



What we know, what we don't know, and what we need to know about graduated driver licensing

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Abstract

On November 5–7, 2002, the Symposium on Graduated Driver Licensing in Chatham, MA, brought together 75 researchers and practitioners from the United States, Canada, Australia, and New Zealand to document the current science of graduated driver licensing (GDL) and to outline research needs. Participants reviewed 12 background papers and discussed the papers in depth. The symposium's background papers are published in this issue of the *Journal of Safety Research*.

This paper summarizes and provides a quick reference to information from the symposium papers and participant discussions. It cites the 12 symposium papers, which in turn provide more information and cite original sources. Issues and recommendations not followed by a citation were raised in the symposium discussions.

This paper is divided into seven sections. The first six sections summarize information from the symposium papers and discussions. The sections are: (1) The need for graduated driver licensing; (2) Effectiveness of GDL as implemented; (3) The learner's permit phase; (4) The provisional license phase; (5) The roles of teens, parents, and public agencies; and (6) Enacting and implementing GDL. In each of these six sections, research needs are classified as either *high priority* (important for designing and implementing effective GDL programs) or *lower priority* (useful but not critical for GDL at this time).

The final section summarizes the discussion of research issues and priorities from the symposium's closing session. This section has three topics: general research, issues involving parents, and issues involving graduated licensing legislation and implementation. It presents participants' collective views on both broad priorities and specific issues.

In providing a concise summary of presentations and discussions from the symposium, this paper necessarily omits some information and points of discussion. The views and judgments expressed are the authors' best attempt to capture the symposium's consensus, but they do not necessarily represent the views of the authors, their organizations, or any other individual symposium participant. In particular, they are not necessarily endorsed by the symposium's sponsors: General Motors, the National Highway Traffic Safety Administration, the National Safety Council, and Nationwide.

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1. The need for graduated driver licensing

Motor-vehicle crashes are the leading cause of death and injury among teenagers. As beginning drivers, teenagers lack driving skills and also lack experience in recognizing risky situations. They also are more willing than adults to take risks behind the wheel, such as speeding and not buckling up. This combination of immaturity, inexperience, and risk-taking behavior produces high crash risks for teenage drivers. Graduated driver licensing (GDL) addresses these factors

by phasing in on-road driving, allowing beginners to get their initial driving experience under lower-risk conditions.

GDL is a three-phase licensing system for beginning drivers consisting of a learner's permit, a provisional license, and a full license. The essential features of GDL are that a learner's permit allows driving only while supervised by a fully licensed person, a provisional license allows unsupervised driving under certain restrictions, and both the learner's permit and the provisional license must be held for a specified minimum period of time. [IIHS and TIRF \(2002\)](#) describes GDL, discusses key provisions, and summarizes beginning driver requirements in all states and provinces in the United States and Canada. [NCUTLO \(2002\)](#) provides a model GDL law.

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1.1. Teenage crash risk is high

- *Teenage drivers have the highest crash risk.*
Crash rates per mile of travel, per licensed driver, and per population all are higher for teenage drivers than for any other age group. Fatal crash rates per licensed driver and per population also are higher. Teenage fatal crash rates per mile of travel are higher than those of all other ages except the very elderly (Williams, 2003).
- *Teenage driver risk perception is worse and risky driving behavior is more frequent than for older drivers.*
Compared to older drivers, teenagers are less able to assess driving hazards, drive in a more risky fashion, and think that their crash risk is lower (Ferguson, 2003). Teenage drivers have higher crash risks because of their immaturity and inexperience with driving (Mayhew, 2003; Simons-Morton & Hartos, 2003).
- *Teenage driver crash risk is greatest in the first few months after full licensure.*
The highest crash rate occurs in the first month after licensure. The rate drops quickly for the first few months of licensure and then drops more slowly (Mayhew, 2003; Preusser & Leaf, 2003; Williams, 2003). Crash risk is low for teenage drivers with a learner's permit (Mayhew, 2003; Williams, 2003).
- *Teenage driver crash risk is greatest at night.*
Late night driving increases the risk of fatal crashes per mile of travel for teenage drivers (Lin & Fearn, 2003; Simons-Morton & Hartos, 2003; Williams, 2003). The risk of nonfatal crashes, on the other hand, is only slightly higher at night than during the day. Since teenagers drive many more miles during the day than at night, most fatal crashes occur during the day, even though the risk per mile is higher at night. The hours of 9 p.m. to midnight have both high fatal crash risk and high miles of teenage driving (Williams, 2003).
- *Teenage driver crash risk is higher with other teenage passengers in the car.*
Passengers, especially teenage passengers, increase crash rates substantially for 16- to 17-year-old drivers, and the risk increases as the number of passengers increases (Lin & Fearn, 2003; Williams, 2003). The highest risk situation appears to be male passengers with either male or female drivers. The limited current research suggests that teenage passengers may increase driver distractions and risk taking (Williams, 2003).

