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Research-to-Practice Barriers for  
Novice Driver Crash  
Countermeasures

*A Peer Exchange*

August 14-15, 2018  
Philadelphia, PA

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# Research-to-Practice Barriers for Novice Driver Crash Countermeasures

*A Peer Exchange*

August 14 – 15, 2018  
Philadelphia, PA

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Committee on Simulation and Measurement of Vehicle and Operator Behavior (AND30)  
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## Foreword

This TRB circular includes a summary of the discussions by national experts on teenage driving. Among the 30 attendees were 15 practitioners representing state and private driver education and training programs, state motor vehicle licensing agencies, hospital-based injury prevention programs, auto insurance companies, automobile clubs, and national non-governmental organizations (NGOs) that address teen driving safety through broad and local networks. They were joined by 15 scientists from universities, research firms, a spin-out technology firm, and federal agencies that provided the state of the science.

The focus of this peer exchange was on the barriers that exist to the implementation of evidence-based countermeasures to novice driver crashes. The discussions took place over a day and one-half workshop held in August at the Children's Hospital of Philadelphia (CHOP) and organized jointly by the Committee on the Simulation and Measurement of Vehicle and Operator Behavior and CHOP Center for Injury Prevention and Research. The workshop was developed and structured by an ad hoc planning committee consisting of Suzanne Hill and Flaura Winston at the CHOP Center for Injury Prevention and Research and Angie Byrne and Donald Fisher at the Volpe National Transportation Systems Center. Special thanks goes to Patricia Harris for her extraordinary help with the logistics of the meeting.

During the meeting, full-group discussions by researchers and practitioners were intermixed with smaller subgroup deliberations. Each of these sessions involved a particular goal for the participating groups. The intent of this structure was to elicit and discuss both barriers to the implementation of evidence-based countermeasures and ways around these barriers. One of the proposed solutions visualized was a place where practitioners could go to learn about evidence-based countermeasures and where researchers could list their evidence-based countermeasures that would easily be accessible to practitioners. Resources have been obtained for the development and creation of just such a repository and it is hoped that progress on this repository can be reported at the upcoming January 2020 meetings.

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## **1 Introduction**

The Peer Exchange, or workshop, on Research-to-Practice Barriers for Novice Driver Crash Countermeasures, was convened in Philadelphia, Pennsylvania on August 14-15, 2018 by the Simulation and Measurement of Vehicle and Operator Behavior Committee (AND30) of the Transportation Research Board of the National Academies in partnership with The Children's Hospital of Philadelphia.

There were two stated and interrelated goals for the Peer Exchange: 1) That practitioners provide scientists with an understanding of what is needed to take evidenced-based novice driver tests and training programs (and remedial training programs) and move them into practice; and 2) that scientists provide practitioners with an overview of the evidence-based tests and training programs which have largely been untouched in practice even though widely available in peer-reviewed, academic journals. Large advances have been made in both our understanding of evidence-based, novice driver crash avoidance countermeasures that work in the laboratory and our understanding of how to translate research from the laboratory into the field (translational science) since the early 2000s. However, it is unclear if these areas of research have ever been systematically combined to inform the development of countermeasures that can be deployed widely and cost effectively in actual practice to reduce the crash risk for novice drivers.

The 2-day Peer Exchange panel blended the expertise and perspectives of scientists and traffic safety practitioners who focus on developing, evaluating, implementing and advocating for countermeasures to reduce novice driver crashes.

Among the 30 attendees were 15 practitioners representing state and private driver education and training programs, state motor vehicle licensing agencies, hospital-based injury prevention programs, auto insurance companies, automobile clubs, and national non-governmental organizations (NGOs) that address teen driving safety through broad and local networks. They were joined by 15 scientists from universities, research firms, a spin-out technology firm, and federal agencies that provided the state of the science.

This summary, which is organized into seven sections following the introduction, presents key elements discussed at the Peer Exchange. The Peer Exchange format is described next followed by an overview of the major themes emerging from the presentations and discussions.

This summary does not provide an expert analysis or interpretation of the themes that emerged from the Peer Exchange format. An analysis and recommendations are being drafted for publication in a scientific, peer reviewed journal that will also describe in greater detail the two lines of research that informed this Peer Exchange: The first focused on novice driver crash avoidance skills tests and training programs and the second focused on translational science.

