Driver License Testing Of Young Novice Drivers

U.S. Department of Transportation
National Highway Traffic Safety Administration

NHTSA
www.nhtsa.gov

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
DOT HS 811 440		

4. Title and Subtitle	5. Report Date
Driver License Testing of Young Novice Drivers	February 2011
	6. Performing Organization Code

7. Author(s)	8. Performing Organization Report No.
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9. Performing Organization Name and Address	10. Work Unit No. (TRAIS)
Preusser Research Group, Inc. 7100 Main Street Trumbull, CT 06611	11. Contract or Grant No. DTNH22-05-D-15042, Task Order 0014

12. Sponsoring Agency Name and Address	13. Type of Report and Period Covered
U.S. Department of Transportation National Highway Traffic Safety Administration Office of Behavioral Safety Research, NTI-130 1200 New Jersey Avenue SE Washington, D.C. 20590	Final Report, August 22, 2007– December 31, 2009
	14. Sponsoring Agency Code

15. Supplementary Notes

Patty Ellison-Potter served as the NHTSA Contracting Officer's Technical Representative for the study.

16. Abstract

This project documented methods of testing readiness for licensure in the U.S. and found little distinction among jurisdictions with respect to the testing quality and difficulty. States that appeared to have relatively more difficult or relatively less difficult tests were identified based on information obtained from state officials, supplemented by surveys conducted at selected DMVs. FARS data analyses did not indicate that the tests themselves had any effects on driver performance in terms of fatal crashes. A case study of one State (Connecticut) that made changes in its testing and GDL requirements was also conducted. Lengthening the knowledge test had no measurable impact on preparedness for licensure, and practice driving hours did not increase although the requirement for practice hours was doubled. A review of license tests in other countries indicated that they are generally more difficult, and many upgrades have been made in Australia, Canada and New Zealand in conjunction with the introduction of graduated licensing. That trend has not yet happened in the United States. These new tests may be a model for the U.S., although they have not been evaluated to determine the extent to which they alter the young driver problem through improved performance or license delay.

17. Key Words

novice driver, young driver, teen driver, driver licensing, graduated driver licensing, teen crash

19. Security Classif.(of this report)	18. Distribution Statement
	Document is available to the public from the National Technical Information Service www.ntis.gov and free of charge at www.nhtsa.gov

19. Security Classif.(of this report)	20. Security Classif.(of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	52	

Form DOT F 1700.7 (8-72) **Reproduction of completed page authorized**

DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

TECHNICAL SUMMARY

CONTRACTOR	CONTRACT NUMBER
Preusser Research Group, Inc.	DTNH22-05-D-15042, Task Order 0014
REPORT TITLE	REPORT DATE
Driver License Testing of Young Novice Drivers	February 2011
REPORT AUTHOR(S)	
Emily Haire, Allan F. Williams, David F. Preusser	

Driver license tests are designed to ensure that people using public roadways have a minimum level of driving skill and an awareness of safe driving practices and road law. License applicants must proceed through the administrative processes of their respective licensing agencies and must take and pass the actual examinations. In addition to successfully navigating the testing process, young novice drivers also must adhere to graduated driver licensing (GDL) policies which govern driving practice both before and after drivers achieve licensure. When evaluating the effects of driving test procedures, the accompanying graduated licensing policies must also be examined.

The hypothesis is that more difficult license tests require more preparation; and more study and practice increase knowledge and driving competence, leading to safer driving, or increased driving performance. Although this is a logical progression, the research literature regarding the relationship between rigorous testing and increases in driving performance is limited and not altogether clear. What is evident, however, is the well-established finding that the first few months of licensed driving are extremely risky for young novices. Delaying licensure to these novices is an important mechanism for reducing crash rates and enhancing safety. The license testing process is capable of achieving this delay by granting licenses only to better prepared, slightly older drivers. First, tests which are more difficult may motivate applicants to spend extra preparation time and foster delay, even if competence is not increased. Secondly, in addition to increasing preparation time, difficult tests are more likely to enhance delay by identifying people not yet ready to drive on public roads; i.e., applicants who fail difficult tests remain in a prolonged training phase. Concurrently, GDL policies, like testing policies, also may increase competence and delay in the learner stage.

Cataloguing and Analyzing the States

This project called for the documentation of methods of driving licensure in the U.S.; and once these were catalogued, for the classification of tests by quality and difficulty. Two issues arose: (1) the availability of information on driving test parameters was lacking in many cases, and (2) the existing information indicated that there was little distinction among the States and D.C. in terms of test difficulty.

License test failure rates, for both knowledge and in-vehicle tests, are an important gauge of test difficulty, yet many States do not document or maintain them. Of the 51 jurisdictions contacted, only about one quarter had information on test failure rates that were based on actual records data. Driver licensing tests in the United States appear to be generally easy with minimal variation among States. Knowledge tests are based on a sample of questions about road rules and safety practices discussed in the driver's manual. In-vehicle tests are generally short in duration, about 20 minutes, and relatively undemanding in terms of driving maneuvers.

We distinguished relatively more rigorous States from less rigorous States based on a spectrum of licensing test criteria. Driver licensing offices in these States conducted surveys of newly licensed teenagers to supplement the existing information on testing practices, test difficulty, and test failure rates. A cross-sectional analysis of Fatality Analysis Reporting System (FARS) data determined differences in crash rates, accounting for the crash experience of older drivers in the State and State graduated licensing rules. The analyses of fatal crash rates found no evidence that the driver license tests by themselves had any effects on fatal crashes.

A State Case Study of Testing Upgrades

In addition to evaluating existing license testing systems, we conducted a pre-/post-evaluation case study of a State making actual changes in its testing and GDL requirements. Surveys of license applicants were conducted before and after the Connecticut DMV lengthened its knowledge test from 16 to 25 questions and increased passing threshold from 75 percent to 80 percent. Unfortunately there were no strong trends in the data, the test failure rate was low, and it appeared unlikely that merely lengthening the test will have any measurable impact on preparedness for licensure. Connecticut's change in required hours of practice driving from 20 to 40 did not significantly increase the number of self-reported hours of supervised driving practice. More than half of the survey respondents did not achieve the 40-hour criterion. New GDL rules that feature stronger penalties were also established. The new rules carry strong penalty provisions, and compliance will be based partly on how well police enforce the rules and how teens perceive the likelihood of police enforcement. Teen opinion about police enforcement was mixed, although more were apt to think that enforcement was likely rather than unlikely if violations occurred.

Understanding the entire package of passing new laws and establishing policies to encourage compliance with those laws is important. Most of the changes are too recent to be able to measure their effects, but the surveys indicated that most teens affected by the policies were aware of them. There were two exceptions: (1) teens were least aware of special penalties for passengers in the vehicles of teen drivers who are under graduated licensing rules, and (2) many were not aware that police have the authority to confiscate license and vehicle for certain violations. Presumably as experience with the laws increases, perceptions about law enforcement will become more uniform.

An International Review

The testing regimens of 28 European countries and New Zealand, Australia, and Canada were reviewed. Key informants and contacts in these countries provided testing information. There is great variability in the types of tests used and in testing procedures in other countries. In general, test in 28 European countries are longer and more difficult than those in the United States.

The number of questions varies from as few as 18 in Poland to as many as 120 in Turkey. On-road driving times vary and most exceed 25 minutes. Switzerland has a 50-minute test; Norway, 55 minutes. Test failure rates vary from 6 percent in Austria to 57 percent in Great Britain. For the 20 countries with known failure rates, in 13 (65%), one-third or more fail the test.

These countries updated license tests in recent years as GDL systems were introduced. The revised license tests are generally more difficult than in the United States and include additional tests to move from the learner to the restricted phase, to advance further in the graduated licensing system, or to exit to full licensure. New tests are a logical accompaniment to graduated licensing systems, but they have not been a part of the graduated licensing movement in the United States. They may be models for the U.S. to consider, although not without first evaluating the extent to which these new tests alter the young driver problem—either through improved driver performance or license delay. Such international evaluations have not been performed.

Conclusion: Driver Test Changes in the United States

Even though GDL system requirements have changed dramatically, there have been few upgrades in U.S. driving tests (both knowledge and in-vehicle tests). Improvements made to the California driving test occurred in the early 1990s prior to the graduated licensing movement. The only test update subsequent to the GDL movement was the longer knowledge test, as in Connecticut, which appears to have had minimal impact. There may be future changes in testing protocols in the United States, inspired by the American Association of Motor Vehicle Administrator's (AAMVA) project developing recommended uniform testing requirements. More difficult licensing exams and additional testing between GDL stages in other countries may serve as models, pending evaluation, for improved testing in the United States.

1. Introduction

Driving tests are intended to ensure that people using public roadways have a minimum level of competence and are aware of safe driving practices and road law. The assumption is that more difficult tests require more preparation, thus increasing knowledge and driver competence, and leading to safer driving. This is a logical progression, but the research literature regarding these links is limited and not altogether clear. In regard to knowledge tests (sometimes referred to as theory tests), one U.S. study found that teens who were given a new and improved driver manual and a revised knowledge test based on the manual had somewhat fewer crashes than teens using the standard State manual and knowledge test (McKnight & Edwards, 1982). However, in a comprehensive international review of evaluations of knowledge tests, it was concluded that "…the effect of a theory test on driver accident rates is estimated to be exactly 0, i.e., drivers who take a theory test have exactly the same accident rate as drivers who do not take a theory test" (Elvik & Va, 2004).

Early evaluations of road tests also did not find any significant safety benefits, nor do individuals who score higher on knowledge tests have more favorable crash or violation records (Mayhew et al., 2001). In the 1990s, California made one of the very few changes in driver assessment that has occurred in recent decades in the United States, adopting a model, competency based test patterned after a test developed for drivers of commercial vehicles. The test requires about 25 minutes to complete, longer than the standard 10-15, and is considered to be more challenging. Initial research did not find that the new test was associated with any reductions in collision involvement, however; and there is presently no conclusive evidence on the relationship between testing requirements and safety outcomes (Gebers et al., 1998).

Despite these results, there are ways in which driver license testing can enhance safety, whether or not the tests make a difference on their own. This may be accomplished through delaying licensure, an important mechanism for reducing crash rates. Tests which are more difficult may motivate applicants to spend extra preparation time. This extra preparation can both increase competence and foster delay. Difficult tests (both knowledge and in-vehicle tests) are more likely to have higher failure rates, identifying people not yet ready to drive on public roads, and thus also enhancing delay. Granting licenses to better prepared, slightly older drivers is particularly important in view of the well-established finding that the first few months of licensed driving are extremely risky for young novices.

In estimating the effects of driving tests, graduated licensing policies need to be taken into account. This is because graduated licensing brings with it policies that, like testing policies, also may increase competence and delay in the learner stage. These include the lengthier learner holding period (generally six months and sometimes more), higher permit ages in some cases, and parental certification that a certain number of hours of supervised driving experience (generally 50) have been acquired in the learner stage. Testing requirements and graduated licensing provisions have to be studied as a package.

1.1. Novice Driver Testing Project

The primary focus of this project, as initially conceived, was to identify knowledge tests and in-vehicle driving tests in the United States, rank tests by quality and difficulty, and determine if teenagers in States with the most rigorous testing procedures have more favorable driving records than those in States with the least rigorous requirements.