1.2. Teenage driver crash risk may be higher in circumstances not typically addressed by GDL

- *Alcohol.*
Teenage drinking drivers have a higher crash risk than older drinking drivers. Because teenagers in all

states are prohibited from buying alcohol by minimum-drinking-age-21 laws and from driving after drinking by zero tolerance [blood alcohol concentration (BAC) ≤ 0.02] laws, GDL laws in the United States typically do not address drinking and driving. Canadian GDL laws include a zero BAC restriction. The number of teenage drinking drivers in fatal crashes has decreased substantially over the past 20 years (Williams, 2003).

- *Safety belt use.*
Teenagers wear safety belts less frequently than older drivers (Ferguson, 2003). All states except New Hampshire require all drivers to wear safety belts, and no United States GDL law except North Carolina's addresses belt use.
- *Vehicle choice.*
A few studies suggest that teenagers drive older and smaller vehicles than do older drivers (Ferguson, 2003).
- *Fatigue.*
Many teenagers do not get enough sleep, but there is no evidence of the effects of fatigue on teenage crashes (Ferguson, 2003).
- *In-vehicle distractions.*
While there is growing evidence that cell phone use increases crash risk, there is no information specific to teenage drivers. The effects of other distractions such as radios and CD players are also unknown (Ferguson, 2003).
- *High-speed roads.*
Some jurisdictions restrict beginning drivers to lower-speed roads, or to lower-powered vehicles, but there is little evidence of effectiveness (Ferguson, 2003). No state in the United States includes such restrictions in its GDL requirements. Ontario restricts learner's permit drivers from driving on freeways and urban expressways.

1.3. Other methods have not been successful in reducing teenage driver crash risk

- *Driver education.*
In its current form, driver education does not reduce teenage driver crashes (Ferguson, 2003; Mayhew, 2003; Waller, 2003).
- *Probationary licenses.*
A probationary license for beginning drivers differs from a full license only by allowing the license to be suspended, or other actions taken, for less cause than for regularly licensed drivers. The few evaluations do not show substantial benefits (Simpson, 2003).

1.4. High-priority research needs

No additional research is needed to justify the need for GDL.

1.5. *Lower-priority research needs:* Research in several areas could add to existing knowledge of teenage driving, which in turn may make GDL programs more effective

- Study the situations in which passengers increase crash risk, the reasons for the increased risk, and methods to reduce this risk (Williams, 2003).
- Study the role of fatigue in teenage crashes (Ferguson, 2003).
- Study the effects of specific in-vehicle distractions such as cell phones and the potential effects of cell phone laws or cell phone GDL restrictions (Ferguson, 2003).
- Study the effects of the North Carolina safety belt GDL provision.
- Study the potential effects of parental education on teenage drivers' vehicle choice.

2. Effectiveness of GDL as implemented

Many GDL programs in the United States and abroad have been evaluated and all evaluations show positive results. Some evaluations also provide information on why and how GDL works.