## **2 Peer Exchange Format**

To achieve the two goals described above the Peer Exchange agenda was structured as described below.



## 2.1 Common Terms for Technology Transfer Process Established

The workshop opened with a discussion of the technology transfer process, the language of which needed to be established at the very start so that a common understanding of this transfer process and the language used to describe it was shared among the practitioners, traffic safety advocates and researchers.

In traditional technology transfer of engineering and basic science discoveries, organizations such as the National Science Foundation and the National Institutes of Health define “pain points” as customer or market needs with clear economic incentives (willingness to pay) for licensing/purchasing and developing/implementing solutions discovered in academia [1, 2].

In the social sciences (including public health and traffic safety), pain points have a more nuanced definition as there is not a clear “customer” for solutions of societal pain points (e.g., novice driver crashes). In particular, there is not a clear customer who has a business need, the resources and the ability to deliver solutions to novice driver crashes.

As a result, for the purposes of this Peer Exchange, we borrowed and adapted the concept of **pain points**. All three groups worked to reach consensus on defining **societal pain points**, along with the underlying causes of novice driver crashes and associated evidence-based, **societal solutions**. In addition, the groups defined a second order category of pain points, **implementation pain points**, or barriers to implementation of evidence-based solutions along with **implementation solutions**. Finally, **abilities** were defined as mechanisms or processes for getting solutions to those who need it. These technology translations terms were reaffirmed throughout the two days.

## 2.2 Scientific and Practical Perspectives and Priorities

The remainder of the first day, the workshop structure featured brief presentations interjected with moderator-led targeted discussions. The agenda balanced discussions of scientific and practical perspectives on current research and active programs and technologies as well as reflections on priorities for federal and non-government organizations and for the research community. Pain points, solutions and abilities were identified as appropriate in each of the presentations.

Topics presented and discussed included:

- evidence for attention maintenance training programs (science) and corporate-state government partnerships to disseminate them (practice),
- changing teen and parent behaviors through new technologies (science) and more traditional programs (practice),
- evidence on hazard anticipation training programs (science),
- using state licensing centers to identify unsafe drivers (science and practice),
- developmental disabilities and crash risk (science),
- brain injury and teen driver issues (science),
- peer influences and social pressure (science and practice), and
- the role of mental health, racial and ethnic disparities (science).

The intermittent, moderated discussions solicited opinions and perspectives on what interventions currently available are of interest to the states, the challenges for research-based projects becoming practice, and the key priorities for research-to-practice.

### **2.3 Topic-specific Discussion for Technology Transfer Planning**

On the second day, attendees were divided into smaller groups each consisting of a mix of scientists and practitioners for group-specific discussions that challenged them to pick an implementation pain point from the perspective of practitioners (or researchers) and a solution to the pain point from the perspective of the researchers (or practitioners) discussed on the previous day and apply the Technology Transfer Planning Template [3] to identify the implementation barriers, resources and abilities needed to bridge the gap between the pain point and the solution. In particular, the Technology Transfer Planning Template consists of questions that can help guide such a discussion, including questions related to how an end product gets into a target market's hands as well as what production, sales and marketing activities are needed to make such happen.

As noted above, the concept of pain points was extended to not only include the critical societal need (societal pain point) but also the barriers to implementation (implementation pain point). Further, the concept of solutions was extended to include not only the evidence-based interventions to reduce novice driver crashes (societal solutions) but also the strategies (abilities) for overcoming implementation barriers (implementation pain points).

Following the meeting, the TRB and Children's Hospital of Philadelphia (CHOP) facilitators categorized and distilled comments and themes from notes and recordings into the following related categories: societal and implementation pain points; societal and implementation solutions; and those partners with abilities to deliver, scale and sustain the solutions.

## **3 Common Themes on Societal and Implementation Pain Points: Practitioners and Advocates Perspective**

A number of common themes emerged from the presentations, moderator-led discussions and small group targeted discussions that were framed in the common set of terms of the technology transfer process established at the beginning of the workshop. Practitioners, advocates, and researchers described implementation pain points centered on driver education and licensure, legislation and policy (the legislative branch), and programming and planning (the executive branch).