In carrying out this task, two issues became apparent. First, quality information on driving test parameters was lacking in many cases. Second, the existing information indicated that there was little distinction among States in terms of test difficulty, and a meaningful test of the effect of tougher tests on crash rates would be difficult to achieve.

Problems were encountered in collecting information from States on licensing tests, procedures, and results. Information on important testing elements often could not be obtained. In particular, failure rates, a marker for test difficulty, were not documented or maintained in many States. Of the 51 jurisdictions contacted, only about one quarter had information on test failure rates that were based on actual records data. In other instances, administrators or examiners estimated failure rates, but the accuracy of this information is unknown.

Driver licensing tests in the United States appear to be generally easy with minimal variation among States. Knowledge tests are based on a sample of questions about road rules and safety practices discussed in the driver's manual. Applicants can score 20-25 percent of the questions incorrectly without failing. In-vehicle tests are conducted on public roads in most States and on closed courses in a very few States. They are generally short in duration, about 20 minutes, and relatively undemanding in terms of driving maneuvers. The maneuvers typically include parallel parking, and left, right, and three-point turns.

1.2. Project Goals

Because of these factors, the project goals were revised and expanded to include fatality crash analysis, a case study of test changes, and a review of other countries with GDL systems.

All available information on knowledge and in-vehicle tests was obtained from States and summarized. On the basis of this limited and incomplete information, States that appeared to have relatively difficult tests and States appearing to have relatively easy tests were tentatively identified. To supplement information on testing practices, DMVs in these States conducted surveys of newly licensed teenagers, asking about test difficulty, real-time test failure rates, and other items. The survey information was used to revise the groupings of States with more difficult versus easier tests. Cross-sectional analyses using FARS were then conducted to determine differences in crash rates, taking into account the crash experience of older drivers in the State, and State graduated licensing rules.

A second goal was to identify States that were making actual changes in testing requirements, so that the effect of these changes could be gauged. Although New Jersey passed a bill in 2009 to lengthen the licensing test, that change is pending. Connecticut was the only State identified that

had made recent changes in testing requirements by lengthening the knowledge test. The Connecticut DMV conducted before-after surveys of teenagers to ascertain the effects, if any, of this new policy. Connecticut adopted a series of other licensing changes concurrently, and it was possible to study them as well.

Finally, testing regimes in 28 European countries, Australia, Canada, and New Zealand were examined. Driving tests outside the United States are generally more difficult, and many new tests have been introduced in recent years, usually when licensing system rules have been upgraded. This raises the question as to whether these new tests are models for the United States.

2. Current Testing Practices

This section of the report provides a summary of driver licensing parameters, especially regarding the scope and rigorousness of the knowledge and in-vehicle licensing tests. The jurisdictions investigated were the 50 States and the District of Columbia. The current testing practices are presented in the following sections: (1) Sources of Data, (2) Variables of Interest, (3) Knowledge Test Components, (4) In-Vehicle Test Components, (5) Vision Test Components, and (6) Test Failure Rates.

2.1. Sources of Data

The American Association of Motor Vehicle Administrators (AAMVA) advised pursuing each State directly for licensing procedures and test requirements, and the States were indeed our primary source of data. We sought informants in each jurisdiction by telephone, email, and/or postal mail, with repeated attempts from multiple avenues. Informants were State-employed executives, administrators, managers, or staff members of each State's driver licensing agency—housed variously within departments of State, justice, transportation, motor vehicles, public safety, or revenue. Driver license professionals from most States replied to our requests for data in support of the study, delivering data which were readily available and occasionally tailoring data queries to our specifications. Some testing elements, however, were not recorded or were not released by particular States and are absent from this summary.

When necessary we also consulted official State government websites and the most recent versions of State-issued driver manuals for supplemental testing and administrative information.

The Insurance Institute for Highway Safety (IIHS) was an important resource, releasing a confirmed update of its *U.S. Licensing Systems for Young Drivers*, current as of February 2008. Since 2008 a few States have amended their rules, but since crash data through 2007 would be used to evaluate the effects of different requirements, these changes were not taken into account. The IIHS document provided minimum ages of entry into the licensing system, learner's permit and provisional license holding periods, and other graduated requirements in the variables listed below.

2.2. Variables of Interest

Detailed information was sought on current State testing regimens. Because of the importance of the licensing delay factor, information was also gathered on administrative rules and procedures related to testing that can increase delay, such as when the test can be taken and the results known, time barriers to taking the tests, and the time gap between test failure and retest.

An extensive list of test parameters was requested from State licensing agencies. Some items were excluded from this summary due to insufficient information, to the subjective nature of the element, or to a lack in variation. The excluded elements were: the environment in which an applicant takes the knowledge test (e.g., noise level, adequate work space, etc.); the length of time the licensing test elements and conditions had been in effect; the average number of times

applicants take the tests before passing; and "actual content areas tested" of the in-vehicle test (which informants found indistinguishable from "required test elements").

Licensing requirements and testing information presented in this chapter include:

- Knowledge Test Components
  - Whether the test is optional
  - Number of content areas
  - Length of test
  - Scoring criteria
  - Method of delivery
  - Number of languages available
  - Average amount of time to complete
  - Length of time required before retest
- In-Vehicle Test Components
  - Whether the test is optional
  - Scoring criteria
  - Testing environment
  - Use of personal vehicle versus testing vehicle
  - Availability of interpreters
  - Average amount of time to complete
  - Length of time required before retest
- Vision Test Components
  - Whether the test is optional
  - Level of visual acuity
  - Visual field perception
- Test Failure Rates

2.3. Knowledge Test Components

All jurisdictions require original license applicants to take a knowledge test. Some States like Nebraska, New York, and Washington may, however, offer a test waiver if the applicant has completed driver education. Of the States which provided information, only six restrict their knowledge test to a paper-based medium. All others provide computer-based applications solely or in combination with alternatives of paper, oral test delivery, or audio assistance. States offer knowledge tests in an average of six languages. Seven States test in English only; California reportedly provides tests in 32 languages.

The length of the knowledge tests varies from 16 to 80 questions, averaging 30, with a median of 25 questions. Minimum requirements for a passing score range from 70 percent to 85 percent correct, averaging 79 percent. Applicants reportedly complete tests in 10-75 minutes, most taking 25 minutes on average.

The *policy* mandate on wait time before retesting was obtained from 43 States, in lieu of the *actual* time between test failure and retake, which was unavailable. Five States allow applicants

to test twice in the same day, five do not have a required waiting period, 24 have a minimum one-day wait, and six require a one-week delay. New Hampshire and Virginia have the longest mandatory wait times of 10 and 15 days, respectively. The average number of attempts for individual applicants to pass the knowledge test was unavailable. Available knowledge test components are presented by jurisdiction in Table 1 below.

Table 1. Knowledge Test Components

Jurisdiction	Number of Questions	Passing Score	Test Delivery[1]	Available Languages	Test Time, in Minutes	Days to Re-take
ALABAMA	30	80%	ca	14	18	0
ALASKA	20	80%	c	1	25	1
ARIZONA	30	80%	c	2	25	1
ARKANSAS	25	80%	cpa	2	25	1
CALIFORNIA	46	85%	pa	32	30	7
COLORADO	25	80%	p	2	23	½
CONNECTICUT[2]	16	75%	cpo	17	18	7
DELAWARE	30	80%	c	2	40	7
DC	20	75%	ca	4	20	1
FLORIDA[3]	20	75%	cpa	3	13	½
GEORGIA[3]	20	75%	-	-	-	1
HAWAII	30	80%	p	9	30	7
IDAHO	40	85%	cp	7	25	3
ILLINOIS	35	80%	cpo	5	13	1
INDIANA	50	80%	-	-	45	-
IOWA	35	80%	cpo	8	25	0
KANSAS	25	80%	-	-	18	1
KENTUCKY	30	80%	-	-	30	1
LOUISIANA[3]	30	80%	cpao	1	13	1
MAINE[3]	20	80%	p	1	25	0
MARYLAND	20	85%	cpo	5	10	1
MASSACHUSETTS	20	70%	cpo	26	25	0
MICHIGAN[2]	80	70%	p	1	75	1
MINNESOTA	40	80%	cpa	-	18	1
MISSISSIPPI	20	80%	cpa	2	35	1
MISSOURI[3]	25	80%	-	-	15	-
MONTANA	33	81%	-	-	20	-
NEBRASKA[5]	25	80%	c	2	10	1

[1] A hyphen (-) indicates where data were unavailable. c=computer, p=paper, a=audio assistance available, o=oral test available.

[2] CT and MI require two intervals of knowledge testing—prior to learner permits and prior to licenses. OR requires a driver safety test in addition to its rules and signs knowledge test.

[3] The road signs test is separate from the knowledge test in FL, GA, LA, ME, MO, TX, and VA. States have passing score requirements equal to the knowledge test passing score, with the exception of VA, which requires a 100% passing score of a ten-question traffic sign test before proceeding to the knowledge test.

Jurisdiction	Number of Questions	Passing Score	Test Delivery[4]	Available Languages	Test Time, in Minutes	Days to Re-take
NEVADA	50	80%	cpa	2	-	0
NEW HAMPSHIRE	30	80%	po	1	30	10
NEW JERSEY	50	80%	co	10	35	-
NEW MEXICO	25	75%	-	-	-	-
NEW YORK[5]	20	70%	-	-	-	1
NORTH CAROLINA	25	80%	cp	9	25	1
NORTH DAKOTA	25	80%	c	7	25	1
OHIO	40	75%	ca	7	25	1
OKLAHOMA	20	75%	cpao	2	25	1
OREGON[2]	35	80%	cpao	6	16	1
PENNSYLVANIA	18	83%	cao	2	15	1
RHODE ISLAND	-	-	-	-	25	-
SOUTH CAROLINA	30	80%	cp	9	35	1
SOUTH DAKOTA	25	80%	-	-	10	1
TENNESSEE	30	80%	cpo	4	45	7
TEXAS[3]	30	70%	cp	2	15	-
UTAH	50	80%	cp	1	30	½
VERMONT	20	80%	cp	4	10	1
VIRGINIA[3]	25	80%	ca	2	-	15
WASHINGTON[5]	25	80%	c	-	25	½
WEST VIRGINIA	25	76%	c	3	18	7
WISCONSIN	-	-	c	8	45	-
WYOMING	25	80%	cpo	1	23	½

Very few State informants reliably answered questions regarding the knowledge test date of origin or latest revision. Only Michigan and West Virginia indicated that the full battery of knowledge test questions might be available for analysis. All other States were unable to release test questions or deferred us to their practice questions, which are publicly available online or in manuals but do not necessarily represent the actual questions used during license testing.

States did not deliver uniform content areas of their driver licensing knowledge tests, some providing much more detail than others. The most commonly reported test question topics have to do with traffic laws and rules of the road; road signs, signals and pavement markings; and driving skills. Six States extract road signs questions and deliver them in a separate test. Other States included variations of vehicle operation and equipment; speed and space management; parking; and safe driving practices. Less common were questions about implied consent, occupant protection, financial responsibility, environmental conditions, and title and registration requirements.

[4] A hyphen (-) indicates where data were unavailable. c=computer, p=paper, a=audio assistance available, o=oral test available.

[5] In NE, NY, and WA the knowledge test may be waived under certain conditions.