2.1. Evaluations consistently show that GDL reduces teen driver crashes

Shope and Molnar (2003) summarize studies of six states: California, Florida, Michigan, North Carolina, Ohio, and Pennsylvania. Simpson (2003) summarizes studies of seven states: California, Connecticut, Florida, Kentucky, Michigan, North Carolina, and Ohio, and of three Canadian provinces: Nova Scotia, Ontario, and Quebec. Begg and Stephenson (2003) summarize three studies of GDL effects in New Zealand. McKnight (2003) and Preusser and Leaf (2003) describe results in Maryland, and McKnight (2003) summarizes results in Oregon.

GDL programs differ substantially across jurisdictions and the evaluation methods also differ from study to study. The evaluation results thus far show that these GDL programs are effective regardless of their specific details. Because of the differences in GDL programs and their evaluation methods, it is not possible to combine these results into a single numerical measure of GDL effectiveness.

2.2. GDL may be effective beyond the teenage years

Research shows that all beginning drivers, regardless of age, have higher crash rates. Maryland, New Jersey, and some jurisdictions outside the United States apply GDL to all beginning drivers (IIHS and TIRF, 2003; Simpson, 2003). Evaluations have found that GDL reduces crashes among beginning drivers of all ages (New Zealand: Begg & Stephenson, 2003; Nova Scotia and Ontario: Simpson,

2003). New Zealand results also suggest that drivers who began driving under GDL have lower crash rates in later years than similar-aged non-GDL drivers (Begg & Stephenson, 2003).

2.3. *Why does GDL work?* While much remains to be learned (Simpson, 2003), research to date suggests two reasons

- *GDL reduces teen driving.*
GDL programs that require a learner's permit to be held for some minimum period of time may delay the age at which a young driver obtains a license to drive without supervision (Begg & Stephenson, 2003; Lin & Fearn, 2003). GDL programs with a nighttime driving restriction reduce nighttime driving, as shown by a substantial reduction in nighttime crashes (Lin & Fearn, 2003; Preusser & Leaf, 2003; Shope & Molnar, 2003).
- *GDL improves driving knowledge and behavior.*
Extended learning of the type produced by GDL can lead to crash reductions (McKnight, 2003).

2.4. High-priority research needs

- *Continued evaluations of additional GDL programs, especially in United States.*
Up-to-date information on the effectiveness of GDL is vital when GDL laws are considered in states that do not yet have them.
- *Effects of specific GDL components and provisions.*
These are discussed in the Learner's Permit Phase section and the Provisional License Phase section.

2.5. Lower-priority research needs

- Additional information on GDL's effects on licensing age, driving knowledge, skill, and behavior. Why does GDL work? With whom does it work best (Simpson, 2003)?
- Further understanding of why GDL effects vary across jurisdictions. Separate the effects of differences in the GDL programs themselves, differences in the jurisdictions, and differences in the evaluation methods (Simpson, 2003).
- Study the effects of GDL on different cultural, gender, and ethnic groups (Shope & Molnar, 2003).
- Additional information on long-term GDL effects on drivers after they receive an unrestricted full license.

3. The learner's permit phase

Under GDL, beginning teenage drivers first must obtain a learner's permit, which allows them to drive only while supervised by a fully licensed person. All states and prov-

inces in the United States and Canada issue learner's permits to beginning drivers who have reached a specified minimum age and have passed vision and knowledge tests. Under GDL, the learner's permit must be held for a specified minimum amount of time to allow the beginning driver to acquire on-the-road experience. Some GDL jurisdictions also require a minimum amount of supervised driving during the learner's permit phase, typically 20–50 h (IIHS and TIRF, 2002).

3.1. The learner's permit allows beginning teenage drivers to gain experience under low-risk conditions

- *Teenagers with a learner's permit drive regularly under supervision.*
Several surveys of both parents and teenagers in GDL jurisdictions document substantial supervised driving practice (Mayhew, 2003). In particular, in California and Michigan, where 50 h of supervised driving is required, most teenagers and parents report exceeding these requirements (Mayhew, 2003).
- *Learner's permit driving is safe.*
Crash rates for beginning drivers with learner's permits are much lower than for newly licensed drivers (Mayhew, 2003). Crashes typically occur when drivers violate the requirements of their permit and drive unsupervised (Williams, 2003).
- *The learner's permit phase contributes substantially to the safety benefits of GDL.* (Mayhew, 2003).

