found in traditional driver education delivered in the United States and in other countries. It also reviewed online basic driver education programs that were approved or accepted in at least one U.S. State to replace the standard driver education classroom requirement in the driver licensing process.

Fifty-six supplemental programs provided information for the United States study, and 59 provided information for the international study. There were many similarities among the supplemental programs with most programs covering the same topics using similar training techniques. Venues of the programs and intended target audience tended to be different. Case studies of representative programs provided in-depth information for all three studies. Program providers universally felt that their efforts were increasing driver safety, although no formal evaluations were identified to support their claims. There was virtually no oversight of the supplemental programs for a variety of reasons.

Forty unique online basic driver education providers furnished information about their programs. State personnel in 14 of the 15 States that accepted online driver education provided information from their point of view. Most online programs covered the same topics, but the level of student engagement varied, ranging from none to active interaction with an instructor. Many of the 14 States were unable to provide significant oversight of the programs for various reasons, which may have contributed to the variations in program engagement levels. There is an absence of significant oversight and regulation of the training programs and a need for formal scientific evaluations of the effects of both supplemental and online driver education on young driver safety.

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EXECUTIVE SUMMARY

Introduction

The first 6 months of unsupervised driving are the most hazardous in a novice driver's driving experience (McCartt, 2006). Most States adopted graduated driver licensing (GDL) systems to give novice drivers experience in a protective environment, gradually introducing them to more risky driving conditions as they gain experience. Despite the gains of GDL programs, teenage drivers still have crash rates that are higher than that of experienced drivers over age 25. Statistics show that the causes of teen driver crashes are similar to that of adults --primarily due to failures to scan the road properly (hazard anticipation), speed management, incorrect assessment of roadway conditions, and distraction (Braitman, Kirley, McCartt, & Chaudhary, 2008). While most GDL programs advocate post-license driver training after the initial driver education course, most States do not mandate further training (Groeger & Banks, 2007).

Many providers offer supplemental driver training programs and many States now accept online basic driver education training. There is a need to document and examine both kinds of driver training programs in the United States and around the world.

Approach

The goal of this project was to describe the current state of supplemental driver training and online training by documenting as many programs as possible to examine what topics were being taught and what methods were being used to deliver the programs. A first step for the project was to review the literature and research on basic and supplemental driver training for newly-licensed young drivers. Researchers conducted an extensive literature review of the scientific and popular literature to see what types of programs were in existence and what information was available on the effectiveness of such programs.

Separate efforts examined supplemental programs in the United States and in other countries around the world. Two teams of researchers worked independently to identify as many active programs as possible. They used an extensive network of contacts and an intensive Internet search to identify providers of programs that could qualify for inclusion in the study. Once a program was identified, researchers attempted to contact the program. Information obtained from discussions with knowledgeable staff from each provider formed the basis for general classification systems for the United States and foreign country programs. Case studies of each class of program provided in-depth information.

A third effort identified and described online basic driver education programs in the United States using the same approach. Researchers contacted State personnel who were knowledgeable about online driver education requirements in States where online driver education was accepted as part of driver licensing and developed case studies.

Results

United States Supplemental Driver Training. Fifty-six agencies gave us information about supplemental driver training programs in the United States. Most of these providers had been in existence for more than 5 years and they offered multiple types of courses such as basic driver education or thrill-seeking in addition to the supplemental driver training course that was of most interest to this study. The various supplemental programs covered essentially the same topics and used similar approaches to training young drivers.

- Most (59%) providers operated in only one location, 13% in 2 or 3 locations, and 21% in at least 4 locations. Most of the programs (66%) reported that they served a limited region such as a State or within a radius of 500 miles or less. The remainder served a greater area, national, or international markets.

- About half (52%) of the programs had minimum age restrictions usually based on the States' minimum driver permit age. Three out of 4 (73%) programs allowed students who held only driver permits to take the course while another 21% required that the drivers have unrestricted licenses. Only 5% of the programs required that the student must take a previous course in the series before taking the supplemental course. The majority (94%) of programs allowed parents to attend the courses.

- When describing the reasons that students take their supplemental training programs, most programs (85%) listed safety as the main reason. Most programs (81%) also reported that students took the training because their parents made them. Other reasons included obeying court orders (30%), removal of points (20%), and thrill seeking (20% overall and 44% of race track programs). About half (55%) listed insurance discounts as a major reason for taking a course, especially for the Basic Driver Education Plus programs.

- Class size varied from
  - less than 10 students (16%),
  - 11 to 20 students (41%),
  - 21 to 31 students (11%),
  - 30 to 100 students (16%),
  - to unreported (16%).

  Pupil to instructor ratio for the in-vehicle portion of the training ranged from
  - 1:1 (39%),
  - 2:1 (11%),
  - 3:1 (23%),
  - 4:1 (2%),
  - to a remote instructor (9%) at closed-course and race track programs.

- Most U.S. programs offered multiple types of course such as basic driver education and thrill-seeking training. Course content was similar but the venues differed. Eleven courses were primarily standard driver education programs that included some other

training such as skid recovery training, 19 used private driving facilities with some form of road courses or other "driving areas" where on-road training took place, 16 programs conducted their instructor activities at racetracks, and 2 programs traveled to different venues to deliver the courses. Two programs were for corporate employee drivers and 2 programs used simulators or another non-traditional technology as a primary part of the training.

- Of the supplemental training programs to increase driver safety, topics often included advanced vehicle handling and control, vehicle dynamics, and cognitive and perceptual techniques to identify and respond to potential hazards.

- Costs ranged from free to over $1,000 with most $250 to $450. While all of the program providers asserted that their courses improved driver safety, no formal research evaluations of the safety benefits had been conducted, and there was virtually no oversight of the courses by some external body.

International Supplemental Driver Training. The international research team gathered information from 59 supplemental programs outside the United States. Most of the programs were in Canada (28) followed by the United Kingdom (15), Australia (8), New Zealand (4) and 1 each in Austria, Ireland, Israel, and Kenya. Over half (61%) of the providers had been operating for 10 years or more.

- Most providers addressed a market of individual, general drivers, followed by corporate employer drivers, performance motoring enthusiasts, and those who sold "wholesale" programs for use and delivery by local providers.

- Most of the courses followed similar training approaches and covered the same topics as those in the United States. One difference was that some countries required, or strongly suggested, that drivers take a supplemental course.

- Some programs had notable advanced facilities that could create a range of driving scenarios and realistic experiences for the drivers. Most young drivers had taken the supplemental programs abroad when the training was required by mandate to garner a driver's license. Similar the United States, however, no truly independent evaluations of the safety effects of the individual programs had been conducted.

- Costs ranged from $250 to $1,000 USD.

Table ES-1 shows the number of programs in each category for the U.S. and International supplemental training providers. Table ES-2 shows the percentage of the providers who included specific skills and knowledge in their training programs.

Table ES-1. Number of Providers and Numbers in Each

Program Category	United States	International
Fleet-Driver-Oriented	2	18
Motorsports-Driver-Oriented Racetrack (U.S.)	16	13
General-Driver-Oriented Basic Driver Education Plus	- 11	25 --
Closed Course	19	--
Wholesale Program Suppliers	0	3
Technology	6	0
Traveling	2	0
Total	**56**	**59**

Table ES-2. Skills and Knowledge Covered in Supplemental Training Program

Skills and Knowledge	United States	International
Basic vehicle control	83.9%	71.2%
Advanced braking	89.3%	83.1%
Skid control	85.7%	67.8%
Hazard identification	89.4%	89.8%
Hazard avoidance	91.1%	88.1%
Alcohol/drug Impairment	60.7%	--
Night driving	51.8%	--
Physics of driving	82.1%	50.8%
Managing distractions	82.1%	70.4%
Laws	37.5%	--

Online Basic Driver Education. Forty online basic driver education providers were identified in 15 States that accepted online basic driver education in lieu of a standard classroom driver education. Researchers held in-depth discussions with State personnel in 14 of the 15 States to document the States' practices related to online driver education. Table ES-3 provides a brief description of the agencies responsible for approval and oversight of the programs, and the number of online programs approved in each State.

Table ES-3. States Approving Online Driver Education Courses.

STATE	Number of Approved Online Courses *or* Course Providers	Agency Responsible for Approval and Oversight
California	Unknown	DMV & Dept of Education, but private secondary schools avoided oversight; also, local school boards had discretion
Colorado	9	Department of Revenue
Florida[1]	6	Department of Highway Safety and Motor Vehicles; Department of Education (High School Driver Education programs)
Georgia	5	Dept. of Driver Services
Idaho	1	Department of Education
Indiana	3	Department of Education with additional Bureau of Motor Vehicles oversight, but local control; Criminal Justice Institute over commercial driving school partnerships
Kansas	Unknown	Department of Education, but local control
Nebraska	4	Department of Motor Vehicles
Nevada	17	Department of Education but local control; Division of Motor Vehicles (commercial driving schools)
Oklahoma	6	Department of Public Safety
Pennsylvania[2]	Approx. 22	Department of Education, but local control
Texas	5 (2 planned for 2010)	Department of Public Safety (parent taught); Texas Education Agency (school programs)
Utah	3	Office of Education (school programs); License Division, Dept. Public Safety (commercial schools)
Virginia	4	Department of Education
Wisconsin	2	Department of Public Instruction; Southwest Tech's Technical College System Board

Of the 40 identified providers, 7 were State or local entities, 3 were nonprofits, and the remaining 30 were for-profit businesses. The State and local providers included 3 technical, community, or State colleges; 3 virtual high schools; and a cooperative educational service agency. The non-profits included a State association of driver educators (VADETS), a nonprofit company (NDTI), and a State association for DUI programs (Florida).

[1] Florida required all first-time licensees to complete a 4-hour Traffic Law and Substance Abuse Education course, but otherwise did not require formal driver education.

[2] Pennsylvania approved public and commercial driving schools, 22 of which offered an online course. It did not directly approve individual online courses.

Although the content across courses was fairly consistent, the courses varied greatly in training approach. The primary distinguishing factor among the courses was how much student engagement was involved with the training. Some courses required very little engagement and could be completed very quickly while others required very high engagement, often including some form of interaction with a person through a virtual training environment. Below is a brief description of the classification system:

- **Courses Requiring Average Student Engagement.** These programs were representative of the most common types of courses teens were taking online at the time of this report in States where online driver's education was subject to state regulation and approval. States took different approaches to time requirements, and all of these programs required more than a half day to complete. Traditional in-person classes typically require 30 hours of class time. Teens could generally complete these courses independently, though online or telephone help was available if requested. Tests were adequately constructed and there was some attention to test security. This category is broad, encompassing a variety of delivery methods, but there was more to these courses than lengthy screens of text. About half of the courses fit under this umbrella, and 4 case studies illustrate it.

- **Courses Requiring High Student Engagement**. These programs were generally virtual classrooms and/or involved concurrent behind-the-wheel activities. All supplemented the theory course with some form of human interaction. They required more active learning on the part of the student, and had more instructor and student interaction. The programs accomplished this in different ways, including homework assignments that required students to seek further information or analyze material, or pairing classroom material with concurrent behind-the-wheel training. Instructor-student interaction often involved certified driving instructors who kept track of each student's progress and gave feedback on homework, or parents who made significant time commitments as instructors for their teen's concurrent behind-the wheel training. In either case, students were required to apply what they learned, either in actual driving with a parent or professional instructor, or in assignments submitted to instructors who graded their progress. These courses often took longer to complete, in some cases longer than traditional brick-and-mortar 30 hour classes. Oversight by a parent or other instructor added another level of assurance that the student was learning and applying the information presented online. About a third of the courses fit into this category, and three were selected as case studies.

- **Courses with Potential for Low Student Engagement**. These courses included several features that, when added together, may open the door for teens to get a certificate of completion without learning the course content. Generally, these programs included text-intensive screens that were not very engaging. Students could click through the screens at any speed, skip the lessons entirely, take tests repeatedly, or copy the tests to circulate to other students. These features were not evident from the Web site itself in most cases, but were noted while researchers were taking the courses. These features would not be immediately apparent to State regulators or parents reviewing the course Web sites. About 15 percent of the courses fit into this category. Four were combined into a single case study to illustrate this type of program.

Similar to the supplemental programs, no definitive evaluations had been conducted examining the effectiveness of the programs against some benchmark.

Conclusions

Given the number of supplemental programs that are operating in the United States and around the world, it is clear that there is a demand for driver training that goes above the knowledge and skills that are being taught in basic driver education in the United States. Course content was similar for the U.S. and international programs, but the venues differed. Most programs developed their own training materials. Of the supplemental training programs to increase driver safety, topics often included advanced vehicle handling and control, vehicle dynamics, and cognitive and perceptual techniques to identify and respond to potential hazards.

Online basic driver education programs are becoming more common as State education budgets are slashed and private driver training costs are increasing. Course content was similar across the 40 courses reviewed in 15 States. Most courses relied on driver education standards and had to be approved by the State. The primary distinguishing factor among the course was how much student engagement there was with the training. Some course required very little engagement and a student could go through the computer screens very quickly while other course required high engagement, often in the form on interaction with a person through a virtual training environment.

Absence of significant oversight and regulation of the training programs was a common theme in all types of training programs. The Internet-based programs did have at least some general standards to draw on, but it was apparent that most of the training programs were not adhering to these general standards. The clear definition of standards for all of the types of programs would also provide much needed points of reference for States considering whether to accept or implement particular supplemental or online driver education programs as part of their graduated driver licensing process.

Taking the findings from these three research efforts into consideration, it is clear that there is a need for formal scientific evaluations of the effects of both supplemental and online basic driver education on young driver safety.

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1. INTRODUCTION

This report provides an examination of supplemental driver training programs in the United States and around the world. Specifically, the focus was on programs that covered knowledge and skills above and beyond those normally found in traditional driver education as delivered in the United States. Also included in the review were online basic driver education programs in the United States since this delivery method was emerging as a new approach to delivering traditional driver education to young drivers.

2. APPROACH

The ultimate goal of this project was to describe the current state of supplemental driver training and online training by documenting as many of programs as possible to examine what topics were being taught and what methods were being used to deliver the programs to newly-licensed young drivers. As such, the final product is a description of each area based on currently available information from active programs for whom the information could be verified through discussions with the program providers.

A first step for the project was to review the literature and research on basic and supplemental driver training in the United States and abroad. Researchers conducted an extensive literature review of the scientific and popular literature to see what types of programs were in existence and what information was available on the effectiveness of such programs.

The literature review is followed by separate sections of the report for supplemental programs in the United States and supplemental programs abroad. Two teams of researchers worked independently to identify as many active programs as possible. Researchers used an extensive network of contacts and an intensive Internet search to identify providers of programs that may qualify for inclusion in the study. Once a program was identified, attempts were made to contact the program, and discussions were held with knowledgeable staff from each provider. Information obtained from these discussions was used to develop general classification systems separately for the United States programs and programs abroad. The details of the findings for each study are presented in separate sections of the report.

A third team of researchers undertook another effort to identify and describe basic online driver education programs in the United States. Again, researchers networked with known contacts and also conducted an extensive Internet search to identify potential providers of online programs. Once a program was identified, attempts were made to contact the provider for a discussion of the programs offered. Contacts were also made with State personnel who were knowledgeable about online driver education requirements in the States where online driver education was accepted as part of driver licensing. Details of the findings for the States and online programs are provided in a separate section of this report.

3. LITERATURE REVIEW

Traditional driver education has consisted primarily of thirty hours of classroom instruction coupled with 6 hours of on-the-road driving instruction (the 30/6 model) with most States allowing full licensure at age 16 (Mayhew, Donelson, Beirness & Simpson, 1986). Mayhew's (2007) literature review concluded that there is no evidence that traditional programs are effective at reducing crash rates among newly licensed drivers. Thomas, Blomberg, and Fisher (2012) conducted a recent review of driver education in the United States and found that although there was considerable variability in requirements across States, traditional driver education programs continued to follow the model of 30 hours of classroom instruction followed by 6 hours of in-car, or behind-the-wheel instruction, despite the lack of evidence that this model reduces crash risk among young drivers.

Because traditional driver education has not been sufficient to reduce crash rates, graduated driver licensing (GDL) had gained significant traction since starting in the mid 1990's. As of April 2008, all 50 U.S. States have enacted various levels of graduated drivers license programs. Forty-one States restricted driving for GDL drivers, and 39 placed restrictions on driving with passengers at night (Williams & Mayhew, 2008). The widespread implementation of GDL programs in the United States and abroad had been credited with helping reduce the number of crashes for newly licensed drivers (Baker, Chen, & Li, 2006; Foss & Evenson, 1999). The elevated crash risk experienced by younger drivers is highest over the first few months of unsupervised driving at a time when drivers are the most inexperienced (Preusser, 2006; McKnight, 2006). GDL programs allow teenage drivers to gain experience during these critical times while under the supervision of a fully licensed driver and with a variety of driving restrictions. It must be noted, that many GDL programs still include traditional driver education in the licensing process.

Despite the gains of GDL programs, teenage drivers still have crash rates that are higher than that of experienced drivers over the age of 25. Statistics show that the causes of teen driver crashes are primarily due to failures to scan the road properly (hazard anticipation), speed management, incorrect assessment of roadway conditions, and distraction (Braitman, Kirley, McCartt, & Chaudhary, 2008). While most GDL programs advocate the use of post-license driver training, further training is not mandated in most States (Groeger & Banks, 2007). In fact, only Michigan currently goes as far as having a second-tier of driver education in its GDL process.

While drivers do gain experience and knowledge in traditional driver education and GDL programs that can help them through the licensing process, additional training may be necessary to help young drivers travel the roadways safely. As such, a number of post-licensure and advanced driving performance courses are surfacing around the world. The literature on these supplemental driver training programs is quite extensive. Many courses focus on the areas where the 30/6 programs and GDL leave off. Training of this type often focuses on various combinations of advanced driver feedback, awareness training, risk avoidance skills and/or driver monitoring. Other programs are focused on advanced vehicle handling skills (e.g., skid recovery). The modes in which training is delivered also takes many forms. The remainder of

this literature review examines studies that have looked at how these supplemental training programs may be helpful or harmful to young drivers.

3.1 Field and On-Road Training

Driver training that takes place after a driver has received his or her license is referred to as post-license driver education (PLDE). Ker et al. (2005) conducted a systematic review of 40 years worth of PLDE research spanning 1962 to 2002 (with most studies in the 1970's and 80's). The studies they reviewed primarily consisted of correspondence and group education courses. Their results indicated that many of these efforts did not significantly reduce injuries or crashes in drivers. However, they acknowledge that their pooled results were likely influenced by variability in the quality of the studies they reviewed. It should also be noted that correspondence and group courses limit the opportunities for drivers to receive active practice in a car with one-on-one attention from an instructor. Such passive learning methods have often proven to be inferior to active learning methods, regardless of age (Ivancic & Hesketh, 2000; Romoser & Fisher, 2009).

A recent study by Stanton et al. (2007) and another by Walker et al. (2009) investigated a training method that incorporated active learning components in the field. Their program incorporated a field version of the information, position, speed, gear, and accelerate (IPSGA) paradigm developed by Coyne (2000) and the Institute of Advanced Motorists (IAM, 2007). This paradigm differs from other field courses that offer skid training because it trains drivers to be proactive and plan ahead for hazards. This has the benefit of encouraging drivers to proactively scan their environment for potential hazards – a skill that many novice drivers lack (Pradhan et al., 2005). IPSGA trains drivers to scan the environment using all means, including mirrors. It teaches drivers how to deal with potential hazards (Information), position their car to give them the best possibility to avoid a crash (Position), adjust their speed to one that is appropriate to the situation (Speed), put their car in the gear for optimal vehicle control (Gear), and accelerate back up to highway speeds once past the hazard (Accelerate). In their study, Stanton et al. (2007) tested75 drivers on a pre-determined 25 mile route around London, using the participant's own vehicle, and coached them one-on-one once per week for 8 weeks. Drivers used the IPSGA method to negotiate a series of mock-up scenarios. Drivers who received the training demonstrated statistically significant improvement in speed, limit points, roadcraft, steering, headway, use of mirrors, gear changes, and overall performance, while those in the control groups actually performed worse in steering, responses to hazard, gear changes, and overall performance. Walker et al. (2009) tested 25 drivers in the same method and found that drivers' situational awareness was improved compared to a control group.

In recent years, another type of supplemental driver training in the field has experienced a surge in popularity. Skid training attempts to train drivers on how to recover in the event of a loss of control in slippery road conditions, as well as how to conduct evasive maneuvers in an emergency situation (Katila, Keskinen, & Hatakka, 1996). Professional driving instructors conduct training of this type on a closed course or skid pad. Research, however, suggests that training of this type can actually have adverse consequences by engendering a state of overconfidence in the trainee (Gregersen, 1996; Katila, Keskinen, Hatakka, & Laapotti, 1996; Mayhew, Simpson, Williams, & Ferguson, 1998).

On the other hand, a study by Petersen, Barrett, and Morrison (2006) investigated training evasive maneuvers and found drivers who received training on braking techniques with and without antilock braking systems (ABS) used a smoother braking profile when approaching stops and had fewer ABS activations than control group drivers. They also found that drivers had better postural stability during turns and stops, which has been found to lead to vehicular control in those types of maneuvers, especially in emergency situations (Petersen, Barrett, & Morrison, 2008; Treffner, Barrett, & Petersen, 2001).

3.2 Computer and Internet-based Training

Within the last 10 years, computers have become more capable of handling complex multimedia interactions. As such, computers have become a popular choice for delivering a variety of educational content. The Internet allows training content to quickly reach a wide audience. As with any type of instruction, creating effective training for delivery either on a local computer or over the Internet can be expensive and time consuming. Video, animations, 3-D interactions and any multimedia content all need to be produced and programmed. Without such content, instruction delivered on a computer is reduced to a virtual textbook with passive images and text.

The U.S. Department of Education recently conducted a meta-analysis of the effectiveness of Internet-based learning (Means et al., 2009). This effort noted a paucity of research for school-aged children in grades K-12. The bulk of research was focused on college students or adult learners. The research that has been conducted did suggest that Internet-based learning had benefits above and beyond learning in the classroom. It also appeared that a blended approach, part classroom and part Internet, was even better for learning. The authors do note, however, that the delivery medium is not the only consideration when talking about learning. Other factors, such as course content and time on task are important and difficult to separate out of the results of the meta-analysis.

Even without strong research evidence for driver education or K-12 education in general, computer-based programs are becoming more prevalent and even accepted in-lieu of classroom driver education programs in some States. Only one controlled study of computer-based and Internet-based driver education versus classroom driver education was identified. Masten and Chapman (2003) compared the effectiveness of home-based computer and Internet driver education courses to those delivered in a classroom. Participants were randomly assigned to groups. The results of the study showed no statistically significant differences on an exit exam of knowledge or safe driving attitudes for the classroom students versus the computer- or Internet-trained groups. However, a larger percentage of the classroom-trained students passed the official licensing exam on the first try. The authors conclude that the computer-based and Internet-based programs were at least as effective as the classroom training. No large-scale studies have been conducted to determine the effectiveness of Internet/computer-based driver education programs for reducing crash rates of young drivers.

In addition to the Internet-based programs aimed at teaching traditional driver education topics, many new programs are being developed to train young drivers on more advanced cognitive and decision-making skills that are not covered in traditional driver education programs. Studies into the effectiveness of these supplemental Internet-based programs are discussed below.

Harrison (2005) explored the effects of computer-based training on go or no-go decisions when turning left across traffic at intersections. In this study, participants were shown a series of 200 digital images of oncoming traffic at intersections. They were instructed to make an indication of whether or not they felt it was safe at that moment to proceed into the intersection. Incorrect decisions were given a negative consequence of an extra-long pause between trials – forcing participants to wait. A portion of the images contained motorcycles in the oncoming traffic stream. The presence of a motorcycle was considered by the program to make the turn more risky. As a result, participants learned to avoid a "go-decision" when motorcycles where shown to be close to the intersection. In a follow up experiment 4 weeks later with the same participants, it was found that the training effect persisted.

In a study by Pollatsek, Narayanaan, Pradhan, and Fisher (2006) a computer-based program named Risk Awareness and Perception Training (RAPT) was created to train younger drivers on how to better anticipate hazardous situations. In the program, novice drivers were asked to look at overhead views of various scenarios in which vehicles, vegetation, and road geometry might be combined to obscure pedestrians or vehicles that might conflict with the driver's own vehicle. After reading a description of the situation, participants were asked to move circles to those areas to identify where they would begin to adjust their driving (e.g., slow down) and where hidden pedestrians or vehicles might be located. After training, participants were tested on a large-scale driving simulator and drove through various environments containing similar (near transfer) and non-similar (far transfer) hazardous scenarios. They found that trained drivers were nearly twice as likely as untrained drivers to fixate on those areas that might contain a hazard. The same results were later replicated during field drives in which trained and untrained participants drove a pre-defined route on suburban and rural streets. Again, trained participants were significantly more likely than untrained participants to fixate on hazardous areas (Pollatsek, Fisher, & Pradhan, 2006).

A third-generation version of the program, called RAPT-3, was also developed and tested. RAPT-3 incorporated overhead views of hazardous situations and street-level images of those situations on real roads. Successive images from the driver's point of view were shown at intervals of 3 seconds, showing the view of the hazard as the driver passed. In addition to placing circles around potential hazards, participants were also asked to indicate on the images where they would look right or left as they passed the hazard. This strategy not only taught drivers where to look, but also trained glance timing. The results indicated that RAPT-3 was effective in getting trained drivers to successfully identify hazardous situations when driving in the field. The hazard anticipation performance of novice drivers trained with RAPT-3 was approximately equal to that of experienced drivers over age 25 (Pradhan, Pollatsek, Knodler, & Fisher, 2009).

In another line of research, it has been shown that drivers who look away from the road for more than 2 seconds within any 6 second period significantly increase their likelihood of being involved in a crash (Klauer, Dingus, Neale, Sudweeks, & Ramsey, 2006). Pradhan et al, (2010), tested a computer-based program named FOrward Concentration and Attention Learning (FOCAL). The objective of this program was to train drivers on how to manage their glances away from the forward roadway to reduce the instances of prolonged glances. Results indicated

that FOCAL training resulted in shorter glance durations on the computer simulation task than did placebo training.

In another study, Horrey, Lesch, Kramer, and Melton (2009) developed a computer-based training program to improve driver planning and monitoring skills. The first phase of the program educated drivers on the dangers of distracted driving and change blindness. The second phase required participants to apply the Assess, Consider options, Take appropriate action (ACT) technique to various traffic scenarios. Videos were used as a means to reinforce learning. After training, performance was assessed on a closed-course driving track as participants were asked to perform several in-vehicle secondary tasks. Trained participants reported a significant decrease in their willingness to perform in-vehicle secondary tasks and acknowledged the increased risk of such activities. In addition, drivers in the trained group were significantly more likely than those in the control group to elect to perform the secondary tasks while the vehicle was stopped or parked.

3.3 Using Simulators for Training

Simulators have been used for training purposes as early as the 1970's and 1980's. However, up until recently, the cost of driving simulation technology had limited their utility in research and training. Active learning, defined here as practicing target skills in an environment that is contextually very similar to the environment in which the skills will ultimately be used, is an effective means to achieve high levels of training transfer. Driving simulators allow active learning by making it possible to give immediate feedback on driver performance. It is as close as a person can come to training on real roads with a licensed driving instructor, but without the crash risk. Some countries are further along than others in leveraging simulators for driver training.

According to research by Kappé and Emmerik (2005), The Netherlands employs approximately 100 low-cost simulators for initial driver training. Hazard anticipation training in a simulator is now required for all drivers trying to earn a learner's permit (Vlakveld, 2005). In a related study out of the Netherlands, De Winter et al. (2007) investigated the performance of 520 participants who completed the Netherlands driving simulator training program across 42 different driving schools. They found that men committed more driving violations in the simulator than women, and women committed more errors. Also, drivers who routinely exceeded the speed limit committed more errors than those who did not. The results of the study found that when participants in the training were forced to obey a specified speed limit, the number of errors dropped and training retention increased.

In one study, Ivancic and Hesketh (2000) compared training outcomes for error versus errorless learning in a driving simulator. Participants were divided into two groups. Participants drove a simulated 4.8 kilometer route with the goal of errorless driving. They were judged on maneuvers such as overtaking and merging, as well as vehicular control skills such as slowing at intersections and blind curves and speed maintenance. For the error training group, non-compliance resulted in a simulated crash or a virtual parking ticket. For the errorless group, the threshold at which the simulator triggered negative events was increased. As a result, drivers in this group could drive more quickly, but did not receive feedback as frequently as the error

group. Results indicated that error learning lead to better transfer to post-training driving tests. However, in a follow up experiment with far-transfer scenarios, differences in the training outcomes between the groups were much weaker.

Although not focused on newly licensed drivers, a more recent study endeavored to examine transfer of simulator training to the field. Parker et al. (2007) developed a military driving simulator for training soldiers on how to handle large military vehicles in cold, wintery conditions. The goal of the research was to develop physics models for the virtual vehicles and feedback mechanisms that would closely correspond to how the vehicles would move and respond in similar conditions in the field. The models not only included vehicular models, but also terrain and weather conditions for traction in different terrain types such as ice, packed snow, and deep snow. They had participants drive similar vehicles in the simulator and in the field, executing identical maneuvers in each. Their results found a good correlation of the field and simulator results, validating the use of simulator as a means of training soldiers in the absence of similar conditions in the field.

Romoser and Fisher (2009) also performed an experiment that validated training results from a simulator in the field. In their study, they investigated the effects of customized feedback and active practice in a simulator for increasing older drivers side-to-side scanning in intersections. The study consisted of two experiments. In the first experiment, they found that customized feedback in the form of showing older drivers a video replay of their errors in the simulator made older drivers more receptive to receiving training and changing their driving behavior. In the second experiment, they compared the training of three groups of drivers (active training, passive training, no training). Approximately 6 weeks after training, drivers from all groups participated in follow-up simulator and field drive sessions. The number of extra side-to-side glances in the active learning group nearly doubled both in the field (from 44% to 82% of turns pre- to post-training) and in the simulator (from 31% to 67% of turns pre- to post-training). There were no significant gains in either the field or simulator for the passive training or control groups.

Currently, nearly all driving studies investigating the use of driving simulators as training tools employ simulators that have a subject driver with all other vehicles within the environment being controlled by the computer. However, that is beginning to change. Driving simulation platforms are being developed for distributed simulation (Wang & Zhang, 2008). Systems such as these involve multiple simulators communicating with each other over a distributed network, allowing multiple drivers to drive simultaneously within the same virtual environment. These platforms are also referred to as distributed virtual reality (DVR) systems or distributed virtual environments (DVE). The combined computing power of each simulator on the network could support large numbers of simultaneous users, keeping the shared worlds consistent and allowing for much more complex training interactions. Not only could fellow students interact in combined scenarios, but instructors could also drive and serve as virtual instructors in the simulated environment. No studies of the effectiveness of such systems were identified.

3.4 Video and Classroom Training

Only two recent studies in the literature included evaluations of supplemental driver training delivered via video only or by classroom lecture only. Isler, Starkey, and Williamson (2009)

studied video-based hazard perception training that required participants to scan and point out hazardous situations from various video-based traffic scenarios. During the training, participants would operate a mock steering wheel as if they actually were driving a car. Their results were typical of other studies of hazard anticipation in that younger, inexperienced drivers had more difficulty in pointing out hazards in the scenarios than older, experienced drivers. Once the scenarios were complete, participants received commentary on the scenarios as a form of feedback. After feedback was delivered, younger drivers' hazard anticipation skills improved to a level comparable to older, experienced drivers.

Another study by Rosenbloom, Levi, Peleg, and Namrodov (2009) evaluated supplemental driver training delivered in a more traditional classroom setting. Specifically, they set out to test the effectiveness of the Loewenstein Hospital's Rehabilitation Center's Road Safety Workshop. Participants in the workshop were recruited from several different schools. The workshop focused on speeding, drunk driving, driving while tired, yielding the right of way, and proper passing. Safe behavior was assessed via a self-report questionnaire. Results showed that participants from vocational high schools reported safer attitudes toward driving than students in public schools. They also found that participants from schools with relatively low academic achievement records had lower overall knowledge of road safety and worse attitudes about road safety. However, these students also showed the most gains in those areas after the workshop. They also found that the workshop was effective in changing young drivers' overall attitudes.

3.5 Summary and Implications for the Current Study

Given the ongoing high crash rates among newly-licensed young drivers, there has been a renewed call to extend training beyond the initial phase of driver licensing. GDL is a first step towards a multi-tier training process, but requiring supplemental driver training as part of GDL has only been enacted in one State to date.

The evidence as to the safety benefit for such supplemental training is mixed. A number of studies have shown that supplemental programs that address various cognitive skill aspects of driving (e.g., hazard anticipation) may increase safety. However, evaluations of the effects of "advanced driving performance" courses suggest that these types of courses may actually affect safety negatively by engendering a false sense of confidence in young drivers. This literature review served as a starting point for the identification and classification of supplemental driver education programs for young drivers. The remainder of the study focused on searching for and communicating with programs that fit within the various categories. Through these search efforts, it was hoped to describe existing programs since it is important to know to what extent supplemental driver education courses are being offered. Such an effort will help to determine how much these programs may be impacting driver safety, whether the impact is positive or negative.

4. STUDY 1: SUPPLEMENTAL DRIVER TRAINING IN THE UNITED STATES

This portion of the study focused on describing supplemental driver training programs operating in the United States. Any program that could be considered supplemental training was initially included in the study, but many were culled after it was realized they did not truly fit within the scope of the study. The remainder of this section of the report covers the methods used to gather information on the programs, the classification system that emerged, and case studies of programs from each class are provided in Appendix A.

4.1 Methods

Researchers identified programs through Internet searches and networking with existing contacts throughout the driver education domain. Online searching was extensive and used varied search terms to identify potential candidates for contact.

Initial attempts to contact program providers were made via e-mail. Each e-mail included a brief narrative explaining how the provider was identified and why they were being contacted. A project synopsis was also attached to each e-mail. If providers responded, a telephone discussion time was scheduled at the convenience of the program provider. In a few cases, discussions with providers could not be arranged and information was collected from program Web sites and other available secondary sources.