2.4. In-Vehicle Test Components

Forty-seven jurisdictions require in-vehicle licensing tests for novice drivers without exception. Driver testing agencies in Indiana, Iowa, Texas, and Wyoming, however, allow applicants to waive the in-vehicle test if they have successfully completed driver education. Only DC offers a DMV test vehicle; all other jurisdictions require applicants to provide their own vehicle. Of the 37 States which provided information on the availability of language interpreters, 60 percent do not provide interpreters; about ten percent provide interpreters only for applicants who are hearing impaired.

Most States require in-vehicle tests to be conducted on public roadways, though there are exceptions. Maryland conducts testing on closed-courses only. Florida, Minnesota, and New Jersey operate on either public roads or test courses, depending on the location of the driver exam station. Utah and Michigan use both test environments; e.g., Michigan conducts its basic control skills tests on closed DMV courses, but driving skills are tested in traffic, on public roads.

Information regarding in-vehicle test time was available from 45 jurisdictions—all reporting estimates, not actual timed results. The range for all jurisdictions was 10 to 75 minutes in-vehicle, averaging 22 minutes. Maryland and Mississippi reported the shortest test; Kentucky, Hawaii, and Michigan, the longest.

States did not deliver uniform required test elements of their in-vehicle tests, as some States group elements into five or six identifiable descriptions and others, up to 28 specific tasks. Several jurisdictions stood out by requiring progressive, in-vehicle evaluations in separate tests. Michigan has two in-vehicle tests: a Basic Control Skills Test involving slow-speed, constricted space maneuvers on a closed course; and an On-the-Road Test in which proficient driving in a number of environments must be demonstrated. Michigan applicants must pass the basic skills test before examiners allow them to proceed to the road test. Ohio has a similar protocol, featuring a Maneuverability Test and a Driving Test. Texas has three standalone in-vehicle driving tests: the on-street test, the backing test, and parallel parking test.

Thirty-one States delivered their passing score threshold based on either a percentage value or a demerit scale. They are presented here as percentage values only, with demerit-based scores normalized on a 100-point scale. Passing grades for the in-vehicle driving test ranged from 64 percent correct in Illinois to 94 percent in Tennessee, averaging 78 percent for all jurisdictions in the U.S. Arkansas and North Carolina did not report a minimum passing score, only that the passage or failure of the applicant was at the examiner's discretion. Examiners in the majority of States inform applicants of their test results immediately after the test has been completed and offer a debriefing of driving errors. Several also provide written summaries, test receipts, or copies of the scoring sheet to the applicants. The number of attempts an individual applicant makes before passing the in-vehicle test was not available.

Actual testing delays after initial failure were unavailable. The policy-mandate for delay until retest was reported by 47 jurisdictions, with nearly half of those requiring only a minimum one-

day wait or less. One-third of those States require a week; about 20 percent of States impose a waiting period of more than seven days. Tennessee and Maine stand out, with longer delays escalating with the number of errors made on the driving test. Available in-vehicle test components are presented by jurisdiction in Table 2 below.

Table 2. In-Vehicle Test Components

Jurisdiction	Passing Score[6]	Scheduling Wait, in Days	Test Time, in minutes	Days to Retake	Third-Party Testing
ALABAMA	75%	14	25	0	N
ALASKA	-	-	25	7	Y
ARIZONA	80%	1	20	1	Y
ARKANSAS	D	0	15	30	N
CALIFORNIA	85%	<5	25	14	-
COLORADO	-	1	18	1	Y
CONNECTICUT	88%	-	18	14	-
DC	-	60	15	7	-
DELAWARE	-	≤14	30	14	-
FLORIDA	-	0	15	1	Y
GEORGIA	75%	-	-	1	Y
HAWAII	70%	1	38	7	N
IDAHO	85%	3-7	35	3	Y
ILLINOIS	64%	0	18	1	-
INDIANA	-	-	30	14	-
IOWA	65%	0	20	0	-
KANSAS	-	-	-	1	-
KENTUCKY	80%	-	38	7	-
LOUISIANA	80%	0	30	1	Y
MAINE	-	14-21	25	14-21	-
MARYLAND	85%	2-5	10	1	N
MASSACHUSETTS	-	1-10	23	0	N
MICHIGAN	75%	5	60	1	exclusively
MINNESOTA	-	-	20	7	Y
MISSISSIPPI	85%	0	10	7	N
MISSOURI	70%	0	23	1	N
MONTANA	-	-	20	7	-
NEBRASKA	-	-	15	1	Y
NEVADA	80%	30	NA	0	-
NEW HAMPSHIRE	80%	0	23	10	N
NEW JERSEY	-	-	30	14	N
NEW MEXICO	-	-	20	7	Y
NEW YORK	70%	25	18	-	-
NORTH CAROLINA	D	0	15	7	-
NORTH DAKOTA	75%	1-21	20	1	N

[6] A dash (-) indicates where data were unavailable. "D" indicates "discretion of the examiner".

Jurisdiction	Passing Score[6]	Scheduling Wait, in Days	Test Time, in minutes	Days to Retake	Third-Party Testing
OHIO	75%	1-2	15	7	N
OKLAHOMA	70%	0	20	7	N
OREGON	75%	19	20	28	-
PENNSYLVANIA	-	-	15	7	N
RHODE ISLAND	-	-	NA	-	N
SOUTH CAROLINA	80%	0	18	1	Y
SOUTH DAKOTA	80%	-	15	1	-
TENNESSEE	94%	-	20	1-30	N
TEXAS	70%	-	15	1	-
UTAH	80%	0-45	30	1	Y
VERMONT	80%	≤14	18	7	Y
VIRGINIA	-	-	NA	-	Y
WASHINGTON	80%	-	20	7	N
WEST VIRGINIA	-	0	20	7	N
WISCONSIN	-	-	NA	-	N
WYOMING	-	-	20	1-3	-

2.5. Vision Test Components

Original driver license applicants are required to take a vision test in all States and the District of Columbia. Driver licensing offices conduct vision tests on-location, and some jurisdictions allow eye exam reports or certificates obtained by a Doctor of Optometry or other eye care professional in lieu of a vision test on-site. Vision test results were available from only three States (Connecticut, Florida, and Illinois; see Table 4).

Only five States do not meet the federal guideline for minimum visual acuity of 20/40. Twelve States fail to meet the minimum guideline for visual field of 120 degrees on a horizontal plane; another 18 States do not have a visual field requirement at all.[7] See Table 3 below for minimum vision test requirements for unrestricted licenses.

[7] The 20/40 acuity and 120 peripheral vision guidelines are referenced in *Medical Conditions and Driving: A Review of the Literature (1960 – 2000).* DOT HS 809 690. Bonnie M. Dobbs, Ph.D. September 2005. PRG presented the maximum, binocular, uncorrected visual field value unless otherwise noted.

Table 3. Minimum Vision Test Requirements for Unrestricted Driver License

Jurisdiction	Visual Acuity (Snellen)	Visual Field (Degrees Peripheral)	Jurisdiction	Visual Acuity (Snellen)	Visual Field (Degrees Peripheral)
ALABAMA	20/40	110	MONTANA	20/40	None
ALASKA	20/40	None	NEBRASKA	20/40	140
ARIZONA	20/40	70 horiz., 35 vert.	NEVADA	20/40	None
ARKANSAS	20/40	105	NEW HAMPSHIRE	20/40	None
CALIFORNIA	20/40	None	NEW JERSEY	20/50	None
COLORADO	20/40	None	NEW MEXICO	20/40	None
CONNECTICUT	20/40	140	NEW YORK	20/40	140
DELAWARE	20/40	None	NORTH CAROLINA	20/40	None
DC	20/40	140	NORTH DAKOTA	20/40	105
FLORIDA	20/70	130	OHIO	20/40	70 each eye
GEORGIA	20/60	140	OKLAHOMA	20/60	70 each eye
HAWAII	20/40	70	OREGON	20/40	110
IDAHO	20/50	None	PENNSYLVANIA	20/40	120
ILLINOIS	20/40	140	RHODE ISLAND	20/40	None
INDIANA	20/40	None	SOUTH CAROLINA	20/40	70 each eye
IOWA	20/40	140	SOUTH DAKOTA	20/40	None
KANSAS	20/40	110	TENNESSEE	20/40	None
KENTUCKY	20/40	120 horiz., 80 vert.	TEXAS	20/40	None
LOUISIANA	20/40	None	UTAH	20/40	120
MAINE	20/40	140	VERMONT	20/40	60 each eye
MARYLAND	20/40	140	VIRGINIA	20/40	100
MASSACHUSETTS	20/40	120	WASHINGTON	20/40	110
MICHIGAN	20/40	140	WEST VIRGINIA	20/40	None
MINNESOTA	20/40	105	WISCONSIN	20/40	70 one eye
MISSISSIPPI	20/40	140	WYOMING	20/40	120
MISSOURI	20/40	55 each eye			

2.6. Test Failure Rates

Failure rates for both the knowledge and the in-vehicle tests are used as a proxy for test difficulty and are of particular interest in this study. Acquiring test failure rates for each State and the District of Columbia was successful for fewer than half of attempts—of the 51 jurisdictions, 24 delivered a failure rate for at least one type of license test. Sixty percent of the test failure rates provided were based on actual records data from the 13 States of Arkansas, California, Colorado, Florida, Idaho, Illinois, Iowa, Maryland, Minnesota, Missouri, Nevada, Oregon, and Wisconsin. The remaining failure rates were based on single estimates or on the median of a range of estimates from informants in the States of Connecticut, Kentucky, Maine, Massachusetts, Mississippi, Nebraska, New Hampshire, New York, Tennessee, Utah, and Vermont.

Table 4 below illustrates the driving test failure rate data that were made available for this study. The States appear in alphabetical order and feature knowledge test, in-vehicle test, and vision test failure rates where available.

Licensing professionals in 14 jurisdictions (Alabama, Alaska, Arizona, Delaware, the District of Columbia, Hawaii, Louisiana, Michigan, North Carolina, North Dakota, Ohio, Oklahoma, Rhode Island, and Texas) reported that they simply did not record knowledge, in-vehicle, or vision test failure rates. Thirteen States (Georgia, Indiana, Kansas, Montana, New Jersey, New Mexico, Pennsylvania, South Carolina, South Dakota, Virginia, Washington, West Virginia, and Wyoming) did not respond to our request for licensing test failure rates.

Table 4. Driving Test Failure Rates

Jurisdiction	Knowledge Test Failure	In-Vehicle Test Failure	Vision Test Failure	Data Year
ARKANSAS[8]	46.6%	13.1%	-	2007
CALIFORNIA[8, 9]	42.7%	32.0%	-	2005
COLORADO[8]	31.8%	10.3%	-	2007
CONNECTICUT	30.0%	35.0%	< 5.0%	-
FLORIDA[8,10]	58.1%	28.6%	6.1%	2007
IDAHO[8]	-	4.0%	-	2004-2007
ILLINOIS[8]	8.2%	14.8%	0.1%	2007
IOWA[8]	-	22.2%	-	2002-2006
KENTUCKY	30.0%	30.0%	-	2007
MAINE	35.0%	40.0%	-	-
MARYLAND[8]	52.7%	26.5%	-	2007
MASSACHUSETTS	20.0%	20.0%	-	2007
MINNESOTA[8]	46.0%	33.0%	-	2007
MISSISSIPPI	60.0%	-	-	-
MISSOURI[8]	61.4%	28.4%	-	2007
NEBRASKA	50.0%	29.0%	-	2007
NEW HAMPSHIRE	25.0%	14.0%	-	2007-2008
NEW YORK[11]	22.5%	38.8%	-	2007
NEVADA[8]	41.6%	29.4%	-	2006
OREGON[8]	46.0%	18.0%	-	2007
TENNESSEE	50.0%	-	-	-
UTAH	-	33.0%	-	2001-2007
VERMONT[12]	30.0%	27.5%	-	-
WISCONSIN[8]	28.3%	28.5%	-	2007

The test results controlling for age were largely unavailable. California, Maryland, and Nevada failure rate data were restricted to provisional license applicants (under age 18 in CA and MD) or

[8] Data were based on licensing agency records, not estimations by administrators and examiners.