### **3.1 Training and Licensing**

Practitioners described a situation where several implementation pain points were related to their inability to convince consumers that there were evidence-based tests and training programs focused on novice driver crash avoidance skills. Specifically, practitioners listed the following as pain points:

- a) Not having knowledge of evidence-based guidance they can provide to parents of learner drivers;
- b) The need to prove the value of driver education to consumers (teens and their parents) in order to create more demand for interventions;
- c) The demand for evidence-based, peer-led programs in an environment where peer-led programs often work best in arenas other than training and licensing;
- d) Budget cuts to driver training and education (where often lack of evidence of the efficacy of training is cited as a reason for the cuts);
- e) The need for driver training programs that can easily and affordably be kept current, scalable, and visible to the public; and

- f) The difficulty in developing standardized tests and training programs on a national scale given that such programs often need to be individualized to particular states since the states control training and licensing.

### **3.2 Legislation and Policy**

Practitioners and those who advocate for changes in novice driver legislation and policy identified several implementation pain points. They include:

- a) The reluctance of state legislators to propose new traffic safety laws for fear that they will lose rather than gain safety with the revisions by opening debate on laws that may already be controversial;
- b) The absence of powerful strategies and messages that are needed to convince elected officials to write into law safety initiatives that may not be consistent with their constituents' views such as including nighttime restrictions for probationary and intermediate license holders and a GDL-like process for drivers 18 years old and older; and
- c) Much the same absence of strategies and messages that are needed to convince voters of the importance of various evidence-based safety initiatives.

### **3.3 Programming and Planning**

The programming and allocation of state and local highway safety resources can make it difficult for both practitioners and advocates for novice driver safety, making for additional implementation pain points. There are several prominent reasons:

- a) Practitioners that implement traffic safety programs are typically from non-profit organizations that already have limited resources and don't have capacity to seek out and scale scientifically proven programming;
- b) Teen driving safety is not prioritized within a State's Highway Safety Plan or Strategic Highway Safety Plan as it often competes with efforts to reduce impaired driving, decrease speeding and increase seat belt use;
- c) States have unique situations that require them to modify programs to fit their respective needs;
- d) There is an absence of public messaging programs from state agencies that convince parents of the need for driver education and for monitoring their teens' behavior during the intermediate license phase;
- e) Law enforcement finds it difficult (e.g., GDL in states without decals) or dangerous (e.g., the risk of a violent interaction) to enforce laws designed to make driving safe; and
- f) Competing demands on law enforcement make enforcing traffic laws often of lower priority.

## **4 Common Themes on Societal and Implementation Pain Points: Researcher Perspective**

Researchers identified their own unique set of implementation pain points. At least one pain point had the same theme across training and licensing, legislation and policy, and programming and planning. That pain point centered on researchers' uncertainty about whom to contact in order to bring novice driver crash countermeasures from the lab into the field. This pain point is highlighted below as appropriate.

### **4.1 Training and Licensing**

The implementation pain points in training and licensing were perhaps the largest in number and diversity for the researchers. The pain points include the following:

- a) It was not clear whom to contact among the wide body of driver education schools, larger insurance companies, automobile manufactures, automobile clubs, and foundations, either in general (which organization would be most receptive to an intervention) or in particular (which individual within an organization would be the one to contact);
- b) The extensive resources (running into the millions of dollars) needed to conduct clinical trials of the effect of interventions in achieving impact related to reductions in novice driver crashes are rarely available. (Current, more resource-restricted budgets limit studies to examining the effect of interventions on behaviors that might be associated with crashes – where the behaviors are intermediate outcomes, e.g., speeding, rather than the outcome one would like to evaluate, i.e., crashes);
- c) The timeline for going from a test of a training program to real world implementation is so slow that the technology for which testing and training are needed at the time the test or program has been evaluated has changed dramatically. This is the case even when sufficient resources exist for full scale clinical trials;
- d) The resources needed to study subpopulations of novice drivers at increased risk are not readily available, including novice drivers with ASD, ADHD and TBI;
- e) There are few if any economic incentives for a researcher developing a novice driver crash avoidance skills test or training program (unlike the incentives for a researcher developing a new drug) even though the economic benefits of doing such to society can be very large;
- f) Researchers are not often sure of the precise type of packaging that is needed to move an evidence-based laboratory intervention into one that is scalable and of interest to teens and parents; and
- g) Few states sanction interventions that improve novice driver crash avoidance skills. Thus, if states are doing something to address the issue they may use easiest-to-access programs (a privately operated skid school, etc.) or do nothing.