Once all preliminary data collection activities were complete, four programs were selected for case study. All four case studies involved site visits to the programs for further information gathering. The results of the case studies are presented in Appendix A.

Program and Contact Identification

Due to the variation in terminology and operation of supplemental driver training programs in the United States, the online search process required the use of a wide variety of terms. Many of these search terms were broad and included terms such as “advanced driver training” while others were aimed to identify programs with specific components such as “skid pad” training. A wide array of driver training courses were identified during each search, and time considerations warranted that only those that appeared to fit within the scope of the study be selected.

To facilitate the process for identifying and contacting programs, researchers developed a priority system. The higher the score on the developed scale, the more relevant the program, and therefore, the more effort that was put into gathering information from the program. Specifically, the 5-point system was laid out as follows:

1: Program is primarily focused outside the scope of the study, e.g., corporate or fleet training, but does not specifically exclude qualified new-driver training.

2: Program provides some supplemental training to qualified drivers, but does so under the auspices of a third-party certification program or with some focus on corporate or motorsports driving.

3: Program provides supplemental training and young driver training but it is unclear whether the supplemental driver training program fits specifically into the scope of the study, that is whether there is supplemental training for young drivers after they are licensed.

4: Program provides services within the scope of the study, but it is unclear as to the extent of the services.

5: Information clearly states that the program fits within the scope of the study and may be comprehensive.

In many instances it was clear whether a program was within the study's scope, but a fair number of programs fell into Points 1 to 4. When a program was clearly out of scope, no further efforts were made to gather information. Programs that clearly fit into the study or were borderline were contacted using the procedures detailed below.

Contact Procedures and Record Maintenance

Once researchers identified and prioritized programs, efforts focused on the acquisition of contact information for a program contact person including an e-mail address, phone number, and mailing address. The contact process first used an e-mail introduction. If this correspondence did not elicit a response within a few days, a phone call was made and message left if the person was not reached. If there was no response to the phone message, additional telephone calls were made. If there was still no response after three or four attempts to contact the program, no further efforts were made to contact the program.

The e-mail introduction explained the purpose of the study and that it was being conducted on behalf of the National Highway Traffic Safety Administration of the United States Department of Transportation. The e-mail asked for a discussion time or additional contact information if the contact person was not the appropriate person to discuss details of the program.

Discussion Procedures

The discussions covered a wide array of topics. Topics included:

- Provider information (name, address, contact name and contact information);
- The history of individual programs (e.g., years of operation, number of students);
- Student information (e.g., typical ages, geographical areas, required prerequisites for taking the course);
- Program details (e.g., facilities, cost, number of classes operated, sponsors, marketing);
- Course objectives, content, length, vehicles, materials, languages;
- Instructor information (e.g., qualifications, training and retraining, components taught); and
- Program evaluation and measures used.

The researchers asked the program contacts to elaborate on each of the above topics and took notes during each discussion.

Case Studies

Researchers selected examples from the most prevalent classes of programs, as well as programs with especially interesting approaches, for detailed case studies. All of the case studies included site visits. The case studies include a general description of the program, followed by details on facilities, students, course content, and instructors. Case studies for the United States programs are presented in Appendix A.

4.2 Results

Classification of Programs

A primary objective of the project was to develop a classification system for supplemental driver training programs. The final classification system developed here included 6 classes of programs. The classes do not represent "good" or "bad" types of programs, rather they represent programs with shared characteristics. The final classification system relied heavily on the venue of the program rather than on the course content since most of the courses covered similar topics and used similar training techniques. A brief description of each class is first provided below. Table 1 lists the number of providers in each program category with whom discussions were held for this project.

- **Basic Driver Education Plus.** A number of programs offered basic driver training aimed at preparing young drivers to pass the driving tests. To be considered a Basic Driver Education Plus program, the program must have been primarily a "standard" driver education program, but must also have included some other training that went above and beyond basic driver education aimed at passing the driver licensing exam. These programs may not be as involved as the other program classes below where numerous skills were trained, but they did spend some time on supplemental skills (e.g., skid recovery training) that are not usually part of basic driver education.

- **Traveling.** As the category name suggests, these programs traveled to different venues to deliver the course. While some had a home base they operated from, to be included in this category, the courses must have spent a great majority of their time traveling to multiple locations around the country.

- **Closed Course.** A closed-course program was one that was held at a private driving facility that included some form of road course or other "driving area" where on-road training took place. Some of these programs simply used large parking lots where they set up a driving course for participants. These facilities generally included classroom facilities as well.

- **Race Track**. Race track programs conducted their instruction activities at a race track facility. The program may have used the actual race track or other facilities at the race

track for the on-road portion of the training. Many of the providers also had a separate thrill-seeking course, but to be included in this study they must have had a driver training course that was focused on teaching safe driving skills to teenage drivers. Thrill-seeking-only programs were not included in this study.

- **Technology.** Technology programs included programs that used simulators or any other non-traditional technologies as a primary part of the training. This class also included programs that had some form of online training component where supplemental skills were taught.

- **Fleet-Driver-Oriented.** Fleet programs were primarily oriented to corporate employee drivers, and their principal market was companies, not individuals. However, the included programs indicated that they could and often did provide training to young drivers.

Table 1. U.S. Program Categories and Numbers in Each

Program Category	Number of Providers
Basic Driver Education Plus	11
Traveling	2
Closed Course	19
Race Track	16
Technology	6
Fleet Driver Oriented	2
Total	56

Description of Program Content and Operations

A descriptive analysis of the of U.S. programs is presented below. Percentages are based on the full sample of 56 programs, even if data were incomplete for some of the programs for some of the topics. The text highlights any differences among the classes of programs where appropriate.

Program Scope

The vast majority of U.S. programs (87.5%) had more than one type of course that was offered to students. In fact, 33.9% of the total sample offered 6 or more course types. Most of the course providers in all categories also had course offerings that were beyond the scope of this study, such as those applying to employee drivers, high performance driving, or other audiences or objectives, such as beginner driver education.

Program Background

Overall, 23.2% of programs had been in existence for 5 years or less, 26.8% between 6 and 10 years, 26.8% between 11 and 20 years, and 23.2% had been in existence for 21 years or more. A majority of the providers operated in only one location (58.9%) while 12.5% reported having 2 or 3 locations of operation, and 21.4% had at least 4 locations. Another 7.1% of the programs did not provide location information.

Regarding the areas where their clients generally travel from, 66.0% of the programs reported serving a limited region (a State, or a radius of 500 miles or less). The remainder served a radius of more than 500 miles with many serving national and/or international markets.

Many of the programs (39.3%) did not enforce an age restriction while 51.8% had a minimum age restriction that was usually based on the State's minimum age to hold a driver permit. Drivers could take most of the courses at any of the driver licensing stages (permit, post-unrestricted, and restricted license). In fact, 73.2% of programs allowed students holding only a driving permit to take the course while another 21.4% required that the driver have an unrestricted license. Only 5.4% of the courses required that the student have taken a previous course in the series before taking the supplemental course. The vast majority (83.9%) of programs across all program categories allowed parents of students to attend the course.

When describing the reasons that students take their programs, most programs (85.7%) listed safety as the main reason people completed the supplemental training. Most programs (82.1%) also reported that students took the training because parents made them. Other reasons included obeying court orders (30.4%), the removal of points (19.6%), and thrill seeking (19.6% overall and 43.8% of race track programs). Many programs (55.4%) listed insurance discounts as another major reason for taking a course, especially the Basic Driver Education Plus programs, where 10 out of the 11 programs said drivers take the course for an insurance discount. This is compared to only 6 of the 16 race track programs saying students took the course for insurance discounts. Another important note is that 81.8% of the Basic Driver Education Plus programs said students took the program as part of licensing, whereas only 12.5% of race track, 16.7% of Technology, 21.1% of closed course, and 0.0% of Traveling courses said students took the course as part of licensing.

Overall,

- 41.1% of the courses reported that 11 to 20 students take the course at a time,
- 16.1% had less than 10 students per course,
- 10.7% reported having 21 to 30 students per course,
- and another 16.1% reported having 30 to 100 students per class.
- Another 16.1% reported that the class sizes vary, or did not provide any class size information.

For the classroom portion of the programs,

- 30.4% had a pupil to instructor ratio of 11-20:1,
- 25% a ratio of 5-10:1,
- 21.4% greater than 21:1,
- 8.9% 2-4:1, and only one course had a classroom ratio of 1:1.

For the in-vehicle portion of the programs, the pupil to instructor ratios were much smaller with

- 39.3% of the programs having a 1:1 ratio,
- 10.7% a 2:1 ratio,
- 23.2% a 3:1 ratio,
- 8.9% a 4:1 ratio, and
- 8.9% used a remote instructor who instructed multiple vehicles at a time via radio.

Remote instructors were only used by the closed-course and race track programs. No ratio was available for 8.9% of the programs.

Information on the frequency of courses offered varied substantially as some programs limited the time of year they provided instruction while others offered year-round courses. Therefore, some courses discussed the frequency of courses in terms of those offered per year, while others talked about numbers per month or per week. Overall,

- 26.8% of the programs reported giving 101 or more courses in a year,
- 16.1% gave 37 to 100 per year,
- 7.1% gave 13 to 36 per year,
- 1.8% gave 1 per year,
- 23.2% gave 1 to 5 per month,
- 5.4% gave 6 to 12 per month,
- 1.8% gave 8 or more per week,
- 5.4% gave 4-7 per week, and
- 1.8% gave 1-3 per week.

Of the courses that said they offered 101 or more courses per year, 63.6% were driver education plus programs. Many of these programs operated on a continual basis and considered each student a separate “course” as the program was often individualized for the student.

The total number of students trained by the programs varied widely with most only able to provide estimates of the number students completing the courses. One of the newer programs reported having trained only 30 students while others reported having trained several hundred

thousand students over the life of the program. Some programs were not willing to divulge how many people had completed the course out of fear that competitors would obtain the information.

Facilities

As mentioned earlier, the type of facility used by a program was a primary discriminating factor for the classification of programs in this study. By definition, closed-course programs primarily took place on some type of closed course or parking lot, and race track programs had to at least be hosted at the race track, although they did not necessarily have to involve driving on the race track. Other course types may have used a "closed course" at times, but this was not their primary facility for training. Facilities for each of the classes of programs are described separately below.

Ten of the 16 race track courses included driving on the race track with 6 of the program providers actually owning the race track. Ten of the race track courses included driving on a closed course other than the race track, and 5 of the providers owned the closed course. Five included driving on both the closed course and the race track. Only one race track course did not include driving on a closed course or the race track. Five of the closed course programs included driving on a parking lot, and 3 providers owned the parking lot. Fifteen of the 16 courses included classroom activities with 8 providers owning the classroom facilities. Twelve used a skid pad for training, and 7 of the providers owned the skid pad.

Fourteen of the 19 Closed-course programs used a street-like closed driving course, and 6 owned the courses outright. Four also claimed to use a race track (1 provider owning the track), but it was determined the tracks were not used for professional racing. Seven used closed parking lots for training and none of the providers owned the parking lot. Ten of the 19 Closed-course programs used a classroom for activities with only 3 providers owning the classroom facilities. Four used a skid pad, and 2 providers actually owned the skid pad.

Only 1 of the 11 Basic Driver Education Plus programs used a closed course, none used a race track, and 5 used a parking lot, none of which were owned by the program providers. Eleven used a classroom for activities, and 5 owned the classroom facilities. Three also used a skid pad for training, but did not own the skid pad.

One of the 2 Traveling courses used a closed course sometimes, and both used parking lots. Neither used a race track or classroom, but both conducted training on a skid pad. They did not own any of the facilities they used.

None of the 6 Technology courses used a closed course or race track, although 2 reported using parking lots for training with one provider owning the parking lot. Three used a classroom for training with 2 providers owning the classroom facilities. None conducted skid pad training.

Neither of the Fleet courses reported using a closed course, race track, skid pad or parking lot for training. One reported using a classroom, which it owned.

Lecture/Classroom Materials and Skills/Knowledge

Classroom/Lecture instructional materials and aids varied widely with 60.7% of all programs using some sort of video, 50% pamphlets or handouts, 33.9% computer programs, 30.4% books, and 14.3% the Internet. Most programs (64.3%) produced the materials themselves, but some programs adapted materials from a variety of sources with no source mentioned more than once across programs.

Skills and knowledge, both lecture and in-vehicle, taught by programs were remarkably similar across programs. The most prevalent topics and the percentage of programs covering them are presented in Table 2.

Table 2. Percentages of U.S. Programs Covering Specific Skills and Knowledge

Skill/Knowledge	Percentage of Providers
Basic vehicle control	83.9%
Advanced braking	89.3%
Skid control	85.7%
Hazard identification	89.4%
Hazard avoidance	91.1%
Alcohol/drug Impairment	60.7%
Night driving	51.8%
Physics of driving	82.1%
Managing distractions	82.1%
Laws	37.5%

In addition to being taught in English, 13 of the programs were taught in Spanish, 6 in French, and 5 some other language.

Duration of Training Activities

Many programs provided information on how much time was spent on specific training activities during the course. The primary activities mentioned were lecture, closed course/parking lot/race track driving, live on-road driving in real traffic, skid pad driving, use of simulators, Internet learning, parent instruction, videos, self-study, and self-practice. Almost all programs started with classroom/lecture activities and then progressed to driving. A number of programs had multiple rounds of classroom/lecture and driving activities, alternating among the two. A brief summary of time spent on each activity is provided for each class of programs.

For the Basic Driver Education Plus programs that provided information on lecture time, either 6 or 30 hours was mentioned. On-road driving times ranged from 3 to 14 hours with most spending 6 hours on the road. For those using skid pads, time on the skid pad ranged from 30 minutes to 90 minutes. Those using parent instruction mentioned that between 1.5 and 4 hours were prescribed as part of the course. Videos were used for 15 minutes to 5 hours of instruction. Overall the courses ranged in total time from 6 hours to 40 hours and took from a single day to 6+ days to complete.

For the 2 Traveling programs, one used 30 minutes of lecture while the other provided 2.5 hours of lecture. One provided 3 hours of closed-course driving and the other 4 hours. An hour of skid pad training was conducted for one course and 20 minutes for another. One course included 45 minutes of Internet learning that could be completed separately from the driving portion of the course. Approximately 350,000 people had completed the online course as of the date of this study while 8,000 had completed the driving portion of the course. One course also included a fifteen minute video. In total, one course was 4 hours in length and the other was 8 hours with both being completed on a single day.

Most of the closed-course programs offered between a half hour and 2 hours of classroom lecture. Closed-course driving ranged from 2 hours to 6 hours. Of those offering skid pad training, the training lasted anywhere from 15 minutes to 3 hours. One course did offer 45 minutes of simulator driving. Two courses involved parents in the instruction with 1 only involving parents for 10 minutes and the other for an hour. The programs took 4 to 9 hours to complete and took place on a single day.

All of the race track programs included a lecture ranging in time from 30 minutes to 2 hours. Total time on the closed course or race track ranged from 45 minutes to 7 hours with most in the 2 to 6 hour range. For those using skid pad training, time on the skid pad ranged from 15 minutes to 2 hours. One course reported using 15 minutes of simulator time and 30 minutes of Internet learning. One course indicated that parents were involved in the instruction for one hour. Five programs used videos for 15 to 30 minutes of the training. One race track program allowed for 1 hour of self-study and 1 hour for self-practice. All of the programs took 4 to 10 hours to complete and took place on a single day.

Of the 5 Technology program providing information on training times, lecture times were 0 hours, 1.5 hours, 5 hours, 24 hours, and 30 hours. Two used 6 hours of on-road driving time in live traffic and another 15 hours on the road. Two programs reported using 6 hours of simulator time while another used 8 hours. One program reported involving parents for 1 hour of training. One program was completed solely on the computer and included 10 hours of computer training. The programs ranged from 7 to 38 hours to complete with most taking 6 or more days to complete.

The 1 Fleet program providing information on duration of individual activities included 2 hours of lecture, 40 hours of on-road driving in live traffic, and 2 hours of videos during training. The other course simply stated that it was completed in 2 hours on a single day.

Costs and Sponsors

Course costs varied greatly, ranging from free to over $1,000. Also, many programs offered multiple courses that varied in price depending on the allotted driving time and other activities that were included. Of the 15 Closed-course programs that provided cost information for courses relevant to this project, prices ranged from $150 to $1,200 with most courses falling in the $250 to $450 range. Of the 11 race track programs that provided cost information, prices ranged from $200 to $1,175 with most courses falling in the $300 to $500 range. Fleet program pricing was dependent on the fleet's/individual's needs. One of the Traveling programs was free while the

other was $75. The 3 Technology courses delivered solely by computer ranged in price from $75 to $119 while the other course prices were largely dependent on the time spent in the simulator or on the road with advanced equipment. The cost of the Basic Driver Education Plus courses were largely dependent on the selected activities and amount of time spent on the roadway.

Overall, 46.4% of the programs had outside sponsorship. Only 2 of the 11 Basic Driver Education Plus programs had outside sponsors compared to 11 of the 19 Closed-course programs, 9 of the 16 race track programs, 3 of the 6 Technology programs, and none of the Fleet programs. Eleven of the sponsors provided money directly to the programs, 10 provided vehicles, 10 provided tires, and 16 provided some "other" type of equipment (e.g., brakes) or donation to the course for use.

Programs used a variety of media to attract students. Overall,

- 16.1% used television,
- 21.4% radio,
- 23.2% newspapers,
- 28.6% flyers,
- 69.6% Internet,
- 8.9% magazines,
- 7.1% phone books, and
- 60.7% "other" advertisements.
- Also, 55.4% said word-of-mouth is a primary means of advertising the programs.

Program Objectives and Curriculum

When discussing the overall objectives of their programs, the vast majority (82.1%) indicated that their primary objective was to develop better drivers by improving driving skills. Another commonly cited objective (60.7%) was to increase safety and prevent collisions. The other most commonly mentioned objective (21.4%) was to teach car control with specific emphasis on avoidance and recovery from skids and emergencies. Other occasionally stated objectives included enhancing driver confidence, increasing awareness of limitations of both cars and drivers, learning risk management, hazard awareness, and teaching the physics of driving.

The vast majority (76.8%) of all providers developed their own programs in-house, taking bits and pieces from a wide variety of sources and using their own experiences to guide the course development. Sources included police training curricula, practices from various car clubs, recommendations from car manufacturers, and textbooks.

Vehicles

Overall, 69.6% of programs said that they provided cars for the students to use; 16.1% used students' own vehicles, and the remaining 14.3% either did not use cars for training or did not provide any information about vehicles used. Of the 39 programs providing vehicles, 28 actually owned the vehicles, 5 leased them, and 6 borrowed the cars. Of the Basic Driver Education Plus programs 90.9% used dual brakes vehicles compared to only 23.5% of the Closed-course

programs, 0% of the race track programs, 0% of the traveling programs, 0% of fleet programs, and 17.6% of the technology programs. Six programs (2 Closed-course, 4 race track) used "mechanical skid cars" specifically designed for practicing skid recovery. One race track program also used a vehicle with an engine cutoff switch. If a student's own vehicle was to be used, the programs completed brief inspections to make sure the vehicles were safe.

Instructors

The background of instructors varied greatly depending on the class of program, and many programs employed instructors from different backgrounds.

Table 3. Percentages of U.S. Program Categories Employing Various Types of Instructors

	Basic Driver Education Plus (N=11)	Traveling (N=2)	Closed Course (N=19)	Race Track (N=16)	Technology (N=6)	Fleet-Driver-Oriented (N=2)
Regular School Teachers	81.8%	100.0%	10.5%	18.8%	66.7%	0.0%
Active Police Officers	27.3%	100.0%	36.8%	18.8%	16.7%	50.0%
Retired Police Officers	54.5%	50.0%	36.8%	25.0%	33.3%	100.0%
Professional Drivers	27.3%	100.0%	15.8%	12.5%	33.3%	0.0%
Certified Instructors	72.7%	50.0%	36.8%	12.5%	16.7%	0.0%
Race Car Drivers	0.0%	50.0%	47.4%	93.8%	0.0%	0.0%
Emergency Medical Drivers	9.1%	50.0%	10.5%	0.0%	16.7%	0.0%
Only Valid Drivers License	45.5%	50.0%	15.8%	12.5%	33.3%	0.0%

Other than the above driving history and license requirements, the only other mentioned qualification requirement to be considered for an instructor position was teaching experience. All of the Basic Driver Education Plus programs, both of the traveling programs, 42.1% of the closed-course programs, 37.5% of race track programs, 66.7% of technology programs, and none of the fleet programs required past teaching experience.

The great majority of instructor training was conducted in-house with 69.6% of all programs claiming to conduct lengthy in-house instruction. Another 10.7% said in-house instructor training was completed on an as-needed basis.

Re-training/re-certification of instructors varied across programs with 3.6% of all programs requiring it every 6 months, 17.9% every year, 5.4% every 2 years, 53.6% on an on-going basis, 10.7% never, and 8.9% did not provide enough information.

Overall, 71.4% of programs ran a background check on instructors.

Program Evaluation

When discussing how they evaluated their programs, 44.6% reported that a student feedback form was completed at the conclusion of the course. Also, 30.4% reported using verbal feedback from participants or parents of participants, while 25.0% also relied on observing student performance to determine if the training was working as intended. Three of the Basic Driver Education Plus programs and 1 race track program reported giving students a multiple choice exam to see if knowledge improved. Two each of closed-course, race track, and technology programs reported using actual DMV statistics to track the records of students. Overall 17 of the 56 programs said they had been formally evaluated by a third party, but no evaluation data were made available to this study.

4.3 Discussion

Researchers sused an extensive network of contacts and conducted Internet searches to identify as many programs as possible that fit within the scope of the current study. A substantial number of potential programs purported to be “advanced” driver training programs or claimed to offer some type of training above and beyond that found in basic driver education. After further review, however, it was discovered that many of these programs were simply basic driver education programs and did not provide training that went above and beyond that found in traditional driver education courses in the United States.

A number of programs were identified, however, that offered at least some training that could be considered supplemental to basic driver education since it covered knowledge or skills not commonly taught in a traditional United States driver education course that aims to help drivers pass the driver licensing tests to become a licensed driver.

Many of the programs were willing to talk to project staff and provided a substantial amount of information about their programs. The programs that project staff spoke to likely represent a fraction of those that exist in the United States, but it is felt that enough programs were contacted to provide an accurate picture of at least the types of programs in existence and the training they are delivering.

The great majority of programs had been in existence for more than 5 years and offered courses other than the supplemental driver training course that was of most interest to this study. Regarding the programs of most interest to this study, it was discovered that the various

programs covered essentially the same topics and used similar approaches to training young drivers even though the venues varied greatly. As such, the devised classification system was largely based on the facilities where the programs were delivered (e.g., at a race track versus on some other closed course).

Given the nature of the knowledge and skills taught, it does not appear that the programs reviewed would be detrimental to young driver safety, although some might argue that the skid pad training had the potential to negatively influence the safety of the young drivers. However, all of the providers strongly believed that their programs were improving safety by providing drivers with knowledge and skills they needed to safely operate a vehicle in a modern traffic environment. A few argued that they specifically avoided skid pad training because they felt it negatively affected safety, but the great majority felt that the young drivers needed to understand why vehicles skid and how to recover if they ever encountered the situation. Also, the project staff who attended the various courses for the case studies felt that, if anything, the skid pad training showed young drivers how easily they can lose control of the vehicle and likely helped to teach the drivers to avoid situations that may lead to a skid (e.g., driving fast in heavy rain).

Perhaps the most important finding, however, was that no scientific evaluations of the safety impact of these types of training courses had been conducted to date. Several of the courses claimed to have information available (e.g., driver license numbers of participants) that would allow for a retrospective study of participants versus some control group, but such a study would suffer greatly from self-selection bias. Many were willing to participate in a prospective study should the opportunity arise, and some had sufficient student flow rates to generate a sample large enough to support a study of program effectiveness.

5. STUDY 2: SUPPLEMENTAL DRIVER TRAINING IN CANADA AND AROUND THE WORLD

This portion of the study focused on documenting driver training programs outside of the United States. Any program that could be considered supplemental in the United States was included, even if the program was part of "standard" driver education in its own country. While an effort was made to identify and contact programs throughout the world, the study was limited to programs that either had personnel that could speak English well enough to convey information to the researchers or had written materials available in English. Therefore, the information contained in this section is heavily weighted to the Canadian Provinces and Territories, the United Kingdom, Germany, Austria, Australia, and New Zealand. Where possible, programs from Africa, Asia, and the Middle East were included. This study effort was completely independent of the United States study. Therefore, the methods varied slightly, and the presentation of results is also slightly different in format.

5.1 Methods

Researchers identified programs through Internet searches and networking with existing contacts throughout the driver education field. Online searching was extensive and used detailed and varied search terms to identify potential candidates for contact.

A series of e-mail and phone inquiries requested a discussion with program providers. When a positive response was received, a telephone discussion time was set up at the convenience of the program provider. In some cases, an e-mail discussion was used. In a few cases, discussions with providers could not be arranged and information was collected from program Web sites and other available secondary sources.

Four Canadian courses were selected for case studies. Three of the four case studies involved site visits to the programs for further information gathering. The results of the case studies are presented in Appendix B.

Program and Contact Identification

Due to the variation in terminology and operation of Supplemental Driver Training Programs in Canada and around the world, the online search process required the use of different terms and search techniques for each country. For example, in Britain, the term *tuition* was widely used for instruction and training in program descriptions.

To facilitate the process for identifying and contacting programs, researchers developed a 5-point priority system. The higher the score, the more relevant the program, and therefore, the more effort that was put into gathering information on the program. Specifically, the 5-point system was as follows:

1: Program was primarily focused outside the scope of the study, e.g., corporate or fleet training, but does not specifically exclude qualified new-driver training.

2: Program provides some supplemental training to qualified drivers, but does so under the auspices of a third-party certification program or with some focus on corporate or motorsports driving.

3: Program provides supplemental training and young driver training, but it was unclear whether the supplemental driver training program fits specifically into the scope of the study, that was whether there was supplemental training for young drivers after they are licensed.

4: Program provides services within the scope of the study, but it was unclear as to the extent of the services.

5: Information clearly states that the program fits within the scope of the study and may be comprehensive.

Contact Procedures and Record Maintenance

Once researchers identified and prioritized programs, efforts focused on the acquisition of contact information for a principal program contact person including an e-mail address, phone number, and mailing address. The contact process first used an e-mail introduction. If this correspondence did not elicit a response within a few days, a phone call was made and message left if the person was not reached. A second e-mail followed if there was no response to the phone message, and a final phone call was made if there was still no response to the second e-mail.

The e-mail introduction explained the purpose of the study and that it was being conducted on behalf of NHTSA. Requested information included the types of training provided, how the training was delivered, what kinds of students participated, and so on. The e-mail asked for a discussion time or additional contact information if the contact person was not the appropriate person to talk with.

Discussion Procedures

The discussions covered a wide array of topics. Based on the study objectives, these topics included:

- Provider information (name, address, contact name and contact information);
- The history of individual programs (e.g., years of operation, number of students);
- Program details (e.g., facilities, cost, number of classes operated, sponsors, marketing);
- Course objectives, content, length, vehicles, materials, languages;
- Instructor information (e.g., qualifications, training and retraining, components taught); and
- Program evaluation and measures used.

Program contacts were asked to elaborate on each of the above topics. Notes were taken during each discussion and a descriptive analysis of the programs conducted.

Case Studies

Researchers selected examples from the most prevalent categories of programs for detailed case studies. Five case studies were prepared. Three of the case studies involved telephone discussions and site visits; one included only e-mail correspondence with the program developer and information taken from advertising information; and the other included a telephone discussion as well as a review of research documents, and information gathered from the program Web site. Four of the 5 programs were in Canada, and the fifth in Europe. The case studies include a general description of the program, followed by details on facilities, students, course content, instructors, and unique aspects of the course. The case studies are presented in Appendix B.

5.2 Results

Information was gathered on 59 supplemental programs of driver education and training outside the United States. The international programs were from 8 countries, with about half the total in Canada and about half the rest from the United Kingdom. The distribution of the programs' home countries is shown in Table 4. Almost all the programs operated only in their home countries, but some, such as Test and Training International and Young Drivers of Canada, were international in scale.

Table 4. Distribution of International Providers by Home Country

Country	Number of Programs
Canada	28
United Kingdom	15
Australia	8
New Zealand	4
Austria	1
Ireland	1
Israel	1
Kenya	1
Total	59

Language of instruction covers a wide range among the 59 international programs – at least 18 were identified. Ten languages were offered among the Canadian programs.

Classification of Programs

An objective of the project was to develop a classification system for supplemental driver training program. Within the developed classification for the international programs there were four categories, based on the origins and orientation of the training, as well as the target audiences. The categories and the number of programs listed in each are shown Table 5.

Table 5. International Program Categories and Numbers in Each

Category	Number of providers
Fleet-Driver-Oriented	18
Motorsports-Driver-Oriented	13
General-Driver-Oriented	25
Wholesale Program Suppliers	3
Total	59

The main criterion for inclusion in the project was availability and usage of the supplemental program by young drivers. However, in many cases where supplemental training was the principal business, the youth novice driver audience was not the primary market for the program providers. The Fleet-Driver-Oriented providers were primarily oriented to corporate employee drivers, and their principal market was companies, rather than individuals. For Motorsports-Driver-Oriented providers, individual drivers were a principal market, but the drivers targeted were more likely to be performance motoring enthusiasts, rather than employee drivers or general drivers.

The key characteristic of General-Driver-Oriented providers was that they primarily address a market of individual, general drivers. For these providers the youth market was often primary, but in those cases the principal business was typically beginner driver education, with supplemental training a secondary line of business.

Wholesale program suppliers consisted of a small number of providers that "wholesale" programs across some jurisdiction for use and delivery by local providers. That is, they provide programs or materials to resellers, who in turn provide training to retail customers using the wholesaler's materials.

Where there appeared to be substantial differences among the provider categories in the program content and operations information, these differences are pointed out in the discussions below.

Program Scope

A majority of the international providers offered a single course relevant to the purpose of the current study, but a many (42.4%) offered several different relevant courses for different purposes. Most of the course providers also had additional course offerings that are beyond the scope of this study, such as those applying to employee drivers, high performance driving, or other audiences or objectives, such as beginner driver education.

Program Provider Reach and Scale

The great majority of the program providers were quite well-established, having been in operation for many years. Across both geographic zones and all the provider categories, well over half of the providers (61%) had been operating for 10 or more years.

A substantial majority of the providers (71.2%) operated a single location, but 22% reported having more than one location, and a few (3.4%) had many locations (35 to 99). The Fleet-Driver-Oriented providers did not seem to operate a large number of locations, and they were less likely to serve a national or international market, perhaps reflecting strong markets among fleets on a relatively local level. A majority of the providers (59.3%) drew their trainees from a limited region, that is, a single province or State, or a radius of 500 km or less. The remaining 40.7% served national or international markets. Nearly half (48.4%) of the offshore programs served a national or international market. Only the largest Canadian providers had a national market.

While being available to young novice drivers was a criterion for inclusion of a program provider, the client demographic for these providers varied widely. Among the overall international group, a minority of the supplemental training providers trained mostly youth. In Canada, only a single provider served mainly youth. The greater proportion of offshore programs serving mainly youth (35.4%) may largely be due to the European licensing requirements for supplemental training and the extensive U.K. PassPlus program, which was targeted directly at newly licensed youth. Some providers (20.3%) specified a minimum age for students, typically ranging from 16 to 18 years old.

Class size varied widely across providers. A few (6.8%) offered one-on-one instruction, but 30.5% had classes of 12 or more students taking the course at one time. Among the offshore programs, one-on-one instruction largely reflects the contribution of the U.K. PassPlus program's format. Where multiple-student classes were used, two-thirds of programs (66.1%) indicated student/instructor ratios between 5:1 and 20:1.

In-vehicle student to instructor ratio was 1:1 in 42.4% of the programs, with others ranging up to 4:1. Some programs (16.1% of offshore programs) had students driving alone at off-road facilities with remote instructors in radio contact with the driver.

Many of the providers had a substantial scale of operations. Some of the providers (17%) run over 100 classes per year. The total number of students that have been trained by the international providers varied widely, depending on the operation scale as well as how long they had been in business. Overall, about half had trained less than 4,000 students. Table 6indicates the proportion of all international providers who reported a total number of students trained to date.

Table 6. Number of Students Trained by International Providers

Number of Students Trained	Percentage of Programs
Up To 900	20.4%
1,000-4,000	30.5%
5,000-20,000	15.2%
Over 20,000	15.3%
Not Reported	18.6%
Total	100%

The top of the international range was over a million students, with the next highest being about 50,000. Among the Motorsports-Driver-Oriented providers, the median number of students trained was lower, at about 2,000, but the top of the range for the large, long-established programs was comparable to other categories.

Program Markets

The main reasons for students taking the supplemental courses were: (1) safety in general; and (2) being required by parents. Insurance discounts were seen as frequent motivators in 30.5% of cases. A wide range of other motivators were possible, but these appear to be relatively minor factors in the market. Court and regulatory driver improvement requirements to take training were infrequent in Canada (7.1%), but more common in the markets for the offshore programs (22.6%). Learning the limits of one's car was a reason indicated for taking the training in 12.9% of the offshore programs, but did not appear as a reason in Canada.

Drivers took the courses at various driver licensing levels, but the great majority of providers (94.9%) indicated that their clients were typically fully-licensed drivers. A minority (25.4%) also served drivers who were not yet fully licensed, and this was most common in those jurisdictions that required supplemental training before full licensing was granted. Nearly all courses (93.2%) had no other prerequisites beyond age or licensing requirements. Parents of students were allowed to attend all or parts of most courses, although a quarter of the providers (25.4%) did not permit this. No provider indicated that parent attendance was required.

Facilities

Different facilities and settings appeared across the group of international providers. More than half (57.6%) used a closed-course facility of some sort. These were about equally divided between race track courses (22%) and other areas, such as parking lots (20.3%). Race track

course use offshore was about double that in Canada (29% vs 14.3%), with parking lot use correspondingly higher in Canada (28.6%).