[9] Rates are based on a query of one day of data recorded in 2005.

[10] Knowledge test failure rate includes road rules tests only, excludes road sign tests (conducted separately in FL).

[11] Knowledge test failure rate is the mean of an estimated range.

[12] Knowledge test and in-vehicle test failure rates are the means of estimated ranges.

to applicants under 20 years of age (in NV). The remaining States provided data for all new applicants taking drivers tests.

Figure 1 above presents the data from Table 4 in graphic form, sorted by ascending knowledge test failure rates. Figure 2 below illustrates data by ascending in-vehicle test results. Knowledge test failure rates were not available from Idaho, Iowa, or Utah. In-vehicle test failure rates were not available from Mississippi or Tennessee. Missing test results for those five States are illustrated as 0 percent.

Figure 1. Driver License Test Failure Rates, Sorted by Knowledge Test Failure Rate

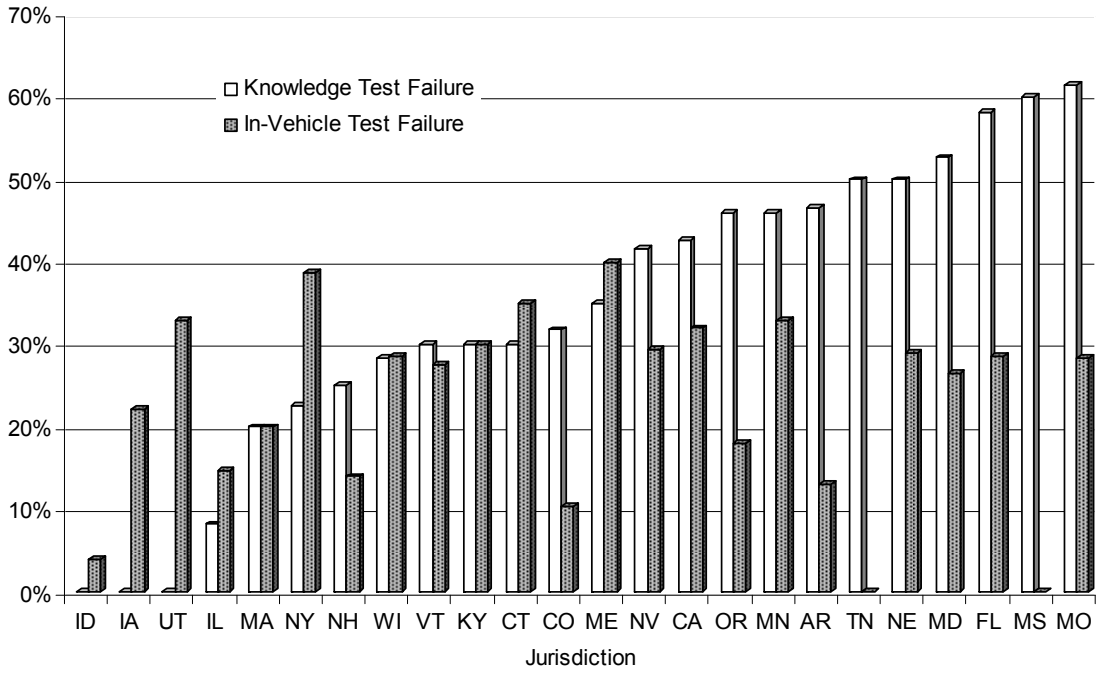
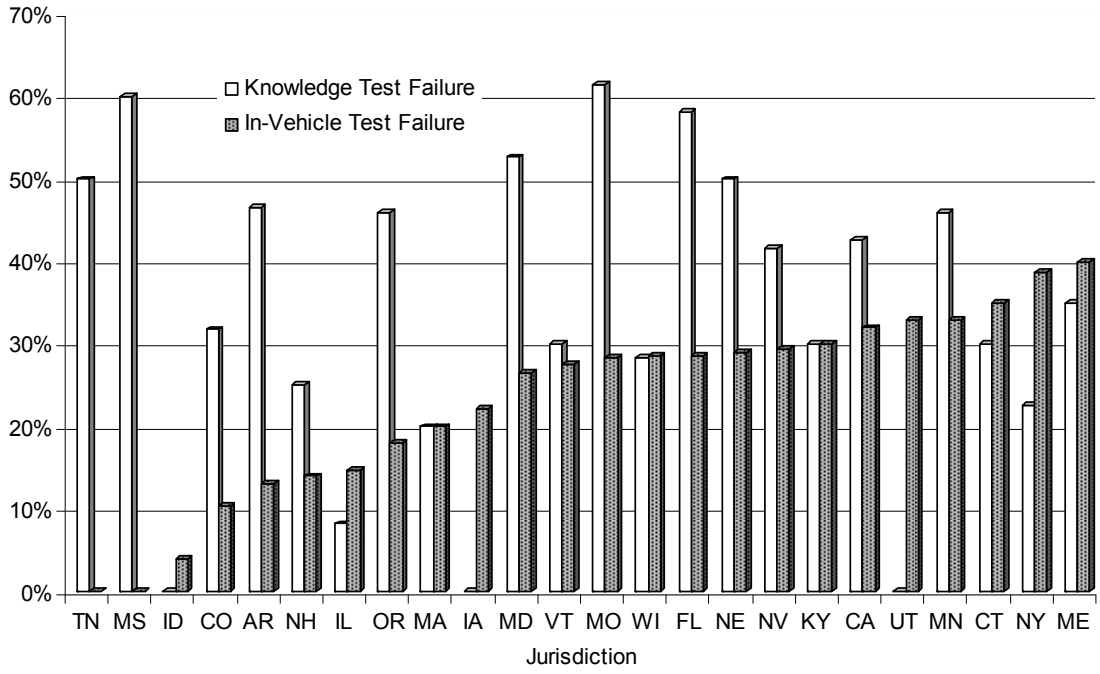


Figure 2. Driver License Test Failure Rates, Sorted by In-Vehicle Test Failure Rate



Our hypothesis is that higher failure rates are indicators of more stringent testing. Nine States (Minnesota, Oregon, Arkansas, Nebraska, Tennessee, Maryland, Florida, Mississippi, and Missouri) fall into the highest quartile of knowledge test toughness, all having over 46 percent of applicants fail. Only Illinois falls into the lowest quartile of 15.4 percent and under. Similarly, California, Minnesota, Utah, Connecticut, New York, and Maine represent the States with the most severe in-vehicle driving tests, with applicants failing over 30 percent of the time. Most States reported knowledge test failure rates that were higher than the in-vehicle test failure rates—the exceptions being Illinois, Wisconsin, Connecticut, New York, and Maine.

3. Licensing Requirements

Testing of novice drivers was the focus of this study. However, testing cannot be fully understood without a discussion of the full learning and licensing system of which testing is only one part. Novice drivers must learn to drive before they can take the test. Then, once licensed, most are subject to a range of restrictions covering their first one to two years of driving. This section describes this larger system in terms of when young people may begin to learn to drive through: (1) the Learners Permit; (2) Supervision/Education; and (3) Graduated Licensing Provisions.

3.1. Learners Permit

Age of entry into the learner/permit stage of licensing ranges from 14 to 16 years. Applicants in most States must take a knowledge test to enter this stage, though some do not do so until just prior to licensing. The permit phase lasts from 6 to 12 months, with the exception of a 10-day holding period in Wyoming. Following the completion of the learner stage, applicants may move into provisional driver licensing generally by age 16—ranging from age 14 years, 6 months in South Dakota to age 17 in New Jersey—with the successful completion of the in-vehicle test. Few States require the in-vehicle test prior to the permit stage. Virginia requires novice applicants under 18 to commence the driving stage at a licensing ceremony presided by their local juvenile or domestic court judge. Table 5 lists the permit and licensure ages for all 50 States.

Table 5. Permit and Licensure Ages

Jurisdiction	Minimum Age for Learner Permit (year, month)	Learner Permit Holding Period (months)	Minimum Age for Provisional License (year, month)
ALABAMA	15	6	16
ALASKA	14	6	16
ARIZONA	15, 6	6	16
ARKANSAS	14	6	16
CALIFORNIA	15, 6	6	16
COLORADO	15	12	16
CONNECTICUT	16	6 (4 with DE)	16, 4
DC	16	6	16, 6
DELAWARE	16	6	16, 6
FLORIDA	15	12	16
GEORGIA	15	12	16
HAWAII	15, 6	6	16
IDAHO	14, 6	6	15
ILLINOIS	15	9	16
INDIANA	15	2	16, 1
IOWA	14	6	16
KANSAS	14	6	16
KENTUCKY	16	6	16, 6
LOUISIANA	15	6	16

Jurisdiction	Minimum Age for Learner Permit (year, month)	Learner Permit Holding Period (months)	Minimum Age for Provisional License (year, month)
MAINE	15	6	16
MARYLAND	15, 9	6	16, 3
MASSACHUSETTS	16	6	16, 6
MICHIGAN	14, 9	6	16
MINNESOTA	15	6	16
MISSISSIPPI	15	6	15, 6
MISSOURI	15	6	16
MONTANA	14, 6	6	15
NEBRASKA	15	6	16
NEVADA	15, 6	6	16
NEW HAMPSHIRE	15, 6	0	16
NEW JERSEY	16	6	17
NEW MEXICO	15	6	15, 6
NEW YORK	16	up to 6	16, 6
NORTH CAROLINA	15	12	16
NORTH DAKOTA	14	6	16
OHIO	15, 6	6	16
OKLAHOMA	15, 6	6	16
OREGON	15	6	16
PENNSYLVANIA	16	6	16, 6
RHODE ISLAND	16	6	16, 6
SOUTH CAROLINA	15	6	15, 6
SOUTH DAKOTA	14	6 (3 with DE)	14, 6 (14, 3 with DE)
TENNESSEE	15	6	16
TEXAS	15	6	16
UTAH	15	6	16
VERMONT	15	12	16
VIRGINIA	15, 6	9	16, 3
WASHINGTON	15	6	16
WEST VIRGINIA	15	6	16
WISCONSIN	15, 6	6	16
WYOMING	15	10 days	16

3.2. Supervision/Education

Thirty-five States require driver education (DE), most on a 30:6 classroom to behind-the-wheel hourly ratio; five offer it as optional to the supervised driving (SD) requirement; and the remaining 11 do not require driver education. Certified supervised driving is required in tandem with or as an alternative to driver education in 42 States; nine States have no SD requirement. Four States do not meet the 30-hour supervised driving recommendation, 30 jurisdictions meet, and three surpass it. See Table 6 for a review of driver education and supervised driving requirements.