3.2. Additional information on learner's permit requirements and driving would be useful

- *Starting age and other entrance requirements.*
The minimum age for a learner's permit ranges from 14 to 16 years across the states and provinces of the United States and Canada (IIHS and TIRF, 2002). There is no information on the effects of these starting age differences or on other entrance requirements.
- *Minimum holding period.*
The typical minimum holding period is 6 months, although it ranges from 10 days to 1 year (IIHS and TIRF, 2002). A few states have no minimum holding period for the learner's permit. While the length of the holding period affects the amount of supervised driving, there is little direct evidence on how long the holding period should be. Surveys in states and provinces with a 6-month holding period report strong support from both parents and teenagers (Mayhew, 2003). Evaluations in states and provinces that lengthened their holding period requirements show mixed results: some reported crash reductions while others did not (McKnight, 2003).

- *Supervised driving amount, type, and structure.*

Surveys of parents and teenagers document substantial supervised driving practice during the learner's permit phase (Mayhew, 2003). Some states require a minimum number of hours of supervised driving, typically 20–50 h, and some of these additionally require a minimum number of supervised driving hours at night. In those states where surveys have been conducted, parents and teenagers report that they approve of these requirements and in fact exceed them (Mayhew, 2003). But there is no direct research on how a minimum supervised driving requirement affects the amount of supervised driving, how it helps or hinders parents in supervising their teenagers' driving, or on how much supervised driving should be required.

- *Role of driver education.*

Some jurisdictions reduce the mandatory learner's permit holding period for beginning drivers who successfully complete an approved driver education course (IIHS and TIRF, 2003). Two studies suggest that this holding period reduction may in fact increase crashes (Mayhew, 2003).

- *Restrictions other than supervision.*

Some jurisdictions require the supervising driver to be at least 21 years old or to be a parent, guardian, or driving instructor. Some jurisdictions restrict nighttime driving during the initial months with a learner's permit, or restrict the number of passengers that can be carried, or require that learner's permit drivers and supervisors be sober and drug-free. These restrictions have not been evaluated.

3.3. High-priority research needs

- *Study how to structure supervised driving practice.*
Research may help improve the knowledge and skills gained during supervised driving practice. Topics include how to motivate and inform parents and teens, the appropriate amount and type of supervised driving, how to monitor compliance, and how to evaluate its impact (Mayhew, 2003).

3.4. Lower-priority research needs

- Study the comparative benefits of different starting ages and minimum lengths for the learner's permit (Mayhew, 2003).
- Develop more effective tests for graduation to a provisional license (Mayhew, 2003).
- Evaluate the contribution of the learner's permit phase to overall GDL effects (Mayhew, 2003).
- Evaluate the contribution of the learner's permit phase to developing driving skills and judgment. What is learned—knowledge, skills, judgment—and how is it learned?

- Investigate methods to discourage illegal unsupervised driving.
- Study the effects of the “driver education discount”—reducing learner’s permit minimum holding length for persons who have completed driver education—on driving skills and on crash risk. Investigate methods to integrate driver education more effectively into the learner’s permit phase.
- Study the effects of learner’s permit license plates—special ‘L’ plates to identify a car driven by a learner’s permit driver that are required in New Zealand and other foreign jurisdictions.

4. The provisional license phase

Under GDL, teenage drivers must successfully complete their learner’s permit requirements, reach the minimum age required in their jurisdiction, and pass a road test to receive a provisional license. This license allows unsupervised driving under certain conditions. Provisional licenses typically prohibit unsupervised driving at night, may limit the number or type of passengers, and may have other restrictions.