About a quarter of the international providers (28.8%) used skid pads, with the proportion higher in Canada (35.7%) and among the Motorsports-Driver-Oriented providers (38.5%).

Overall, the majority of international providers (69.5%) used a classroom facility. Classroom use was high in Canada (85.7%), but appeared in just 54.8% of the offshore programs. Only a handful of the larger providers owned the roadway facilities that they used, and 22% of all providers owned their classroom facilities. Canadian providers were more likely to own classroom facilities (32.1%).

Costs and Sponsors

Course costs were relatively modest in most cases, with 54.2% being $250 USD or less. Only a small minority of programs (11.9%) were over $500, and the top of the range was just over $1000. Average cost seemed quite comparable between Canadian and offshore programs and varied relatively little among the categories of program providers.

Overall, only a small minority of all international providers (11.9) had outside sponsorship, but over half (53.8%) of the Motorsports Oriented providers had sponsors. The sponsors were typically car or tire manufacturers, although one program was sponsored by a satellite radio company.

Students were most typically attracted through providers using conventional advertising in print and broadcast media (83.1%), with some use of Internet advertising (35.6%) and word-of-mouth (44.1%).

Program Objectives and Curriculum

The indicated principal objective of the nearly all programs was to increase driver skill for reasons of increased safety. The most commonly stated specific objectives included: improved driving habits, increased awareness of shortcomings in the student's driving, risk management, and car control. Occasionally stated objectives included: enhanced confidence, hazard awareness and perception, winter driving, driving physics, and the culture of safety. In looking for a specific established program or approach as the basis of the provider's course offerings, only a third (33.9%) seem to indicate that there was one. However, among those there were apparently quite a large number of sources. Only a few material sources appeared in more than one program, most notably the U.K. *Roadcraft* and BMW Porsche programs. Nearly all providers developed their own courses. There were apparently few curriculum or materials developers that supplied any substantial number of on-the-ground course providers, but 3 were captured in the Wholesale Program Suppliers.

The project looked for a number of possible course components and to what extent they were used in the programs. Proportion of component usage is indicated in Table 7 below.

Table 7. International Usage of Teaching Components

Component	Percentage of Programs Using
Classroom lecture	75%
Closed-course driving	55%
On-road driving	40%
Skid pad	25%
Simulator driving	2%
Internet learning	2%

Clearly, the mix of program components was diverse among the programs, and no program appeared to use all the potential teaching approaches. Among those courses that used a classroom component, the average time was 2 ½ hours, and the distribution of classroom time was similar across the categories. The maximum classroom time was 7 hours.

Closed-course driving time ranged up to 6 hours, with an average of about 3 1/2 hours. This holds true for the Fleet-Driver-Oriented and Motorsports-Driver-Oriented providers, which were strongly oriented to closed-course driving. The General-Driver-Oriented providers also used about the same amount of closed-course driving, if they used it all.

On-road driving, among those using it, averaged about 2 1/2 hours, with a maximum in most categories of 6 hours. Only a handful of General Diver Oriented providers used over 6 hours on-road. The Motorsports-Driver-Oriented providers used much lower on- road driving times, if any.

Skid pad training, for those providers that used it, averaged about 2 hours, with a maximum of 5 hours. Fleet-Driver-Oriented providers used less skid pad time. While simulator use was rare, average time of use was 2 1/2 to 3 hours for those who used them. Internet learning was also rare, but one Fleet-Driver-Oriented provider indicated 10 hours of Internet learning. Where video presentations were used, time was less than an hour.

In a little over half of the programs (55.9%), the order of components was classroom followed by driving. However, a wide range of more complex sequences of classroom, driving, simulator, and videos appeared in the remaining programs. The average total working time for courses in all categories was about 7 hours. Only 15.3% of programs took over 8 hours, but the maximum was 24 hours.

Training Vehicles

A majority of courses (57.6%) provided vehicles for the students to drive. Vehicles provided were either leased or owned by the provider. Fewer of the Motorsports Oriented category (30.8%) provided vehicles. About a quarter (25.8%) of the providers overall used dual-brake

cars, and these were more prevalent among General-Driver-Oriented providers (44%). A few programs (8.5%) used mechanical skid cars, with most appearing among Fleet-Driver-Oriented providers. Those providers that used the student's car typically inspected the tires or some other basic parts of the car.

Classroom Materials

Classroom instructional materials and aids usage varied widely. Just over half used videos (54.2%) and pamphlets/handouts (57.6%). A minority (40.7%) indicated use of classroom aids, such as books or workbooks (25.4%), and visual aids such as flipcharts or overhead projections (19.3%). Most programs (61%) produced at least some of their own materials, but materials were also adopted from a wide base of governmental and private safety organizations.

The percentages of programs using specific skill and knowledge topics are provided in Table 8.

Table 8. International Program Skill and Knowledge Topics Addressed

Skill and Knowledge Topic	Percentage of Programs
Basic vehicle control	71.2%
Advanced braking	83.1%
Skid control	67.8%
Hazard identification	89.8%
Hazard avoidance	88.1%
Physics of driving	50.8%
Managing distractions	70.4%

Other topics identified by a minority of programs included traffic laws, impairment, night driving, visual scanning, steering and seating position, speed and space management, and attitudes. Noteworthy topics appearing in a few cases included hazard anticipation, decision making, and time management. A wide range of topics were identified explicitly in one or two programs. Of course, few of these topics were simple, and some programs may have addressed aspects of the some of these topics without explicitly identifying them as such.

Instructors

Instructors were drawn from a number of different backgrounds in different programs. Most programs used instructors with some sort of formal certification (57.6%). In about a quarter of

the international programs (23.7%) race car drivers were employed as instructors, and this proportion was similar in Canada and offshore. Predictably, more of the Motorsports-Driver-Oriented providers (46.2%) used instructors that were or had been race car drivers.

A few programs (5.1%) listed other professional drivers as instructors. Police officers (active or retired) were employed by some programs (15.2%). This was mainly offshore (only one Canadian program used police) and among Motorsports-Driver-Oriented providers (23.1%). Other factors identified as considerations in instructor selection by a few programs included personality, communication, teaching or coaching ability, and military background.

Instructor training varied, with about half (49.2%) of the programs indicating the scope of training for instructors being "as needed." A minority of programs (18.6%) had lengthy comprehensive training for their instructors, as well as driving assessments. Some programs had skid pad training for instructors (3.4%), or had instructors take the course as a student as part of their training (11.9%). Most programs (71.2%) had some pattern of retraining, either "as needed" or periodically (ranging from 6 months to 2 years). Most programs (66.1%) ran background checks on potential instructors.

Program Evaluation

A number of different evaluation methodologies were used across programs. Over half (59.3%) used a student or instructor feedback form. Many (45.7%) also indicated observation of students or student verbal feedback. Also seen as success indicators were pass rates, customer referrals, and returning corporate clients. A few programs (8.5%) suggested collision statistics provided evaluation information for their program. A similar number of programs (8.5%) indicated that there had been formal evaluation of their program, but no reports or documentation were indicated as available.

5.3 Discussion

Substantial effort was expended to identify and talk with as many supplemental driver training programs around the world as possible. Finding providers in non-English speaking countries that spoke English well enough to convey detailed information proved difficult at times and limited the overall reach of the study. It is believed, however, that enough discussions were held with program providers to adequately describe the current state of supplemental driver education outside of the United States.

It appears that a fairly large number of young drivers are receiving supplemental driver training around the world, especially in countries such as Austria where the training is a part of driver licensing. A common theme from both Canada and offshore was that supplemental driver education for youth was a secondary effort for the program providers. Many providers had been in business for a long time (over 10 years), but most had focused primarily on a different market, such as fleet training, training high-performance motorsports enthusiasts, or teaching beginner drivers basic driving skills.

Even though most providers claimed to have developed their own programs, across all programs the core knowledge and skills taught were very similar. The great majority of programs used classroom lecture and either closed-course or on-road driving for the training, while only about a quarter used any type of skid pad training. Most providers employed certified driving instructors or instructors with substantial driving experience to deliver the programs. Costs were generally $250 to $300 USD with a few over $500.

Given the nature of the knowledge and skills taught, it does not appear that the programs reviewed would likely be detrimental to young driver safety. Most of the providers strongly believed that their programs were improving safety by providing drivers with knowledge and skills they needed to safely operate a vehicle in a modern traffic environment. A few programs indicated that evaluation data had been collected, but none was available to this study, and none of the program providers had an independent scientific evaluation of program effectiveness.

6. STUDY 3: ONLINE TEEN DRIVER EDUCATION

Online teen driver education was an area of driver training about which relatively little was known at the outset of this study. In the United States, at the time of this report, about half of the States required teens to take some form of basic driver education prior to obtaining a drivers license; a number of others also allowed teens to obtain an unrestricted license at an earlier age, or conferred other benefits on those completing an approved driver education course (Thomas, Blomberg & Fisher, 2012). Although there was considerable variability in requirements across States, traditional driver education programs followed the model of 30 hours of classroom instruction followed by 6 hours of in-car, or behind-the-wheel instruction – the "30/6" model. With the growth of the Internet, however, had come growth in the number of online driver education course offerings aimed at replacing the classroom portion of driver education. The market was clearly expanding, yet little was known about the number, type, and characteristics of programs currently offered online.

The objective of this study effort was to identify the types of online driver education programs currently available in the U.S. and to inventory as many as possible of these programs. The focus was on those programs designed or intended to replace traditional classroom driver education and to prepare teen drivers to pass the States' driver license knowledge tests required for licensure. The specific objectives were to:

- Identify States that had approved online driver education courses in-lieu of traditional classroom courses, and document their approaches and the specific courses approved;

- Develop a classification system of existing online driver education courses that could be sorted by key characteristics such as type of course, States where approved, advertised cost, etc.;

- Obtain more detailed data on the specific characteristics of individual courses through discussions with key program personnel; and

- Identify a subset of courses illustrative of the different classes of programs and document them as case studies.

6.1 Background

In general, online education can take place via a variety of instructional modes including virtual classrooms, hypertext courses, video-based courses, Web-supported textbook courses, and peer-to-peer courses. Beyond simple online courses, there are virtual programs (a virtual course of studies) and even virtual schools and virtual universities. In a larger context, online courses are a form of distance education or distance learning, and represent a technological counterpart to paper-based correspondence courses that have existed for decades.

In addition to the growth of the Internet, online student learning, and virtual schools in particular, received a big push at the State and local levels with the No Child Left Behind Act (NCLB) of

2001. Schools were encouraged to embrace technology as a tool for implementing the requirements of NCLB, including its provisions for better access to quality education and freedom of choice. This emphasis was particularly relevant to driver education programs, where there was a trend away from school-based programs and public sector funding and toward the private sector. And even where driver education programs have continued to receive public support, funding levels have dropped, in some cases dramatically. Thus, circumstances were ripe for an explosion of online driver education providers, especially in the private sector. In many cases, businesses already offering online traffic schools and "defensive driving" courses had only to expand their program offerings to include teen driver education.

A recent meta-analysis (Means et al., 2009) suggested that online learning can be more effective than traditional face-to-face or classroom learning, and that a blend of online learning with face-to-face instruction can be especially effective. The meta-analysis also found that online learning is enhanced if students are able to control their interactions with media and other online resources, and if they are encouraged to reflect upon the course material. However, only a few of the studies in the meta-analysis involved high school age or younger students. And except for the Masten and Chapman (2003) study conducted in California, there have been no well-controlled studies of the effectiveness of online driver education programs, either in terms of knowledge gained or crashes avoided.

In 2009, NHTSA released its Novice Teen Driver Education and Training Administrative Standards. The standards are the product of the National Driver Education Standards Project, a collaborative endeavor of NHTSA, the American Driver and Traffic Safety Education Association (ADTSEA), the AAA Foundation for Traffic Safety, the Driving School Association of the Americas (DSAA), and other stakeholders in the field. The standards are administrative only, addressing the important areas of program administration, education and training, instructor qualification, parent involvement, and coordination with driver licensing. Further effort is needed to develop a consensus curriculum and content standards and benchmarks. Until then, curriculum standards developed by ADTSEA and DSAA (included in the NHTSA report) serve as a national standard.

The NHTSA Standards report contained no recommendations for the administration or delivery of online driver education, advising States instead to "refer to a general standard for online education such as those established by the North American Council for Online Learning (NACOL) in the absence of national standards specific to the delivery of online driver education or online teacher preparation." However, many of the recommended administrative standards for traditional classroom driver education also have relevance to online instruction. In addition to using a curriculum that exceeded nationally accepted content standards and benchmarks, they included having a process for monitoring and evaluating/auditing individual programs, ensuring the curriculum material is kept current, training and certification of instructors, use of concurrent and integrated classroom and in-car instruction, distributive learning, parental involvement, and conducting valid post-course evaluations for improving the effectiveness of the program.

NACOL's[3] *National Standards for Online Course Quality* provides guidelines addressing online course content, instructional design, technology, student assessment, and course management. The standards were intended for all types of (K-12) online learning. Most were applicable to any course of instruction, for example, a concise course overview and syllabus, division of material into units and lessons with clearly stated objectives, frequent assessments and feedback, and information on how to communicate with the instructor. Others were more challenging, and some might argue unrealistic or even undesirable, with respect to online driver education. These included requirements related to student-instructor interaction, student-student interaction, activities that engage students in active learning, and provision of multiple learning paths for students to master the course content.

In this context, this project set out to learn how States approved and regulated online driver education courses, and to describe currently available courses. The next section of this report outlines the methods employed. A later section details the project results, including a summary of practices in States allowing online driver education, a list of identified programs, and an overview of key program characteristics. Case studies illustrating various classes of courses available at the time of this report are presented in Appendix C.

6.2 Methods

Given this project's focus on online courses designed to replace traditional classroom driver education, the researchers first sought to identify those States approving one or more online driver education courses. An initial listing of potential States was compiled based on: (1) a review of information contained in a recent compendium of driver education and the GDL process by Thomas et al. (2012); (2) a search of online program Web sites to check States where programs identified themselves as "DMV approved"; and (3) a review of driver licensing Web sites in candidate States, for information about online driver education options.

An attempt was then made to contact a driver licensing or driver education administrator by telephone in each of the identified States, both to confirm their status as an "online driver education" State and to obtain additional information related to program administration. In particular, the study was interested in:

- Understanding their process for approving and overseeing programs (who was responsible, what standards or requirements must be satisfied, any differences from classroom driver education, etc.);
- Obtaining /confirming a list of currently approved programs;
- Verifying student requirements, if any, for taking online driver education;

[3] Also known by iNACOL, for International Association for K-12 Online Learning

- Obtaining information on numbers of students completing online courses, and availability of data that could be used to evaluate online program effectiveness; and

- Hearing any thoughts they might have about the benefits and challenges posed by this relatively new approach to educating young drivers.

For most of the States, researchers contacted an identified Driver Education and Training Administrators (DETA) member. For States without a DETA representative, attempts were made to identify an appropriate contact through an Internet search or by calling the motor vehicle or driver licensing office. In several cases, contact was made with more than one person within a State (e.g., someone from the Department of Education as well as Department of Motor Vehicles). The State representatives were asked to review the summaries included in this report to ensure their accuracy.

The resulting master list of approved programs and/or program providers served as the starting point for the identification of current online driver education course offerings. The primary exception was California, where online course providers that designated themselves as private secondary schools were not required to be approved by the State. Consequently, California was unable to provide the project a list of approved courses. The many courses offered in this State were identified through Internet searches, with the awareness that the project would be unlikely to identify every course.

Initial information about each of the identified courses was extracted from the course Web site. Since these Web sites were typically the primary marketing tools for the courses, they often provided considerable information about the courses, including in some cases a course demonstration. From the Web site, researchers were typically able to gather information about:

- The type of provider (for-profit, nonprofit, State/local entity);

- The types of courses offered;

- States where the course was DMV-approved or accepted;

- Other types of courses offered by the provider (e.g., defensive driving courses, courses for older drivers, advanced driver education); and

- Course cost.

Two separate approaches were then used to gather additional information about the courses. First, an attempt was made to contact as many of the providers as possible and speak with them by telephone. The initial request was made via e-mail and included a one-page synopsis of the project. Follow-up requests were made to non-respondents, and in some cases “cold calls” were also made, although these tended to be less successful in establishing contact with a company principal. In addition to the telephone discussions, additional insight was gathered by taking the course’s free demonstration and/or by enrolling in many of the courses and experiencing them first-hand. Sometimes this was done by simply signing up as a student, and other times it was

done after speaking with providers who often granted course access at no cost. Together, these approaches provided information covering:

- Estimates of the number of teens taking the course;
- The role of instructors in presenting the course;
- Methods employed to ensure students devoted adequate time to the course;
- Course testing procedures;
- Approaches used to market the course; and
- Existence of any data pertinent to course evaluation.

Researchers used the above information to develop a classification system. The system differentiated programs primarily based on their delivery and requirements for engagement with the course material. The classification process did not involve any judgments about the effectiveness of the programs, although it did reflect some level of potential program usefulness based on existing standards for the delivery of online education in general.

Case Studies

Finally, researchers selected a subset of the identified courses in each class for case studies. The intent here was to select a cross-section of programs representing the range of available course offerings within a class. These courses selected for case study were not necessarily the best or worst in the class, rather they were representative of the most common types of courses within the class. Case studies of the online programs are presented in Appendix C.

6.3 State Practices

Researchers identified 15 States that either approved or accepted one or more online courses as an alternative to traditional classroom driver education (see Table 9). In-depth discussions were held with State personnel in 14 of the 15 States (no definitive contact was identified for Nebraska) to document the States' practices related to online driver education. In all 15 States, driver education was either required for initial licensure, allowed for earlier licensure, or conferred some other licensing benefit such as waiving practice driving hours. It should be noted that online programs might have been offered in other States. This was particularly true if the State did not approve online courses or course providers per se, but instead approved commercial driving schools that might opt to offer a course online, especially if the course had been locally developed. In addition, online courses might be offered through a State's virtual high schools or through its community colleges. These types of offerings would have been difficult to identify even if it had been possible to talk directly with driver education administrators in all 50 States. On the plus side, the identified States likely captured the largest markets for online courses, as well as those where online instruction has been directly addressed by State driver education program administrators.

The 15 identified States varied greatly in their approaches to regulating online course providers, with significant implications for the type, characteristics and number of available courses, as well as the number of teens choosing to enroll. The following overview highlights some of the more important differences. More specific information for each State is included in the individual State summaries that follow.

Table 9. States Approving Online Driver Education Courses.

STATE	Number of Approved Online Courses *or* Course Providers	Agency Responsible for Approval and Oversight
California	Unknown	Theoretically DMV and Dept of Education, but private secondary schools avoided oversight; also, local school boards had discretion
Colorado	9	Department of Revenue
Florida[4]	6	Department of Highway Safety and Motor Vehicles; Department of Education (High School DE programs)
Georgia	5	Dept. of Driver Services
Idaho	1	Department of Education
Indiana	3	Department of Education with additional Bureau of Motor Vehicles oversight, but local control; Criminal Justice Institute over commercial driving school partnerships
Kansas	Unknown	Department of Education, but local control
Nebraska	4	Department of Motor Vehicles
Nevada	17	Department of Education (but local control); Division of Motor Vehicles (commercial driving schools)
Oklahoma	6	Department of Public Safety
Pennsylvania[5]	Approx. 22	Department of Education, but local control
Texas	5 (2 planned for 2010)	Department of Public Safety (parent taught); Texas Education Agency (school programs)
Utah	3	Office of Education (school programs); License Division, Dept. Public Safety (commercial schools)
Virginia	4	Department of Education
Wisconsin	2	Department of Public Instruction; Southwest Tech's Technical College System Board

[4] Florida required all first-time licensees to complete a 4-hour Traffic Law and Substance Abuse Education course, but otherwise did not require formal driver education.

[5] Pennsylvania approved public and commercial driving schools, 22 of which offered an online course. It did not directly approve individual online courses.

Program Approval and Oversight

Online driver education programs fell under the purview of State departments of motor vehicles/public safety, departments of education/public instruction, local school boards, community college systems, or some combination of the above. In one State, California, providers who designated themselves as private secondary schools had no State oversight.

Idaho had some of the most rigorous requirements in place for online driver education. These included provisions for concurrent behind-the-wheel instruction, instruction by a certified driver education teacher, and adherence to national curriculum (ADTSEA) and online instruction (iNACOL) standards. Idaho had only one approved course that was offered through the Idaho Digital Learning Academy. In contrast, there were several California online providers who avoided State oversight by designating themselves as private secondary schools. Most States fell somewhere between these two ends of the continuum, either approving limited numbers of the more popular, nationally marketed driver education programs, and/or allowing local schools and school districts (or private driving schools) to offer their own programs or to partner with an outside provider. In a few States (Indiana, Pennsylvania, and Utah), national online providers were only able to operate if they joined with a local driving school and/or public school or school system.

Florida was unique, in that it did not require driver education per se, but did require all first-time licensees to complete a 4-hour Traffic Law and Substance Abuse Education Course. The State had approved 8 course providers, 6 of whom offered an online course. Even though a large number of commercial driving schools and Web sites offered "approved TLSAE" courses in Florida, they were all required to use one of these 6 approved courses.

Student Eligibility for Online Courses

In most States, the online courses had been approved as direct substitutes for the required classroom driver education. Any teen could take them, and students received a certificate of completion that was equivalent to one from a public or private high school or a commercial driving school. Some States, however, had additional requirements in place for online students. In Texas and Oklahoma, online courses were only offered as a parent-taught driver education option, although any student could apply to do so. Parents had to meet certain qualifications set forth by their State's Department of Public Safety and had to oversee their child's course work as well as behind-the-wheel training. Due to the latter requirement, courses (or versions of courses) offered in these States included guidance for parents in behind-the-wheel instruction. In Virginia, online courses were only approved for home-schooled students.

Number of Students Enrolling

About two-thirds of the States maintained some data on the number of students completing their driver education requirement through an online program, and a few States even tracked the specific online program taken. States with significant numbers/percentages of teens completing their driver education online included California (33 to 50%), Florida (183,000 total students in 2008, but not all were newly licensed teens), Georgia (40%), and Texas (35 to 40%). At the

lower end (among States reporting) were Idaho, Virginia, and Wisconsin, all with less than 5% of teens completing their driver education online. Not surprisingly, numbers were highest where there were fewer requirements or constraints for taking a course online, and/or where some of the larger national online driver education providers had been approved. Other growth influences were new requirements for classroom driver education as part of GDL laws, and declining numbers of public schools offering the traditional programs (sometimes associated with rising costs to teens and their families). It was also clear that online courses had limited marketing potential in States where driver education was either not required or did not have some associated licensing benefit.

Course Evaluation

Three States (Texas, Florida, and Virginia) had carried out evaluations of their driver education programs, and several others maintained some level of evaluation data. The Texas evaluation of its parent-taught driver education programs (not necessarily limited to online programs) was published in 2007 (Pezoldt, Womack, & Morris, 2007). This evaluation, however, was unable to distinguish between the different types of parent-taught programs being used.

Virginia was also interested in examining the relative effectiveness of various types of driver education programs. The Department of Education maintained statewide data on where students completed their classroom driver instruction, whether at a particular high school or commercial driving school, as a home-schooler supervised by a parent, or via an online course. With support from the Department of Motor Vehicles, these data had recently been linked with students' driving and crash rates, for a preliminary evaluation of the effectiveness of the various approaches. While the numbers for public school students taking a class online were relatively low, home-schoolers taking one of the approved alternative courses (and presumably their behind-the-wheel instruction from a local driving school) were found to have higher crash rates than those taking driver education as part of their standard high school curriculum (Wigand, Virginia Department of Education, personal communication, November 2009).

Florida had a rigorous process in place for approving and monitoring providers of its 4-hour Traffic Law and Substance Abuse Education course. In order to become approved, a program had to be offered initially as a traditional in-person class. After a period of 2 years, and after graduating 2,500 students, the Division of Highway Safety and Motor Vehicles (DHMSV) would evaluate the effectiveness of the program by comparing the violation and crash experience of its graduates with that of a matched control group. If successful, program providers could then go through the process of converting their classroom curriculum into an online program and/or DVD for submission for separate DHSMV approval. All programs were re-evaluated every 5 years to ensure their continued effectiveness (McGlockton, 2009).

A few other States also had data that could be used in evaluating online program effectiveness. Idaho, Kansas and Wisconsin all maintained some level of data on where students completed their driver education course work and/or the type of program taken (public school, commercial driving school, online, etc.), while Georgia kept data on which specific online program students took. In addition to these States, Colorado began tracking type of course in 2008, and California indicated it planned to do so starting in 2010.

State Perspectives Regarding Online Course Administration

Several of the State administrators noted that it would have been helpful to have had more time to prepare for the arrival of online driver education. If, for example, an unexpected legislative decision introduced online driver education into a State where regulations and resources were not already in place, administrators reported finding it difficult to "get the horse back in the barn." Interviewees also noted the complexities of having more than one regulatory body involved. It was not uncommon for online driver education to be regulated by a Department of Motor Vehicles (overseeing commercial driving schools), in addition to a statewide Department of Education and local school boards (overseeing high schools), and problems sometimes arose if the different regulatory bodies had very different standards, interests, or constraints.

Several administrators also noted that the license applications and auditing that worked well for traditional commercial driver education needed to be modified for online providers. Rather than relying on traditional brick-and-mortar paperwork, some States had developed specialized license applications for online providers. It was found that a rigorous application form alone could weed out online providers who were unable to meet State standards. Similarly, the ongoing auditing process for online providers might differ from audits of traditional commercial driving schools. For example, it could require actually taking the courses and conducting audits more frequently than traditional once-a-year audits, since Web sites are easily changed.

6.4 State Summaries

The following sections describe individual State approval and oversight practices for online driver education programs, along with listings of approved programs. Information was current at the time of this report, but the reader is cautioned that changes over time are likely. Appendix D contains contact names for the providers of the information.

6.4.1 California

At the time of this report, California required 30 hours of classroom driver education and 6 hours of behind-the-wheel instruction for teens wanting to obtain a driver license before age 18. State oversight of driver education courses had been controversial, involving both the legislature and the courts. In general, the Department of Education oversaw public schools, though local public school boards had considerable discretion, and the DMV oversaw commercial driving schools. However, many California online driver education providers had designated themselves as "private secondary schools" and were exempt from oversight by the Department of Education or the DMV. In effect, these providers had the freedom from State oversight that is traditionally granted to parochial schools, without necessarily offering other classes or having full-time students. The DMV had unsuccessfully sought oversight of online driver education for more than 8 years. However, at the time of this report, the DMV could not audit the private school online providers' curriculum or teaching methods for purposes of accreditation, but by court order had to supply certificates of completion for their students. A further issue for the DMV was budgetary constraints brought about by the current economy. While many online providers advertised DMV acceptance or approval on their Web sites, it was often difficult or confusing for

the layperson to interpret, and beyond that, "DMV approved driving school" or "private school" was not a reliable indicator of the quality of the course.

The California DMV did not publish a list of approved online driver education providers since some were not subject to DMV approval. As such, there was no accurate count of the number of online programs operating in California.

The earliest online driver education courses began around the year 2000. By State law, public schools providing classroom driver education had to do so free of charge, and many had stopped. Many commercial driving schools offering behind-the-wheel training either joined with an online provider, or purchased the right to put their own name on an existing course. Other commercial schools had developed their own online courses. Public schools could also partner with an established online provider.

California was the location of Masten and Chapman's 2003 DMV study, comparing teens who were randomly assigned to (1) traditional classroom driver education, (2) a CD-ROM course, (3) a workbook course, or (4) an existing online and/or workbook course. Few differences were found, but differences tended to favor the CD-ROM course and the existing online and/or workbook course. However this 2003 study design differs from more recent course delivery at the time of this NHTSA project. Masten and Chapman's participants were told that they had one attempt to pass a proctored final exam, and strict test security was maintained. California courses in early 2010 often offered unlimited online attempts to pass the final test, and test security varied with the provider. Since no records were kept on whether teens received their driver education in traditional classes or online, no data were available to determine whether Masten and Chapman's findings would hold true for current online delivery. In 2010, the DMV planned to begin keeping track of whether teens completed traditional or online classes, but did not plan to track the numbers of teens graduating from specific commercial schools or specific Web sites.

6.4.2 Colorado

At the time of this report, Colorado did not require driver education for teens who waited until age 16 to begin driving. However, completion of an approved class did allow teens to obtain a driver education permit at age 15 to 15 ½ (30 hours of education with 6 hours Behind-The-Wheel); and a driver awareness permit at age 15 ½ to 16 (4 hours of education). Both would allow teens to begin logging their required 50 hours of practice driving once the permit had been obtained.

The Colorado Department of Revenue had approved 9 online driver education courses. These programs had their curricula approved by the Department of Revenue/Division of Motor Vehicle, Driver Education Compliance Section, which also approved "brick-and-mortar" classes. The 9 approved online courses were:

- American Safety Council;
- Costech Driver Training;
- DriversEd.com;

- On-Line Teen Driving;
- Virtual Drive of America;
- Welcome Driver Colorado;
- I Drive Safely;
- NDTI; and
- TeenDrivingCourse.com.

The first online course offering was believed to have been in 1998, and the legislation to accept online driver education in lieu of traditional classroom began in 2001. The new law was driven by the legislature and the efforts of online providers, rather than initiated by the DMV. The unexpected change made it challenging for the Driver Education Compliance Section to develop appropriate oversight quickly. Promulgated rules were adopted in December 2006, even though the Driver Education Compliance Office did not initially have the full Internet access needed to audit online classes.

Colorado's driver education standard for beginning teens was 30 hours of classroom, followed by 6 hours of behind-the-wheel instruction. Traditional classes, online classes, and home schooling could all satisfy the classroom requirement. The home schooling option was available regardless of geographic location. An exemption from the 6 hours of behind-the-wheel training was allowed only for rural students living outside a 30-mile radius of a commercial driving school. These students were required to complete an additional 12 hours of parent-supervised driving (for a total of 62 hours).

At the time of this report, Colorado had a 33-point curriculum that applied to all driver education classes, regardless of format. Web-based providers seeking initial approval were required to supply the Driver Education Compliance Manager with a CD or PowerPoint presentation, documenting where and how the 33 curriculum points were addressed. Approved programs were audited at least annually. Colorado's Driver Education Compliance Section had drafted a set of proposed requirements that would be specific to online driver education. In particular, the guidelines attempted to address the amount of time and attention that students actually devoted to the course material. These requirements were expected to become effective in early 2010.

Students who completed either online or traditional classes received Form DR2460, a signed affidavit of completion. Some traditional "brick-and-mortar" schools could administer the DMV written permit exam, but no online schools could do so, due to concerns about the identity of the person taking the exam. At the time of this report, all Internet students were required to take the DMV knowledge test in-person at the DMV. Some traditional private driving schools joined with selected online schools, allowing teens to take classroom lessons online, and behind-the-wheel at the private driving school. Other driving schools elected not to offer behind-the-wheel instruction to teens who had completed their classroom portion online, citing concerns about what the students had been taught.

In October 2008, the Colorado Driver Education Compliance Section began collecting specific statewide data on where teens completed their classroom driver education—whether at a particular high school or commercial driving school, through home schooling, or through an online course at a specific Web site. In the last fiscal year, Web-based programs accounted for

17.5% of teen driver education, while brick-and-mortar classes accounted for 78.6%, and home study accounted for 3.9%.

6.4.3 Florida

At the time of this report, to obtain a license in Florida all first-time drivers regardless of age had to complete a 4-hour Traffic Law and Substance Abuse Education (TLSAE) course, or an approved driver education equivalent. For teens, this course had to be completed before applying for learner's licenses. There were a variety of ways students could access an approved course, including via the Internet.

In order for a driver education course to be approved by the Florida Department of Highway Safety and Motor Vehicles (DHSMV) as satisfying requirements for licensure, it initially had to be offered as a traditional in-person class. After a period of 2 years, and after graduating 2,500 students, the DHSMV would conduct a study to document the effectiveness of the program. If the program was judged to be effective, providers could then go through the process of converting their classroom curriculum into an online program and/or DVD for submission for separate DHSMV approval. Additionally, DHSMV conducted a 5-year evaluation on every approved course based on driver outcome data of crashes and violations.

All approved programs were listed on the DHSMV Web site. At the time of this report, 6 out of 8 identified providers had been approved to offer online courses. These were:

- American Safety Council,
- American Safety Institute,
- Driving Training Associates,
- Florida Association of DUI Programs,
- Improv Comedy Traffic,[6] and
- Lowest Price Traffic School.

Because of changes in Florida law deregulating the driver education industry in 1996, these course developers or providers could offer their courses to another affiliate who could then market the course as their own "Florida approved TLSAE course." As a result, there were many commercial providers of approved online driver education programs (both the shorter TLSAE as well as more comprehensive programs) operating in Florida. If a Web site claimed that its program was approved, but a potential user wanted to be sure that it met State standards, the user was encouraged to contact the program provider or DHSMV for confirmation.

Curriculum standards for the 4-hour TLSAE were quite broad, and included instruction in the driver licensing process, the effects of alcohol and other drugs on driving, penalties for DUI, vehicle handling and control, Florida traffic law, and other topics important to safe motor vehicle operation. But while the DHSMV had some control over the content of approved courses, it did not certify individual instructors, or have control over how the course content was transmitted.

[6] Author's note: Provider's teen online course did not appear to be available at the time of this report.

Thus, the quality of instruction may be an important differentiating factor among available courses.

Florida public schools were also required to offer driver education courses to students wanting to take them as electives. Courses offered through the schools were taught by certified teachers who had completed the 9 additional hours (three courses) of college-level training, or its equivalent, needed for a driver education endorsement. Each district was responsible for developing or selecting its own curriculum, with overall oversight by the Department of Education. Alternatively, a school could contract with a private driving school to provide instruction, or could encourage students to enroll in an online course offered by the Florida Virtual School. Completion of one of these school-based courses could exempt students from the TLSAE course.