Table 6. Driver Education and Supervised Driving Requirements

Jurisdiction	Driver Education Required	Classroom: BTW: Observation Hours	Supervised Driving (SD) Required	Supervised Driving Hours, Total	Supervised Night Driving
ALABAMA	Optional	30:6 (0 with SD)	Optional	30 (0 with DE)	0
ALASKA[13]	N	0	Y	40	10
ARIZONA	Optional	30:6	Optional	30 (0 with DE)	10
ARKANSAS	N	0	N	0	0
CALIFORNIA	Y	30:6	Y	50	10
COLORADO	Y	30:6	Y	50	10
CONNECTICUT	Y	30:8	Y	20	0
DC	N	0	Y	40	10
DELAWARE	Y	30:7:7	Y	50	10
FLORIDA[14]	Y	4	Y	50	10
GEORGIA	Y	30:6	Y	40	6
HAWAII	Y	30:6	Y	0	0
IDAHO	Y	30:6:6	Y	50	10
ILLINOIS	Y	30:6	Y	50	10
INDIANA	N	0	N	0	0
IOWA	Y	30:6	Y	20	2
KANSAS	Y	30:6:12	Y	50	10
KENTUCKY	N	0	Y	60	10
LOUISIANA	Y	30:6	N	0	0
MAINE	Y	30:10	Y	35	5
MARYLAND	Y	30:6	Y	60	10
MASSACHUSETTS	Y	30:12:6	Y	40	0
MICHIGAN	Y	24:6:4 and 6:30	Y	50	10
MINNESOTA	Y	30	Y	30	10
MISSISSIPPI	N	0	N	0	0
MISSOURI	N	0	Y	40	10
MONTANA	Y	60:6	Y	50	10
NEBRASKA[14]	Optional	8	Optional	50 (0 with DE)	10
NEVADA	Y	30	Y	50	10
NEW HAMPSHIRE	Y	30:10:6	Y	20	0
NEW JERSEY	Y	30:6	N	0	0
NEW MEXICO	Y	30:7	Y	50	10
NEW YORK[14]	Optional	5	Optional	20	0
NORTH CAROLINA	Y	30:6	N	0	0
NORTH DAKOTA	Y	30:6	N	0	0
OHIO	Y	24:8	Y	50	10
OKLAHOMA	Y	30:6	Y	40	10
OREGON	Optional	30:6:6	Y	100 (50 with DE)	0

[13] Alaska requires 10 of 40 hours of supervised driving to be conducted during inclement weather, not necessarily darkness.

[14] Florida requires a Traffic Law & Substance Abuse Education Course, minimum of four hours. Nebraska and New York require a 5- to 8-hour driver safety course.

Jurisdiction	Driver Education Required	Classroom: BTW: Observation Hours	Supervised Driving (SD) Required	Supervised Driving Hours, Total	Supervised Night Driving
PENNSYLVANIA	N	30:6	Y	50	0
RHODE ISLAND	Y	33	Y	50	10
SOUTH CAROLINA	Y	30:6:6	Y	40	10
SOUTH DAKOTA	N	0	N	0	0
TENNESSEE	N	0	Y	50	10
TEXAS	Y	32:7:7	N	0	0
UTAH	Y	18	Y	40	10
VERMONT	Y	30:6:6	Y	40	10
VIRGINIA	Y	36:7:7	Y	40	10
WASHINGTON	Y	30:6:1	Y	50	10
WEST VIRGINIA	N	0	Optional	30 (0 with DE)	0
WISCONSIN	Y	30	Y	30	10
WYOMING	Y	30:6	Y	50	10

3.3. Graduated Driver Licensing Provisions

Using the NHTSA recommended GDL components and criteria, optimal graduated licensing provisions are the following:

Entry age into the learner stage (learner permit) – 16 years
Mandatory holding period of the learner permit – 6 months
Amount of supervised driving required – 30 to 50 hours
Age for intermediate stage or provisional license – 16 years, 5 months
Prohibition on unsupervised driving – 10 pm to 5 am
Passenger restrictions, excluding family – 1 teenager for first 12 months of Provisional Licensure; no more than two teenage passengers until age 18
Age at which night restriction expires – 18 years
Age at which passenger restriction expires – 18 years.

The Insurance Institute for Highway Safety (IIHS) rates young driver licensing provisions on a descending scale of Good, Fair, Marginal, or Poor (Table 7). According to IIHS, thirty-five jurisdictions received the grade of Good, 10 States were Fair, and 6 were Marginal as of August 2009 (IIHS, October 2009).

Table 7. State GDL Dates and Grades, IIHS 2009

Jurisdiction	Original GDL Dates	Latest GDL Update	GDL Grade
ALABAMA	10/1/2002	-	F
ALASKA	1/1/2005	-	G
ARIZONA	7/1/2008	-	F
ARKANSAS	7/1/2002	7/30/2009	G
CALIFORNIA	7/1/1998	1/1/2006	G
COLORADO	7/1/1999	7/1/2005	G
CONNECTICUT	10/1/2003	8/1/2008	G
DC	1/1/2001	-	G

Jurisdiction	Original GDL Dates	Latest GDL Update	GDL Grade
DELAWARE	7/1/1999	8/31/2006	G
FLORIDA	7/1/1996	10/1/2000	F
GEORGIA	7/1/1997	7/1/2006	G
HAWAII	1/9/2006	-	G
IDAHO	1/1/2001	5/29/2007	M
ILLINOIS	1/1/1998	1/1/2008	G
INDIANA	1/1/1999	7/1/2010	G
IOWA	1/1/1999	-	F
KANSAS	1/1/2010	-	G
KENTUCKY	10/1/1996	4/1/2007	G
LOUISIANA	1/1/1998	9/1/2004	F
MAINE	9/13/2003	-	G
MARYLAND	7/1/1999	10/1/2009	G
MASSACHUSETTS	11/4/1998	9/1/2007	G
MICHIGAN	4/1/1997	-	F
MINNESOTA	1/1/1999	8/1/2008	G
MISSISSIPPI	7/1/2000	7/1/2009	F
MISSOURI	1/1/2001	1/1/2007	G
MONTANA	7/1/2006	-	M
NEBRASKA	1/1/1999	1/1/2008	G
NEVADA	7/1/2001	10/1/2007	G
NEW HAMPSHIRE	1/1/1998	6/16/2009	F
NEW JERSEY	1/1/2001	5/1/2010	G
NEW MEXICO	1/1/2000	-	M
NEW YORK	9/1/2003	2/22/2010	G
NORTH CAROLINA	12/1/1997	12/1/2002	G
NORTH DAKOTA	NA	NA	M
OHIO	1/1/1999	4/6/2007	G
OKLAHOMA	8/15/2000	11/1/2009	G
OREGON	3/1/2000	-	G
PENNSYLVANIA	12/22/1999	-	G
RHODE ISLAND	1/1/1999	7/9/2005	G
SOUTH CAROLINA	7/1/1998	3/5/2002	M
SOUTH DAKOTA	1/1/1999	7/1/2004	M
TENNESSEE	7/1/2001	-	G
TEXAS	1/1/2002	9/1/2009	G
UTAH	7/1/2001	7/1/2004	G
VERMONT	7/1/2000	-	F
VIRGINIA	7/1/2001	7/1/2008	G
WASHINGTON	7/1/2001	-	G
WEST VIRGINIA	1/1/2001	7/10/2009	G
WISCONSIN	9/1/2000	-	G
WYOMING	9/16/2005	-	F

4. Rating States by Test Difficulty

4.1. Identifying States

Identifying States in terms of the difficulty of their driving tests proved challenging given the incompleteness of the information, unknown validity in some cases, and the lack of variation. A numerical scoring system was considered, giving equal weight to the various testing parameters, and that provided some guidance. In addition, two of the authors independently reviewed the available information, each choosing four States that seemed to have relatively difficult tests and four with relatively easy tests. Failure rates and length of tests were the key indicators considered. Agreement was reached on the following States.

- Relatively More Difficult Tests:
  - Connecticut, Minnesota, Rhode Island, and Tennessee.
- Relatively Less Difficult Tests:
  - Arkansas, Iowa, Kansas, and West Virginia.

To supplement information on testing that had been obtained from the States, surveys were conducted by DMVs with teens who had just taken their in-vehicle driving tests. Eight hundred and forty-four (844) surveys were successfully completed in all States (i.e., Connecticut, Minnesota, Rhode Island, Tennessee, Arkansas, Kansas, and West Virginia). In Iowa, many teens were unavailable for surveying, due to their being tested outside of state driver examination centers or obtaining drive test waivers via a minor's school license. Surveys in Connecticut were done at five DMV offices (Danbury, Wethersfield, Hamden, New Britain, and Bridgeport). In Rhode Island, four DMVs were included (Woonsocket, Wakefield. Middletown, and Pawtucket). In Kansas, four offices participated (Olathe, Mission, Topeka, and Wichita). In Minnesota there were three locations (Arden Hills, St. Cloud and Rochester); and two in Tennessee (Nashville and Memphis). In Arkansas, one office in Little Rock provided data. At each location, teens who had just taken their driving tests were approached and asked to participate. Cooperation rates were high, ranging from 89 to 95 percent.

Respondents were asked about their perceptions of test difficulty, how long they prepared for the tests, if there were any administrative hurdles in scheduling it, whether they failed the test the first time they took it, and their opinion regarding the adequacy of the tests in screening out those not ready to drive. Most respondents were 16 or 17 years old.

Selected survey results are presented in Table 8. The total number of respondents, indicated in Table 8, ranged from 57 in West Virginia to 280 in Connecticut.

There was some variation among States in test failure rates and how teens viewed the tests. Few thought the knowledge tests difficult. In four of the seven States, less than 10 percent chose this response. The only State that stood out was West Virginia, where 21 percent thought the test difficult. This corresponds with the test failure rate, which was highest in West Virginia at 57 percent, followed by Arkansas at 47 percent. About one quarter of the respondents in Kansas,

Minnesota, and Tennessee failed the knowledge test the first time they took it. In Connecticut, 10 percent failed, and only 4 percent failed in Rhode Island.

Table 8. DMV Survey Responses

Survey Item	AR (n=99)	CT (n=280)	KS (n=107)	MN (n=104)	RI (n=152)	TN (n=95)	WV (n=57)
Failed knowledge test	47%	10%	27%	27%	4%	27%	57%
Thought knowledge test difficult	11%	6%	4%	5%	5%	12%	21%
Failed road test	10%	18%	17%	34%	11%	19%	33%
Thought road test difficult	3%	10%	4%	16%	5%	12%	13%
Think tests indicate license readiness	92%	80%	83%	88%	78%	82%	84%

Few thought the on-road test was difficult. The only States where more than 10 percent thought so were Tennessee (12 percent), West Virginia (13 percent), and Minnesota (16 percent). In terms of the road test, the highest failure rates were in Minnesota (34 percent) and West Virginia (33 percent). In-vehicle test failure rates in the other States ranged from 10 to 19 percent.

In all States, more than three-quarters of teen respondents thought that the tests adequately measured preparedness to have a license to drive (range 78-92 percent).