4.1. Nighttime driving restrictions are effective

Nighttime driving restrictions are the most common, widely accepted, and best understood provisional license requirement. Research has established conclusive evidence that nighttime driving restrictions reduce crashes (Begg & Stephenson, 2003; Lin & Fearn, 2003; Shope & Molnar, 2003; Simpson, 2003).

The hours of nighttime restrictions vary considerably from short (1 a.m.–5 a.m.) to long (6 p.m.–6 a.m.; IIHS and TIRF, 2002). Research suggests that GDL reduces driving and crashes much more during restricted nighttime hours than other hours (Foss & Goodwin, 2003).

Many GDL jurisdictions allow unsupervised nighttime driving during restricted hours for certain purposes, such as to and from school-related activities, work, and religious events (IIHS and TIRF, 2003). The effects of these restrictions on overall compliance with nighttime driving restrictions and on crashes are not known.

4.2. Passenger restrictions may be effective

Teenage passengers increase crash risks for teenage drivers. Consequently, some GDL jurisdictions restrict the number of teenage passengers in a provisional license driver’s vehicle (IIHS and TIRF, 2002). Current research suggests that these restrictions are violated more frequently than nighttime driving restrictions (Begg & Stephenson, 2003; Foss & Goodwin, 2003). Passenger restrictions may have contributed to the overall GDL effects, but research to date cannot separate the effects of passenger restrictions from other GDL requirements.

4.3. Additional information on other provisional license requirements would be useful

• Starting age and length.

The minimum age for a provisional license ranges from 15.5 to 17 years (IIHS and TIRF, 2002). A later minimum age clearly reduces driving and crashes by teenagers below the minimum age, but no current research addresses the tradeoffs of teenage mobility, convenience, and crash risk posed by different starting ages. Similarly, the minimum age and minimum holding period required for a full license vary, but no current research addresses the costs and benefits of these different provisions.

• Penalties for violations.

Drivers who violate provisional license restrictions or who violate other traffic laws may be required to participate in a driver improvement program or may have the length of their provisional license phase extended. The limited current research suggests that these measures may reduce violations and crashes (McKnight, 2003).

• Second-level driver education.

One state and some foreign jurisdictions incorporate second-level driver education instruction into their GDL programs (Ferguson, 2003; McKnight, 2003). Second-level driver education occurs after the beginning driver has experience with basic driving skills. It teaches more advanced skills such as hazard recognition and how to respond to emergency situations. These second-level education programs have not yet been evaluated.

• Additional provisional license requirements.

Safety belt use is required and alcohol use is prohibited by other laws, so these concerns typically have not been addressed in GDL programs. It is possible that a closer connection would be useful. For example, if safety belt or alcohol use violations led to a licensing action, such as an extended period of nighttime driving restriction, then compliance might be improved (Ferguson, 2003). Jurisdictions outside the United States have restricted provisionally licensed drivers to certain roads, vehicles, or speeds. There is little information on compliance with or effects of these provisions (Ferguson, 2003).

4.4. High-priority research needs

• Additional information on passenger restrictions.

Study compliance, effectiveness in reducing crashes, and methods to increase compliance.

4.5. Lower-priority research needs

- Study the relative benefits of different nighttime driving restriction hours. Issues include the effects on

- parents and teenagers, compliance with the restrictions, and crashes.
- Study the effects of nighttime driving restriction exemptions for school, work, and other purposes (Williams, 2003).
- Evaluate the effects of second-level driver education (McKnight, 2003). Continue to evaluate new methods to improve risk perception skills.
- Study methods to increase GDL enforcement by police, including methods to integrate GDL enforcement into other traffic enforcement activities such as checkpoints.
- Study the potential effects of speed, road type, and vehicle-type GDL restrictions.
- Study crashes that occur while young drivers are violating conditions of their provisional license.
- Study the potential benefits of advanced driving and knowledge tests to graduate to a full license.