Because of its commitment to an ongoing evaluation of its TLSAE-approved curricula, DHSMV maintained data on people completing each program, including name, date of birth and gender. These data have been linked to the individual's driver license number, so that crashes and violations can be tracked. In 2008, nearly 183,000 first-time drivers completed their required driver education training online using one of the 6 approved programs.

6.4.4 Georgia

At the time of this report, Georgia did not require driver education for teens who waited until age 17 to apply for a driver license. However, completion of an approved driver education course allowed teens to obtain a Class D license at age 16. The driver education model for Georgia included 30 hours of classroom, followed by either 6 hours of behind-the-wheel professional instruction or 40 hours in a structured, parent-taught behind-the-wheel program. The classroom requirement could be completed in a traditional classroom or online, as long as the Department of Driver Services (DDS) had approved the program.

Georgia had 5 online driver education courses that had been approved by the DDS, the same agency that oversees traditional "brick-and-mortar" classes. These were:

- Costech,
- DriversEd.com,
- I Drive Safely,
- Virtual Drive, and
- Taggart's Driving School (using the American Safety Council program).

Online driver education in Georgia began when Joshua's Law took effect in January 2007, requiring driver education for the first time. Previously only a 4-hour Alcohol and Drug Awareness Program had been required. The online option was attractive for two reasons: it was less expensive for families, and it helped rural students who did not have convenient access to traditional classes.

Web-based providers seeking DDS approval at the time of this report were required to complete a 15-page application, which was available on the DDS Web site. They supplied their

curriculum, screen shots, and a completed curriculum standards checklist, and they consented to a background check. For auditing purposes, the DDS had the same login and passcode access that an enrolled student would have. Five pages of the application asked specific questions about such topics as the level of instructor interaction with students and the parameters of date-and-time monitoring for students. The checklist was completed by the applicant but verified by the DDS staff.

In 2009 about 40% of Georgia teens completing their classroom driver education did so online. Many Georgia high schools contracted with private driving schools to teach at the high school. In turn, many private driving schools joined with the approved online providers for the classroom portion of driver education. Furthermore, high schools could partner directly with commercial Internet providers.

Georgia reported that the State maintained records on whether teens completed their classroom hours in a traditional or online class, and in addition, which specific vendors the students used.

6.4.5 Idaho

At the time of this report, Idaho required students 15 to 17 years old to complete 30 hours of classroom driver education, 6 hours of behind-the-wheel instruction, and 6 hours of in-car observation before they could apply for a supervised instruction permit. To participate in a class, a student had to be at least 14 ½ years old and hold a driver training permit. All behind-the-wheel training had to be taken concurrently with the classroom training, regardless of whether the student was enrolled at a public school or commercial driving school. Both public and private school courses were required to meet or exceed Idaho's approved content standards and benchmarks, which were developed based on national standards.

Only one online driver education course had been approval to operate in the State. The course was developed in 2005 by the State's coordinator of public driver education, Brian Johns, in response to legislation passed in 2003 providing for a statewide virtual high school. The 10-week course curriculum closely followed the State curriculum guide. In addition, it met national (ADTSEA) standards, as well as standards for online education set forth by the International Association for K-12 Online Learning (iNACOL). A notable feature of the iNACOL standards is the very active role that online instructors play in teaching the curriculum and providing student assessments and feedback.

In order to take driver education through the Idaho Digital Learning Academy, students had to have registered for the course through their high school and had to have made arrangements with a certified driving instructor (most often at a local commercial driving school) to provide the required concurrent behind-the-wheel instruction. Because of the rigorous nature of the online course, and the added demands of finding a cooperating behind-the-wheel-instructor, few students had opted to take it. Johns reported that of approximately 20,000 total students taking driver education each year in Idaho, only about 400 did so through the online option. Consideration was being given to shortening the course, and also to marketing it more widely. (At the time it was not advertised on the Department of Education or DMV Web sites.)

Although the online course required a "live" instructor, feedback from participants had suggested that not all instructors were equally engaged with their students, and quality control monitoring of instructors had proven difficult. While some of the best instructors were reported to offer regular "Idaho live" sessions and to use instant messaging to communicate with students as they worked on an assignment, other instructors may have had minimal virtual contact, either with their students or with their parents and behind-the-wheel instructors. Still, one of the biggest factors affecting student outcomes appeared to be the amount of time spent taking the course. An examination of data from four sessions taught in 2005 found that students' final classroom grades were highly dependent on the number of hours they spent online doing coursework; those making A's averaged more than 40 hours, those making C's averaged closer to 30 hours, and those making F's averaged much less than 30 hours (closer to 15 to 20 hours).

The Department of Education maintained a record of where students completed their driver education, so that a more comprehensive evaluation of the effectiveness of their online courses would be possible. At least for the near future, the Department did not foresee any additional online driver education courses being approved for use in the State, primarily because of its strict requirements for instructor involvement in line with the iNACOL standards.

6.4.6 Indiana

Indiana did not require driver education for teens at the time of this report, but enrollment in an approved driver education course did allow teens to obtain a learner's permit at age 15 rather than 16, and successful completion of the course also allowed them to obtain probationary licenses at age 16 years 1 month, rather than 16 years 6 months. The model for Indiana teens was 30 hours of classroom and 6 hours of behind-the-wheel instruction. There were no specific curriculum requirements, although commercial driving schools had to cover a list of classroom (and behind-the-wheel) topics. The classroom requirement could be met either traditionally or online. Three online providers had been approved at the time of this report:

- DriversEd.com
- I Drive Safely
- Welcome Driver

Online driver education began in Indiana in April 2009, when DriversEd.com joined with one of the State's Regional Educational Service Centers. The State had 9 Regional Educational Service Centers that functioned as co-ops, to provide cost effective shared resources for local schools. For example, two or more small rural schools might share a resource teacher. In this case, DriversEd.com joined with CIESC, serving Central Indiana including Indianapolis. CIESC continued to offer traditional "brick-and-mortar" drivers education classroom courses, and CIESC provided behind-the-wheel instruction to both their traditional and online students. Like all the Regional Educational Service Centers, CIESC generally fell under the jurisdiction of the Department of Education, with additional driver education oversight from the Bureau of Motor Vehicles. Indiana was a local control State, however, and local school districts had considerable latitude in terms of curriculum.

In November 2009, online driver education was also approved for commercial driving schools that contracted with an approved online provider. The classroom portion could be completed online, with behind-the-wheel instruction completed at the partnering commercial school. The online provider had to be approved by the Indiana Criminal Justice Institute, which oversaw the State's commercial driving schools. Potential providers were required to submit a curriculum, demonstrate adherence to basic NACOL standards, and hold a contract with a local commercial driving school. The 3 providers listed above had recently been approved at the time of this report.

Indiana did not have a system in place to keep track of where teens obtained their drivers education, and had no immediate plans to implement such a system.

6.4.7 Kansas

In Kansas, a teen wanting to obtain a restricted license at 15 or 16 had to first obtain an instruction permit and take an approved driver education course. Those who successfully completed the course, including a behind-the-wheel component, were not required to undergo any further DMV testing for their restricted licenses.

The classroom portion of the driver education course could be provided by public and private high schools, community colleges, or commercial establishments. The Department of Education set standards and offered course guidelines, but schools were free to develop their own curricula. All programs had to be reviewed and accredited by the Department of Education.

Since moving to competency-based education requirements, Kansas public schools were no longer required to document the length of their course (e.g., 30 classroom hours). Instead, students had to score 80% or better on the final course exam to receive their certificate of completion. Commercial schools, however, still had to be able to document that students had received at least 8 hours of classroom plus 6 hours behind-the-wheel instruction. Students taking a driver education course in either setting were required to complete their final course exam in the presence of a live instructor.

At the time of this report, commercial driving schools in Kansas did not offer online driver education, since they could not satisfactorily document that participating students had received the required 8 hours of instruction. Public schools, however, had been offering Internet-based courses as an alternative learning option since about 2001. At least 34 public school systems in the State were offering some form of online driver education. Schools had either developed their own online course, or had contracted with a private provider to do this. Since each school system was operating independently, there was no centralized list of available courses. Also, because Kansas law required that any provider of driver education services have a physical location in the State that could be audited, and that the instructors be Kansas driver education endorsed, schools could not contract with national "virtual providers" of online driver education; nor could these providers have their courses independently approved for State accreditation.

The Department of Education reported that it maintained a database of the total number of students completing driver education in each school district, and the number of students

completing an online driver education course. For the 2008-09 academic year, 1,491 students completed their course online, out of a total of 16,365 students (9%). No centralized data was kept on the specific online programs taken.

6.4.8 Nevada

At the time of this report, in order to obtain a driver license before age 18 Nevada teens were required to complete a driver education class unless no class was offered within a 30-mile radius of their homes and they could not complete online courses. In that situation, the teen had to log 100 hours of adult supervised driving while holding a learner's permit. Completing the classroom course, either traditionally or online, reduced the required supervised permit hours to 50. Behind-the-wheel instruction was not required. The Nevada standard was 30 hours of classroom, but commercial driving schools could meet the requirement with 15 classroom hours and 5 behind-the-wheel hours, since each behind-the-wheel hour counted as 3 classroom hours. These 15 hours could be completed in a traditional, online, or correspondence class. At the time of this report, Nevada had required driver education topics, from which providers created their own curricula, and efforts were underway to implement a required curriculum.

The Nevada DMV was responsible for overseeing commercial driving schools, whether online or traditional. It had approved the following commercial online providers.

- 1st NevadaLicense.com
- All American Driving School (Internetdrivered.com)
- CheapDriversEd.com
- DriversEd.com
- DriversEdOnline.com
- Edrivestar.com
- IDriveSafely.com
- Teenroadrules.com
- National Driving & Traffic School (nvdriver.org)
- OnlineTeenDriving.com
- PursuitOfExcellenceDriving.net
- Safe and Save Driving School (safe4udrivingschool.com)
- Safe2Drive.com
- Teendrivingcourse.com
- TrafficSchool4Less.com

Local public school districts offered the option of either traditional or online classroom driver education. Schools were overseen by the Department of Education, but Nevada was a "local control" State, giving considerable discretion to local schools, and there did not appear to be a centralized list of approved schools. However, most high schools who offered the online option were thought to use one of the following:

- Clark County School District Virtual High School, or
- Great Basin College.

Clark County's Virtual High School was a comprehensive online high school serving the Las Vegas area. Great Basin College was a State college open to anyone but primarily serving rural areas of northern Nevada. At the time of this report, its community interest courses included teen and adult classroom driver education, as well as behind-the-wheel instruction.

The earliest online teen course in Nevada was licensed in 2002. Demand increased with the 2005 advent of GDL laws, making classroom driver education a requirement for licensure before18. Also, fewer high schools were offering traditional brick-and-mortar driver education classes, especially in rural areas.

At the time of this report, Nevada did not keep records on where teens complete their classroom driver education, so it was unknown how many teens complete online courses.

6.4.9 Oklahoma

In Oklahoma, completion of a driver education course was not a requirement for licensure, although teens who did so could get their learner's permit 6 months earlier (at 15½ instead of 16) and were only required to hold an intermediate license for 6 months instead of one year. With these incentives in place, the minimum age for full licensure was 16½ for teens taking driver education, compared to 17½ for those not taking driver education. All driver education courses and programs in the State (whether offered through the public schools or by private driving schools) had to be approved by the Department of Public Safety.

Online courses had been approved as parent-taught driver education programs in Oklahoma since around 2001. Parents wanting to instruct their teens themselves, rather than enroll them in a public or private school program, had to first identify the course they wished to enroll in from one of the State's 8 approved providers, then complete a one-page Parent-Taught Driver Education Affidavit. Among other things, the affidavit certified that they and their son or daughter met all the requirements set forth in OAC 595:10-13 – Parent-Taught Driver Education. Only after an application had been submitted and approved by DPS could a student be enrolled in a course. Of the 8 approved alternative driver education providers, 6 offered their courses online. They were:

- All Star Driver Education (refers to teendrivingcourse.com);
- I Drive Safely;
- National Driver Training Institute;
- DriversEd.com;
- Virtual Drive of America; and
- OnlineTeenDriving.com.

All courses were required to provide a minimum of 30 hours of classroom instruction and 55 hours of behind-the-wheel instruction, covering specified topics and driving skills. Although intended for home-schooled students and their parents, anyone could apply to enroll in one of these alternative programs of instruction. The primary incentive for doing so was often

monetary, since the parent-taught courses were generally less expensive than those offered by private driving schools and public school systems.

No data was available on the number of students completing their driver education requirements online.

6.4.10 Pennsylvania

There was no requirement in Pennsylvania for teens to take a formal driver education course, although those who did so were able to obtain full licensure 6 months earlier (at 17 ½). No information was kept on the number of teens completing a driver education course. Courses could be offered by public or private high schools, or by private driving schools. Out of a total of 500 school districts in the State, 304 were reported to offer some form of driver education to students residing in their district. While a few of these school districts had developed online programs, most of the State's online driver education programs were offered by its private driving schools. The Department of Education was responsible for overseeing these programs and maintained a list of approved programs and program types.

In order for a public school or private driver training school to have had its online program approved by the Department of Education, it must have completed a detailed application documenting its compliance with the State's content performance expectations. The expectations were in-lieu of mandatory standards in a State where education was locally controlled. Pennsylvania's Online Theory Driver Education Policy was prepared in late 2006, in response to the decision by the developer of an approved driver education correspondence course to create an online version of the course. Requirements for approval were quite strict. Potential online course providers had to provide:

- Measurable goals and objectives for a 30-hour course, and the estimated time required to complete the online course;
- An explanation of how the course would operate, including a copy of the enrollment agreement listing all fees or costs associated with the program;
- A hard copy of all information that would be provided to students online;
- A course outline for each lesson with cross reference to each Driver Education Content Expectation;
- A listing of tests, materials and supplies that would be provided to participants, or pages that would be downloaded by students;
- A listing of Web sites that the student would be required to visit;
- A listing of questions, tests and quizzes students would be expected to complete;

- A detailed explanation of how student progress would be monitored by a PA certified teacher with certification in Driver and Safety Education, or by a licensed PDTS classroom teacher;

- A detailed explanation of how the school would identify participating students;

- A complete description of the evaluation/grading system;

- A copy of the certificate to be issued for successful completion of the course; and

- A copy of the PA teaching certificate or PDTS teacher's identification card.

These requirements had effectively excluded non-Pennsylvania based programs, unless offered by a local driving school or high school and taught by a Pennsylvania certified driver education instructor.

Online programs offered by public schools or private driving schools were approved for a period of 2 years after which the schools had to re-apply for approval.[7] Schools with approved programs were listed on the Department of Education Web site. At the time of this report, 22 schools were approved to offer online driver education courses – either locally developed or in partnership with one of the national providers.

6.4.11 Texas

At the time of this report, completion of an approved driver education course was required in Texas for persons wanting to obtain a driver license prior to age 18. It also allowed waiver of the DMV road test. Students opting to take a "block" driver education course could complete the classroom requirements prior to obtaining their Texas Instruction Permit, while those enrolling in courses in which classroom and in-car instruction were offered concurrently were required to obtain their Instruction Permit after completing the initial 6 hours of classroom instruction and prior to engaging in any in-car activities.

Driver education programs were offered through the State's public school system, by private driving schools, and as a parent-taught course. When offered through the public schools, the course could be either a 56-hour elective classroom course that awarded credits toward high school graduation or a 32-hour classroom course with no associated credits. Courses offered by private driving schools and through the parent-taught program were only required to include the 32 hours of classroom instruction. Public schools might or might not offer the required 7 hours of behind-the-wheel instruction and 7 hours of in-car observation; if they did not, students had to contract with a local commercial (licensed) driving school or enroll in the parent-taught program for their in-car instruction. All of the State's driver education programs – public, private, and parent-taught – were required to meet standards set forth by the Texas Education Agency, or TEA (see "Program of Organized Instruction for Driver Education and Traffic Safety,"

[7] Programs offered by private high schools were reviewed by the Department of Education on an annual basis.

November 2009). TEA was also responsible for reviewing and approving traditional public school and commercial (licensed) school driver education programs.

Parent-taught driver education had been an option in the State since 1997, and was overseen by the Department of Public Safety (DPS). As of January 2010, 8 courses were listed on the DPS Web site as approved for parent-taught driver education. Of these 8, 5 were offered online, and one additional program was reported to be in the process of developing an online option. They included:

- National Driver Training Institute (Course #102);
- Driver Ed at Home (Course #105);
- Virtual Driver of Texas (Course #107);
- DriversEd.com (Course #108);
- I Drive Safely (Course #109); and
- Curb Buster (Course #104, online course under development).

Although approved as parent-taught programs, about 70% of students taking one of the approved courses were public school students. A big reason for this was cost: faced with tight budgets, public schools sometimes needed to charge several hundred dollars for students to take a course at the high school, compared with costs as low as $20 for an approved parent-taught course. As a result, approximately 30% of Texas teens were completing their driver education requirements through a parent-taught course, 60% at a commercial (licensed) driving school, and only 10% in a public school setting.

Until 2010, online or Internet-based driver education had only been available in Texas as part of its parent-taught option. However, the State had strongly embraced the concepts set forth in the "No Child Left Behind Act of 2001," and in particular its goal of enhancing education through technology. A target data of 2020 was set for making all K-12 education courses available through its Texas Virtual School Network (TxVSN). With this goal in mind, the Texas Region 4 Education Service Center was in the process of approving 2 online driver education courses for offering through a school district beginning January 2010: "Driving Into the Future," developed by the Region 6 Education Service Center, and "Virtual Drive of Texas," developed by Kevin Knapp with the Amarillo School District. Both courses would meet the same TEA curriculum standards as other approved driver education courses, and in addition meet iNACOL standards for online instruction. To enroll in either course, students would be required to sign up through their schools and complete their work under the supervision of a certified driving instructor. Regular student-teacher and student-student interaction and communication would be a requirement for the course.

TEA was also responding to recently passed legislation (SB 858) requiring that an "alternative method of instruction" for classroom driver education be offered by commercial (licensed) driving schools. After developing a set of rules or guidelines, the agency planned to be in position to begin approving online or other alternative programs for commercial school use in early 2010.

An evaluation of parent-taught driver education in Texas was published in 2007 (Pezoldt, Womack, & Morris, 2007). This evaluation, however, was unable to distinguish between the different types of parent-taught programs being used. The State had since begun collecting information by individual provider, with a goal of generating collision rates for individual driving schools and parent-taught courses.

6.4.12 Utah

Utah required first-time driver license applicants of any age to complete classroom driver education. The model was 30 classroom hours in the high schools or 18 classroom hours in commercial driving schools. Either was required to be supplemented by 6 hours of behind-the-wheel instruction and 6 hours of on-road observation. The classroom requirement could be met traditionally or online. It was not required before applying for the learner's permit, but was required in order to get a driver license. At the time of this report, Utah approved these 3 online driver education courses:

- Utah Electronic High School;
- A-1 Driving School, using DriversEd.com; and
- A-1 Driving School, using Utah Valley University's online classroom capabilities.

Online driver education had been offered by the Electronic High School and the A-1 Driving School since 2004.

Utah's Electronic High School was part of the public school system and was overseen by the Utah State Office of Education, as were the State's brick-and-mortar high school driver education classes. The required State curriculum for driver education was available online. The classes had to be based on one of four approved textbooks, and the Electronic High School curriculum was based on *Drive Right*. The 7 instructors were all licensed educators with driver education and driver examiner endorsements on their licenses. Students were assigned to specific instructors who monitored their progress, graded their essays, and provided feedback; consequently, the course was not a shortcut of the 30-hour requirement. It was open to any Utah teen, and the only cost was the textbook.

The A-1 Driving School was a commercial driving school offering both traditional and online classes, as well as behind-the-wheel instruction. Like all other commercial driving schools in the State, A-1 was under the authority of the Utah Driver License Division. Under the A-1 umbrella, students could choose between two online programs: DriversEd.com, a large national provider, and Utah Valley University, a State university. The Utah Valley University curriculum was an online video course based on the A-1 Driving School classroom lectures.

At the time of this report, driver education teachers in the traditional high school programs were also licensed as driver license examiners, and so they were able to administer the Driver License Division written test. However, teachers at the Electronic High school did not administer the test because they did not have face-to face contact with the students. In Utah, commercial driving schools could not administer the DLD written test, even in brick-and-mortar classes. Thus all online students in Utah took the written test at the Driver License office.

Utah did not keep records on whether teens completed their classroom driver training in a traditional or online venue.

6.4.13 Virginia

In order to obtain their initial provisional driver's license, Virginia required all teens under the of 19 to complete 36 hours of State-approved classroom driver education, 7 hours of behind-the-wheel driving, and 7 hours of in-car observation. Since driver education could be taught in-lieu of a portion of the required 10th grade health curriculum, about 90 percent of students received their classroom driver education at their local public or private high school. They then obtained their behind-the-wheel instruction either through their school, which could contract with a private driving school for this purpose, or directly through a driving school of their choice. Teens who were home-schooled had the option of taking driver education at a public school, at a private driving school, or most typically, taking an approved online course.

Four online driver education courses had been approved by the Virginia Department of Education at the time of this report. All but one (Virginia Association of Driver Education and Traffic Safety, VADETS) were approved for home-schooled students only. The approved courses were:

- DriversEd.com;
- I Drive Safely;
- National Driver Training Institute; and
- VADETS Online Driver Education Course.

In order for a course to have been approved, its developer must have completed a detailed application form showing how the curriculum content satisfied the State's Driver Education Standards of Learning and how it assessed students' abilities to meet these standards. Providers must also have certified that their course satisfied the State's 36-hour instructional requirement. As a result of these requirements, many potential online program providers had opted not to complete the Virginia application process. At the same time, if a potential program provider had completed the application process and had certified that it met all the necessary requirements, it was likely that the Department of Education had approved it.

Only about 3,000 of the total 96,000 students taking driver education during the 2008-09 academic year did so via an online program. Of this total, about 2,500 represented home-schoolers. Of the remaining, most were students who had fallen through the "safety net," e.g., by moving into the area after the course at their high school was offered, or failing to pass a course in which they were enrolled. Non-home-schooled students who wished to take the online VADETS driver education course had to obtain permission from the school principal and had to take the online course under the supervision of a driver education teacher. They also had to take the final exam at the school in the presence of a school official designated by the principal.

The first online courses had been approved in Virginia in about 2003. At the time of this report, the Department of Education and the Department of Motor Vehicles maintained statewide data

on where students completed their classroom driver instruction – whether at a particular high school or commercial driving school, as a home-schooler supervised by a parent, or via an online course. These data had been linked with students' driving and crash records to facilitate some preliminary evaluations of the effectiveness of the various approaches. For example, students completing their driver education course work at commercial schools, as well as home-schoolers, were found to have higher crash rates than those who had taken the course as part of their standard high school curriculum. Specific results were not made available.

6.4.14 Wisconsin

Wisconsin teens who wanted to obtain a drivers license before 18 were required to complete 30 hours of classroom driver education, 6 hours of behind-the-wheel instruction, and 6 hours of on-road observation. Wisconsin had only 2 approved online driver education programs, both operated by State institutions. At the time of this report, Wisconsin's commercial driving schools had not been allowed to offer online courses. Online classes had been offered by the two State institutions since about 2004, with pilot work beginning as early as 2001. The approved programs at the time of this report were:

- Cooperative Educational Service Agency, Region 2 (CESA2); and
- Southwest Tech.

The Cooperative Educational Service Agency allowed public schools to share staff and resources; for example, two smaller schools might share a special education specialist. The State was divided into 12 regions, and CESA2 served south-central and southeastern Wisconsin, where 29 public and 2 private high schools contracted with CESA for their classroom driver education. The contracts always included both traditional and online driver education, and any student in those schools could choose the Internet option. (Some schools did not contract with CESA for driver education, either because they provided their own programs, or because they offered no driver education.) Approved CESA driver education programs were administered by the Wisconsin Department of Public Instruction, and CESA driver education teachers were always DPI-licensed teachers with DPI driver education certifications. In terms of curriculum, however, Wisconsin was a strong "local control" State, giving districts a great deal of latitude with regard to curriculum.

Southwest Tech was part of Wisconsin's technical college system and was overseen by the Wisconsin Technical College System Board. In 2005, Southwest Tech received State approval to offer online driver education to any Wisconsin teen regardless of school district.

As of this writing, Wisconsin did not have a required curriculum for either public or commercial classroom driver education. Wisconsin's 2 online programs had developed their own curricula and did not contract with any of the national Web-based driver education companies. Both the CESA2 and Southwest Tech coordinators were veteran teachers and veteran driver educators. Both estimated that their programs required at least as much time and effort as traditional classes, if not more. The programs were notable for homework assignments, parent involvement, and instructors who provided feedback to their assigned students. After completion, students were still required to pass the DMV written knowledge test.

Internet programs accounted for less than 5% of Wisconsin teens taking driver education. In 2009 about 800-900 teens completed the CESA online program, and about 225 teens completed the Southwest Tech program.

Both CESA2 and Southwest Tech have records of the students who have completed their courses. The Wisconsin Department of Transportation had recently contracted with a market research firm to conduct telephone interviews with 60 Wisconsin teens who completed online driver education and 40 who completed "brick-and-mortar" driver education. Part of the interview was scheduled to ask about violations and crashes, but the project did not plan to link drivers to electronic DMV violation and crash histories.

6.5 Identified Online Courses

Researchers identified 40 unique providers of online teen driver education courses. Most of the identified programs came from State contacts and were approved as a classroom substitute in at least one of the contacted States. Other programs were identified via Internet searches. The authors acknowledge that the project was unlikely to have identified every online course. The online courses most likely to have been missed were those offered by smaller commercial driving schools and local public schools or school systems, including community colleges and virtual schools. It was likely that some California courses were also missed since the State did not maintain a comprehensive list. Appendix D lists the identified providers, along with their course names, Web site addresses, types of course offered, and States where approved (or in California, accepted) in lieu of traditional classroom driver education. The providers appear in descending order by the number of States in which they were approved or accepted.

Based on initial Internet searches, there appeared to be a larger number of online driver education courses. Many Web sites, however, proved to be alternative sites for the same online provider (e.g., oneclickdriversed.com, teendriverseducation.com, and onlineteendriving.com were all used by Advantage Driving School in California). In addition, some providers permitted multiple affiliates to re-badge the course as their own. For example, Costech Technologies' course was offered under more than 50 different domain names. Similarly, although there were only 6 approved 4-hour Traffic Law and Substance Abuse Education courses in Florida, there were an unknown number of Web site "storefronts" and private driving schools across the State offering these courses for a fee. In some cases, it was possible to discern what course was being offered, but in others this was not revealed. Researchers also found that some Web sites did not provide a course at all, but referred to other providers and received a commission, typically a percentage of the course cost.

The multistate providers identified typically made State-specific curriculum adjustments that are not reflected in the table. Many of the larger providers also offered a course in every State, even in States that did not recognize online courses as a substitute for traditional courses. These non-approved courses could be generic, or could be adapted to the laws and licensing requirements of the specific State.

Some providers created different versions of a course to meet State delivery requirements. Three basic types of courses are identified. They include:

- *Classroom/textbook theory courses*. These courses present the information that has traditionally been covered in driver education classroom settings. In the online setting, the lecture and/or textbook are generally replaced by such features as online screens of text, illustrations, animations, videos, and so on. In most States, these courses are accepted as substitutes for 30-hour classes, but the 4-hour Florida TLSAE courses also fall into this category.

- *Classroom/Textbook theory with behind-the-wheel instruction*. These courses present the same information as the classroom/textbook theory courses with the addition of some type of behind-the-wheel instruction integrated into the course. The behind-the-wheel instruction may be led by a professional instructor or a parent, depending on State requirements.

- *Virtual classrooms*. These courses present traditional classroom/textbook theory, but do so through direct interactions with instructors as well as class peers via the Internet. They use live video chat, instant messaging, forums, chat boards, and other means of active communication for students via the Internet. They may also include integrated behind-the-wheel instruction.

The following sections provide more specific information about the identified courses and course providers. The reader is reminded that the information was gathered from a variety of sources, and that not all sources were available for all providers. In particular, researchers were able to:

- Access a Web site for 39 of the 40 providers (Southeast Community College in Nebraska had a Web site, but it did not contain information about their online driver education course);
- Speak with 27 providers by telephone;
- Review a course syllabus or outline for 28 of the 40 providers;
- Take 6 free course demos (offered on the Web sites); and
- Complete 11 providers' courses, and take at least a portion of 15 more.

6.6 Results

The following section provides the results of the discussions with the various programs. Any notable differences among the various types of online programs are highlighted where applicable.

Provider Characteristics

Of the 40 identified providers, 7 were State/local entities, 3 were non-profits, and the remaining 30 were for-profit businesses. The State/local providers included 3 technical, community, or State colleges; 3 virtual high schools; and a cooperative educational service agency. The non-

profits included a State association of driver educators (VADETS), a not-for-profit company (NDTI), and a State association for DUI programs (Florida).

A number of the providers (and especially the for-profits) offered driving-related courses and services in addition to their online teen courses. Twenty offered defensive driving or points-reduction courses, 11 had behind-the-wheel training, 10 had adult driver education, and 8 had courses especially for older drivers. Only 1 of the identified providers offered a driver training course that taught "advanced" skills, 2 offered commercial driver training, and one offered training for motorcyclists.

Researchers attempted to gather information about the number of teens taking each provider's course, as an indicator of relative market share. Unlike the above information that was generally available on provider Web sites, enrollment numbers were only available from provider contacts. However, not all providers could be reached for interviews, and some of those reached preferred not to reveal this information. The 23 providers who provided enrollment numbers may not be entirely representative of the entire sample. For 2009, 10 providers served less than 1,000 students, 5 providers 1,000 to 5,000, and 8 providers more than 5,000 students. The community college and virtual school offerings generally fell into the smallest category, along with other single-State providers. An exception was the Utah Electronic High School, which served over 1,000 students in a recent year. Also in this mid-range category was the National Driver Training Institute, a program that targeted home-schooled students. At the upper end were the multi-State providers DriversEd.com, I Drive Safely, Virtual Drive, Welcome Driver, Soma Stream Interactive, Costech Technologies, and Advantage Driving School, as well as 2 Florida TLSAE providers (Lowest Price Driving School, American Safety Institute), and one multi-State and TLSAE provider (American Safety Council).

Twenty-six providers offered insights into how they marketed their courses. Of these 26, 18 reported engaging in direct marketing to schools; 13 linked from affiliate Web sites; 13 used Facebook, Twitter, or other social marketing tools; 9 offered some form of financial incentive to schools or driving schools; and 9 engaged in Internet search engine optimization, including pay-per-click. In contrast, only a few of the providers reported using the traditional media of radio, television, and Yellow Pages listings.

Course Characteristics

Information was gathered with respect to 45 online courses. Some of the 40 providers had multiple courses of interest including 2 each for Driversed.com (standard + parent taught), I Drive Safely (standard + parent taught), national Driver Training Institute (standard + parent taught/home school), American Safety Council (standard + TLSAE), and Virtual Drive (parent taught + virtual classroom). While many of the identified providers offered a number of versions of their courses, the delivery of these in particular merited separate consideration.

Of the 45 courses, 30 were offered as substitutes for traditional classroom driver education. Four (DriversEd.com, I Drive Safely, Virtual Drive, and National Driver Training's "Help for the Teenager Who Wants to Drive") were approved as parent-taught and/or home school courses and included concurrent behind-the-wheel instruction. Five were set up as virtual classroom courses.

These are courses that mimic a standard classroom course in all respects except that course material is presented online and students interact with each other and with their instructor online. The 5 virtual classroom courses included those offered by Great Basin College and Clark County School District in Nevada, Southwest Tech in Wisconsin, Idaho Digital Learning Academy (in Idaho), and Virtual Drive (in Texas only). The Idaho course required concurrent behind-the-wheel training provided by a certified driving instructor, while the Virtual Drive course could be combined with either parent-taught or commercial driving school behind-the-wheel instruction. One course, offered by Southeast Community College in Nebraska, was offered as a standard online course, but students were overseen by an instructor who also guided their behind-the-wheel training. The remaining 5 courses were the 4-hour TLSAE courses required by Florida.

Course costs ranged from $19 to $425, with the highest costs including subsequent behind-the-wheel instruction. Costs were also higher for the parent-taught courses incorporating behind-the-wheel instruction, and generally, but not always, higher for courses offered in approved States than for comparable courses offered in States that did not recognize online driver education. Lower course costs were found in Florida for the 4-hour courses and California with many available options.

For the courses for which information was available, most were appropriate for students not having access to high speed Internet (i.e., those with dial-up Internet connections). However, several providers indicated that the presentation might not be optimal, and four also made their course or video components available on CD/DVD as an option. Providers also noted that students often accessed their courses using computers at their schools or public libraries.

With regard to courses presentation, 25 of the courses for which information was available used animation, and 24 incorporated videos into their programs. The amount and quality of both, however, was found to vary greatly. Only 6 courses included any audio accompaniment to their text. Almost half of the courses provided information for parents. In addition to any detailed guidelines for parent behind-the-wheel instruction, common materials included tips for teaching their teens to drive and a downloadable parent-teen driving contract. Seven courses included homework as part of their course requirements, and most often these were the courses offered in a virtual classroom setting. Only 4 courses were identified that had either a required or optional student workbook. Beyond these basic descriptive characterizations, there were a number of other aspects of course delivery differentiating the various courses, and these are described in the sections below.

General Course Delivery

While course content, which was often dictated by a State-mandated curriculum, could be similar from course to course, researchers found wide differences in the presentation of that content. Some courses were only screens of text, with minimal pictures and occasional diagrams; screens were sometimes longer than pages from a traditional textbook, with few points of emphasis to break up the presentation. Other courses delivered short, easy-to-read screens, interactive animations, photos and diagrams, videos, puzzles, and so on. Still others resembled a traditional classroom lecture, supplemented by videos and worksheets.

Courses also varied in the extent to which the student needed to actively find information or apply the material. A course that required active learning might require the student to seek out information from other Web sites and report on it, or to watch a video and summarize the material. Alternatively, active learning sometimes meant learning a technique and practicing it behind the wheel. More passive learning was characterized by moving from slide to slide by clicking a mouse, followed by clicking multiple choice answers on quizzes. Somewhere in between, courses included fill-in-the blank quizzes, crossword puzzles, or screens that asked rhetorical questions.