4.2. Revised Rankings

Test failure is likely to be the best proxy for test difficulty. On that basis, Minnesota and West Virginia are the only two States that stand out. Minnesota had previously been ranked in the relatively difficult category; West Virginia had tentatively been ranked among the easy testing States. Minnesota had a failure rate of 34 percent on the in-vehicle test, and 27 percent on the knowledge test, although based on official records for 2007 the knowledge test failure rate was 46 percent (see Table 1), which gives them a high ranking. Official records for 2007 in Minnesota indicated that 33 percent failed the drive test, which almost matches the 34 percent failure rate based on the DMV survey. West Virginia did not supply failure rate information. However, in the DMV survey they ranked high on both knowledge test failure rate (57 percent) and in-vehicle test failure (33 percent).

It is important to note that test failure can reflect test difficulty or lack of preparation for the test, or both. Tests in Minnesota and West Virginia do not appear to differ in length or content from tests in other States. The drive test is 20 minutes in length in both States, which is average. The knowledge test in West Virginia has 25 questions of which 19 have to be answered correctly. Minnesota's knowledge test has 40 questions, which puts it in the top quartile in terms of length, and 32 correct answers are required. There is some evidence from the DMV surveys that teens in these two States may be less prepared for the test than their counterparts in other States. That

is, 96 percent of teens in Minnesota, and 86 percent in West Virginia, said they spent 10 or fewer hours practicing specific maneuvers for the driving test, whereas the range in other States for this amount of time was 75-82 percent. In terms of preparation for the knowledge test, West Virginia teens spent the least amount of time, 98 percent saying they spent 10 or fewer hours. The range in the other States was 84-93 percent. Minnesota had by far the highest percentage of teens spending zero hours preparing for the knowledge test, 26 percent compared with 4-12 percent in the other six States.

4.3. Crash Rates Analysis

Assuming that Minnesota and West Virginia have the most difficult tests, does this make a difference in their teen crash rates compared with other States? As noted earlier, the limited range and the relative weakness of testing protocols are a problem for the cross-sectional analysis between States with more difficult and less difficult testing. However, the minimal variation in testing protocols can nonetheless be analyzed to determine if it is associated with higher or lower teen crash rates. State crash rates are influenced by many factors, and it is necessary to control as best as possible for these other influences in comparisons of this type. One technique to control for State differences in crash rates is to reference teen crash rates in a State to an older age group in that State who are not directly influenced by licensing and testing policies. Another technique is to take into account other factors that may influence teen crash rates, and, as noted earlier, graduated licensing policies come into play here.

Testing policies are most likely to affect the youngest teens, so two groups were considered: 15-16 year-olds, and 15-17 year olds. Analyses were based on five years of data on driver involvements in fatal crashes, 2003-2007, drawn from the Fatality Analysis Reporting System. The older reference group was comprised of 25-59 year-olds. Driver fatal crash involvement rates per 100,000 population were computed, and the rates for teens were divided by the rate for the 25-59 group.

The rating scale for graduated licensing systems used by the Insurance Institute for Highway Safety was discussed earlier. The classifications of good, fair, marginal, and poor are based on point counts for the entire system, from entry to graduation. These are applicable to 15-17-year-olds. The points achievable for the learner period, which are applicable to 15-16-year-olds, were computed separately and will be displayed.

Table 9 shows the population-based rates for drivers in fatal crashes in the seven States. The substantial variation between States in crash rates reinforces the importance of controlling for these differences by using an older age group as a reference. Table 10 shows the crash ratios for the States, dividing the teen crash rates by the rate for 25-59 year-olds, and provides the graduated licensing scores.

Table 9. Drivers in Fatal Crashes per 100,000 Population

Age Category	AR	CT	KS	MN	RI	TN	WV
15-16 years	10.74	2.09	11.97	6.98	2.80	5.89	9.83
15-17 years	15.42	4.93	13.48	9.99	6.14	11.13	14.04
25-59 years	11.64	4.14	7.77	5.51	3.22	11.03	10.96

Table 10. Relative Rates for Teenage Drivers and GDL Ratings

State	GDL Learner Points	GDL Full Points	Age 15-16	Age 15-17
Arkansas	2	2 (Marginal)	0.92	1.32
Connecticut	2	6 (Good)	0.50	1.19
Kansas	1	2 (Marginal)	1.54	1.74
Minnesota	2	3 (Marginal)	1.27	1.81
Rhode Island	4	9 (Good)	0.87	1.90
Tennessee	3	8 (Good)	0.90	1.28
West Virginia	2	4 (Fair)	0.53	1.01

Inspection of Table 10 indicates that the data are basically uninformative as to the role of more difficult tests. West Virginia has among the lowest relative rates, but Minnesota was among the highest. Interestingly, the results are also ambiguous regarding the contribution of graduated licensing. For the three States rated "good," there was positive evidence for 15-16 year-olds. That is, the average relative risk for Connecticut, Rhode Island, and Tennessee was 0.76, compared with 1.06 for the other four States, all rated as "fair" or "marginal". However, for 15-17-year-olds, who should reflect the full effects of graduated licensing, the average relative risk was 1.46 in the good States and 1.47 in the others.

The bottom line is that there can be no assurance that the testing regimen in West Virginia has any connection with the superior crash record of teenagers in that State.

5. A Case Study

5.1. Connecticut

Connecticut has a graduated system rated as "good," but as in other States with this top rating, teenagers are still dying and officials are realizing that more is needed to deal with the young driver crash problem. Several high profile deaths of 16- and 17-year-olds in Connecticut led to Governor M. Jodi Rell appointing a task force in 2007 to assess and recommend new strategies for reducing crashes and injuries involving teenagers. The task force had broad representation from the fields of law enforcement, insurance, medicine, driver education and school administration as well as officials from the State departments of motor vehicles, public health, transportation, and public safety. Parents of teenagers who had been killed in crashes also participated.

In 2008 the task force issued its final report, including 20 recommendations for improving safety measures for teenage drivers. One of the measures involved enhanced driver testing in Connecticut, making it more comprehensive. This recommendation pertained to both the knowledge test and the in-vehicle test, although so far only the knowledge test has been changed. Prior to this change, Connecticut had the shortest knowledge test of any State, 16 questions, 12 of which had to be answered correctly to pass. In the DMV surveys, only 6 percent of Connecticut teens taking this test thought it was difficult, and only 10 percent failed it on the first try, a lower failure rate than in any of the States surveyed other than Rhode Island.

The new test consists of 25 questions, 20 of which have to be answered correctly. That is, 80 percent of the questions have to be answered correctly compared with 75 percent in the shorter test. The new test applies to teenagers who obtained a learner's permit after August 1, 2008. The DMV survey in Connecticut reported on in Table 8 was conducted in the fall of 2008, so with the minimum four-month learner stage, all getting licensed at that time would have entered the learner stage prior to August 1. To gauge the effect of the new testing requirement, a second sample was obtained in Connecticut at the same DMVs in February, 2009, at which point most or all would have gained their learner's permit subsequent to August 1 and be subject to the new rules.

Several other new provisions became effective August 1, 2008. One provision required learners to have at least 40 hours of behind-the-wheel driving before becoming licensed, increased from 20 hours. Teens obtaining their permit prior to August 1 were subject to the 20-hour rule; teens with permits after August 1 needed to have at least 40 hours of supervised driving. Thus the two surveys tapped the effects of this new provision as well.

Several other provisions went into effect on August 1, applicable to licensed drivers. All of these new rules apply to anyone getting a license after this date, so both DMV samples were subject to them. The new rules including the following:

- Reduction in the start of the nighttime restriction from midnight to 11 p.m.
- Doubling the time of the passenger restriction from 6 months to 12 months.

- Instituting a fine of $75 (increasing it from $15) for16-17-year-old drivers and each of their passengers for failure to use a seat belt.
- Instituting a 30-day suspension and a $125 license restoration fee plus court costs for use of a cell phone/text messaging.
- Instituting a 48-hour administrative license suspension and vehicle seizure for 16-and 17-year-olds who violate the night or passenger restrictions, or are racing or speeding 20 miles per hour or more above posted limits, driving recklessly, or driving under the influence of alcohol or other drugs.

Young novice drivers were asked questions about their awareness of these new laws. Since these and other laws introduced carry substantial penalties, teens were also asked about their expectations that police would enforce the laws vigorously.

5.2. Results of the New Knowledge Test

Teens who took the 16-question test prior to the August 1, 2008 license system changes and teens who took the revised 25-question test seven months after license system changes were asked about their estimations of test difficulty, how long they studied for the test, and whether or not they passed it on their first try.

Novice drivers were questioned at random just after taking their on-road test for licensure. Questions were presented regardless if the subject passed or failed their test. A total 547 teen drivers (ages 16 and 17) answered the questions; 264 prior to the license system changes and 283 after the changes. The majority of drivers answering questions were age 16 (59%) and male (57%).

Table 11 indicates that there was some increase in estimated test difficulty. A little more than two-thirds who took the shorter test thought it was easy, compared with 57 percent taking the longer test, and slightly more who took the longer test (6 vs. 10 percent) thought it was difficult. These were statistically significant differences.

Table 11. Ratings of Knowledge Test Difficulty in Connecticut

Test Difficulty	2008 Sample (N=257)	2009 Sample (N=277)
Easy	172 (67%)	157 (57%)
Neither easy nor difficult	70 (27%)	91 (33%)
Difficult	15 (6%)	29 (10%)

Chi square=7.36, $p < .05$

In terms of time spent preparing for the test, the 2008 group taking the shorter test actually said they spent more time (average of 4.6 hours) preparing for the test than teens taking the longer test (3.5 hours).

Test passage rates were high in both groups. Failure rates were slightly higher in the group that took the longer test (15 percent vs. 10 percent, chi square=4.04, p = .05).

5.3. Results of the New Practice Hours Requirement

The other change that could be studied was the increase in required practice hours as a learner from 20 hours prior to August 1, 2008 to 40 hours. The hours spent practice driving with parents basically did not differ in the two Connecticut samples, one subject to the 20-hour requirement, and the other under the 40-hour requirement. The average number of hours driven with parents in the 20-hour group was 32.7 compared with 33.1 in the 40-hour group. The total number of hours driven as a learner was nearly the same in each group (39.6 vs. 40.8).

Interestingly, 70 percent of teens subject to the 20-hour minimum said they drove at least this number of hours, and only 37 percent in the 40-hour group drove at least 40 hours.

5.4. Awareness of the New GDL Requirements

Table 12 indicates that, with two exceptions, there was substantial familiarity among teens about the new graduated licensing rules that would apply to them. In most cases, the 2009 sample had greater familiarity than the 2008 group, which would be expected because the new rules had been in effect for a longer period of time. More than 90 percent were aware of the existence of a new set of rules. And generally 80-90 percent in both samples knew the particulars involving the night and passenger rules and the penalties for drivers using cell phones or not using seat belts. Fewer knew that passengers were also subject to special fines for non-use of seat belts and that there was a provision for administrative license suspension and vehicle removal for violations of the night and passenger restrictions. Sixty-one percent in both samples knew about the passenger fine for non-use of belts. Fifty-nine percent in the 2008 sample and 69 percent in 2009 knew about the administrative license and vehicle removal provisions, so there is the possibility that recognition of this aspect of the new law was increasing over time.