5. The roles of teens, parents, and public agencies

With or without GDL, most parents are involved in managing their teenage drivers by teaching driving skills, supervising their driving while under a learner's permit, and restricting their driving in various ways when they are first licensed to driver without supervision. GDL can codify and support parents in these activities. Parents also are in the best position to enforce GDL requirements for their beginning drivers. Law enforcement and motor vehicle departments also have important roles and responsibilities for beginning teenage drivers.

5.1. Young drivers support GDL

- *Young drivers generally support GDL programs and restrictions.*
Survey data in several jurisdictions show strong support (Begg & Stephenson, 2003; Foss & Goodwin, 2003; Mayhew, 2003; Preusser & Leaf, 2003).
- *Young drivers report that they generally comply with GDL restrictions.*
Passenger restrictions are violated more frequently than nighttime driving restrictions (Begg & Stephenson, 2003; Foss & Goodwin, 2003). Little is known about the circumstances when provisional drivers violate the driving restrictions or how compliance could be improved.

5.2. Parents support GDL but could use help

- *Parents do not understand teenage driving risks well.*
While parents know that teenage driving is risky, they do not understand the dangers of specific situations such as driving at night or with other teenage passengers (Simons-Morton & Hartos, 2003).

- *Parents strongly support GDL.*
Surveys in several jurisdictions show that parents support GDL (Foss & Goodwin, 2003; Mayhew, 2003; Simons-Morton & Hartos, 2003).
- *Parents could use help in managing their teenage drivers.*
GDL establishes norms for and supports many restrictions on their teenage drivers that parents will impose themselves (Preusser & Leaf, 2003). Few materials have been developed to encourage and to teach parents how to teach and manage their teenage drivers. One promising program, Checkpoints, is currently being tested. Parents also could use guidance as they supervise driving by teenagers with learner's permits (Simons-Morton & Hartos, 2003).
- *Parents are critical to enforcing compliance with GDL provisions.*
In surveys, parents and teenagers report that GDL nighttime restrictions are violated on occasion and passenger restrictions are violated more frequently. Not surprisingly, teenagers report more violations than do parents. Little is known about how parents enforce GDL provisions or how they could be encouraged and supported (Foss & Goodwin, 2003).

5.3. Law enforcement's role in GDL is largely unknown

- *GDL appears to be a low priority for law enforcement.*
Some GDL provisions such as a nighttime driving restriction are inherently difficult to enforce, since violations are hard to detect (Foss & Goodwin, 2003). However, law enforcement could check on possible GDL violations when they stop a teenage driver's vehicle for some other reason, such as speeding.
- *A stronger connection between GDL and other traffic laws could make GDL enforcement easier.*
Safety belt use and zero BAC laws appear to be especially relevant.

5.4. Motor vehicle department roles in GDL also are largely unknown

- *Motor vehicle departments issue licenses and enforce license penalties.*
But virtually nothing is known about how motor vehicle departments administer GDL programs and enforce compliance with GDL provisions.

5.5. High-priority research needs

- *Effective methods to encourage and help parents manage their teen's driving.*
Develop a better understanding of how parents teach and manage teen driving; study how GDL programs and specific requirements affect parental management; develop, implement, and evaluate strategies for

improving parental management (Lin & Fearn, 2003; Simons-Morton & Hartos, 2003).

5.6. Lower-priority research needs

- Study the level of compliance with different GDL provisions.
- Study the effects of parental restrictions on teenage driver crash rates.
- Study the reasons for noncompliance with GDL provisions and investigate ways to increase compliance (Foss & Goodwin, 2003; Lin & Fearn, 2003).
- Investigate methods to increase law enforcement participation in GDL enforcement.
- Study the relations among a GDL provision's restrictiveness, compliance, and benefits.
- Study methods to integrate parents into teenage driver programs operated by schools, departments of motor vehicles, and insurance companies.
- Investigate the usefulness of driving contracts between parents and teenagers in various social and cultural subgroups.
- Study the process of learning to drive from the perspectives of parents and teenagers, to increase knowledge of factors that indicate when teenagers are ready to learn to drive and to drive without supervision.