Courses also varied in the extent to which their delivery facilitated long-term retention. Some courses had features to improve retention, such as repeated exposure to material, workbooks, quizzes that went beyond a multiple choice format, comprehensive exams, and so on. Others provided only one exposure to the material followed by immediate recall tests, and some courses had no comprehensive final exam.

Interaction With an Instructor

Courses differed in the hours during which "live help" was available, and in the credentials of those providing the help. Advertised hours ranged from 24/7 to weekday business hours, and response times varied within the range of what was advertised. Some programs provided clerical or tech support only, while others employed certified driving instructors who were experienced classroom and behind-the-wheel teachers. Another difference was the degree to which the instructors were involved at all in the course delivery for most students. In most programs, there was interaction only when a student sought it out. In a few programs, however, an assigned instructor provided personal feedback on each student's assignments, test results, and progress.

Time Requirements

Courses varied in whether and how they tried to ensure that students spent enough time to learn the material. Some courses used timers to prevent students from moving ahead too quickly. Timers could be page level, section level, course level, or some combination. The researchers found that lengthy section timers did not always work as intended, since students could find other things to do while long periods of time elapsed. Timers were not always as advertised; courses might state up front that their timers would require considerably more time than they actually did. Some courses avoided page, section, and course timers entirely, but required the lessons to be spread over some number of days or weeks.

As an alternative to (or in addition to) metered delivery, some courses endeavored to present attractive, entertaining material that would interest students, so that they were more willing to spend time learning, rather than being coerced. Another alternative was to include assignments and homework, often with an assigned instructor who knew when students logged in and out of their classes. In contrast, some courses allowed students to advance the screens as fast as they could click, sometimes even proceeding to the quizzes and final exam without opening the lessons.

Concurrent Behind-the-Wheel Training

For most programs, the online program was a stand-alone course, followed by separate enrollment in behind-the-wheel training as part of the State's required licensing process. Some courses, however, employed concurrent online and behind-the-wheel instruction. For these types of courses, a student completed an online lesson and then put theory into practice in a specified behind-the-wheel lesson. Parent-taught driver education courses included special materials for parents to assist them in fulfilling this role as an instructor. However, a few online courses were also offered in conjunction with behind-the-wheel training by a professional driving school instructor.

Parent Involvement

Another difference between online programs was the level of parent involvement. In many courses, parents did not need to take part in the learning process unless they actively chose to do so. The student might be required to supply a parent's name and contact information, and the parent might receive payment notification and graduation notification, but teens could essentially complete these courses on their own. At the other end of the continuum, some courses copied parents on all e-mail communications to and from students, including feedback on assignments, and some required parents to proctor tests. Parent-taught courses placed added responsibilities on parents to direct their teen's behind-the-wheel driver training and to verify their driving experience to State licensing authorities.

Identity Verification

Courses varied in whether and how they tried to ensure that the student who received the certificate actually completed the course and the tests. Some did not address identity verification. Some cautioned about fraud and included an "I accept" button to click before taking the class. Others used "student solicited" identity questions; i.e., they had the student answer a short list of questions, and then asked one or more of the questions again throughout the course. Courses that placed considerable emphasis on identity verification required parents to monitor all tests using pass codes, or required that a proctored final exam be taken at a brick-and-mortar location. Future varieties of identity verification may include "third-party" identity questions, biometrics like voiceprints and keyboard strokes, and Webcams. While these were used in some traffic schools, they were not found for online teen driver education courses at the time of this report.

Tests

Passing a test to get a certificate of completion to take to the DMV is unquestionably a major motivator for most teens. For online driver education, there was dramatic variability in how different courses presented their tests. On the surface, most required students to pass end-of-unit quizzes with some level of proficiency before moving to the next unit. Similarly, most courses had a comprehensive final that had to be passed at some level. Test questions ranged from very easy to very challenging. Some courses presented a test, immediately provided the correct answers (which might even be copied and saved), then immediately offered the chance to take

the test again. Other courses used programming techniques to prevent students from easily copying and saving test answers, pulled quiz questions randomly from a larger test pool, and even required completion of additional assignments prior to retaking a test. Some courses required that the final exam be taken at a proctored classroom, and others required a parent to certify that they proctored the final exam.

6.7 Course Classification

As noted earlier in this report, the authors do not claim to have identified every online driver education course, nor to have held discussions with every course provider, nor to have taken every course in its entirety. Thus, the goal was not to fit every course into any particular classification system. Rather, the goal was to learn enough about available online course offerings to develop a meaningful classification system, and then to describe several providers illustrating the different classes within the system.

There are many dimensions upon which a classification system of online driver education courses might be built. The system described here focuses on online courses that replace a standard 30-hour driver education classroom course. For this reason, it does not address the Florida TLSAE 4-hour courses, even though they were included in the overall research project. The system categorizes courses primarily based on their deliveries, specifically with regard to levels of *student engagement* with the course material and with instructors. This classification approach appeared to be the most meaningful since courses differed markedly in how much the student was engaged in the various learning activities, but less so in their content/curricula, which were generally either evaluated by the States prior to approval or, in California, readily available on the DMV Web site. Here, engagement refers to the extent to which a student must actively participate in the learning exercises and the extent to which the student must participate in outside activities as part of the online driver education course. The following three levels of engagement were identified:

- Courses Requiring Average Student Engagement. These programs were representative of the most common types of courses teens were taking online at the time of this report, in most States where online driver's education was subject to State regulation and approval. While there was debate about whether these programs should always require 30 hours of time, and while different States took different approaches to time requirements, these programs required more than a half day to complete. Teens could generally complete these courses independently, though online or telephone help was available if requested. Tests were adequately constructed and there was some attention to test security. This category is broad, encompassing a variety of delivery methods, but there was more to these courses than lengthy screens of text. About half of the courses identified fit under this umbrella, and four were selected as case studies to illustrate it.

- Courses Requiring High Student Engagement. These programs were generally virtual classrooms and/or involved concurrent behind-the-wheel activities. All supplemented the theory course with some form of human interaction. They required more active learning on the part of the student, and had more instructor-student interaction. The programs accomplished this in different ways, including homework assignments that required

students to seek further information or analyze material, or pairing classroom material with concurrent behind-the-wheel training. Instructor-student interaction often meant certified driving instructors who kept track of each student's progress and gave feedback on homework. It also meant parents who made significant time commitments as instructors for their teen's concurrent behind-the wheel training. In either case, students were required to apply what they learned, either in actual driving with a parent or professional instructor, or in assignments submitted to instructors who graded their progress. These courses often took longer to complete, in some cases longer than traditional brick-and-mortar 30 hour classes. Oversight by a parent or other instructor added another level of assurance that the student was learning and applying the information presented online. About a third of the courses identified fit into this category, and three were selected as case studies.

- Courses with Potential for Low Student Engagement. These courses included several features that, when added together, may open the door for teens to get a certificate of completion without learning the course content. This level of program generally included text-intensive screens that were not very engaging, the ability to click through the screens at any speed (or to skip the lessons entirely), and tests that the teen could take repeatedly and/or copied and circulated to other teens. In most cases, these features were not evident from the Web site itself, but were noted while taking the courses. These features would not be immediately apparent to State regulators or parents reviewing the course Web sites. About 15 percent of the courses identified fit into this category. Four were combined into a single case study to illustrate this type of program. All four were offered in California, where State agencies did not have a great degree of online course oversight. It is unlikely that these were the only courses like this—they were four examples that the researchers found through Internet searches and completed in their entirety.

6.8 Discussion

The primary goal of this project was to describe driver education programs that were offered via the Internet. This undertaking faced a number of challenges in identifying existing courses and establishing contacts for additional information. The rapidly evolving nature of online driver education further complicated the task. Obtaining lists of courses from States that approved or accepted online driver education in-lieu of traditional classroom courses helped, but also added another dimension and round of contacts to the project. Notwithstanding, this project was able to produce a "snapshot in time" documenting State regulation of online courses, and the range of available course offerings.

The 15 identified States that approved or accepted online courses at the time of this report all either required driver education for licensure or conferred some other benefit on teens who completed it. These were the States that offered the greatest markets to online course providers. However, States were found to vary greatly in their approaches to regulating and approving online courses. Some had a more rigorous application process that reduced the number of providers seeking approval. Others placed restrictions on who could take an online course, or what form the course took (e.g., for home-schooled students only, or requiring that online courses be parent-taught). Some States required that providers have a "brick-and-mortar"

presence in the State, or that they partner with a local driving school or school system. All of these administrative considerations have important implications for the future growth of online driver education programs, both nationwide and in individual States.

There was also great diversity with regard to the online courses themselves. Differences included the number of students served, the provider type (for-profit, State or local entity, etc.), and the course type (classroom only, classroom with parent-taught behind the wheel, virtual classroom, etc.). The most salient differences, however, were with respect to course *delivery*. Wide differences were found in how engagingly the material was presented, the role of instructors, time spent learning the material, and how students were tested. Interestingly, these features of the courses could not always be judged from their Web sites, but became more apparent when taking the courses.

In contrast, course content was generally not found to be an issue, in part because this was more easily regulated by the States. Although the researchers found some isolated factual errors, the primary issue here seemed to be keeping course material up-to-date. Courses frequently cited old crash data or "showed their age" in other ways, one even advising teens to "always carry a quarter" with them so they could phone for help in case of an emergency on the road.

Many State regulators stressed the importance of having adequate time to put regulatory procedures in place, and many noted that online oversight was different from traditional oversight. Interestingly, many of the online providers agreed, expressing support for stronger regulation to discourage providers who offer questionable products.

The best model for using online technologies to educate young drivers remains to be determined. However, several options emerged from the current study. In Texas, Virtual Drive of America had recently joined with local school systems to offer a virtual classroom course. There are also likely to be more partnerships between national online providers and virtual high schools, like the collaboration between DriversEd.com and the Florida Virtual School. National providers bring a well-developed platform, alternatives for meeting State's delivery preferences, and a core curriculum that can be adapted to State requirements. Virtual classrooms or high schools bring a teaching approach that addresses many of the objections to "standard" online delivery. They make the course more interactive by adding assigned teachers and such features as homework, individualized feedback, discussion boards, time to digest the material, and more controlled testing.

There may also be more affiliations between national online providers and local commercial driving schools, as was the case in Indiana, Pennsylvania, and Utah. It remains to be seen whether these affiliations evolve into true hybrid models, with instructor interaction during the course. At the time of this report, the current practice was online theory, followed by instructor-led behind-the-wheel training; however some online providers and commercial driving schools expressed an interest in a more integrated approach.

Alternatively, more States may develop their own virtual classrooms, as exemplified by the Idaho Digital Learning Academy. Online programs incorporating parent-taught driver education were another model, and tie in well with State graduated licensing requirements. In the end,

there may be no single ‘best” model, but instead a number of models from which States could choose.

7. GENERAL DISCUSSION

This study included three of the most extensive information gathering efforts to date relating to supplemental driver education programs in the United States and abroad, as well as the current state of online basic driver education in the United States. The separate studies focused on the prevalence of such programs, the nature of the training that was taking place, and regulation and oversight of the programs. Each study section above provided the process used to gather information and a description of the findings. Below is a brief summary of those findings along with their overall implications for the future of research in the young driver training domain.

Somewhat surprisingly, it was found that the great majority of the supplemental driver training programs in the United States were teaching very similar knowledge and skills with similar training techniques, and it was primarily the venue of the training that distinguished the programs. It is also important to note that a large number of programs claimed to provide advanced training, but many of these courses were simply basic driver education programs that prepared young drivers to pass the drive tests. A number of thrill-seeking courses were also identified, but these were not included in this study since they did not focus on driving safety. Of the programs that were truly focused on supplemental training to increase driver safety, topics often included advanced vehicle handling and control, vehicle dynamics, and a variety of cognitive and perceptual techniques to identify and respond to potential hazards. While all of the program providers asserted that their courses improved driver safety, no formal research evaluations of the safety effects (good or bad) had been conducted, and there was virtually no oversight of the courses by some external body. This represents a clear deficiency that should be addressed before any such training is considered for inclusion in a multi-phase graduated driver licensing program that might go above and beyond basic driver education as it operates in the United States today.

The research effort that focused on supplemental driver training in Canada and abroad found very similar results to those that were observed for the United States. Most of the courses followed similar training approaches and covered the same topics as those in the United States. The one major difference that was found was that some countries required, or at least strongly suggested, that drivers take a supplemental program. As such, some programs had notably advanced facilities that could create a wide range of driving scenarios to allow realistic experiences for the drivers. Obviously, much larger numbers of young drivers had taken the supplemental programs abroad when the training was required by mandate to garner a driver's license. However, similar to the United States, no truly independent evaluations of the safety effects of the individual programs had been conducted.

The research effort that focused on online basic driver education required a different approach than the other two studies since the Internet-learning arena is rapidly changing and expanding. This project focused on programs that were approved, or at least accepted, by one State to replace classroom driver education. Although the content across courses was fairly consistent, the courses varied greatly in training approach with some appearing to be more effective than others. The primary distinguishing factor among the courses was how much student engagement was involved with the training. Some courses required very little engagement and could be

completed very quickly while others required very high engagement, often including some form of interaction with a real human through a virtual training environment. Similar to the supplemental programs, no definitive evaluations had been conducted examining the effectiveness of the programs against some benchmark although Virginia did indicate that some form of data had been gathered to evaluate program effectiveness.

Taking the findings from these three research efforts into consideration, it is clear that there is a need for formal scientific evaluations of the effects of both supplemental and online driver education on young driver safety. The online programs are becoming more common as State education budgets are slashed and private driver training costs are increasing. Also, given the number of supplemental programs that are operating in the United States and around the world, it is clear that there is a demand for driver training that goes above the knowledge and skills that are being taught in basic driver education in the United States. Whether that demand is being met with a safety-improving product remains to be seen.

Finally, the common theme of the absence of significant oversight and regulation of the training programs leads to the notion that research efforts could be focused on the development of scientifically supported standards for each area of training. The Internet-based programs did have at least some general standards to draw on, but it was apparent that most of the training programs were not adhering to these general standards. The clear definition of standards for all of the types of programs would also provide much needed points of reference for States considering whether to accept or implement particular supplemental or online driver education as part of their graduated driver licensing process.

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APPENDIX A: CASE STUDIES OF PROGRAMS IN THE UNITED STATES

United States: Drive 2 Survive (Closed Course Program)

Drive 2 Survive (D2S) was a driver training service run by the National Institute of Vehicle Dynamics, a 501(C)(3) nonprofit organization based in Waldorf, Maryland. The program was started in 2005 and is managed by Eric Espinosa, a State-certified law enforcement trainer who specializes in training law enforcement personnel in emergency response situations and driving under other stressful conditions. As such, the course content was largely based on the training that law enforcement personnel receive with some additions by the in-house staff. According to D2S, it was the "only licensed advanced driving program approved by the Maryland Motor Vehicle Administration."

D2S offered a single-day program aimed primarily at young drivers, car clinics that could accommodate a large number of young drivers, an SUV training course, corporate programs, and a government fleet course. Project staff attended the single-day course at the Maryland State Police Training Academy that was built in 1998 to train police officers from across the State. As such, the remainder of this case study primarily will focus on the single-day program for young drivers as delivered at the Maryland State Police Training Academy on the day it was attended. The course included approximately 2 hours of classroom lecture followed by 6 hours of behind the wheel exercises on a skid pad, closed course, and skills training area. The following summary describes the facilities, student population, and course activities in further detail.

Facilities

D2S operated at three locations including the Maryland State Police Training Academy, RFK Stadium in Washington, DC, and a Federal law enforcement training facility. Each facility included a classroom for lectures, a closed street course, a skid pad, and a large "parking lot" area to perform drills. D2S either rented the locations for the day, or the locations donated the day to the program. All facilities could be used year-round.

On the day project staff visited, the course began in a classroom at the Maryland State Police Training Academy. The classroom was arranged with a "conference table" in the center where approximately 15 class participants sat. Multiple rows of seats were positioned at the back of the room for parents to sit. A projection screen was placed at the front of the room for the visual presentation and lecture.

The driving program included behind-the-wheel activities on a skills training area, on a skid pad, and on two closed street courses (the highway response course and the tactical course). The skills training area was a 300' x 600' asphalt paved rectangular surface. The area was divided into three stations with various cone configurations used for drills (e.g., slalom). Multiple vehicles were operated simultaneously in the area during a drill session.

The skid pad was a 175' x 300' special asphalt paved surface. Water was added to the surface via large sprinklers to increase the slipperiness of the surface. The area was large enough to allow multiple vehicles to conduct drills simultaneously.

As described on the Maryland Department of Public Safety and Correctional Services Web site:

> The Highway Response Course is an expandable one mile oval roadway with interior connections to simulate driving conditions. It's varied geometry includes 1/4 mile straight-away, reverse curves, decreasing radius curves, and "broken back" curves. Pavement surfaces vary with asphalt, concrete for a bridge simulation, chip seal, and graded aggregate. Safety is also important, and large pavement widths allow driver correction as well as recoverable slopes in lieu of a guardrail. It provides flexibility in training with a segmentable course that allows up to three simultaneous exercises, standard State highway signage allows clockwise and counter-clockwise vehicle direction, and a closed-circuit television system allows remote observation and taping/playback capabilities.
>
> The Tactical Course is a fifteen acre training area segmented to allow specialized skills and simulation of urban driving conditions. It is lighted to allow night training and also equipped with closed-circuit television system similar to the Highway Response Course. An urban grid is designed with two signalized intersections, railroad crossing, portable pedestrian mock-up system, and other varied geometry like a cul-de-sac, an offset alley, and a "hammerhead."

Student Information

Although the single-day program was primarily attended by young drivers, it was open to anyone. Students must have a learner's permit and at least 10 hours of driving time behind the wheel. Parents of students are strongly encouraged to attend the course. Students came from a wide catchment area in the Washington, DC, metro area. D2S did not conduct extensive publicity about its program, instead choosing to focus on word-of-mouth and some limited advertising in local high schools. In fact, D2S has held some "lotteries" for local high schools in which students can win free tuition to the single-day course. Approximately 2,500 students had completed the single-day course to date.

Course Information and Content

The single-day course was generally offered one to two times a month on weekends. Students must register in advance and can do so online or over the phone. Payment of $299 must be made in advance via the Internet or over the phone. Classes required a minimum of 10 students, or the class was rescheduled. Classes generally had 15 to 30 students.

On the day visited by the project staff, the course first began with 15 students in the classroom for the 2-hour lecture. Before the lecture began, all students registered that included signing a liability release and providing a drivers license/permit that was copied and kept on file. Students on this day ranged from a 15-year-old permit holder to college-age students who were attending because of a recent crash.

The classroom lecture covered a wide array of topics and included a PowerPoint presentation, animated simulations, and a model steering wheel. Student and parent participation was encouraged throughout the presentation. Specific topics of the lecture:

- Basic vehicle control
- Physics of driving/vehicle dynamics
- Hazard avoidance
- Crash mitigation techniques
- Ocular driving
- Emergency stopping/advanced braking
- Skid management and recovery
- Managing low traction surfaces
- Maintaining vehicle stability
- Alcohol impairment
- Off-road recovery
- Distracted driving
- Shuffle steering
- Body position

After the classroom lecture, the students were divided into three groups. Each group started at a different portion of the behind-the-wheel training (i.e., skid pad, skills area, road course). The three groups then rotated to each station. Three students were assigned to each vehicle that had a single instructor in the car. Instructors had radios that allowed them to speak to the drive coordinator and other cars as needed. Students who were not driving rode in the back seat. Each station started with the instructor providing an example of the activities that were to be undertaken.

D2S provided the vehicles for the course. The vehicles included a combination of Scion tCs and Toyota Camrys. Each was outfitted with a dual brake system that allowed the instructor to stop the vehicle if needed. The Scions primarily were used for the higher speed activities, while the Camrys were used for the skills portion of the course and off-road recovery drills.

For the skid pad training, cones were set up in three circles, and three vehicles simultaneously drove in circles around the cones. The instructor used the parking brake to throw the vehicle into a skid. The students then had to recover from the skid. Students kept driving until they demonstrated they could recover from the skids. After this first session, cones were then set up and multiple vehicles traveled in a “figure 8” pattern around the cones. At any time in the pattern, the instructor might throw the vehicle into a skid and the driver would have to recover while also avoiding the other vehicles. Parents watched the training from a safe distance.

The skills training included multiple cone setups for various vehicle handling drills. These included a vehicle slalom, last second lane change, backing exercises, and a variety of other drills aimed at getting the drivers more comfortable with vehicle handling skills. Again, multiple cars operated simultaneously at the various stations, and three students were in the vehicle with one instructor for most of the drills. Sometimes, however, one-on-one instruction took place and

the other 2 students watched from a safe distance. Parents watched the training from a safe distance.

The closed-course training involved use of both courses. Three students rode in the vehicle with each instructor. Multiple cars were on the tracks at a given time, but spaced well apart. Instructors first demonstrated the skills to be covered on each lap around the track. Skills covered included high-speed braking in turns and straightaways, and last-second swerve-to-avoid where the student had to avoid a cone by steering to the right or left at the command of the instructor. These activities allowed students to experience the feel of anti-lock braking activation and vehicle stability limits. Another section of the courses was dedicated to off-road recovery training where students intentionally drove the right side of the vehicle off the roadway and then had to smoothly recover. Students performed the drills multiple times until the instructors were satisfied with their performance.

A typical day for the training:

- 7:30 am — Arrival of participants, coffee, registration.
- 8:00 — Classroom lecture
- 10:00 — On-road/skid pad/skills training
- 12:00 — Lunch
- 12:30 — On-road/skid pad/skills training
- 2:30 — On-road/skid pad/skills training
- 4:30 pm — Debrief and certificates presentation

Instructor Information

All of the instructors were either active police driving trainers or retired police trainers. Each was certified every 2 years by the Maryland MVA as an instructor of emergency vehicle operation for law enforcement. Each also attended a 2-week instructor training program at a nationally recognized advanced driver training facility. As part of the police certification process, background checks were completed on each instructor. Each instructor was capable of teaching all aspects of the course and was available to answer questions as needed. A Spanish translator was provided if needed.

Course Evaluation

No rigorous program evaluations had been conducted of the single-day training program or other programs offered by D2S. Students completed evaluation/feedback forms at the end of each session, and these were used by the program to assess the level of customer satisfaction.

United States: Fresh Green Light (Technology Program)

Fresh Green Light (FGL) was a for-profit driver training organization based in Rye, New York. The program was founded in November of 2009 to offer novice drivers a more comprehensive, multi-modal driver training experience. Their training incorporated classroom, driving simulator, online cognitive skills training, and behind-the-wheel exercises.

Project staff met with program directors at the FGL offices in Rye. The remainder of this case study will focus on observations and information obtained during the visit. The following summary describes the facilities, student population, and course activities in further detail.

Facilities

Although active expansion efforts were underway, at the time of the site visit, FGL only offered training in Westchester County, New York. The office in Rye was equipped with state-of-the-art classroom facilities, Virtual Driver Interactive (VDI) StreetReady driving simulators, and served as the home base for FGL's two hybrid on-road training vehicles (one vehicle is a Ford SUV, the other is a mid-sized Ford sedan).

The entire FGL office was designed to be welcoming and casual - similar to a modern coffee house. The design was very open and airy with a small kitchen area in the center of the office space. Classroom facilities and driving simulators flanked the kitchen area. Small offices and desks were present throughout the location.

The classroom facility was used to deliver the 5-hour DMV pre-licensing class required by New York. The classroom had several rows of long tables for students that face a large, interactive touch screen. No more than 12 students were typically taking the class at one time.

Student Information

A driver's permit was required to enroll in the teen programs. Approximately 50 teenagers were enrolled with FGL at the time of the project site visit.

Course Information and Content: Teen Beginner Program

Although labeled a "beginner" program, this course included numerous facets that took it above and beyond most basic driver education programs. The *Teen Beginner* program lasted approximately 4 to 5 months and incorporated online cognitive skills, driving simulator, behind-the-wheel and classroom exercises. In addition, students took a Point and Insurance Reduction Program (PIRP) approved by the New York Department of Motor Vehicles. Teen courses were individually paced.

Upon enrollment, students completed a battery of CogniFit cognitive skills tasks in the FGL office. All tasks were delivered via computer and Internet. Tasks were designed to profile the student's baseline cognitive skills in the following areas.

- Confidence
- Width of the field of vision
- Short-term memory
- Assessment (speed, distance)
- Divided attention
- Changing plans
- Visual scanning
- Eye-hand coordination
- Response time
- Focus

Once this initial assessment was made, a personalized version of the CogniFit New *Driver Online Training Program* was laid out for each student. The student completed their cognitive skills training over the course of the next several months at their own pace at home, or anywhere they had Internet access. The length of cognitive skills training varied widely from a few hours to almost 20 hours, depending on the student's baseline assessment.

FGL was considering adding StreetSmarts 101, another cognitive development tool, to their Teen Beginner program since they noticed that many teens were not completing the CogniFit training. Anecdotally, they feel parents of special needs children were requiring their kids to complete the CogniFit training, but many others were not. CogniFit training required completing tasks that may seem abstract and not related to driving - especially to teenagers. FGL hoped that introducing StreetSmarts 101 will offer teens a cognitive training tool that may be more engaging.

Students also began a specific curriculum on driving simulators. Students completed 4 simulator lessons. Each lesson took approximately 90 minutes to complete. A student was not allowed to progress to the next lesson until he/she passed the previous one in the series. The curriculum was based on VDI's StreetReady lesson plan. VDI and the American Driver and Traffic Safety Education Association (ADTSEA) developed StreetReady. StreetReady was designed to include the National Driver Education Curriculum (NDEC) recommended by NHTSA. The simulator training totaled 6 hours, assuming the student passed each lesson the first time. Students scheduled each lesson in FGL's online scheduling system.

Seven behind-the-wheel lessons were included in the Teen Beginner program. These lessons ranged from basic vehicle orientation to interstate driving. Each driver completed training in both the SUV and sedan. The vehicles were equipped with 360-degree video cameras that recorded each 90-minute driving session. Recordings are used to educate students as well as instructors. Students schedule each lesson in FGL's online scheduling system, and may be picked up and dropped off within a 10-mile radius of the FGL facility. Students get 10.5 hours of behind-the-wheel instruction.

The Teen Beginner Program also gave students the 5-hour pre-licensing class required by New York. No more than 12 students took the class at one time. The pre-licensing class was always given at FGL in their classroom facility.

Towards the end of the training, FGL scheduled and drove the student to his/her DMV road test. Additionally, students took a Point and Insurance Reduction Program (PIRP) approved by the New York State DMV.

A typical curriculum for the Teen Beginner course included the steps shown in 0 Table A-1 (adapted from FGL's *Curriculum - Teen Beginner*).

Table A-1. Teen Beginner Course

Lessons	Format	Description
CogniFit baseline assessment and training.	*Online*	*CogniFit training will continue at the student's pace, on his/her own time.*
1. Getting comfortable	Driving simulator	Get comfortable with the basic functions of a car.
2. The basics	Behind-the-wheel	First behind-the-wheel lesson with a coach, given in a controlled parking lot.
3. Vision, time and space	Behind-the-wheel	Create adequate space around your vehicle through proper zone control, learn how to judge safe gaps, and communicate with other drivers.
4. Speed and positioning	Driving simulator	Execute effective speed and position adjustments as you drive to minimize risk, manage intersections, and perform lane changes.
5. Driver responsibility	Classroom	In this 5-hour pre-licensing class, learn to handle emergencies, maintain your car, and make responsible driving decisions.
6. Mixing with traffic	Behind-the-wheel	Drive in moderate traffic, develop search skills, interpret signs, signals and markings and negotiate intersections.
7. Small spaces	Behind-the-wheel	U-turns, 2-point turns, 3-point turns, parking lot practice, parallel parking.
8. Car control	Driving simulator	Explore the effects of gravity and motion and how to maintain balance and traction control.
9. Hills and curves	Driving simulator	Adjust speed and lane position to maintain vehicle balance when driving through curves. Approach and adjust speed on hills.
10. Highway driving	Driving simulator	Enter, change lanes, manage space between vehicles, and properly communicate with other drivers.

11. Interstate driving	Behind-the-wheel	Enter, change lanes, manage space between vehicles, properly communicate with other drivers, and safely exit limited-access highways.
12. Getting confident	Behind-the-wheel	Work on skills and driving environments that need additional practice. Take a mock road test.
13. The road test	DMV	Final review lesson before we take you to the DMV.
14. Online insurance reduction course	Online	DMV-approved self-paced online program for a 10% insurance reduction.

Course Information and Content: Teen Advanced Program

The Teen Advanced program was also individually paced, and typically took much less time to complete. This program was designed for teens that already had driver education training, but wanted more practice and training. The Teen Advanced program incorporated driving simulator and behind-the-wheel exercises. Students enrolled in this program also took the online insurance reduction course.

As in the Teen Beginner program, students completed 4 simulator lessons. The lessons for the Advanced Teen program were different from those in the Teen Beginner program. These lessons followed VDI's Virtual Defensive Driving Curriculum. Each lesson took approximately 90 minutes to complete. A student was not allowed to progress to the next lesson until he/she passed the current one. The simulator training totaled 6 hours, assuming the student passed each lesson the first time. Students scheduled each lesson through FGL's online scheduling system.

Three behind-the-wheel lessons were included in the Teen Advanced program. There was some overlap with the Teen Beginner lessons, but Teen Advanced driving lessons were geared towards a slightly more experienced teen driver. Each driver received experience in both the SUV and sedan. The vehicles were equipped with 360-degree video cameras that record each 90-minute driving session. Recordings were used to educate students as well as instructors. Students scheduled each lesson in FGL's online scheduling system, and may be picked up and dropped off within a 10-mile radius of the FGL facility. Students were given 4.5 hours of behind-the-wheel instruction.

A typical curriculum for the Teen Advanced course included the steps shown in Table A-2 (adapted from FGL's *Curriculum - Teen Advanced*):

Table A-2. Teen Advanced Course

Lessons	Format	Description
1. Defensive driving - pt 1	Driving simulator	Scan the environment for hazards and apply the DDC Collision Prevention Formula.
2. Mixing with traffic	Behind-the-wheel	Drive in moderate traffic, develop search skills, interpret signs, signals and markings and negotiate intersections.
3. Defensive driving - pt 2	Driving simulator	Defensive driving techniques to handle the top 6 conditions that result in violations or collisions: driver, vehicle, light, weather, road and traffic conditions.
4. City driving and small spaces	Behind-the-wheel	Focus on the ins and outs of city driving plus U-turns, 2-point turns, 3-point turns, and parking lot practice.
5. Defensive driving - pt 3	Driving simulator	Follow and pass other vehicles and encounter potentially dangerous situations that require defensive driving maneuvers.
6. Highway driving	Behind-the-wheel	Enter, change lanes, manage space between vehicles, properly communicate with other drivers, and safely exit highways.
7. Defensive driving - pt 4	Driving simulator	Learning how to be a defensive driving expert and incorporating all the newly acquired skills into a final simulation drive.

Instructor Information

Instructors, or "driving coaches" as they prefer to be called, were very focused on teaching and coaching young people. Most instructors had prior teaching experience. All of the instructors were certified by New York, were exposed to ongoing retraining at FGL, and must pass background and driving history checks.

Course Evaluation

No rigorous program evaluation had been conducted of the training program. Exit interviews of students were conducted from time to time. Other anecdotal information was also collected via letters and comments from patrons. FGL was developing a system to track their students driving history, but this system was not yet implemented.

United States: Skip Barber's Racing School (Race Track Program)

The Skip Barber Racing School was a driver training organization based in Lakeville, CT. Formed in 1975, its original purpose was to train novice drivers to become licensed racecar drivers. As part of its mission, the organization offered specialized training for new drivers designed to improve driving habits and develop skills necessary to prevent common crashes. Specifically, this training fell within the Driving School programs. The Driving School programs applied professional understanding to everyday driving in order to increase a driver's margin of safety on the road.

Mazda, BFGoodrich and Hawk Performance sponsor the Driving School at Skip Barber. Several programs were available that range from a One Day New Driver School to a One Day Racing/Driving Combo. Given the scope of this study, project staff attended the One Day New Driver School program at Lime Rock Park in Lakeville, CT.

The remainder of this case study will focus on what was observed in Lakeville. The course included approximately 2 hours of classroom lecture interlaced among 5 hours of behind-the-wheel exercises on a skid pad, closed course slalom, braking and collision avoidance area. The following summary describes the facilities, student population, and course activities in further detail.

Facilities

Skip Barber Driving Schools were operated at 5 locations (Mazda Raceway Laguna Seca in California, Lime Rock Park in Connecticut, Sebring International Raceway in Florida, Road Atlanta in Georgia, and Road America in Wisconsin). The One Day New Driver Program was not taken on the racetrack. Each facility included a classroom for lectures, a skid pad, and closed staging areas for other drills.

On the day the project staff visited, the course began in a classroom at Lime Rock Park. The classroom was outfitted with a large whiteboard, several rows of seats for students, and several tables and chairs for lunch. The classroom also had partial views of the racetrack below. All classroom activities were in a lecture format. Students and parents were encouraged to ask questions and share experiences relevant to the topics being discussed.

The driving program included use of the skid pad (100' in diameter, 14' wide lane), closed course slalom, and the closed staging area used for braking and collision avoidance drills. The skid pad was a special asphalt paved surface. Water was added to the skid pad to increase the slipperiness of the surface. Two vehicles were operated at a time on the skid pad, one vehicle per turn on the slalom, and one vehicle per turn on braking and collision avoidance drills.

Student Information

No license or permit was required to attend the program. The only prerequisite was a strong suggestion that the student have at least 20 hours of behind-the-wheel driving. In fact, one of the students in attendance the day the project staff visited was 15 years old. There was also no age

limit. All students in attendance on the day the project staff visited were teenagers. Students typically traveled from numerous points across the country to attend the program.

Participants were split into two groups to maximize seat time in the exercises (e.g., one group was on the slalom while the other group was practicing collision avoidance). Both groups received classroom instruction at the same time before getting in the vehicles. Parents of students were encouraged to attend the course. They often sit-in on the classroom portions, and observe the driving portions from a safe distance.