Table 12. Know about GDL Rules

Respondents Know About:	2008 Sample Percent	2009 Sample Percent
New rules existence	94	96
Night restriction	88	92
11 p.m. start time	82	87
Passenger limits	87	92
Zero passengers allowed	88	92
Seat belt fine for drivers	83	85
Seat belt fine for passengers	62	60
Cell phone penalties	90	92
Car and license seizure	61	69

5.5. Perceived Enforcement Likelihood

The new GDL rules feature some strong penalties. Tables 13-15 indicate the extent to which surveyed teens thought the police would enforce these penalties. Opinion was decidedly mixed. More thought enforcement was likely than not likely if there were violations, but perceptions of enforcement ranged from very likely to very unlikely. There were no strong trends in the data, although in the 2009 sample there were small declines in the percentages thinking that violations and penalties for night and passenger violations were very likely to result in stops or penalties. As experience with the laws increases, perceptions about law enforcement will presumably shift toward prevailing police practices, exhibiting less variation.

Table 13. Perceived Likelihood of Being Stopped and Cited by Police for Cell Phone Violations

Likelihood of Stop	2008 Sample Percent (N=259)	2009 Sample Percent (N=280)
Very likely	17	21
Likely	27	30
Somewhat likely	33	31
Unlikely	18	13
Very unlikely	5	5

Table 14. Perceived Likelihood of Being Stopped by Police if Violating Night or Passenger Restriction

Likelihood of Stop	2008 Sample Percent (N=259)	2009 Sample Percent (N=279)
Very likely	17	12
Likely	28	26
Somewhat likely	38	39
Unlikely	14	20
Very unlikely	4	3

Table 15. If Stopped for Night or Passenger Violation, Perceived Likelihood Police Would Take your License/ Seize your Vehicle

Likelihood of Stop	2008 Sample Percent (N=258)	2009 Sample Percent (N=279)
Very likely	31	22
Likely	30	33
Somewhat likely	26	28
Unlikely	10	15
Very unlikely	2	3

5.6. Summary - Driver Test Changes in the United States

There have been few upgrades in U.S. driving tests, even though licensing system requirements have changed dramatically, and overall the tests remain relatively weak. The one major change in testing, the upgrade of the California driving test, occurred prior to the graduated licensing movement.

The only change in testing regimens subsequent to graduated licensing has been an increase in the length of Connecticut's written test. The majority of applicants who took the longer test thought it was easy; however, they were fewer in number than the individuals who took the shorter test and thought it was easy. Even so, those taking the longer test said they studied less for it than those who took the shorter test. Failure rates were low for both tests, but slightly higher for the longer test, 15 percent vs. 10 percent. Overall the change appears to have had only a small effect.

The other State that has discussed changing driver testing requirements is New Jersey, and a bill has been passed in 2009 to lengthen and alter the content of the knowledge test. Like Connecticut, New Jersey formed a study commission to look at ways to further reduce the young driver crash problem, and one of the recommendations was to "enhance the road test to more accurately assess driver skill and safety" (New Jersey Teen Driver Study Commission, 2008). The study commission report noted that New Jersey's test had not been changed in more than 50 years and questioned its validity in today's driving environment. This recommendation is on hold pending completion of a project being done by the American Association of Motor Vehicle Administrators (AAMVA), under contract with the National Highway Traffic Safety Administration. This project, due for completion in late 2009, is intended to develop a non-commercial model testing protocol that, if adopted by States, will result in standardization in the skill elements tested. The project will include the development of a model driver manual and knowledge test, as well as on-road testing procedures, based on best practices assessment. The new protocols will not necessarily lengthen current tests or make them more difficult, but are aimed at increasing uniformity in testing across States.

The AAMVA project can be expected to result in changes in testing done by New Jersey and other States. However, in other countries, there have been many changes in tests in recent years as graduated licensing systems have been introduced, and tests are in general more difficult than in the United States. In the next section, testing regimens in other countries are described, and the question of whether tests in other countries are models for the United States is considered.

6. Driving Tests in Europe, New Zealand, Australia and Canada

Several other countries use knowledge and in-vehicle tests to assess driver license applicants, but there is great variability in the types of tests used and in testing procedures. Many of the tests have been in use for decades, but there have been new developments, most notably hazard perception testing, and tests designed to coordinate with graduated licensing systems.

Hazard perception testing is in response to the long-recognized fact that young novices are poor at detecting, assessing, and responding to hazards, thought to be critical skills in avoiding crashes.

6.1. Europe

In general, tests in 28 European countries are longer and more difficult than those in the United States. Minimum requirements for tests are laid down in the 2nd European Driving License Directive, updated by Commission Directive 2000/56. For example, there is a minimum length of on-road time for the driving test of 25 minutes, which many countries exceed. Driving in real traffic is required in all countries, though some also make use of a special testing ground. In many cases, the examiner has a choice of routes, but in some countries fixed routes are used.

Table 16 summarizes requirements for knowledge tests in 28 European countries; Table 17 indicates key features of driving test requirements (Bonninger et al., 2005).

There is usually some wait time for scheduling a knowledge test, a matter of a few days, or 1-2 weeks, but rarely longer. The number of questions varies from as few as 18 in Poland to as many as 120 in Turkey. In most cases, 80-90 percent of the questions need to be answered correctly in order to pass (not shown in table). Failure rates, known for 19 of the 28 countries, vary from 17 percent in Estonia to 70 percent in Spain, but are usually in the 20-40 percent range.

For driving tests, there are also generally waiting times to schedule, usually 1-4 weeks. On-road driving times vary, and in a few cases are less than the 25-minute European Directive requirement. Most countries, however, exceed 25 minutes, and Switzerland has a 50-minute test; Norway, 55 minutes. Test failure rates vary markedly, from 6 percent in Austria to 57 percent in Great Britain. For the 20 countries with known failure rates, in 13 (65 percent), one-third or more fail the test.

Table 16. European Knowledge Tests

Country	Wait time	# Questions	Failure rate (%)
Austria	1 wk	60	25
Belgium	none	40	35
Croatia	1-2 wks	38	47
Czech	2 wks	25	30
Denmark	2-4 wks	25	-
Estonia	1-2 wks	30	17
Finland	1 wk	60	20
France	4 wks	40	35
Germany	2 wks	30	29
Great Britain	2 wks	50	38
Greece	2-3 days	30	-
Hungary	2 wks	55	40
Ireland	2-8 wks	40	-
Latvia	2-3 days	30	22
Lithuania	3-4 days	30	22
Luxembourg	1 wk	20	46
Monaco	1 wk	40	55
Netherlands	1 wk	50	-
N Ireland	2 wks	35	-
Norway	none	45	-
Poland	up to 4 wks	18	20
Portugal	2 wks	30	40
Russia	-	20	-
Slovakia	4-30 days	27	-
Spain	10 days	40	70
Sweden	2-3 wks	70	40
Switzerland	1-5 days	50	25
Turkey	none	120	-

6.1.1. New Testing Requirements in Europe

High test failure rates can result from lack of preparedness as well as test difficulty. Great Britain, however, which has the highest failure rate for the in-vehicle driving test, has a notoriously difficult test (Calian and Stecklow, 2002). Interestingly, this country has been a leader in upgrading test requirements and is now considering further changes. In 1999, the test was redesigned, adding about 7 minutes of drive time (Mayhew et al., 2001). Subsequently, a hazard perception test was added, which is taken a few minutes after completing the knowledge test. The applicant is shown 14 one-minute clips of a road traffic journey on a computer screen and is required to click the mouse as soon as a potential hazard is spotted. The faster the hazard is recognized, the more points are awarded.

In 2007, Great Britain increased the number of questions on their knowledge test from 35 to 50, and new driving test requirements are currently under consideration because of concern with the continuing high rate of novice driver crashes once licensed. In the consultation document (UK

Dept for Transport, 2007), it is pointed out that the current test focuses on vehicle control, whereas research shows how important attitude and understanding of risk and interaction with other road users are, which should somehow be reflected in the test. (UK Dept for Transport, 2007).

Table 17. European Driving Tests

Country	Wait time	# Questions	Failure rate (%)
Austria	-	25	6
Belgium	2 wks	at least 25	-
Croatia	up to 3 wks	30	45
Czech	2 wks	30	35
Denmark	2-6 wks	25	-
Estonia	1-2 wks	45	33
Finland	1 wk	30	20
France	6-8 wks	25	45
Germany	2 wks	at least 25	28
Great Britain	6 wks	38-40	57
Greece	3-7 wks	at least 25	-
Hungary	1-3 wks	40	40
Ireland	30 days	at least 25	52
Latvia	3-5 days	at least 25	38
Lithuania	1 wks	at least 25	39
Luxembourg	4 wks	30	50
Monaco	1 day min.	25	44
Netherlands	3 wks	35	54
N Ireland	4-11 wks	35-40	-
Norway	2 wks	55	-
Poland	up to 4 wks	25	30
Portugal	2 wks	at least 20	20
Russia	-	at least 20	-
Slovakia	1-4 wks	15-20	-
Spain	1-2 wks	20	49
Sweden	3 wks	35	30
Switzerland	1-3 wks	50	-
Turkey	none	-	24

In 2008, the Netherlands introduced a new test that is quite different from standard tests (Vissers & Reitman, 2007). The core element is an independent driving task, in which the novice is asked to drive to a specific location (e.g., railway station, school), finding their way and making driving decisions in the process. Along the way, they are asked to make specific driving maneuvers, such as turning, parking, and stopping. At some point along the route, they are asked to verbalize what they see as the risks, predictions about what will happen, and how they intend to handle them. A final component consists of their being asked to reflect about their driving behavior, and their strengths and weaknesses.

6.2. New Zealand

New Zealand introduced a graduated licensing system in 1987. In 1999, licensing rules were revised. A learner license, available at age 15, must be held for six months. There is then a restricted license period with night and passenger restrictions. The restricted period lasts 18 months for new drivers up to age 25, or 12 months if an approved driver education course is taken. For drivers age 25 and older, the restricted period lasts six months, 3 with driver education.

With the introduction of the 1999 graduated licensing rules, an advanced exit test was introduced to assess whether or not drivers should be allowed to graduate from the restricted phase and obtain a full license. Such a test did not exist in the 1987 version of graduated licensing, and there was concern that graduation was time-based only, with drivers not having to show any improvement in driving behavior prior to full license status. There was also interest in using hazard perception testing to assess fitness to drive.

The exit test (known as the Full License Test) is a three-phase on-road test. In the first phase, basic driving skills are assessed. In the second phase, applicants are required to identify hazards in urban areas and verbalize these to the examiner after they have been negotiated. In the third phase, applicants are asked to identify prospective hazards in higher speed zones (highways, freeways) and to verbalize these to the examiner and say what actions they are taking to address them. Test completion takes about 55 minutes; about 30 percent of applicants fail the test.

The Full License Test is 2-3 times longer than the basic road test that must be passed to pass from the learner to the restricted license phase. The test currently in use was introduced in 2006, replacing an earlier test developed in the United States. The test includes about 20 minutes of actual driving, both in low-speed and high-speed environments. As of mid-2009 this basic test and all other testing requirements are under review and may undergo change. The plan is to have a discussion document for public consultation later in 2009 with resulting legislation to be considered in 2010 (M Woodside, personal communication, 2009).

6.3. Australia

6.3.1. New South Wales

New South Wales originally introduced a graduated licensing scheme in the 1960s, and has since modified licensing rules several times. In 2000, a system was introduced with four phases: learner (six months), provisional P1 (one year), provisional P2 (two years) and full license. The provisional phases had various restrictions, e.g., top speed limitations, low BAC limits (now zero BAC as of 2004). To move from the learner phase to P1 status, a basic on-road driving test had to be passed. To progress from P1 to P2, it was necessary to pass a touch-screen computer-based hazard perception test. Progression from P2 to full license (the exit test) was contingent on passing a computer-based driver qualification test, assessing advanced hazard perception scenarios, and knowledge of road rules and safe driving practices.