6. Enacting and implementing GDL

Good research is critical to efforts to adopt or improve state GDL laws. Research can demonstrate GDL's benefits in lives saved, injuries avoided, and costs saved. Research can investigate and address potential objections to GDL. Research can evaluate the effects of GDL after implementation. Finally, research results should be presented clearly, accurately, and concisely, in an easily understandable form.

6.1. Research components for enacting and implementing GDL

- *Demonstrate the value of GDL.*
Summarize the teenage driver crash problem without GDL: crashes, injuries, and costs. Information on the impact of teenagers' crashes on nonteen victims and on the costs of these crashes to the state is especially useful. Show the effects of GDL in jurisdictions where it has been implemented. To the extent possible, show the effects of specific GDL components such as nighttime driving restrictions. While traffic safety sometimes is a low priority for legislators, GDL can be framed as a method to protect young people and help families.
- *Learn what parents, teens, and interest groups think.*
Investigate parents' and teenagers' views on driving risks. Learn how parents and teenagers view GDL's

tradeoff of driving convenience for increased safety. Investigate the views and potential objections of interested groups. Public opinion surveys can be especially useful and influential.

- *Obtain state-specific data.*
Crash, injury, cost, and opinion data from the state itself are by far the most useful and persuasive. Data from nearby states, from other states, from the United States as a whole, and from other countries are increasingly less relevant. Experience in other states will suggest potential objections.
- *Present research findings clearly and concisely so they can be easily understood.*
Write clear and concise executive summaries for all research reports. One-page summaries are ideal. Then, use this information in different formats and venues as needed. Researchers should work with communications and public relations professionals to be sure the information is accurate and clear.

6.2. High-priority research needs

- *State-specific data on teenage driver crashes, impact on other road users, injuries, and costs; state-specific survey data on public attitudes.*
Data on state-funded costs, such as Medicare, are especially useful.
- *Evaluation results on GDL effects in all GDL states.*
Results from nearby states and from states that implemented GDL recently are most important.
- *What information has been most useful in adopting GDL and how can it best be presented.*
This information comes from collective experience rather than traditional research.

6.3. Lower-priority research needs

- Effects of GDL on rural, farming, and ranching communities.
- Effects, both retrospective and prospective, of GDL on insurance rates.
- Impact of GDL on families, measured in time and convenience.

7. GDL research priorities

During the symposium's final session, participants discussed overall research needs and priorities. The discussion was organized into three areas: general research, issues involving parents, and issues involving GDL legislation and implementation. This section, organized in the same three areas, records the participants' collective views on both broad priorities and specific issues and can be viewed as a complement to Sections 1–6.

7.1. General research on GDL

Previous sections of the symposium, summarized in this paper, include a substantial list of research topics. The discussion, summarized below, revisited the most critical research priorities and a few other issues. Three research topics stood out as the highest priority:

- *Passenger restrictions during the provisional license phase.*

This topic is discussed in the Provisional License Phase section. Other teenage passengers increase crash risks. Some GDL programs have passenger restrictions. Compliance with these restrictions appears to be lower than with other GDL requirements such as nighttime driving restrictions. Research is needed to study how and under what circumstances passengers increase risk, how to reduce these risks, the effectiveness of passenger restrictions, attitudes toward and compliance with passenger restrictions, and methods to increase compliance.

- *Methods to enforce GDL provisions.*

This topic is discussed in the Roles of Teens, Parents, and Public Agencies section. The limited information available suggests that law enforcement and motor vehicle departments do not enforce GDL vigorously. Parents appear to have a greater role, but there is little information available on how more formal GDL enforcement can support parents. Research is needed to study how law enforcement can be encouraged to enforce GDL provisions, perhaps through regular traffic enforcement activities such as patrols and checkpoints, how to make closer connections between GDL and other traffic laws such as safety belt use and zero BAC, and how formal GDL enforcement can support parents.