Although an exact count was not available, it was estimated that "thousands" of students have completed the program to date.

Course Information and Content

The One Day New Driver School was offered one to two times each month. Students must register in advance and could do so online or by telephone. Payment of $999 must be made in advance (cost is often reduced if students register early). All Driving School programs take place rain or shine. Classes generally had 18 students.

On the day visited by the project staff, students arrived and were registered by 8:30 am. Immediately after registering, students were taken on the course and taught how to operate a vehicle equipped with a manual transmission. All students were able to operate the vehicle after brief instruction. Upon demonstration of this ability, students returned to the classroom for their initial classroom session.

The initial classroom session consisted of a welcome, brief introduction, and overview of the program's activities. The instructors began to frame driving as something that needs practice and instruction, not something that comes innately. Students were warned about the general public's unfortunate tendency to be overconfident in their abilities behind the wheel. The morning classroom session addressed the following topics:

- Your driving environment (interior of the vehicle)
- Seating position
- Hand placement
- Vision (including mirror adjustment)
- Vehicle weight
- Load transfer, pitch and roll
- Stored energy and spring rebound
- Tires (contact patches, friction, skid direction)
- Wheel spin
- Understeer and oversteer
- Skid recovery (correction, pause, recovery)
- Threshold and ABS braking
- Braking on a turn

Immediately following the first classroom session, students broke into two groups. One group proceeded onto the staging area for braking exercises. The other group proceeded onto the skid pad to practice skid recovery. After sufficient time had passed, the two groups switched locations and driving exercises. Instructors communicated with each other via two-way radios while on the course.

Behind the wheel portions of the program were conducted with one instructor and up to three students in the vehicle. Mazda 3s were used in slalom, braking and collision avoidance exercises. These vehicles had front wheel drive trains, ABS, and automatic transmissions. Mazda RX-8s were used on the skid pad. These vehicles had rear wheel drive trains, ABS, and both automatic and manual transmissions.

Braking exercises began with straight line ABS braking at 35 and then at 40 mph. Several vehicles were on the staging area at once, but only one vehicle was engaged in the drill at a time. Braking exercises concluded with braking on a turn at 35 mph.

Two vehicles were engaged in skid pad training at the same time. Most skids were induced by the student abruptly releasing the throttle. If necessary, instructors used the emergency brake to induce a skid. Students kept driving until they demonstrated they could recover from the skids.

The class broke for lunch in the classroom, followed by an afternoon classroom session that addressed the following topics:

- Constant, increasing, decreasing and compromise cornering;
- Passing on side roads;
- Vision (including mirror adjustment);
- Collision avoidance; and
- Load transfer, pitch and roll.

Afternoon on-course driving exercises included a champagne slalom, emergency lane change/collision avoidance, and champagne slalom competition. Students proceeded in the same manner as in the morning: one group proceeded to the slalom while the other group proceeded to the collision avoidance area. Mazda 3s were used for both collision avoidance and slalom exercises. Only one vehicle was engaged in either exercise at a time.

The “champagne” slalom was designed to include several corners and irregularly spaced gates. To emphasize the importance of soft inputs to throttle and brake, the slalom vehicle was equipped with a bowl that was in a fixed, elevated position on the hood. Instructors placed a tennis ball in the bowl. The primary objective of the exercise was to get through the slalom course without the tennis ball falling out of the bowl. If the ball fell out of the bowl, the student was instructed to stop the vehicle on the course, get out, and replace the ball. The secondary objective was a quick lap time. Time was added to the lap time for missing gates and knocking over cones.

The collision avoidance exercise involved approaching a simulated obstacle (cones) at a speed of 35 mph before being told to swerve to the right or left a distance of one traffic lane and then

brake. Students did not know which direction they would be swerving until the last second before hitting the simulated obstacle. After practicing this drill several times, students were then told to swerve up to a distance of two traffic lanes.

As a surprise to the students, the last behind-the-wheel exercise was a team competition for fastest time through the champagne slalom. Each group of drivers made up one team (two groups total). The instructors shared some strategies for the competition with the drivers, and then observed the teams throughout the exercise. This competition served as a fun conclusion to the day, but also introduced a small amount of social pressure into a driving exercise. Instructors were able to point out mistakes made and risks taken by each driver as a result of this pressure. Students were reminded the importance of not succumbing to social pressure while driving.

The program ended with a certificate presentation in the classroom that includes a gift bag of small souvenirs for each student. A typical day for the training follows the pattern shown in Table A-3.

Table A-3. Schedule of Training Activities

Start Time	End Time	Activity	On-Course Activity
8:00	8:30	Students arrive and register	Students taught to drive a manual transmission
8:30	9:30	First classroom session	
9:45	12:00		Skid pad, straight and turn braking
12:00	1:00	Lunch	
1:15	2:15	Second classroom session	
2:30	4:30		Champagne slalom, collision avoidance, champagne slalom competition
5:00	5:20	Wrap-up and certificate presentation	

Instructor Information

All of the instructors were experienced racecar drivers and employees of the Skip Barber Racing School. In addition to their racing experience, all instructors were trained in-house for each course they teach. There was always a chief instructor involved in the course, and he/she constantly evaluates the other instructors. Every 2 years, all instructors were required to undergo a two to 3 day retraining. Instructors were ranked internally according to their experience and ability to teach different courses offered by the driving school (new instructor, junior instructor, senior instructor).

Course Evaluation

No rigorous program evaluations have been conducted of the training program. Debriefing exit interviews were conducted from time to time. Anecdotal evidence is also collected via letters and comments from patrons.

United States: Tire Rack Street Survival (Traveling Program)

Tire Rack Street Survival (TRSS) was a driver training program run by the Tire Rack Street Survival Foundation, a 501(C)(3) nonprofit organization based in Greenville, South Carolina. The program was formed in April 2002 by the BMW Car Club of America Foundation (BMW CCA) and several other corporate sponsors: BMW of North America, ZF Corporation of North America, The Tire Rack, and Liberty Mutual Insurance.

TRSS was managed nationally by Bill Wade and facilitated by several partners: The Tire Rack, the Sports Car Club of America Foundation (SCCA), BMW, and the BMW CCA.

TRSS offered a single-day program aimed at novice drivers, 16 to 21 years old. TRSS driving exercises were partly based on the BMW CCA's Car Control Clinic. The focus was on educating teens in car control techniques that go beyond today's driver's education, and giving them the hands-on experience to help them become safer and smarter drivers. Project staff observed the program sponsored by the New Jersey Chapter of the BMW CCA at the Raritan Expo Center in Edison, New Jersey. The remainder of this case study will focus on what was observed in Edison. The course included approximately two and one half hours of classroom lecture interlaced among 4 and one half hours of behind the wheel exercises on a skid pad, closed course, and skills training area. The following summary describes the facilities, student population, and course activities in further detail.

Facilities

TRSS programs were hosted by third party groups and/or organizations. It was most common that a car enthusiast organization, such as the BMW CCA or equivalent, sponsored the program. Locations were chosen that could accommodate the program with classroom facilities and a large enough closed-off parking lot for the driving exercises. Each TRSS event used a standard slalom, alternate slalom, straight line braking exercise, braking and turning exercise, constant radius skid pad, figure 8 skid pad, single lane change collision avoidance, double lane change collision avoidance, and combined (autocross) exercise. The way the exercises were set up depended both on the size of the location and judgment of the chief instructor running the program.

On the day project staff visited, the behind-the-wheel portion of the training was set up in a large parking lot closed off from public access. The parking lot was divided into three stations: one for braking exercises, one for slalom exercises, and one for skid pad exercises. The classroom part of the training was delivered in a large conference room with the help of a projector and a projection screen. The classroom was arranged with the projection screen and computer at the front of the room, and several rows of chairs for students and parents. All classroom activities were in a lecture format. Students and parents were encouraged to ask questions and share experiences relevant to the topics being discussed.

Student Information

Licensed or permitted drivers d 16 to 21 could attend the program. If the student was a permitted driver, all conditions of the permit must have been met in a safe manner. As described on the TRSS Web site (http://www.streetsurvival.org/):

> Permitted drivers will be allowed in the Tire Rack Street Survival program IF:
>
> All conditions of the permit can be met in a safe manner, i.e. if the permit requires a licensed driver in the car at all times. If a parent is required to be in the car in addition to this, then this student will not be allowed as it would require a passenger in the back seat of the car and that is considered too hazardous for the exercises in the school, and some times it is physically impossible.
>
> The driver must be a minimum of 16 years old (regardless of the minimum age for the State issuing the permit) and have had a permit for a minimum of ½ the time required by the State holding jurisdiction over that permit, (not the State that the school is located in) i.e. if the permit must be held for 6 months before the driver can take their driving test, then the student must have had the permit a minimum of 3 months.

Students were split into two groups to maximize seat time in the exercises. One group received classroom instruction while the other was on the driving course. Parents of students were encouraged to attend the course. Parents often sit-in on the classroom portion, and observe the driving portions from a safe distance. Approximately 5,000 students had completed the program to date.

Course Information and Content

The TRSS program was scheduled according to demand. The schedule was posted on the TRSS Web site. Parents and students could request a TRSS program be delivered in their area. If TRSS receives enough requests, a program will be scheduled as nearby as possible. Students must register in advance, and can do so online. Payment of $75 must be made in advance. Classes generally have 25 students.

On the day visited by the project staff, the course instructors met approximately one half-hour before students began to show up for registration. They reviewed the vehicle inspection process, in-car coaching guidelines, the exercises to be performed, the course as it was being laid out, and the names of the students they had been assigned. All instructors then took a lap through the driving exercises to ensure their comfort and approval of the course as it was laid out.

Students arrived and were registered by 8:30 a.m. Immediately after registering, students met their assigned instructors and proceeded to their cars for safety reviews of their vehicles. Safety reviews included a visual inspection of the vehicle, confirmation of whether the vehicle had a functioning anti-lock braking system, a required check of tire pressure, and a demonstration of proper seating position. Instructors also stressed the importance of maintaining a clean vehicle

interior since objects left inside the vehicle cabin become projectiles in the case of emergency maneuvers or a crash, and may inhibit the use of the vehicles controls.

After the safety reviews of their vehicles, students all attended a brief welcome session in the classroom. General goals for the day were discussed before all students were taken onto the course for a "wake-up" threshold braking drill. Completing this drill before any real classroom or on-course instruction began was done purposely to get the attention of the students and embed in them the importance of focus while driving. The class then broke into two groups that alternated between classroom and driving activities for the rest of the program. Classroom topics included:

- The driver's environment (seating, seat belt, steering);
- The driver's vision (3 and 10 rule, target fixation);
- Tires (demands on tires, tire pressure, tire treads);
- Vehicle dynamics (contact patches, tire grip and weight, weight transfer);
- Obstacles and changing road conditions;
- Handling up to and beyond the limits of traction (braking, cornering, front and rear wheel skids); and
- Judgment (visual awareness and obstructions, hazard awareness, knowing your limits, distracted driving).

Instructors communicated with each other via two-way radios and conspicuous visual indicators (bright colored flags) while on the course. Behind the wheel portions of the program were always conducted with one student and one instructor in the vehicle. Students provided their own vehicles. Because of their increased size and weight, no SUVs were allowed on the course. Vehicles ranged in size from a Mini Cooper to a Subaru Outback. Vehicles on the course had front wheel, rear wheel, and all wheel drive trains. Most of the vehicles on the course were equipped with automatic transmissions.

Morning on-course driving exercises included skid pad, slalom, straight and turn braking. ABS braking was the focus of the braking exercises, although threshold-braking technique was discussed. Instructors led students through circuit training that included slalom and braking exercises. Students were led in a serial pattern, and were assigned to the skid pad portion of the course one at a time. Each student was given several minutes on the skid pad while their instructor led them through understeer- and oversteer-induced skid recovery.

The class broke for lunch in the classroom, followed by an airbag deployment demonstration on the driving course. The instructors kept stressing that the airbags in the vehicles were explosive devices. Witnessing an electronic detonation of an airbag on the course was designed to reinforce this idea, and to further curb improper seating position for both the driver and passengers in the vehicle.

Afternoon on-course driving exercises included a figure-8 skid pad, emergency lane change/collision avoidance, and irregular slalom. Students proceeded in the same manner as in the morning with a serial circuit including the slalom and collision avoidance exercises. One student at a time was selected for several minutes of training on the figure 8 skid pad.

The program ended with a certificate presentation in the classroom, followed by a combined autocross style exercise on the driving course. A typical day for the training followed the pattern shown in Table A-4.

Table A-4. Tire Rack Schedule of Training Activities

Start Time	End Time	Activity	On-Course Activity
7:45	8:00	Instructors arrive	
8:00	8:20	Instructor meeting	
8:00	8:30	Students arrive	
8:30	9:00	Instructors review car with students	Tire pressure and empty car
9:00	9:15	Welcome classroom session	
9:25	9:45	Warm up exercise for all students	Threshold braking
9:45	9:55	Split group and move to next activity	
9:55	10:55	Group A on course, group B in class	Skid pad, slalom, straight and turn braking
10:55	11:05	Switch	
11:05	12:05	Group B on course, group A in class	Skid pad, slalom, straight and turn braking
12:05	1:00	Lunch	Airbag deployment
1:00	2:00	Group A on course, group B in class	Figure 8, lane change, irregular slalom
2:00	2:10	Switch	
2:10	3:10	Group B on course, group A in class	Figure 8, lane change, irregular slalom
3:10	3:15	Assemble in classroom	
3:15	3:30	Wrap-up and certificate presentation	
3:30	4:00	Combined exercise - all students	Combined exercise

Instructor Information

All of the instructors were volunteers and were typically members of the Car Club that hosted the training program. Some instructors had teaching experience, and others had police experience. Many instructors were also novice racecar drivers, although most of their driver training was usually in conjunction with their Car Club's driving activities. The lead instructor for the Car Club hand picked each instructor. No background or driving history checks were typically run.

On the day the project staff visited, instructors were all members of the New Jersey Chapter of the BMW CCA. All instructors had taught the TRSS course before. As is typical, one instructor was designated for classroom instruction and all others were assigned to students and to help on the driving course.

Course Evaluation

No rigorous program evaluation had been conducted of the training program. Students filled out evaluation/feedback forms at the end of each session, and these were used by the program to assess the level of customer satisfaction.

APPENDIX B: CASE STUDIES OF PROGRAMS IN CANADA AND AROUND THE WORLD

International: Fleet Safety International (Fleet Oriented)

Over the past 30 years Fleet Safety International (FSI) has trained over 50,000 students from all over Alberta, Canada. They trained both corporate and private clients in cars and trucks, and on motorcycles, though their predominant client market is corporate fleet driver drivers. The primary curriculum they use was designed with the oil and agribusiness employee in mind. FSI provided a broad range of supplemental training programs, both custom and pre-packaged. In addition, FSI's "A" Driving School, which operated the New Driver Programs (beginner driver education), received the distinction of top driving school in Calgary for 6 years running.

Dr. Randy Flemmer founded FSI in 1978, at which point he was a certified driving instructor, although he had significant misgivings about the way that drivers were being educated. Over the years, the FSI curriculum and infrastructure has evolved significantly to reflect Dr. Flemmer's research and experience with alternative methods, both in terms of adult education in general (in which he has a doctorate) and specifically in driver training.

The researcher's site visit included attendance in the classroom and in-car components of the beginner driver education supplemental training program.

Facilities

Fleet Safety International had a corporate headquarters in the Foothills Industrial Park in southeast Calgary, Alberta, Canada. They also had a mobile location in Strathmore, Alberta. FSI ran two tracks in Calgary: a paved course and a larger gravel/dirt course. FSI had several different multimedia-equipped classroom formats located at the Calgary headquarters. These were tailored to both small groups of corporate or supplemental trainees, as well as larger groups of new drivers. FSI generally did not provide vehicles for training, aside from their skid truck. However, new drivers (beginner driver education students) were trained in FSI vehicles. FSI also provided a relatively unique "blowout truck," which simulated single or double blowouts in the front tires.

Student Information

Young drivers of various levels of experience took the FSI "Mentally Active" Program to improve safe driving skills, to save on insurance premiums or because parents made them take the course. Students have held an unrestricted license to take the program. Parents were allowed to attend, if they wish to.

FSI's "A" Driving School provided comprehensive new driver training, with different tiers, depending on the level of training desired by the student. This included both their SAFER classroom course, and an in-vehicle course, designed for beginner drivers, and also closed-course skid control and collision avoidance. In Alberta, beginner drivers received their restricted learners' permit at age 14.

Course Information and Content

The FSI training was based on an explicit conceptual framework, with three key elements: Traffic Law, Defensive Behaviour, and Situation Skills. These concepts were considered equally relevant no matter what driving culture and level of experience a student comes from, so the program was quite flexible and customizable.

The core of the FSI curriculum was the SAFER system of defensive driving, SAFER being an acronym for Space, Attitude, Foresight, Eyesight, Responsibly. This was an attitude-focused approach derived from a philosophy that the human (or human-environment) element can, at any time, introduce factors that were outside of traditional defensive driving theory and practice. The goal of the FSI program was to build habitual responses so that situational driving skills become automatic.

Both the classroom and in-car components of FSI's supplemental training regimen focused heavily on the tenets of their proprietary SAFER system of defensive driving. As mentioned earlier, these were space, attitude, foresight, eyesight, and responsibly. The in-class curriculum introduced and was organized around these core concepts, as follows.

Space: A key component of any defensive driving theory, this was addressed specifically as a matter of following distances, clearing blind spots, basic speed law (i.e., driving to your ability in the conditions you are presented with), and generally always having safe space and escape routes if vehicles in front or behind act erratically.

Attitude: This component was significantly more central to FSI's programs than was generally the case in defensive driving courses. This may be the most important component of the course, as the other components all depend on the driver's state of mind. A driver's proactive driving attitude means that he/she will be defensive by default, will know the laws of the road, and will cultivate situation skills to protect his- or herself when basic defense was not enough.

Foresight: Situational awareness was taught as an active routine of monitoring the driving environment, and being aware of what in that environment was not being monitored.

Eyesight: FSI teaches students to focus their vision out the top two-thirds of the windshield, in order to look out to a 15-to-18-second visual lead time, while being able still to see objects closer up in their periphery. This section also dealt with "inattention blindness," which uses a "triple look" intersection check, and other visual scanning techniques.

Responsibly: Related to the Attitude component, Responsibly dealt with reasoned, moral decision making that will "allow you to drive for life."

The maximum number of students per class was 12, but often classes were run with 3 or 4 participants. Classroom evaluation was primarily based on attitude and active participation.

The order of classroom and in-car instruction varied, depending on the number of participants attending each course. One session of each component was run in the morning and the afternoon.

In-car instruction was conducted one on one – one instructor and one student. The training began with a pre-trip check of the vehicle, which included a visual inspection of the car (lights, plates, mirrors, etc.) as well as engine room inspection and confirmation of insurance and registration. Once the external check was complete, the instructor asked the student to start the vehicle and test the headlights, 4 way flashers, brake lights and backing lights so that both could confirm that they were functional.

Once on the road, the instructor asked the student to drive naturally, so that his/her driving habits could be observed; the caveat, of course, being that students do not perform any illegal or reckless driving actions. The instructor provided instructions on how to proceed to whichever facility they intend to have the student drive on, be it the loose dirt and gravel track or the smaller concrete track. These were both a reasonable distance from the training office, so the instructor had ample opportunity to observe the student and begin to get a feel for both obvious task weaknesses and also potential issues related to the more intensive track training.

This first half hour was important to the instructor, for it not only allowed for assessment of the student's current ability and attitude, but also allowed a rapport to be developed with the student. FSI felt that this made students more receptive to the overall safety message that the instructor will later introduce. It was also probable that this approach meant that some students were more comfortable with the demands made of them on the track.

Upon arrival at the track, the instructor had the student do backing exercises first, so that he/she was more at ease in the vehicle when moving on to the more intense, high speed drills. The backing exercise was conducted in a short double-pylon slalom set, in which the student had to complete several consecutive backing pivots without hitting any pylons. Initially the instructor simply asked that the student use only the mirrors to complete the exercise; they do not want students swiveling around to look out the rear windshield, especially since many commercial vehicles have obstructed rear views. The instructor let the student try once outright in order to observe his/her technique, before resetting the exercise and coaching the student through the course. For a student without significant backing experience, the exercise provided a challenge on that first run through, but the coaching quickly made it possible to successfully complete.

This coaching resulted in the student steering until both pylons were visible in the side view mirrors, and then backing slowly – there was great emphasis on conservative speeds at this point – with the inside pylon in focus while regularly checking the outside pylon. The student was then asked to continue backwards to the appropriate pivot point, and then steer fully around the pivot until the next inside pylon was in view in the opposite mirror, at which point he/she straightened up and repeated the procedure for the following pair of pylons, and so on. This exercise was repeated a number of times according to the student's ability.

The next exercise was straight line emergency breaking. This involved being taught full lock ABS breaking as well as threshold breaking, or "progressive squeeze braking" as FSI had termed

it. Completed at a flat 60km/h, both techniques were employed at the cue of the instructor, on a long lane marked with cones, so that efficacy of the technique and the student's skill can be assessed. Between attempts, each technique was discussed by the instructor in terms of weight transfer, vehicle balance and stance, traction, and overall surface conditions.

The follow-up to straight line braking was collision avoidance. This was completed in a cone course designed to simulate a situation in which the car enters a confined space with just enough room on either side of a simulated vehicular obstacle to avoid collision if the maneuver was performed correctly. This set up allowed the instructor to provide more insight into vehicle dynamics, further explaining kinetic energy, the relationship between pitch, roll and yaw in different situations, and how to use these factors to best maneuver in the crash avoidance procedure.

The actual process of avoidance was first performed with no braking, and the student was allowed to try his/her natural response to the situation. If the student let off the gas during the avoidance, he/she was instructed to keep moderate acceleration on during the swerve and to not let off or break until counter-steering was complete after the obstacle was passed. This was intended to keep the stand of the vehicle neutral and balanced, meaning that all four tires will have more comparable footprints on the roadway. This same procedure was repeated later on with Progressive Squeeze Braking (both before and after steering), in order to teach the student how to decelerate the car in an avoidance situation while maintaining traction at all contact points.

Slalom driving was introduced as a supplement to the non-braking collision avoidance, and further hones the skill of steering around an object while maintaining light acceleration, in order to keep the vehicle balanced and tracking normally. Along with the collision avoidance, slalom driving was used to emphasize the importance of keeping one's eyes up, and viewing the driving environment through the top half of the windshield. Failure in this exercise was often the result of improper vision, which exacerbates problems with pedal control and steering.

The final exercise was rear crash avoidance. This was meant to simulate a stoplight situation where the student had pulled up behind another vehicle. The instructor let the student pick the distance initially, gauging the choice against the decisions made on the road on the way to the track. The instructor asked the student to monitor the rearview mirror, and made a hand signal in the mirror to indicate a theoretical vehicle approaching from behind. The student then had to act on the situation and exit on the escape route. This was another situation, in which the correct action was sometimes counterintuitive, and the instructor instructed the student to isolate the acceleration task and the steering task in order to keep the vehicle balanced and in control until such time as counter steer was complete.

After these exercises were completed satisfactorily, the student and instructor moved to FSI's skid truck. This was a large pickup truck with a 30km/h governor and rear wheels that could be steered 30 degrees to either side, simulating an instantaneous skid. FSI claimed that this setup far better simulates actual skid situations than most other skid simulation products. It seemed to provide a realistic and unpredictable skid initiation for the student to react to, and allowed the instructor to time skid initiation.

The instructor began by having the student react to skids while driving a straight line at the 30km/h speed ceiling, and then after he/she became proficient at that, the student drove over to the slalom course and was asked to complete the slalom course with random skid events. This forced students to really keep their eyes up and focus on the driving objective instead of merely reacting to the slalom course. For instance, having the truck go through a set of pylons, one might instantaneously be given a skid and have to correct for that, and then steer out of the next set of pylons all while maintaining speed. On the loose surface of FSI's gravel course, this required a high level of attention and vision.

When closed course driving was complete, there was a second segment of city driving on the way back to FSI headquarters at which time the instructor evaluated the student on city driving techniques and asked for a segment of the drive to be done with commentary. This was done in order to evaluate the student's perception of the "big picture" and also to use the student's narrative to evaluate attention factors, such as foresight and eyesight. FSI's "Mentally Active" driving program proprietary in-car evaluation criteria were detailed and comprehensive in assessing driving competency.

Instructor Information

The hiring process at FSI was primarily about fitting into the corporate and safety culture upon which the company and the courses were based. The process for hiring in-car instructors was protracted and in-depth. It involved a probationary period that was followed by a progressive co-instruction period, where each new instructor could be observed, evaluated and further trained by a senior instructor.

Over the years FSI had noted that larger driver training organizations sometimes have difficulty maintaining a consistent standard of quality of instruction. It can be assumed that having to hire 100 driving instructors means having to hire at least a few instructors that do not necessarily meet a high standard. Because of this, FSI tends to try to match smaller numbers of instructors to their particular culture and training scheme, and to manage them on a personal level. Teaching experience and excellent "people skills" were required. Initial training was a lengthy process and included instructor certification. Retraining was ongoing, taking place every 6 months.

Course Evaluation

No course evaluation information was available.

International: Mecaglisse (Motorsports Oriented)

Mecaglisse was a large driver training facility in Quebec, Canada, that had several race and other driving tracks. A wide range of courses were offered all year around to all levels of drivers. While many of the courses were racing or performance oriented, at least one was targeted at teaching novice drivers safety-related driving skills that go above and beyond those covered in basic driver education courses.

The company was founded in 2002 by a family that emigrated from France to Quebec, a mostly French-speaking province of Canada. Led by Vincent Kirchhoff, the owners were passionate about a variety of motorsports, including rally, supermoto, road racing, enduro, off road, and sport bike racing. The driver training complex was built in the countryside less than one hour from the Mount Tremblant ski resort, and about 90 minutes from the city of Montreal. The facility was spread across 700 acres of forested land, and had heavy snowfalls in winter that was important to the many winter driving courses provided.

Facilities

The facility itself had more than 9 miles of varied tracks that were used at various times of the year depending on the weather conditions. The tracks were used as follows.

SUMMER
1. Asphalt track 1.4 miles: Car, motorcycle
2. Gravel and dirt track 1.5 miles: Rally cars
3. Sand track 1.2 miles: Off-road truck/SUV
4. All-road track 4.3 miles: Enduro motorcycle, ATV

WINTER
1. Ice track 1.5 miles: Car
2. Snow track 1.5 miles: Rally car
3. Ice track 0.25 miles: Car

Student Information

Mecaglisse served a wide variety of people, and markets to both individuals and corporate groups. Although most of the customers came from Quebec, some visited from other parts of Canada and the United States. Participants must have been 16 years old. Approximately 30 percent of participants were under 25.

All participants must have been fully licensed drivers. Many take the course to improve their winter driving skills, or, in the case of younger participants, because their parents want them to learn those skills. Parents often attended either as full participants, or as observers.

Course Information and Content

Numerous courses were offered in both summer and winter.

- Discovery Training (defensive driving)
- Reflex Training (rally)
- Adrenaline Training (lapping school)
- Performance Training (rally + lapping school)
- Contact Training (1/2 day - car - winter)
- Sensation Training (1/2 day - Glaxter prototype car - summer)
- Sport Motorcycle Riding
- Supermoto (motorcycle) Riding
- Tactical Training (military/law)

Only the Discovery Training course was particularly relevant to the scope of this study. The course was mostly offered to individuals in the winter and can be delivered in French or English. The course was developed in-house, by one of the Kirchhoff family members. The course was based on his experience as an instructor in various driving schools. It was a full-day course, with about 15-20 participants per session. The cost of this course for participants supplying their own car was $250 for 16-to-25-year-olds, and $350 for those over 25. There was a $200 surcharge if the student opted to use a vehicle provided by the school. Only drivers over 21 could use the school-provided vehicles.

The broad objective of the Discovery Training course was to train drivers to be safer when on the public roadway. To that aim, students were instructed in mirror adjustment, steering techniques, trajectories and cornering, emergency braking, hazard identification and avoidance, and controlling skids. The intricacies of driving on ice and snow were the main focus.

Each training group had two instructors for a pupil to instructor ratio of between 7:1 and 10:1. Short-range radios were given to each student to allow for feedback from instructors after each driving exercise. Instructors did not ride in the vehicles.

A typical day for the Discovery Training follows this pattern.

- 9:00 am — Arrival of participants, coffee.
- 9:30 — Classroom theory
- 10:30 — Practical training
- 12:30 — Lunch on the spot or in the club house
- 1:30 — Practical training
- 4:00 — End of training
- 4:30 pm — Debrief and certificates presentation

Instructor Information

The company had over a dozen instructors on staff, including both automobile and motorcycle enthusiasts. Most of the instructors had racing backgrounds. After passing a background check, new instructors were trained extensively by senior instructors before being allowed to teach students. Most of the instructors had been with the company for many years, and the owners believed they had a good awareness of the instructors' skill levels and experience.

Course Evaluation

No rigorous program evaluation had been conducted on the Discovery Training program or other programs at the facility. Students filled out evaluation/feedback forms at the end of each session, and these provided a picture of their satisfaction level.

International: Test and Training International (Motorsports Oriented)

Test & Training International (T&T) was a very large company based in Austria that provided a variety of supplemental driver training programs. The firm's system had been developed over more than 20 years in conjunction with the Austrian Automobile, Motorcycle and Touring Club (OAMTC).

Headed by a father and son team, T&T had its roots in 1984 when former European champion rally driver Franz Wurz became the OAMTC's head of training. In 1987, he led the effort to open what had been called the world's first professional road safety training center, in Teesdorf, near Vienna. Since that time, 8 more centers have opened in Austria, along with others in a dozen more countries.

Alex Wurz was a Formula 1 driver for 12 years, and together with his father, founded T&T International in 2006, while also acquiring the marketing rights for the road safety training centers (Test & Training GmbH) from the OAMTC.

T&T tried not to focus on just one or two categories of drivers, but wanted its training to reach a wider audience, with a broader treatment of road safety. As an example, over the past 20 years, over one million young Austrian children have completed "Hello Car" road safety training sessions.

Company members prided themselves on using evidence-based research to guide activities, and company managers and psychologists work with international researchers to not only disseminate research results, but also to conduct some of their own studies.

Facilities

One of the core elements of the company was its expertise in building large, complex training facilities, and it had now completed more than 20 of them throughout the world, including locations in Bulgaria, Croatia, Germany, Israel, Italy, Latvia, Lithuania, Luxembourg, Poland, Slovenia, Spain, and Switzerland. Nearly 3 million people had taken courses through this network. The facilities average 14 hectares (~ 35 acres) in size, with multiple paved tracks and other driving areas, as well as classrooms, offices, and dining rooms. The size of the facilities allowed for more than one event to occur simultaneously, and also allowed for a variety of driver training options, reducing the amount of time that the facilities sit idle.

Facilities included a wide range of technical equipment, such as:

- Skid plate (also called: hydraulic plate, kick plate);
- Water obstacles (hidden water jets that spray vertically on command);
- Mechanical obstacles (dry obstacles);
- Speed measurement systems;
- Slippery surfaces;

- Radio communication for participants;
- Video-based feedback equipment;
- Special roll-over simulators (trucks and cars);
- Roll-over tanker;
- Mobile training equipment for training for all kinds of vehicles;
- Anti roll-over equipment for motorcycle safety demonstrations; and
- Equipment for road safety training in schools (mobile electric car, inflatable cars, painting books, etc.).

Student Information

With over 2.8 million participants at its worldwide facilities, the company had served drivers of all backgrounds. In 2003, Austria introduced a mandatory second phase of driver education, which was developed by T&T in collaboration with the government, the Austrian Road Safety Board, the Association of Austrian Driving Schools, and the automobile clubs.

"Multi-phase" training had resulted in hundreds of thousands of newly licensed drivers being required by law to take courses at facilities such as those run by T&T. Students first take traditional driver education and training, resulting in being licensed and able to drive by themselves. A few months later, these new drivers take a 2-hour feedback drive. Sometime later, they spend a full day at a track facility, followed a couple of months later by a second feedback drive.

Thus T&T served students for the mandatory day-long track training course, as well as people who voluntarily enrolled in one of the company's other supplemental driving courses or coaching.

Course Information and Content

T&T offered a wide range of supplemental driving courses, including:

- Children and youth programs (from 6 to 18);
- Novice drivers;
- General road safety training programs;
- Economy driving;
- Winter driving;
- Loading safety;
- Programs for seniors and those with disabilities;
- Assessment programs for company fleets;
- Driver training for ambulance, police, and fire fighters;
- Special forces and military driver training;
- Off-road training;
- Drift training;
- Race car training; and
- High-speed training.

The facilities could accommodate most vehicle types, including:

- Passenger cars;
- Trucks and buses;
- SUVs and vans;
- Special vehicles (heavy haulage, wide load, fire truck, etc.);
- Armored vehicles;
- Rally and race cars;
- Sports cars;
- Mopeds;
- Motorcycles (motocross, supermotard, race bikes, etc.); and
- Quads/ATVs.

The most popular course, "multi-phase" training, had over 500,000 participants at the 9 T&T facilities in Austria. It was usually taken by 17- to-19-year-olds, in groups of 10 (with one instructor who uses short-range radios), and required about 8 1/2 hours.

- 1 x 50 minutes. Theory in classroom
- 6 x 50 minutes. Practical sessions on track
- 1 x 50 minutes. Lunch
- 2 x 50 minutes. Group discussion on road traffic psychology

The overall objective of the course was to reduce crashes by increasing awareness and improving attitudes. To that end, the course covered the following in the classroom:

- Basic laws of driving physics
- Brake technology
- How do vehicles respond when negotiating bends?
- Oversteer and understeer
- What passive and active safety devices are in vehicles?