In 2007, the New South Wales graduated licensing system was revised. The learner stage was increased from 6 months to 12, and the number of required driving hours is 120, up from 50, including 20 at night. The P1 and P2 provisional stages remain at one year and two years, respectively. There is a nighttime peer passenger restriction for provisional P1 drivers, and restrictions on both hand-held and hands-free cell phones for learner and provisional P1 drivers and passengers.

With the introduction of the 2007 rules, the initial on–road driving test to move from learner to the P1 stage was substantially revised. The new test is about double the length of the previous version, featuring extensive assessments over 25 individual roadway segments. The emphasis has been changed from vehicle maneuvering skills to checks of driver behaviors associated with the avoidance of common crash scenarios involving novice drivers.

6.3.2. Victoria

Victoria adopted new graduated licensing rules in 2008, a learner stage of at least 12 months, available at age 16, a P1 phase of at least one year including cell phone restrictions and a passenger restriction (no more than one passenger ages 16-21), and a three-year P2 stage.

An automated touch-screen based hazard perception test is in use in Victoria. It was developed as an exit test, for advancement from the probationary to full license stage, but is used instead to assess whether learners can advance to the probationary license stage. Test items were based on an analysis of novice driver crashes where hazard perception may have played a role, for example, crashes involving a novice driver rear-ending a vehicle slowing to make a left turn.

The hazard perception test is used in conjunction with a basic on-road test, as a condition of progressing from learner to P1. The on-road test has now been changed, effective July 1, 2008. The impetus for the change was a new requirement that learners accumulate 120 hours of supervised practice. The intention was to develop a test that would discriminate between drivers with and without 120 hours of practice, whereas the prior test was developed when most learners would have less than 20 hours of supervised driving experience. Accordingly, the new test requires candidates to demonstrate driving skills and competency under more challenging traffic situations.

The new test was developed by VicRoads over a period of about 12 months with assistance from a panel of road safety and test development experts from around the world. The test takes about 30 minutes of on-road driving time to complete, and involves two stages: an assessment of basic car control skills in 50-60 km/h speed zones, and an assessment in more challenging traffic situations, conducted primarily in 60-80 km/h speed zones. The new test will complement the existing screen-based hazard perception test.

In other Australian States that have introduced graduated licensing, there are multiple testing requirements, though not “exit” tests per se.

6.3.3. Western Australia

A learner license can be obtained at age 16, and after a minimum period of six months a road test is available. Passing the test permits entry into a second learner stage allowing driving under supervision only. This stage has a six month minimum and requires at least 25 hours of supervised driving. Drivers then must pass a computerized hazard perception test to be granted a license that allows unsupervised driving, although there is a midnight-5 am driving restriction in place for six months.

6.3.4. Queensland

A learner license is available at age 16, and must be held for at least one year, with 100 hours of driving experience obtained. Passing a road test at that point leads to a P1 license, with a restriction on carrying more than one passenger under age 21 from 11pm to 5am. The P1 license must be held for at least one year, at which point a computerized hazard perception test must be passed to move to a P2 license. The P2 license does not have a passenger restriction, but has other restrictions such as a cell phone ban and a ban on high-powered vehicle use. A full license becomes available at age 25.

6.3.5. South Australia

A learner license, available at age 16, must be held at least six months, with at least 50 hours of supervised driving accumulated. At that point, a road test can be taken, or a competency-based training course. This involves driving with an accredited instructor; there is no road test, but rather short on-road assessments conducted by the instructor. This leads to a P1 phase, which lasts a minimum of one year. Successfully completing a computerized hazard perception test then leads to P2 license, which lasts for at least six months. The P1 and P2 licenses both have restrictions, such as a zero BAC limit and top speed limitations; the P1 license has some additional rules, for example having to display a P plate, signifying license status.

6.4. Canada

6.4.1. Ontario

Ontario was the first North American jurisdiction to introduce graduated licensing, in 2004, and they introduced an advanced on-road “exit” test at that time. In the early years of graduated licensing, there was concern that teenagers might curtail their driving while in the system out of concern that they would incur a violation that would keep them from advancing. Thus, they would graduate from the restricted phase after the time period was up without having obtained sufficient driving experience in the protective learning environment. An exit test that was more demanding than the initial basic road test was introduced to deal with this situation. The test was expected to screen out those who had not acquired essential safety skills, and in performing this function, there was expectation that teens would be motivated to practice so as to improve their proficiency and enable them to pass the test and graduate.

The Ontario test was adopted from the Commercial Driving License test for trucks and buses (Townsend et al., 1993). It is based on specific driving maneuvers (e.g., parallel parks, left, right, and three-point turns) performed in residential, commercial, and expressway settings, the examiner observing lane deviations, hazard observation, and traffic monitoring during the session. Field trials indicated that the test was significantly more challenging than the first level basic on-road test.

6.4.2. British Columbia

Subsequently, British Columbia adopted graduated licensing, and included an exit test that was intended to act as an incentive for new drivers to learn and practice skills throughout the licensing period. The idea was to "raise the bar," not allowing full licensure until new drivers were able to demonstrate a high level of proficiency under various driving conditions.

In the British Columbia test, drivers are tested on vehicle maneuvers in residential and commercial areas, and on high-speed roads, similar to the Ontario test. In addition, new drivers are also tested on hazard perception, their ability to "read" the area around them for potential dangers. Hazard perception is tested by the examiner asking the new driver at certain points to name the hazards that are immediately beside, one block ahead, and behind their vehicle, saying a few words to describe what they see. The advanced test takes about one hour to complete: 5 minutes of introduction, 45 minutes on the road, and 10 minutes of debriefing.

Development of the advanced test in British Columbia prompted a redesign of the basic on-road test that must be passed to enter the restricted stage. The test contains similar maneuvers as the exit test and also assesses hazard perception, but while the vehicle is stationary, not moving as in the advanced test.

6.4.3. Alberta

An advanced exit test is also part of Alberta's graduated licensing program. The complete test takes one hour, of which 40-50 minutes is actual driving time. It is substantially more difficult than the 25-30 minute basic test. The advanced test includes some different driving maneuvers and is performed over a more comprehensive range of traffic conditions. New drivers must also demonstrate proficiency in hazard perception. On two occasions along the test route, one in light traffic, the other in heavier traffic, the examiner asks the driver to talk about things or situations in the vicinity that could create a hazard and may require preventive or evasive action. Hazards can be fixed, e.g., blind curves, or variable, e.g., turning vehicles ahead, pedestrians approaching roadway.

6.5. Discussion

Worldwide, driving tests have generally more stringent requirements (e.g., more supervised driving, multiple stage testing, lengthier tests) than in the United States. And, in other countries with graduated licensing systems, there has been a trend to upgrade tests and to introduce multiple tests: revised tests for advancing from learner permit to initial license, tests that allow progression from one licensing stage to another, and exit tests that must be passed to graduate to full driving privileges. This trend has not been in evidence in the United States.

Although there has been considerable activity in driving test development and implementation in other countries, with tests varying substantially from country to country, it should be noted that the contribution of these tests is not well established. For some, information on their test-retest reliability, and validity, in terms of distinguishing novices from experienced drivers, is unknown. Many of the tests are new, and most have not been evaluated, so little is known about their safety value, the extent to which their introduction has improved safety overall, and their predictive validity in distinguishing between novices more or less likely to be in crashes. This goes for both road tests and computer-based hazard perception tests (Mayhew et al., 2001; Siegrist, 1999; OECD, 2006). An early evaluation of Victoria's initial hazard perception test indicated that novices with low scores had higher crash involvement than novices with average or high scores, but the test had very low psychometric properties. (Congdon, 1999) The test was revised based on these findings, but no evaluation has been published. Palamara and Adams (2005) reviewed the effects of hazard perception testing in Australia and concluded that there was no evidence that its introduction anywhere in Australia had an impact on the crash and injury rates of young drivers.

Thus despite the logic of these tests, dovetailing with the stages of graduated licensing, their contribution is as yet undetermined. This contribution could come through knowledge or ability gains in preparing for the tests, or from delay in licensure resulting from extra preparation time and test failure. Whatever the case, these new developments present several models for the United States to consider, pending future evaluation results.

7. Summary and Conclusions

Driving tests in the United States were investigated in this study. Available information on the parameters of knowledge and in-vehicle tests was obtained from State officials and public sources. The intention was to classify tests by quality and difficulty, and to compare teen crash rates in States with the most difficult tests and States with the easiest tests. This proved difficult, largely because there turned out to be little variation across States in test difficulty. A few candidate States were selected as appearing to be relatively more or less difficult, and surveys of teens who had just taken their driving test were conducted by DMVs in these seven States to augment the often limited information available from State sources. On the basis of this information, the selection of States with more or less difficult tests was revised. There were few apparent differences in test difficulty, on-road test length, time spent preparing for the test, or relative crash risk based on test difficulty.

Another goal of the study was to investigate States that had made recent changes in testing requirements. Again, this proved difficult in that only one State-Connecticut—could be identified that had changed their tests in recent years, and the change was quite trivial: an increase in the number of test questions from 16 to 25, and a minimal increase in passing criteria from 75 percent to 80 percent. Surveys undertaken in Connecticut before and after this change indicated that the longer test was judged to be somewhat more difficult than the shorter one, and marginally fewer passed the longer test, but time spent studying for the longer test was actually less than in the case of the shorter test. It appears unlikely that merely lengthening the test will have any measurable impact on preparedness for licensure.

Connecticut made other changes in licensing polices along with lengthening the knowledge test, and it is important to see how the entire package of policies may make a difference. Most of the changes are too new to be able to measure their effects, but the surveys indicated that most teens affected by the policies were aware of them. There were two exceptions. Teens were least aware that there are special penalties for passengers in the vehicles of teen drivers who are under graduated licensing rules, and many were not aware that police have the authority to confiscate license and vehicle for certain violations.

The new rules carry strong penalty provisions, and compliance will be based partly on how well police enforce the rules and how teens perceive the likelihood of police enforcement. Teen opinion about police enforcement was mixed, although more were apt to think that enforcement was likely rather than unlikely if violations occurred.

Other than the testing change, the only other licensing change that could be evaluated was the increase in required hours of practice driving from 20 to 40. This change did not significantly increase the number of reported hours practicing with parents, or the total number of hours of supervised practice. And, more than half did not reach the 40-hour criterion. Passing new laws is important, but policies to encourage compliance need to accompany law changes.

There may be future changes in testing protocols in the United States, inspired by the AAMVA's project developing recommended uniform testing requirements. However, the experience of other countries should be examined as well. Other countries in general have more stringent tests, and the other graduated licensing countries—Australia, Canada, and New Zealand—have made changes in their testing, taking into account the new licensing requirements. These include new tests to move from learner to the restricted phase, and tests to advance further in the graduated licensing system or to exit to full licensure. New tests are a logical accompaniment to graduated systems, but they have not been a part of the graduated licensing movement in the United States. Thus there are models for US States to consider, although the extent to which these new tests alter the young driver problem—either through improved driver performance or license delay—has not been established.

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DOT HS 811 440
February 2011

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