- *Long-term effects of GDL.*

This topic is discussed in the Effectiveness of GDL as Implemented section. The limited information on GDL's effects after drivers have graduated to a full license all comes from outside the United States. Research is needed on whether GDL has long-term effects and on what these effects are. This research will help shed light on how GDL affects driver knowledge, skills, and attitudes.

Additional lower-priority research topics raised in the discussion:

- *Study GDL programs and effects in the "best states."*
Compare states that have adopted GDL programs recommended by current research (IIHS and TIRF, 2002) with GDL programs in other states.

- *Study the most appropriate starting age and minimum length for the learner's permit and provisional license phases.*

See discussions in The Learner's Permit Phase section and The Provisional License Phase section.

- *Study the relationship between the restrictiveness of GDL provisions and compliance with these provisions.*

For example, compare nighttime driving restrictions beginning early in the evening with those beginning later. What are the tradeoffs in public acceptance, compliance, and safety? Similar issues are discussed in The Provisional License Phase section.

- *Study the benefits of penalizing provisional license violations by delaying full licensure.*

See discussion in The Provisional License Phase section.

7.2. Parent roles in GDL

Symposium participants recommended research in three broad areas to help parents with these roles. While some information is available in each area, much remains to be learned. The specific questions listed in each area suggest some key topics:

- *Develop a better understanding of how parents teach and manage teen driving.*

What do parents know about teen driving risks, both overall and in specific situations such as at night and with teen passengers? How do teens view parents as driving role models and how can parents be encouraged to be better models? What is the effect of parental management on teen crashes?

- *Study how GDL programs and specific requirements affect and support parents in managing teen driving.*

What GDL requirements are most useful to parents? Do some requirements hinder rather than help? What are the costs of GDL to families, measured in time and convenience? When should GDL information and requirements be communicated to parents and teens and how should it be communicated effectively? How can parents be encouraged to increase their teens' compliance with GDL requirements?

- *Develop, implement, and evaluate strategies for increasing and improving parental management of teen driving.*

What information and materials do parents need? How can this information be delivered effectively to parents? How can formal driver education best help parents manage their teens' driving? How can law enforcement help? Research and program development to assist parents should take into account that both parents and teens are highly diverse. Strategies and materials must be appropriate and effective for

teen drivers of all cultural, ethnic, and social communities.

7.3. Enacting and implementing state GDL programs

Even though there is little organized opposition to GDL, enacting and implementing comprehensive GDL laws is challenging. GDL effectiveness research is essential to the legislative process. Researchers should work with communications and public relations professionals to distill their findings into simple, short messages for GDL advocates and legislators. Symposium participants identified several types of information that are essential for enacting and implementing GDL programs:

- *State-level data on crashes involving young drivers.*
Information from one's own state on deaths, injuries, and economic costs of young driver crashes is persuasive; information from nearby states can also be useful.
- *State-level evaluations of GDL programs.*
Continue ongoing evaluations of GDL programs; conduct at least some type of evaluation in each state that passes a GDL law (e.g., compare both public opinion and teenage driver crashes prelaw and post-law). Legislators are most impressed with recent evidence from nearby or similar states. Evaluate community-based interventions to encourage compliance with GDL such as safety belt checkpoints at school events and revoking school parking privileges for students who receive a moving violation. Compile best practices for community-level implementation of GDL programs.
- *Rural states.*
In some states, farmers and ranchers have voiced opposition to GDL. Research is needed on the positive and negative consequences of GDL in rural and farming communities.

8. Conclusion

The Symposium on Graduated Driver Licensing brought together an impressive array of researchers with extensive experience in GDL. Their collective knowledge, summarized in the papers in this journal, is conclusive. GDL is effective in helping beginning teenage drivers gain driving

knowledge and experience while reducing their risks of crashes and injuries. The issues left to study, described in this paper, are the details on how specific GDL components should be structured most effectively.

The symposium concluded with two strong and clear messages:

- *All states should implement GDL programs for beginning teenage drivers.*
- *Research should investigate the issues detailed in this paper so that GDL programs can even more effectively help our teenagers learn to drive safely.*

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