The bulk of the course was spent on the track, observing and driving, including:

- Correct seating position; steering exercises
- Braking exercises (braking for hazards, emergency braking, braking distances)
- Braking avoidance exercise
- How to brake on slippery road surfaces
- How to negotiate bends correctly, how to brake in bends
- How to compensate for an oversteering or understeering vehicle

Psychologist-led group discussions were based on materials provided by outside companies, and cover several topics, including understanding novice drivers' risks, avoiding overconfidence, personal driving style and choices, and self-evaluation of driving skills – both strengths and weaknesses. Parents were not allowed to attend the course, partly because of the possibility that their presence might reduce the openness and effectiveness of the group discussion portion.

Most of the course content was developed by the government, and was mandatory, but T&T also supplements it with extra training or content when feasible. The course costs approximately $235 USD, and was offered 7 days per week. It was normally conducted in German, but can also be run in Turkish or Croatian.

Students normally drove their own cars during the training, but if needed, students could use a car for free if they were OAMTC auto club members. Some insurance companies offered a $150 USD rebate to course graduates who registered and drove for 3 years without any collisions.

Another noteworthy element was that T&T had developed its own video-based event data recording system that recorded driver and vehicle data during the course. Video and data could be burned onto a DVD allowing participants to review their driving.

Instructor Information

Approximately 600 instructors worldwide worked in accordance with the T&T system. New hires were mostly certified instructors with good teaching skills. They first underwent a background check and then entered extensive training conducted by senior instructors. Graduates of the course received a reference manual of everything covered in the train-the-trainer program. Annual retraining kept instructors up to date with new research and techniques. Instructors also occasionally observed each other teaching, to provide feedback and learn from each other.

Course Evaluation

T&T gathered evaluative data about its own program by having each student fill out a questionnaire about their attitudes toward driving. Although no formal program evaluation had been conducted on the course per se, T&T's Traffic Psychologist was part of a broader formal evaluation done on the "Multi-phase" program throughout Austria, on behalf of the Federal Ministry of Transport, Innovation, and Technology. The study was outlined in a report titled "Evaluation der zweiten Ausbildungsphase in Österreich." The evaluation design included four levels: statistical data from all novice drivers in Austria, a process evaluation for participants, a wide scale survey, and a before-and-after comparison.

Researchers found good overall acceptance of the program, as participants' feedback was positive. The process evaluation and the wide scale survey showed considerable changes in attitude on the track training day, and somewhat more agreement with safety-related statements afterwards. Accident analysis revealed a reduction of the overall number of crashes, as well as reductions in serious accidents, especially single vehicle accidents caused by male drivers. Specifically, the number of seriously injured novice drivers dropped by 28% between 2004 and 2008.

Researchers also examined broad economic cost savings, and calculated that the country saved many millions of dollars annually after implementing the new program.

International: DriveWise (Beginner Driver Education)

DriveWise was a large driver training provider that offered both beginner driver education and supplemental driver training. The company was a closely-held corporation that operates primarily in Canada. It was founded in 2006 by the current principals, who came from a background of simulation and training in the aviation industry.

The company offered training directly through company-owned facilities in Barrie, Ontario, and through other companies that used its simulator equipment and curriculum. There were 35 locations across Canada. The supplemental training was targeted at teaching experienced employee drivers and novice drivers safety-related driving skills that go above and beyond those covered in basic driver education courses. Courses could be custom tailored for the needs of all levels of drivers.

Facilities

The DriveWise fixed facilities consisted of classrooms and simulators. The classrooms were electronically enhanced (*E Instruction*), and included student polling equipment through hand-held remote transmitters. In-car training was conducted on public roads.

The simulator hardware consisted of large, three-screen fixed based units produced by MPRI. Scenarios for the simulators were developed by DriveWise. DriveWise also distributed the simulators to corporate customers who wish to have their own simulator-based training facilities.

Student Information

DriveWise marketed its supplemental programs to individuals and corporate groups, with most of the uptake being corporate groups, seniors, or immigrants. Approximately 10% of participants were novice drivers. All supplemental participants must be licensed drivers. Younger participants typically attended because their parents want them to learn better skills than they obtained in whatever beginner training they have had. Parents did not attend, although this would be permitted.

Course Information and Content

DriveWise offered the following range of courses.

- Supplemental Driver Education Program (ADEP) (5 hours in-class/simulator, 2 hours in-car)
- SafeStart (beginner driver education, 2 options)
- Road Ready (10 hours in-car training)
- Test Ready (4 lessons for test preparation)
- Safety Check Seminar (seniors, in-class and in-car)
- Defensive Driving DDC (6 hours classroom)

Only the ADEP course was relevant to the scope of this study. The course was developed in-house. It was a full-day course, with a varying number of participants per session, including one-on-one. The cost of this course was $300.

The broad objective of the ADEP course was to train drivers to be safer on the public roadway, primarily through improvement of perceptual and cognitive skills and decision making. To that end, students were instructed in basic vehicle control, hazard identification, physics of driving, supplemental braking, hazard avoidance, managing distractions, skid control, driving impairments, laws, night driving, and sharing-cooperation on the road. Course content was developed in house, with some materials, such as videos, obtained from outside sources.

The simulators were used to present controlled and challenging driving experiences, and scenarios could be selected from a proprietary library for addressing specific student needs. Scenarios were topical and typically brief, one minute to a few minutes. Students could recycle through a scenario until the key observations and decisions were made correctly. Students rotated through scenarios and observe each other, being given specific observation tasks by the simulator room instructor. Each training group had two instructors for a typical pupil to instructor ratio of about 5:1. For some portion of the sessions, the class was split, with half in the classroom and half in the simulator area. Instructors rode 1:1 with students in company-owned, dual-brake cars for the on-road portion of the course.

Instructor Information

The company and its licensees had mostly full-time training staff, and all were provincially licensed driving instructors. New instructors were subject to a background check. Ongoing training was primarily by Webinar.

Course Evaluation

No formal program evaluation had been conducted on the DriveWise programs.

International: Young Drivers of Canada (Beginner Driver Education)

Young Drivers of Canada was the largest driving school in North America, providing both beginner driver education and supplemental training through 151 franchised and company-owned locations. Having lost his father to a car accident at a young age, Peter Christianson was personally motivated to develop strong driver education and training curricula for young people in Canada, and he had spent 43 years doing so. Young Drivers (YD) was headquartered in Hamilton, Ontario. Collision*free!* was the YD brand for their supplemental driver training program.

Facilities

YD used public driving facilities such as vacant parking lots to conduct Emergency Maneuvers training during the Collision*free!* program. YD had 151 classroom installations across the country in several formats to suit the needs of their different client groups. These classrooms serviced all provinces except Manitoba, Saskatchewan and Quebec. YD uses both owned and leased vehicles, generally small and midsize cars. YD also trained corporate drivers on their own light trucks and vans.

YD markets and makes use of a proprietary online training resource called CogniFit. This program provides assessment and training of fundamental cognitive capabilities that underlie driver performance using visual perception tasks.

Student Information

New drivers were the biggest market for YD and provided a constant source of young clients who required training for licensing, but YD also offers a range of other courses for experienced drivers as well. The Collision*free!* program was used by corporate clients to certify and recertify employee drivers. The program was available to and attended by non-employee drivers, including young people and seniors.

Course Information and Content

The in-class component of the 4.5-hour Advanced Collision Avoidance Program (Collision*free!*) contained countermeasures to prevent every type of collision:

- The Collision*free!* Approach To Driving video;
- Collision*free!* Approach to Driving test;
- Freeway driving video;
- ABS braking techniques lecture;
- Emergency maneuvers introduction video; and
- Collision analysis worksheet.

The YD Collision*free!* curriculum was built on 4 basic concepts, the "4 YD Habits":

- Effective seeing habits.
- Maintaining space.
- Allowing space for other road users. and
- Driving proactively.

"The 4 Habits and 20 Sub-Habits [that] make up the Collision*free!* Approach to Driving all worked together to advance the four concepts. Each student received a Collision*free!* workbook."

The YD Classroom component concluded its "4 Habits" section with the "Collision*free!* Approach to Driving test," a short multiple choice examination. This allowed the instructor to evaluate a student's level of understand once they have been presented with the material.

The in-car component of the Collision*free!* program consisted of 3 hours of observation, instruction and evaluation, and includes:

YD's Defensive Concepts and Habits (performed on public roads) included:

- Freeway/highway driving tactics (basic lawfulness and defensive approach);
- Gravel shoulder recovery (often absent in other programs, may be exclusive to YD in some markets);
- Head-on collision avoidance;
- "S" approach on left turns at large intersections; and
- Rear crash avoidance technique.

Emergency Maneuvers (performed in public parking lots, etc.) included:

- Rear crash avoidance simulation;
- Threshold braking;
- ABS braking; and
- Emergency braking and swerving.

YD's Collision*free!* driver competency evaluation consisted of a set of evaluation criteria, followed by general analysis, feedback, and an overall score denoting a pass or fail.

Instructor Information

Instructors must have been experienced, licensed drivers and were hired based on their previous work experience and personality through an OMS psychometric test. Candidates must have had at least 5 years of driving experience, a clean driving record, and be available to participate in a 4-week instructor training course to obtain an instructor's license. They must also pass a CogniFit – Fleet Driver assessment and an in-car driver competency evaluation.

There was an official statement on instructor culture for YD and a corporate culture dedicated to these values:

> "Driver training instructors must have a passion for excellence, a love of cars and driving, and, most importantly, a natural camaraderie with people. As a driver training instructor, you will receive both great personal satisfaction and career advancement opportunities (Many of our franchise partners and managers began their careers at Young Drivers as instructors)... Our instructors provide both one-on-one in-car training, and after gaining experience and with additional training, can teach classroom sessions."

Also, with such an extensive network of schools, an important factor in avoiding inconsistency in quality was YD's systematic quality control program. These included a comment sheet with each YD certificate, a Web site questionnaire and telephone calls to determine that all parts of the Collision*free!* program were received.

Course Evaluation

No course evaluation information was available.

APPENDIX C: CASE STUDIES OF ONLINE PROGRAMS IN THE UNITED STATES

U.S. Online: I Drive Safely (Average Engagement)

Provider Overview. I Drive Safely, Inc., is a California-based for-profit company founded in 1998. In addition to its teen driver education programs, it offers a variety of defensive driving courses, corporate and fleet driver training programs, a course especially for mature drivers, and other insurance discount courses. Its online program for beginning teen drivers, the I Drive Safely Teen Driver Education Course, was released in 2005. There were two versions of the course: the standard online course, which had been approved in-lieu of classroom driver education in California, Colorado, Georgia, Nevada, and Virginia (for home-schooled students only), and that was also offered in partnership with local driving schools in Pennsylvania and Indiana; and a parent-taught version of the course that had been approved in Texas and Oklahoma. The latter course included supplemental material to assist parents in teaching their teens behind-the-wheel driving skills.

Over 10,000 teens nationwide completed an I Drive Safely course in 2009. The course was marketed through its Web site and through a network of affiliates who refer to them for commission. The company also engaged in some limited direct marketing to schools, and had begun advertising via Facebook and Twitter. The cost of the course varied by State, and ranged from $69.95 to $99.95 for the standard online course, and $99 to $149.95 for the parent-taught course.

Curriculum. The I Drive Safely course was developed with input from an advisory board of driver education and traffic safety experts, including authors of current textbooks in the field. The first 4 units provide the basic information required to pass a DMV licensing test in preparation for behind-the-wheel training. Units 5 to 7 then deal with progressively demanding aspects of the driving environment and the skills and techniques required of drivers. A final unit addresses the strategic side of using a vehicle for travel, including preparing for a trip and driving unfamiliar vehicles. For the parent-taught version of the course, units 5 to 8 were optimally suited for concurrent behind-the-wheel training.

General Course Delivery. The course presents material on short pages that required minimal scrolling and took only a minute or two to read. The text was accompanied by photos, diagrams, some limited videos, and animations to illustrate particular points, such as proper foot placement for braking or correct yielding at an intersection. Students might be invited to click on a screen to initiate an animation, or to open up a new screen containing further information. An individual module typically consisted of 10 to 12 text screens, beginning with a short introduction and list of specific learning objectives and topics to be covered. Modules concluded with a brief review, followed by a 10-question multiple choice quiz. To aid students in preparing for the more comprehensive unit quizzes, more detailed review handouts, totaling some 120 pages, were available for download. The attractive presentation of the course material, along with the repetition and frequent testing, helped to maintain interest and encourage retention.

Student feedback was encouraged. At the bottom of each page, students were instructed to "click here" to send feedback about the page, and could identify their feedback as either a Web site problem or content related. The course developer commented that this "instant feedback" approach had proven especially helpful for fine tuning the course content.

Interaction With an Instructor. Customer support was available 24/7 via a toll-free phone number, e-mail, or live chat. For questions regarding subject matter, certified driver education instructors were always on call to respond if needed. The Web site noted that calls were answered within 45 seconds, on average, and e-mails within 24 hours. Other than responding to student questions, the course developer indicated that instructors do not initiate interactions with individual students taking the course, i.e., the course was intended to be one that students could complete entirely on their own.

Time Spent on Course. Individual course modules were timed, based on the amount of material presented, and students were not allowed to progress to the next module until the required amount of time had passed. The timers were always in place, even if not required by a particular State. Students were also encouraged to spend time studying the review guide for each unit, and to access and read relevant information in their State driver license handbook.

Concurrent Behind-the-Wheel Training. Although I Drive Safely was designed to be a stand-alone substitute for classroom driver education, it was ideally configured for concurrent behind-the-wheel instruction, and indeed, the parent-taught versions of the course available in Texas and Oklahoma included files for parents to download and use in guiding their teen's in-car instruction.

Parent Involvement. The standard I Drive Safely course had no requirements for parental involvement, although the program Web site linked to a "Parents' Help Page" with tips on teaching teens to drive, a parent-teen safe driving contract, and once a teen was signed up for the course, State-specific information on the licensing process and required forms. Parents were encouraged to contact customer support with any questions or concerns, and were even given their own contact e-mail address.

Identity Verification. I Drive Safely followed individual State requirements for student validation. At the time, these typically only involved asking the student to provide answers to a series of "security questions" at the outset of the program, and then randomly presenting the questions at various points during the course. No additional student verification requirements were in place for the final exam. However, students in Texas and Oklahoma taking the parent-taught course had to also have a form signed and notarized by a parent, per State requirements.

Testing and Test Security. At the completion of each module, students were required to pass a 10-question, multiple-choice quiz with a score of 80% or better (or as required by the State) before progressing to the next module. Any missed questions were identified as incorrect, and the student was given the relevant section of text immediately below the missed question for locating the correct response. Both the quiz and the 50-question final exam could be re-taken as many times as needed to pass. For the quizzes, the same questions were repeated; for the 50-question final exam, new questions were pulled from a larger pool each retake.

Why Illustrative. I Drive Safely represented a large online driver education program. It was especially noteworthy for the effort put into developing a quality curriculum, its high level of

customer support, and ongoing efforts to solicit student/parent feedback to improve future updates of the course.

Information Sources for This Case Study. Researchers spoke with CEO Rick Hernandez and managing partner Gari Garimella, took the course in its entirety, examined the course syllabus, visited the course Web site, and reviewed the student guide and other course-related material they provided.

U.S. Online: DriversEd.com (Average Engagement)

Provider Overview. DriversEd.com is a California-based for-profit company that began as a traditional brick-and-mortar driving school, founded by Isaak Tsifrin in 1982. With the addition of Gary Golduber and Gary Tsifrin in 1997, the business had grown into one of the largest, if not the largest, providers of online teen driver education. Under the Interactive Solutions, Inc. corporate umbrella, the business also offered an online traffic school, online courses for mature drivers and foreign visitors, and behind-the-wheel driving instruction in California and Georgia. The first teen course was launched in California in 2002. At the time of this report, some version of DriversEd.com was approved in 13 States: California, Colorado, Georgia, Indiana, and Nevada; in Nebraska, Pennsylvania, and Utah (in affiliation with local driving schools only); in Virginia and Minnesota (for home-schooled students only); in Texas and Oklahoma (parent-taught version); and in Florida (through Florida Virtual School). Some students enrolled directly with DriversEd.com, while others were enrolled through affiliated commercial driving schools, local public schools, or virtual high schools. Course prices varied by State, but the average cost was $79 to $99 for approved States, and $79 to $135 for the parent-taught versions for Texas and Oklahoma. In addition, a generic course was priced around $30 for teens in States that either did not require driver education or did not recognize online driver education as a substitute for traditional classroom training. Well over 10,000 teens completed versions of DriversEd.com courses in 2009.

Curriculum. Core material that was appropriate in all States makes up central content areas. State-specific material was added in consultation with reviewers from State regulatory agencies, based on the curriculum, laws, and driver handbooks of relevant States. DriversEd.com employed a staff of curriculum writers who received feedback from the certified driver educators who responded to students' questions.

General Course Delivery. The DriversEd.com course is visually appealing, favoring more screens and lower per-screen word counts. For example, the California course employed more than 800 screens, and text was usually accompanied by a photo, diagram, or other illustration. Voice-over narration was available in States that requested it. The course used interactive animations, asking teens to choose between two options, then illustrating the consequences of the correct choice, such as "These two cars reached the intersection at the same time. Which one must yield the right-of-way?" Videos were integral to the course in all States, and they were captioned for the hearing impaired in States that requested this. Overall delivery facilitated long-term retention, with repeated exposure via text, videos, quizzes, and a comprehensive final. A Spanish-language version was available in California, and a correspondence course version was available in Minnesota. The parent-taught version for Texas and Oklahoma included material to assist parents with behind-the-wheel training.

In most States, students clicked through screens of information, selected from multiple choice options with interactive animations, answered multiple choice quizzes, and completed some online crossword puzzles. The parent-taught courses in Texas and Oklahoma were more interactive, since online lessons were interspersed with behind-the-wheel training. In addition, the course material could be used for a more interactive instructor led course, as was the case at Florida Virtual School, a statewide public virtual high school. FLVS used DriversEd.com as its

platform, but added its own certified teachers who followed their students' progress, graded required journal entries and presentations, checked students' comprehension through telephone assessments, and led optional virtual conferences.

Interaction With an Instructor. In its most common form, the course was controlled by the computer server, but State certified driver educators were available 24/7 to respond to questions by live chat, e-mail, or telephone. The same support was available to students and parents for the parent-taught courses in Texas and Oklahoma. As noted above, Florida Virtual School added their own certified teachers who graded student assignments, tested students' comprehension by telephone, and led virtual conferences.

Time Spent on the Course. This course offered State regulatory agencies options for addressing the issue of time on task. Tsifrin's own recommendation was that the course should cover the relevant content and engage the student in learning, without metered delivery. For example, the California course was entirely self-paced, and while students had to proceed in order through more than 800 screens, answer frequent questions, watch videos, and pass quizzes, a fast reader could complete it in about 8 hours. The emphasis was on delivering the same content as a 30-hour traditional class, not on the time it took each individual to complete the course. The Indiana course was also self-paced, with similar general delivery; however due to State requirements, Indiana students could complete only one of 16 sections per day, and could spend no more than 2 hours taking the course per day. Texas similarly allowed only one module every 24 hours. On the other hand, DriversEd.com was also delivered with page, section, and overall timers in States that required this. Golduber noted that timers have the potential to become a distraction, and that some timer set-ups (such as a 90-minute section timer) may invite students to focus their efforts on thwarting the timer instead of learning the course content.

Concurrent Behind-the-Wheel Training. Most commonly, this course was a stand-alone classroom substitute. However, the Texas and Oklahoma parent-taught courses were built around 2-hour online classroom or theory sessions, followed by structured behind-the-wheel lessons.

Parent Involvement. Students were able to complete this course independently in 11 of 13 States where it was offered at the time of this report, the exceptions being the parent-taught courses in Texas and Oklahoma. DriversEd.com also allowed anyone to download a parent-teen driving contract from its Web site.

Identity Verification. DriversEd.com offered State regulatory agencies a variety of options. Less stringent options included student acceptance of "Terms and Conditions" prohibiting dishonesty, or identity verification questions based on student solicited information at enrollment. To comply with State requirements, the Utah course had a proctored final exam at the partnering commercial driving school. No identity verification was used in Texas and Oklahoma, since parental supervision was mandatory. As a traffic school operator, DriversEd.com's parent company also had experience with more stringent options including notarized affidavits, third-party verified identity questions, and proctored final exams at UPS Store locations; however these were not used for teen driver education in any States at the time of this report. A biometric voiceprint identification system was in development for future use in teen driver education.

Tests. Although there was some State-to-State variation, DriversEd.com courses were divided into about 12 lessons, each followed by a short quiz of 5 to 10 items. Students who missed a quiz question were shown the correct answer and given an explanation. Requirements for passing quizzes varied from State-to-State; many required a certain percentage correct but allowed repeated attempts. DriversEd.com used a quiz-generating program and a large question pool to supply a new quiz for each attempt. Questions that were not State-specific were drawn from a pool of 8,000 questions. A final exam of 30 to 50 questions was required in all States, with specific passing criteria determined by each State. The final exam could be taken repeatedly if necessary, but again, new versions were generated. The final exams and quizzes were drawn from the same question pools, presumably making it easy to pass if students paid attention to their quiz corrections. Students who took the final were able to view and potentially save a copy. While there was some risk to test security, the large test pool meant that other teens were unlikely to receive the same questions.

Why Illustrative. DriversEd.com was a large multi-State provider offering content and delivery options that had been able to satisfy diverse regulatory requirements in many States. Options were offered to regulators to address time-on-task, identity verification, and testing, and the general course delivery was engaging. Teens completed the course independently in most States. This delivery was modified in 2 States for parent-taught courses with concurrent behind-the-wheel instruction, and it was used as the foundation for a Virtual High School course, with both modifications requiring a high level of student engagement. At the same time, DriversEd.com was an innovative and highly effective marketer to the consumer, using social media, search engine optimization, contests, games, and referral incentives for teens, schools, teams, and commercial driving schools. Students could log into their courses via Facebook, and DriversEd.com offered a DMV practice test app for the iPhone/iPod touch.

Information Sources for This Case Study. Researchers spoke with COO Gary Tsifrin, took the California course in its entirety, took a portion of the Texas parent-taught course, examined the course syllabus, and visited the course Web site.

U.S. Online: Costech Technologies (Average Engagement)

Provider Overview. Costech Technologies is a Montreal, Canada-based for-profit provider of online education software and computer-based training, including teen driver education. Costech became interested in teen driver education in 1995 when it was asked to help develop a computer-assisted classroom course for a large public school system. In 2004, Costech offered its first stand-alone online course. At the time of this report, Costech was approved in Colorado (CoDriverEd.com) and Georgia (GeorgiaDriverEducation.com), where it could be purchased directly or through about 50 affiliated commercial driving schools, each with its own course name and Web site. In Pennsylvania it was approved in affiliation with four commercial driving schools, each with its own course name and Web site. Course prices ranged from $35 to $135. A generic online version priced at $25 was available as Learn2DriveUSA. About 6,000 to 7,000 teens completed Costech online driver education in 2009. In addition, Costech courses are still used as part of classroom driver education in 16 school districts in North and South Carolina, Georgia, Colorado, and Pennsylvania. In this application, the lessons and tests were completed on school computers and under the direction of a classroom teacher. Contract prices for school districts were $14 or less per student. The chief instructor was Karl Logan, an experienced driver educator who had been the Director of Driver Education for a large metropolitan NC school district.

Curriculum. Core material that was appropriate in all States made up central content areas, and Logan considered the core content to be among the nation's most comprehensive. For example, the breadth of topics ranged from car purchasing and maintenance to all types of driving situations. More in depth coverage was also emphasized, as for example, on several topics that dealt with emergency driving situations. In addition to the core curriculum, State-specific material was added in consultation with reviewers from State regulatory agencies.

General Course Delivery. The Costech course was relatively reliant on pages of text, with some accompanying photos and diagrams. Audio accompaniment to the text was optional at no extra cost, and animations were available for an additional fee. Online videos were expected to be added during 2010. A CD version had been previously used in some public schools and remained available.

This course included an optional online workbook to help students learn the material and meet their time requirements. Students who elected to use the workbook had a more active learning experience. The workbook included fill-in-the-blank and generate-a-list questions that demand greater recall than multiple choice quizzes alone. The workbook was scored by the computer server, and missed questions could be re-attempted many times. Students were encouraged to use or further improve their workbooks if they needed to log additional hours. Students who omitted the workbook found it more difficult to log 30 hours and were less likely to pass the quizzes on the first attempt. Other aspects of course delivery also facilitated long-term retention. There was repeated exposure to the material through reading and/or listening, short quizzes, workbook pages, end-of-module tests, and a comprehensive final exam.

Interaction With an Instructor. The course was controlled by the computer server, but an experienced driver educator was available to respond to questions by live chat, e-mail, or telephone during normal business hours.

Time Spent on the Course. This course was noteworthy in having a strict requirement that students spend at least 30 hours taking it. Page, section, and total course timers were all used. Activity was monitored, and students who stopped scrolling through the pages were "timed out." The final exam could not be taken until the student had logged at least 30 hours, and in addition, students who tried to complete the course in less than 4 days did not receive credit.

Concurrent Behind-the-Wheel Training. This course was not generally built around concurrent behind-the-wheel training.

Parent Involvement. In its most frequently delivered form, students completed this course independently. However Costech offered a behind-the-wheel teaching guide to assist parents during the permit phase of training.

Identity Verification. In States that required identity verification, Costech used identity verification questions based on student-solicited information at enrollment. The questions were then asked again throughout the course.

Tests. Short quizzes were scattered throughout each module, and students who missed questions were directed to the pertinent text but not given the answers. These same questions reappeared on the end-of-module tests, presumably making them easy to pass. A score of 80% was needed to pass each quiz and end-of-module test. While quizzes and tests could be taken repeatedly if needed, only two attempts per day were allowed on any quiz or test. The course had a comprehensive final exam of 100 questions that had to be passed with 80% correct. The final could be taken repeatedly if needed, but new questions were pulled from the test pool for each retest. The final exam test pool was also drawn from previous quizzes and end-of-module tests, presumably making it easy to pass if students looked up the answers to questions they missed, then learned the material. Students could view and potentially save their quizzes, but not their end-of-module tests nor their final exams.

Why illustrative. Costech's teen course was notable for its comprehensive curriculum, optional online workbook, strict 30 hour minimum requirement, and attention to testing procedures. The lead instructor was an experienced driver educator, and the course was delivered by an experienced online course development company. This course had its foundations in computer-assisted classroom courses, and was still used as part of classroom driver education in 16 school districts in 5 States.

Information Sources for This Case Study. Researchers spoke with Karl Logan (operations manager and chief instructor), Paul Skulmoski (president), and Michael LaPlume (marketing director); took a portion of the Georgia course; examined the course syllabus; and visited the course Web site.

U.S. Online: WelcomeDriver (Average Engagement)

Provider Overview. WelcomeDriver, Inc. is a California-based for-profit company owned by the Seidman family, who were involved in providing computer-based training for Fortune 500 companies in the early 1980s. At the time of this report, WelcomeDriver was approved in California, Colorado, and Indiana, and expected to add 3 or 4 more States in 2010. The company's business model was partnering with local commercial driving schools, on a State-by-State basis. WelcomeDriver was also developing USDriver, a generic course for teens in States that either did not require driver education or did not recognize online driver education as a substitute for traditional classes. A mature-driver course (Silver Driver California) was also offered. The teen courses were offered through WelcomeDriver.com, as well as through driving school and other partner sites. The cost for the teen courses ranged from $59 to $99. Just over 5,000 teens completed WelcomeDriver courses in 2009, and that number was expected to increase significantly in 2010.

Curriculum. WelcomeDriver worked with several experienced driving instructors to develop its curriculum, with a particular focus on original content created to illustrate driving scenarios. Core material appropriate in all States made up central content areas. State-specific material was added in consultation with advisors and reviewers from State driving schools and State regulatory agencies.

General Course Delivery. This course was noteworthy for its use of "controlled navigation," an innovative way to present the screens that was intended to mimic a teacher's delivery, with the added benefit that students could pause and review previous material at any time. In a lesson's simplest form, bullet points appeared on the screen one-by-one. More complex screens illustrated driving situations, asked rhetorical questions, and paused before answering. For example, a photo from the driver's seat of a parked car showed a passing car in the left side mirror as the car approached. The accompanying text said, "You want to pull away from the curb. You have signaled, and you are checking this outside mirror. After this car passes, what must you do?" After a pause, the screen would answer, "Left shoulder head check. Stop and think. Why should you do this?" After another pause, the screen would answer, "Develop this habit to cover the blind spot." This delivery made the course feel less passive and more interactive than many teen courses.

In addition to its use of controlled navigation, WelcomeDriver used frequent illustrations, animations, and short videos from various sources. Text blocks were short and readable; for example, over 1250 screens were used in the California course. Overall delivery facilitated long-term retention, since there was repeated exposure via lessons, quizzes, and a comprehensive final exam. A CD version was available to affiliated commercial driving schools but was not sold to the public.

Interaction With an Instructor. The course was controlled by the computer server, but employees (without specific driver education credentials) were available for questions 7 days a week by telephone, e-mail, and live chat.

Time Spent on the Course. This course did not employ timers for metered delivery, but the delivery method of controlled navigation meant that it was not entirely self-paced. Students had to allow every page to load and play out sequentially, and the course presented at least 1,250 screens in every State. The course tracked the time spent on each lesson, without counting "dead time" away from the computer. Owner and vice president Deborah Seidman reported that one unusually speedy student completed the course in 16 hours, which resulted in a telephone call to her parents; they described her as an honors student and a quick study in most things. Depending on State requirements, WelcomeDriver could enforce minimum course time requirements and/or limit the maximum time-per-day spent on the course.

Concurrent Behind-the-Wheel Training. This course was not built around concurrent BTW training.

Parent Involvement. Students were able to complete this course independently in all States where it was offered at the time of this report, although as noted above, the appearance of rushing through could generate a telephone call from the course provider. Parents were copied on all e-mails including status reports. Two optional downloads were provided for parents—a parent-teen contract, and a behind-the-wheel teaching guide.

Identity Verification. Identity verification was not required in any of the States where WelcomeDriver was currently offered, but it was scheduled for use in some States awaiting approval. Seidman stated that student solicited identity questions were a very minimal deterrent to determined cheaters, and noted that cheating was also possible in classroom courses. WelcomeDriver required students to accept "Terms and Conditions" that stated that the students would do their own coursework, under penalty of perjury. All student sessions were fully logged with student ID, time, date, IP address, and browser ID. The company agreed with the State practice of requiring in-person written permit tests.

Tests. Although there was some State-to-State variation, WelcomeDriver teen courses were divided into about 27 lessons, each followed by a short quiz of about 5 to 10 items, randomly pulled from a pool of 10 to 40 questions per lesson. Lessons could be completed in any order, but students had to score 80% or better on every quiz in order for that lesson to be marked complete. In most States, all lessons had to be completed. Students who missed a quiz question were shown the correct answer and provided with an explanation. While quizzes could be taken repeatedly if needed to pass, a quiz generating program drew from the pool to supply a new quiz for each attempt. A comprehensive final exam of about 46 questions had to be passed with a score of 80% or better. The final exam was also drawn from the 400-question pool, presumably making it easy to pass if students paid attention to the corrections on their quizzes. The final could also be taken repeatedly if necessary, but again, new versions were generated. Students who took the final were able to review their questions and answers but could not save a copy. In addition, other teens were unlikely to receive the same final, due to the large test pool.

Why illustrative. WelcomeDriver was a mid-size provider that expected to quickly double the number of States it served. The founders' backgrounds in computer-based education and training dated to the early 1980s. The course delivery, known as controlled navigation, was

innovative and engaging. The company business model was based on partnerships with local commercial driving schools.

Information Sources for This Case Study. Researchers spoke with Deborah Seidman (owner & vice president), took a portion of the California course, examined the course syllabus, and visited the course Web site.

U.S. Online: Virtual Drive of America (High Engagement)

Provider Overview. Virtual Drive of America was founded by Kevin and Eliza Knapp, who were dissatisfied with parent-taught driver education options in Texas. In 2002, they applied their multimedia computer-based training experience to the development of a new online driver education course for students and their parents. Eight years later, the company was still family-owned and operated, and offered a variety of online driver education programs for teens as well as adults. In addition to Texas, their parent-taught course had been approved in Oklahoma, Colorado, and Georgia, and was approved in CD-ROM format for home-schooled students in Minnesota. The online portion of the course was also used by driving schools in California, Colorado, Missouri, and Pennsylvania. An enhanced, 56-hour instructor-led course that met requirements for a high school elective had recently been made available in Texas.

In 2009, over 10,000 teens satisfied their driver education requirements by enrolling in a Virtual Drive of America course. The cost of the course varied by State, and ranged from $29.95 in non-approved States to $169 in Texas. The average cost of the course in approved States was $86.

Course Curriculum. The Virtual Drive of America course was developed based on driver education standards set by the Texas Education Agency (TEA) and consistent with ADTSEA recommendations. All versions of the course followed the same basic curriculum and formatting. The initial course module addressed State driving laws and prepared students to pass their State licensing test. Material in this module was modified to reflect specific State laws and licensure requirements.

The remaining units were designed to be accompanied by in-car lessons and progressed from the more basic skills of starting and stopping a motor vehicle to the more complex skills of freeway driving and driving in adverse weather conditions. For the parent-taught courses, there was a separate online packet (or CD-ROM) that parents could access to obtain guidance on how to instruct their teen and specific lesson plans for 7 one-hour behind-the-wheel sessions. The parent packet also included answers to all of the student review questions and worksheets included with the online program. Although students had the option of taking the behind-the-wheel component of the course from a private driving school, by choosing the parent-taught format they maximized the close link between driving theory and practice.

General Course Delivery. Virtual Drive used a combination of text, audio voice-over, graphic illustrations, video clips, animation, mouse roll-overs, and links to additional reading to help convey course material. Upon completing a module, students were presented a series of questions to check their knowledge. These were intended for learning and review purposes only; students received immediate feedback on their response to each question, but there was no overall score or grade. Students were also encouraged to download and review a study guide, and were required to complete a worksheet prior to taking the module quiz. Worksheets were reviewed and graded by the internal system. The entire course was also available on CD-Rom for students not having access to high speed Internet.

Students choosing to sign up for the 56-hour instructor-led course progressed through the 12-week program as a virtual class. In addition to the workbook assignments and end-of-unit

quizzes, the students were expected to participate in weekly chat sessions hosted by the instructor, post to a question and answer forum, participate in content forum discussions, develop weekly driving plans, and conduct independent Internet searches ("Webquests") on course-related topics. All work was reviewed and graded by the course instructor, with the student's final grade determined by a combination of their participation in the above activities, performance on the module quizzes, documented time reviewing the online material, and results of the final assessment.

Interaction With an Instructor. As noted above, students who had signed up for the 56-hour, instructor-led Virtual Drive class had extensive interaction with their designated instructor. If they had questions, they could e-mail the instructor directly for a personal response, or post the question on the main forum for the benefit of the entire class. Instructors regularly interacted with students through weekly chat sessions, Q&A forums, and feedback on workbook assignments, much as would occur in a regular high school classroom. For the more standard 30- or 32-hour online course, certified driver education instructors were available to respond to student questions via an 800 phone number (extended hours Monday-Friday) or e-mail. However, the instructors did not themselves initiate interactions with the student.

Time Spent on Course. Virtual Drive of America did not use section or page timers in its course delivery. Instead, the course relied on parents, or the virtual instructor, to ensure students were devoting the requisite time to the course material. The required workbook assignments also encouraged students to devote adequate time to each module of the course. In addition, Virtual Drive instructors and staff had full access to student activity reports, which let them know whether students were accessing each page on the Web site and how much time the page was open on their computer screen. Certificates of completion were not issued to students who did not devote adequate time to the course material.

Concurrent Behind-the-Wheel Training. Virtual Drive of America courses were designed to be offered in conjunction with behind-the-wheel instruction, whether provided by a parent or a private driving school. However, it was possible to take the course without the behind-the-wheel component. Certificates were issued at the completion of the theoretical portion of the course, and there was no requirement for documentation of completion of behind-the-wheel training.

Identity Verification and Testing. No special student verification measures were in place for the parent-taught course. It was assumed that parents, in their role as instructors, would ensure that their child was completing the required online course work and testing. Parents were asked to verify their child's score on the 90-question final exam. For the instructor-led virtual class, students were required to take the final exam at their local high school or other central location where it could be monitored. Any student who failed to obtain a score of 70% or better could retake a test as many times as necessary to pass, although they had to wait at least half an hour between retakes of the quizzes, and 24 hours before retaking the final exam.

Evaluation. The effectiveness of the Virtual Drive of America course was independently evaluated by researchers at West Texas State University. Results (unverified) posted on the Virtual Drive Web site stated that teens who had taken the course had a 1.1% collision rate, compared to an 11.4% collision rate among other Texas Driver education graduates.

Why Illustrative. All Virtual Drive of America teen courses, whether parent-taught or instructor-led, provided for concurrent classroom and in-car instruction. As explained on their Web site, students "learn about roadway concepts, State laws, and driving techniques at their computer and then in a practical in-car environment, use the knowledge gained to hone their driving skills and begin working on safe driving habits that will follow them throughout their lives."

Other characteristics of Virtual Drive courses contributing to their selection as a case study included the in-depth support provided to parents on how to direct their teen's behind-the-wheel learning experience, extensive use of worksheets and study guides to reinforce student learning, and for the instructor-led course, adherence to iNACOL standards for online education.

Information Sources for This Case Study. Researchers spoke with founder and company president Kevin Knapp, participated in a virtual classroom course, examined the course syllabus, visited the course Web site and virtual classroom Web site, and reviewed various materials downloaded from the course Web site.

U.S. Online: Idaho Online Driver Education Course (High Engagement)

Provider Overview. The Idaho Online Driver Education Course was developed by Brian Johns, Idaho's driver education coordinator, and was offered through the Idaho Digital Learning Academy (IDLA). The IDLA was established by State legislative action in 2002 (Chapter 55, Title 33) to better serve the needs of the State's secondary school students. The online driver education course was added to the school offerings in 2005. The cost of the course was $75, the same as for other online courses.

Course Curriculum. The online course curriculum closely followed the Idaho Driver Education Curriculum Guide, also developed by Brian Johns. The Guide set forth minimum course content standards and benchmarks required of all public and commercial driving schools offering driver education. It also provided detailed lesson plans for 16 two-hour classes for meeting these standards. By law, Idaho students were required to receive their behind-the-wheel training concurrent with their classroom instruction, and the Guide provided a list of topic areas by class to help instructors plan their drives.

General Course Delivery. The driver education course offered through IDLA met all iNACOL standards for online course delivery. The course was offered approximately 6 times a year, each over a 9-week period. Students from across the State were able to sign up for the course through their school's site coordinator, but were responsible for arranging their own behind-the-wheel lessons with a local certified in-car instructor. Average class size was 24 students, although larger groups could be accommodated. A certified driver education instructor led the class and paced students' progression through the online material. The instructor had to have completed special training, also conducted online under the direction of Brian Johns, to be approved as an IDLA driver education instructor.

A typical online class or unit began with a set of discussion questions related to the topic area, to which students were required to post their responses on an online discussion board. Short videos and/or animations might also be used to introduce a topic. New material was then presented in a PowerPoint presentation, and was supplemented by audio commentary to highlight key information. There were also activity or homework assignments keyed to each unit that had to be completed and either posted to the discussion board or submitted to the instructor.

Interaction With an Instructor. Assigned instructors tracked individual student progress and were available by phone and e-mail to respond to student questions. They were also responsible for contacting both the student's parents and his/her behind-the-wheel instructor on a weekly basis to provide progress reports and coordinate behind the wheel activities. The best instructors hosted regular online chat sessions and provided personalized feedback to students regarding their homework assignments and performance on the unit quizzes.

Time Spent on Course. The online course covered the same material and satisfied the same 30-hour requirement as a classroom course. In practice, it had been found that students who had made A's in the class averaged more than 40 hours online, while those making C's averaged closer to the 30 hours and those failing averaged much less than 30 hours. There were no course

timers requiring that students spend a certain amount of time online; however, instructors had access to activity reports that allowed them to monitor time spent.

Concurrent Behind-the-Wheel Training. As noted above, Idaho required that students receive their behind-the-wheel training in tandem with their classroom instruction. Accordingly, students were required to obtain their permits, and make arrangements with a local certified driving instructor, before beginning the class.

Identity Verification and Testing. The individual unit quizzes were included for learning purposes, and no specific score was required to progress to the next level of the course. The final course exam had to be taken at the local high school and proctored by a teacher or other staff person designated by the principal. Students who failed to obtain a passing score on the exam were allowed to retake a different exam; however, if they failed a second time they failed the course. Other than taking the final exam in-person at the local high school, there were no other security measures in place for ensuring that students complete the coursework themselves.

Why Illustrative. Idaho's Digital Learning Academy Online Driver Education Course was especially noteworthy for its adherence to iNACOL standards, and in particular the hands-on role that certified driver education instructors played in leading the course; the incorporation of homework and other active learning activities; and the ability of students to interact with one another in addition to the instructor. The course was also the only one identified that had provisions for coordinating students' online instruction with their behind-the-wheel training by a certified in-car instructor.

Information Sources for This Case Study. Researchers spoke with Idaho driver education coordinator and course developer Brian Johns, reviewed the State's detailed course curriculum guide (prepared by Johns), and visited the Idaho Digital Learning Academy Web site.

U.S. Online: CESA2 and Southwest Tech (High Engagement)

Provider Overview. This case study was shared by 2 Wisconsin providers who were the only online driver education courses approved in Wisconsin at the time of this report. Both are public educational entities rather than private for-profit companies. CESA2 is the Cooperative Educational Service Agency, Region 2, a co-op allowing south central and southeastern Wisconsin public schools to share staff and resources. Southwest Tech is a technical college that primarily served the southwest corner of the State. The programs were directed by Kurt Schultz at CESA2 and Annette Biggin at Southwest Tech, both experienced driver educators. Online courses had been offered by both agencies for about 5 years. The CESA2 course cost $425, which included payment for separate behind-the-wheel training. It was open to students in any of the 36 high schools that contracted with CESA2, and it graduated about 800 students in 2009. The Southwest Tech course cost $127, was available to any Wisconsin teen, and graduated about 200 students in 2009.

Curriculum. Both courses were based on the *Drive Right* textbook and the State driver handbook, with additional material added by Schultz and Biggin. The CESA2 course was influenced by ADTSEA standards but had not been formally reviewed by ADTSEA, and the Southwest Tech course met NACOL standards.

General Course Delivery. Both providers served a fair percentage of teens who had dial-up Internet connections and slower computers, and both were careful to deliver courses these teens could use. Neither course included audio narration, animation, or streaming video, but both included links to other online resources. At Southwest Tech, the online delivery was supplemented by a course manual in book form, the State handbook, and a DVD of videos. At CESA2 students referred to The *Drive Right* textbook and the State handbook. The CESA2 foundation software was Moodle, and the Southwest Tech foundation software was Blackboard.

Students were required to find information on designated topics from sources including the course manual or textbook, the State driver handbook, Web links, and a DVD with videos in the case of Southwest Tech. Active homework was also required; for example, Southwest Tech students watched a video on railroad crossing safety and summarized what they learned, and CESA2 students checked their tire pressures and tread, reported the results, and discussed the safety implications. The Southwest Tech course used online discussion boards. In both courses, delivery facilitated long-term retention. There was repeated exposure to the material through lessons, homework, quizzes, and a comprehensive final exam.

Interaction With an Instructor. Both courses were noteworthy for their instructors' credentials and levels of support. All instructors for both programs were State certified both as teachers and as driver educators. Individual students had assigned instructors who tracked their progress throughout the course and provided individualized feedback on homework. Instructors also contributed to online discussions at Southwest Tech. Students could contact their instructors by e-mail or telephone, and hours of availability were typically generous. In turn, instructors contacted students whose work was not satisfactory.

Time Spent on the Course. Both courses employed time stamping, so instructors could see when each student logged in and out, and students knew they would be individually monitored. Students were told to limit their course time to 2 hours per day, and not to rush through the course. Neither course used page, section, or course timers to meter delivery. Nevertheless both programs had data showing that the average student spent more than 35 hours on the course. The primary determinants of this were the amount of interactive material with homework, plus instructor oversight.

Concurrent Behind-the-Wheel Training. Both courses were essentially stand-alone courses, but the Southwest Tech course included optional exercises to let teens apply their classroom materials to behind-the-wheel practice with parents.

Parent Involvement. Both courses had notable levels of parent involvement. Parents received an introductory letter from the Southwest Tech course coordinator, inviting them to contact her freely with any concerns. She would likewise contact parents if there were concerns about a student's performance. Parents were told that their teens should not spend more than 2 hours a day on the course in an attempt to rush through. As noted, the course also included optional exercises to let teens apply their classroom materials to behind-the-wheel practice with parents. In the CESA2 course, parents also received an introductory letter, including passwords to allow their teens to take the unit tests and the final. Parents were required state in writing that they proctored these closed-book tests. In the CESA2 course, parents were also copied on all e-mail communications between students and instructors.

Identity Verification. Each student was monitored by an instructor who became familiar with that student's performance and writing style. Through time stamping, instructors were aware of students who might try to submit homework without opening the relevant lesson. The syllabus for each course addressed various forms of academic dishonesty and stated that these were grounds for dismissal from the class. As noted, the CESA2 course required parents to proctor exams and the final.

Tests. Both courses had good test security. It was not possible to right click and save/copy/print any tests or final exams. Both courses had comprehensive finals of 50 to 75 questions, which were not repeats of previously seen test questions. Both courses required a score of 80% to pass the final, and both courses limited the number of times students could take the final. CESA2 students who failed the final on their first attempt were required to contact their instructors and might be required to repeat selected chapters with homework before retaking the final. Similarly Southwest Tech students who failed the final had to contact their instructors, and were allowed a second attempt only if their work had otherwise been satisfactory. Both courses had a large test pool, so students did not receive an identical final on their second attempts. As noted above, parents were required to proctor their teen's CESA2 final and attest that it was taken closed-book and without assistance.

Why illustrative. Both programs required students to engage in active rather than passive learning. Students had to seek out information and summarize or apply what they learned. Students were assigned to certified driver educators/teachers who followed their progress. Both courses often required more time than the traditional classes they replaced. Both were

noteworthy for parent involvement—CESA2 for parent proctoring of closed-book exams, and Southwest Tech for encouraging parents to have their teens apply lesson material behind-the-wheel; in addition, both courses encouraged two-way parent-instructor communication. Both courses had good test security. CESA2 was also notable for its success with special needs teens who might have difficulty in a traditional classroom.

Information Sources for This Case Study. Researchers spoke with Annette Biggin and Kurt Schultz (driver education directors), took a portion of both courses, reviewed the course syllabi, reviewed parent material (CESA2), and viewed the online discussion board (Southwest Tech).

U.S. Online: Courses With the Potential for Low Student Engagement

Provider Overview. Four providers were chosen to illustrate courses with acceptable content but the potential for low student engagement. Three of the 4 provided California courses only, and one provided courses in California and Nevada, plus a generic course, not specific to any State and not intended to result in a DMV certificate of completion. For descriptive purposes, the California course was used for all 4 providers. Two of the providers designated themselves as private secondary schools in California, and were thus exempt from oversight by either the State Department of Education, which oversaw public schools, or the State DMV, which oversaw commercial driving schools. The other two providers were believed to be DMV-approved, although some contradictory information was noted from various sources. All were private, for-profit companies. The courses ranged in price from $20 to $65.

Curriculum. California's DMV publishes its required teen Driver Education Curriculum online. All 4 courses closely followed this curriculum. One of the 4 courses followed the posted curriculum very closely and in similar order, while the others made some changes to the order of presentation and added some additional material.

General Course Delivery. All 4 courses required sustained reading, if one were to absorb the information. One course consisted of multiple screens of text, similar to book pages but perhaps longer, illustrated by pictures, photos, and diagrams. Two other courses added animations with varying degrees of frequency. One included some short videos, and another included several longer videos that need not be viewed to complete the course. In general, however, the 4 courses called for extended reading, which was not necessarily predictable from their Web sites; some Web sites were relatively text intensive and others were more graphic. Students had a relatively passive role in all 4 courses. They clicked through multiple screens of information and clicked on answers to multiple choice tests.

Interaction With an Instructor. All 4 courses were self-serve courses, with helpdesk or instructor interaction only if the student requested it. Although it was difficult to confirm with certainty, it appeared that only one of the 4 providers employed State-certified driving instructors.

Time Spent on the Course. All 4 courses could be completed in a half-day or less, if the teen so desired. One course provider referred to the possibility of taking the course quickly as a selling point, though simultaneously cautioning students not to rush through the material. Another provider emphasized their comprehensive curriculum and urged students to make good use of it, however it was possible to pay a fee and take the final exam directly from a link on the homepage without opening the lessons. The fourth provider used timers and stated that the course would require a considerable time commitment. However one of the authors found it possible to skip the lessons entirely and take only the quizzes and final.

Concurrent Behind-the-Wheel Training. All 4 courses were stand-alone courses, not designed for concurrent behind-the-wheel training.

Parent Involvement. All 4 Web sites encouraged parents to take part in their teens' driver education, but all 4 courses could be completed independently by teens. One provider mentioned parent proctoring of course materials, but this requirement was not observed in the course itself.

Identity Verification. Two courses included user agreements or terms of service messages that the student accepted by registering for the course. The appearance of the agreements was like the "I accept" boxes that people click when downloading or installing software. Language in these online driver education agreements typically stated that the student studied the material and completed the tests without outside assistance. This feature was not noted for the other two courses.

Tests. Potentially problematic test issues included multiple test attempts, open-book testing, and the quality and repetitiveness of test questions. All 4 course providers allowed students to take tests repeatedly to pass. One course used the same questions for all final exams, but in various orders, while another course had at most two versions of the test. Another issue was the ease with which students could look up test answers. For example, using the Browser Back feature made quizzes very easy for one course, since the material covered on each quiz was always covered on the previous page of text. Another course was noted to have very easy and obvious answers for its tests and final, so that it seemed possible to pass by guessing.

There were also potential issues with test security for all 4 providers. One concern was the ease with which teens might be able to circulate the exams, making it possible for others to pass the course without learning the material. For example, at one point during this research project, a teen posted exam questions for one of the courses in an online forum. Three of the courses allowed any student who completed the course to right click and save/copy/print the graded exams. The fourth course did not, but students could print their quizzes and final exam before submitting them for grading. One course provided a print button on lesson and test screens. In sum, the testing issue was the ease with which students could potentially pass the course tests. Whether the teens who took shortcuts fared as well on the DMV knowledge test was another question entirely.

Why illustrative. All 4 courses delivered California's comprehensive and detailed State curriculum, and in fact followed it very closely. All 4 courses had delivery features with the potential for low student engagement. In most cases, these features were not evident from the Web site itself, but were noted while taking the courses. The primary issue was that the door was left open for teens to get a certificate of completion very quickly without studying the material. Teens still needed to pass the DMV written knowledge test after completing these courses.

Information Sources for This Case Study. Researchers spoke with the owners of two of the 4 courses, visited the course Web sites, and took all 4 courses in their entirety.

APPENDIX D: PROGRAMS PROVIDING INFORMATION TO THE STUDY

Table D-1. United States Programs Providing Information

Provider Name	Street Address	City	State
Advanced Driver Education Products and Training	Corporate Headquarters, 2374 Maritime Dr.	Elk Grove	CA
Advanced Driver Training	36 S. Trooper Rd.	Trooper	PA
Advanced Drivers of America	4270 Oakwood Dr.	Williamsville	NY
Advanced Driving & Security Inc.	210 Airport St #10	North Kingstown	RI
Advanced Driving Academy	44932 Ford Rd.	Canton	MI
Advanced Driving Dynamics	314 S. Smokeridge Ter	Anaheim Hills	CA
Alfa Driving School	1533 Howell Mill Rd	Atlanta	GA
All American Driving School	508 Victorian Avenue	Sparks	NV
All Star Driver	774 Straits Turnpike	Watertown	CT
American Traffic Academy	4502 East Sierra Sunset Trail	Cave Creek	AZ
Ault Driver Education Center, Inc.	406 N. Indiana Ave. Ste-10	Englewood	FL
Auto Testers Inc.	1103 W Hibiscus Blvd	Melbourne	FL
Autobahn Teen Driving Academy	3795 South Patterson Rd	Joliet	IL
BIR Performance Driving School	5523 Birchdale Rd	Brainerd	MN
Bloom School of Driving Dynamix, Inc.	PO Box 21087	Columbus	OH
BMW Performance Driving School	1155 Hwy 101 S.	Greer	SC
Bob Bondurant High Performance Driving School	PO Box 51980	Phoenix	AZ
Bridgestone Winter Driving School	Box 774167 / 2200 Village Inn Court	Steamboat Springs	CO
Defensive Driving School	13219 NE 20th St, Ste 206	Bellevue	WA
Drive Lab	PO Box 18825 20th Street Station	Washington	DC
Driven School of Advanced Driver Training Inc.	PO Box 4	Adams	MA
Driving Dynamics Inc.	256 Chapman Rd Ste 202	Newark	DE
Driving MBA LLC	1760 West Chandler Blvd Ste 3	Chandler	AZ
Dutchess School	653 Rt 82	Hopewell Jct.	NY
Evolution Performance Driving School	6 Northern View Drive	New Milford	CT
Excel Driver Services	11930 W 44th Ave	Wheat Ridge	CO
Fast Lane Driving School Defensive Driving Academy	25060 Ave. Stanford #235	Valencia	CA
Fitzgerald's Drivng School	1350 Deer Park Ave	North Babylon	NY
Ford Driving Skills For Life	One American Rd., Suite 214-E1	Dearborn	MI
Fresh Green Light	275 Purchase St	Rye	NY
In Control	188 Main Street Ste 202	Wilmington	MA
Jim Hall Kart Racing School	1555 Morse Avenue, Unit G	Ventura	CA
Jim Russell Racing Drivers School	29359 Arnold Drive	Sonoma	CA
Just Driver Training	6302 Walden Crossing Dr.	Canton	GA
Leatherstocking Defensive Driving School	1377 Newport Rd	Poland	NY
Miller Sports Park Performance School	2901 N. Sheep Ln.	Tooele	UT
Minnesota Highway Safety and Research Center	720 4th Ave South	St. Cloud	MN
MSR Houston	1 Performance Dr.	Angleton	TX
National Institute of Vehicle Dynamics	2590 Business Park Court	Waldorf	MD
National Traffic Safety Institute, Inc. (NTSI)	1211 96th Ave SE	Bellevue	WA
Posit Science Corporation	225 Bush Street, Floor 7	San Francisco	CA
ProFormance Racing School	PO BOX 791	Bellevue	WA
Richard Petty Driving Experience	6022 Victory Lane	Concord	NC
Rocky Mountain Driver Training Program	2850 Skyway Dr	Helena	MT
Safe America Foundation	2480 Sandy Plains Rd.	Marietta	GA
Skid School Stevens Advanced Driver	57 South River Rd	Bedford	NH

Provider Name	Street Address	City	State
Training LLC			
Skip Barber Racing School	29 Brook Street	Lakeville	CT
Summit Point BSR Inc.	201 Motorsports Park Circle	Summit Point	WV
Survivor Drivers	8560 Variel Ave	Canoga Park	CA
Team O'Neil Rally School and Car Control Center	178 Miller Road	Dalton	NH
Texas World Speedway	17529 Highway 6 South	College Station	TX
The Mid-Ohio School	7721 Steam Corners Road	Lexington	OH
Tire Rack Street Survival Foundation	201 Pelham-Davis Circle	Greenville	SC
Top Driver	613 Landwehr Rd	Northbrook	IL
Training Wheels Driver Education	Maple Grove Classroom, 12676 Bass Lake Rd.	Maple Grove	MN
University of Montevallo Alabama Traffic Safety	University of Montevallo Sation 6740	Montevallo	AL

Table D-2. International Programs Providing Information

Provider Name	Street Address	City	State	Country
Drive Pro				New Zealand
CarCaptain	Queens Lodge, 26 York Street	London		United Kingdom
Acuitive Training Limited	Unit 3, Carlisle House, Carlisle Street	Goole	East Yorkshire	United Kingdom
Anchor Driver Training		Mt Warren Parl	QLD	Australia
Bestway Driver Training	221 Blue Mountain Street	Coquitlam	British Columbia	Canada
Suzanne and Terry Friday - The Driving School	10 Hextable Close	Allington	Kent	United Kingdom
Driver Skills	12 G Meadows	Stockton on the Forest	York	United Kingdom
Iscal Driving Tuition	Kensham House	Bradninch	Exeter	United Kingdom
G&M Driving Center	13 Alder Crescent	Greenhills	East Kilbride	United Kingdom
Control Driving	19 Abington Road	Dunfermline		Scotland
Glen Edmunds Performance Driving School	PO Box 19124, 3rd floor, Lengai House, Wilson Airp	Nairobi		Kenya
Ultimate Drivers	2805-239 Queen Street	Brampton	Ontario	Canada
Tameside School of Motoring				United Kingdom
Road & Traffic Education Center		Auckland	Papkura	New Zealand
NorthWest Training Center	i:Tek Building, Business Park Road	Letterkenny	County Donegal	Ireland
Driver Skills Australia Pty. Ltd.				Australia
Murcotts	Road Safety House, 1042 Dandenong Road	Carnegie	Victoria	Australia
Manby Motorplex		Manby	Lincolnshire	UK
RAC Driving Center	46 Grogan Road	Perth	WA	Australia
Test and Training Driving Experience	10 Norscot Way	Madeley	WA	Australia
Advanced Driver Training Techniques	KS House, Pinhoe Training Estate, Venny Bridge	Exeter	Devon	United Kingdom
Advanced Driver Training Center	3 Escott Place	Townsville	Queensland	Australia
RideDrive	21 Ramworth Way	Aylesbury	Buckingham-shire	United Kingdom
International Driving Center	5 Elwy Street	Rhyl	Denbighshire	United Kingdom
Alberta Motor Association	4700 17th Avenue SW	Calgary	Alberta	Canada
Track Techniques Inc.	78 Country Hills View NW	Calgary	Alberta	Canada
Arctic Response Canada Ltd.	104-349 Old Airport Road	Yellowknife	Northwest Territories	Canada
BMW Canada	920 Champlain Court	Whitby	Ontario	Canada
The Lauzon Driving School	635 Boulevard Henri-Bourassa	Montreal	Quebec	Canada
Starlite Driver Training	203-143 Wyndham Street	Guelph	Ontario	Canada
DriveSafe Southland				New Zealand
Safe Drive Training	Shop 3, KP Shopping Centre	Shailer Park	Queensland	Australia
Skids R Us				Wales
Institute of Advanced	510 Chiswick High Road	London		United

Provider Name	Street Address	City	State	Country
Motorists				Kingdom
Roadmasters Safety Group Inc.	424 Lampson Street	Victoria	British Columbia	Canada
Driver Performance Group	6415 11th Avenue	Edmonton	Alberta	Canada
Transcanada Driving Institute	590 Boulevard Decarie	Montreal	Quebec	Canada
Valley Driver Training	430 Notre Dame Avenue	Sudbury	Ontario	Canada
Alberta Advanced Driving School	Box 52024	Edmonton	Alberta	Canada
The Saab Club of Canada	18 Haliburton Avenue	Toronto	Ontario	Canada
Accent Driver Training	160 Baseline Road	Bowmanville	Ontario	Canada
National Defensive Driver Training	The Park Mall, 2 Quebec Street	Guelph	Ontario	Canada
Skid School Kincardine	526 Scott Street	Kincardine	Ontario	Canada
Driving Unlimited	18200 Ford Road	Pitt Meadows	British Columbia	Canada
Advanced Driving Concepts	512 COlby Drive	Dartmouth	Nova Scotia	Canada
BMW Car Club of BC	PO Box 3452, 349 W. Georgia Street	Vancouver	British Columbia	Canada
ILR Car Control School	13 Valley Mills Road	Mount Albert	Ontario	Canada
Skid Control School	576 Bronte Road	Oakville	Ontario	Canada
Canadian Traffic Education	9320-49th Street	Edmonton	Alberta	Canada
DriveWise Canada	121 Commerce Park Drive	Barrie	Ontario	Canada
Drive For Life	2555 Erin Mills Parkway	Mississauga	Ontario	Canada
Mecaglisse Quebec Inc.	1253 Chemin Dufresne	Notre-Dame-de-la-Merci	Quebec	Canada
Fleet Safety International	119-4999 43rd Street SE	Calgary	Alberta	Canada
Young Drivers CollisionFree	1 James Street South, Suite 300	Hamilton	Ontario	Canada
National Advanced Drivers School	PO Box 10	Bombay	South Auckland	New Zealand
John Bowe Driving	PO Box 130	Glen Iris	Victoria	Australia
Test and Training International	Im Fahrsicherheitszentrum Teesdorf	Teesdorf	Baden	Austria
The Israeli Center for Safe Driving Ltd.				Israel
Driving Standards Agency - Pass Plus	P.O. Box 280	Newcastle-Upon-Tyne		United Kingdom

Table D-3. Identified Online Teen Driver Education Programs

Provider	Web site (Alternative Web site)	Program Name (Alternative Name)	Program Type	States Approved/Accepted
Interactive Solutions, Inc. DBA DriversEd.com	http://driversed.com	DriversEd.com	Classroom/Theory Parent Taught + behind-the-wheel	CA, CO, FL, GA, IN, MN, NE, NV, PA, UT, VA; OK, TX
I Drive Safely, LLC	http://www.idrivesafely.com http://teen.idrivesafely.com/	I Drive Safely	Classroom/Theory Parent Taught + behind-the-wheel	CA, CO, GA, IN, NV, PA, VA; OK, TX
Virtual Drive of America	http://www.virtualdriveofamerica.com http://vdriveusa.com	Virtual Drive	Parent Taught + behind-the-wheel Virtual Classroom	CA, CO, GA, MN, NE, OK, TX; TX
National Driver Training Institute	http://www.usdrivertraining.com	NDT Help for the Teen-ager Who Wants to Drive	Classroom/Theory, Parent Taught + behind-the-wheel	CA, CO OK, TX, MN, VA
Advantage Driving School (CA) / Online Learning, Inc. (All other)	http://www.oneclickdriversed.com http://www. teendriverseducation.com http://www.onlineteendriving.com	Golden State Private School / Golden State Driving School	Classroom/Theory	CA, CO, NV, OK
Cyberactive	http://www.teendrivingcourse.com http://www.driveredtogo.com	TeenDrivingCourse.com DriverEdToGo.com	Classroom/Theory	CA, CO, NV, PA
American Safety Council, Inc.	http://www.safemotorist.com http://www.123driving.com/ (TLSAE) http://www.highschooldriver.com (TLSAE)	SafeMotorist.com FirstTimeDriver	Classroom/Theory 4-hour TLSAE	CO, GA; FL
Welcome Driver, Inc.	http://www.welcomedriver.com http://www.driveredcolorado.com http://www.godriver.com	Welcome Driver DriverEdColorado.com Go Driver California Click School	Classroom/Theory	CA, CO, IN
Costech Technologies*	http://www.codrivered.com http://www.georgiadrivereducation.com http://www.learn2driveUSA.com	Costech CO Driver Ed. Costech GA Driver Ed. Learn2DriveUSA	Classroom/Theory	CO, GA, PA
Drivers Education Online	http://driversedonline.com	DriversEdOnline.com	Classroom/Theory	CA, NV
Cheap Drivers Ed, LLC	http://www.cheapdriversed.com	Cheap Drivers Ed	Classroom/Theory	CA, NV
Driver.org	http://www.mycaliforniapermit.com	My California Permit	Classroom/Theory	CA
Allstars School of Driving	http://www.teendriversedonline.com http://www.onlinedrivingschool.org http://www.alternativeprivateschooling.com	Teen Drivers Ed Online OnlineDrivingSchool.org Altern. Private Schooling	Classroom/Theory	CA
Pacific High School	http://www.cal-driver-ed.com http://www.pachighschool.com	Cal-Driver-Ed Pacific High School	Classroom/Theory	CA

Provider	Web site (Alternative Web site)	Program Name (Alternative Name)	Program Type	States Approved/Accepted
R3 / Sagana Group, LLC	http://www.driversedUSA.com	DriversedUSA	Classroom/Theory	CA
Private Educational Network	http://www.penschool.com http://www.driversedclass.com	PEN Online Solutions Teen Driver Ed DriversEdClass.com	Classroom/Theory	CA
SomaStream Interactive - California	http://www.teenautoclub.com http://www.7-11driversed.com	Teen Driving Academy 7-11 Drivers Ed	Classroom/Theory	CA
Drivers Ed Direct	http://www.driverseddirect.com http://www.onlinedriverseducation.com	Drivers Ed Direct Online Drivers Ed	Classroom/Theory	CA
Safety Drivers Ed, LLC & Bay Area Driving School	http://safetydriversed.com	Safety Drivers Ed	Classroom/Theory	CA
Capitol City Driving School	http://capitoldriversed.com http://capitolcitydriving.com	Capitol Drivers Ed 101	Classroom/Theory	CA
Lowest Price Traffic School	http://lowestpricetrafficschool.com	Florida Drug and Alcohol Awareness Course	4-hour TLSAE	FL
Florida Association of DUI Programs, Inc.	https://myfirstlicense.com	Drug, Alcohol, Traffic Educ. (D.A.T.E.) Course	4-hour TLSAE	FL
American Safety Institute / First Time Driver	http://www.firsttimedriverclass.com	Traffic Law & Substance Abuse Education course	4-hour TLSAE	FL
Driver Training Associates	http://www.drivertrainingassociates.com/florida/florida-drug-and-alcohol-course.html http://www.driverlicenseschool.com http://ticketschool.com	Traffic Law & Substance Abuse Educ.Course; Florida 4-Hour Learner START course	4-hour TLSAE	FL
Idaho Digital Learning Academy	http://www.idahodigitallearning.org/Webapps/portal/frameset.jsp?tab_tab_group_id=_25_1	Idaho Online Driver Education Course	Virtual Classroom	ID
Southeast Community College	http://southeast.edu/	Southeast Community College Driver Educ. Class	Classroom/Theory + behind-the-wheel	NE
Great Basin College	http://www.gbcnv.edu/drivers-ed	Basic Online Driver Education for HS Students	Virtual Classroom	NV
Clark County School District Virtual High School	http://ccsdde.net	Driver Education	Virtual Classroom	NV
The Online Traffic School, Inc.	http://1stNevadalicense.com	A Better First Nevada License	Classroom/Theory	NV
Drive Safe America, LLC	http://www.trafficschool4less.com	Traffic School 4 Less	Classroom/Theory	NV
Inventrum	http://www.safe2drive.com	Safe2Drive	Classroom/Theory	NV
All American Driving School	http://www.Internetdrivered.com	All American Driving School Nevada Driver Education Course	Classroom/Theory	NV
DriveStar Driving School	http://www.edrivestar.net	eDriveStar	Classroom/Theory	NV

Provider	Web site (Alternative Web site)	Program Name (Alternative Name)	Program Type	States Approved/Accepted
LRS Systems, Ltd	https://www.teenroadrules.com	Teen Road Rules	Classroom/Theory	NV
Soma Stream Online – Nevada	http://www.nvdriver.org http://www.dmvdriverseducation.org http://pursuitofexcellencedriving.net	Nevada 30-hour Driver Education Course	Classroom/Theory	NV
Utah Electronic High School	http://www.schools.utah.gov/ehs	Driver Education	Classroom/Theory	UT
A-1 Driving School with Utah Valley University	http://www.uvu.edu/ce/classes/drivered	Driver Education Online Video Course	Classroom/Theory	UT
Virginia Association of Driver Education and Traffic Safety (VADETS)	http://vadriveredu.org	VADETS Online Driver Education Course	Classroom/Theory	VA
Southwest Tech	http://www.swtc.edu/red_courses.aspx?id=CE03	Driver Education Theory	Virtual Classroom	WI
Cooperative Educational Service Agency, Region 2	http://drivered.cesa2.org	CESA2 Driver Education	Classroom/Theory	WI

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National Highway Traffic Safety Administration

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