#### **4.2 Legislation and Policy**

Above, the first implementation pain point for researchers in the area of training and testing was identifying individuals to contact. This theme re-emerges within legislation and policy:

- a) Researchers are not clear whom to contact in the legislature within their states; and
- b) Researchers are not sure how to influence the legislative process even when they make contact.

#### **4.3 Programming and Planning**

Again, the common theme re-emerges with programming and planning:

- a) Researchers are not clear whom to contact in the executive branch, including the State Highway Safety Offices and the Department of Motor Vehicles (or equivalent); and
- b) Researchers are not sure how to influence the executive branch programming and planning.

### **5 Common Themes on Societal and Implementation Solutions**

Roughly half of the workshop's presentations by researchers focused on researcher-developed solutions that address the societal pain point of novice driver crashes and are currently met with implementation pain points — or barriers to implementation. A few researcher-developed solutions described in the Peer Exchange were aligned with implementation pain points of both the researchers and the practitioners and so could serve as successful examples of research-to-practice. (See below.)

A key overarching theme shared by all participants was the lack of a clear “customer” for the solutions that would have the economic incentive to cross the gap between research and practice. For example, a novice driver and his/her family, may not be willing to pay for or are not motivated to adopt/execute a solution.

### **5.1 Training and Licensing**

The evidence-based interventions in the area of licensing and training included virtual driving assessment before the road test [4], novice driver crash avoidance skills training programs [5], and programs for parents and teens during supervised driving [6, 7]. Examples were also given of programs that have been widely implemented such as Share the Keys [8, 9] or suggestions for programs that surveys had indicated would appear to work [10], but for which data are still needed.

### **5.2 Legislation and Policy**

Perhaps the legislation which has proved to be the most successful is the graduated driver licensing (GDL) laws that have been implemented now in all jurisdictions in the United States. GDL consists of three stages: increases in the minimum age at which a driver can obtain a driver’s license, restrictions on driving at nighttime, and restrictions on driving with other teen passengers. GDL programs have been estimated to reduce crashes among teens by some 30% [11]. There are many websites where teens and parents can gather information, both here in the United States [12] and also in Canada [13]. The story of how GDL programs went from the research stage to actually being implemented in laws in all 50 states is an interesting one and well worth reading [14]. Some states are now beginning to incorporate GDL orientations for parents as part of the GDL process (e.g., Connecticut and Massachusetts).

### **5.3 Programming and Planning**

Although one state (Connecticut) has a dedicated coalition to implement evidence-based programs, there is little indication that other states have such a coalition or that the coalition has been able to help move forward on the implementation of evidence-based programs. Perhaps the closest an intervention comes to being one the executive branch might implement is the virtual driving assessment that is now being administered in some jurisdictions in Ohio prior to the road skills and was referred to above [4].

## **6 Common Themes on Abilities to Deliver, Scale and Sustain the Solutions**

The traffic safety community, as represented at the Peer Exchange, identified pain points and solutions, as discussed above. In addition, the Peer Exchange agreed that the ability actually to implement the solutions so identified has been hindered by lack of connections and communications between scientists and practitioners. In this section we have included attendees’ recommendations for follow- up action.

### **6.1 Training and Licensing**

Through the Peer Exchange, barriers to addressing implementation pain points in novice driver crash avoidance through evidence-based solutions emerged. Scientists are not aware they should be engaging with end-users to understand what is needed or wanted in the field during their research process. They said there is little opportunity for this to occur organically. One researcher stated that this Peer Exchange was the first time he had ever interacted with end-user practitioners.

Attendees agreed that scientists and practitioners go to different meetings: Transportation Research Board committee members and attendees are mainly scientists from academia and the federal government who present to each other. Lifesavers Conference<sup>1</sup> attendees are mainly practitioners such

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<sup>1</sup> <https://lifesaversconference.org>

as local NGO's who implement state grants, state traffic safety professionals, law enforcement, and safety advocacy groups.

While Lifesavers, Governors Highway Safety Association<sup>2</sup>, Association of American Motor Vehicle Administrators<sup>3</sup>, American Driver Training Safety Association<sup>4</sup> and other professional association meetings do feature presentations from scientists, it was unclear how often productive dialogue occurs to match implementation pain points with solutions and ability once the presenter steps away from the podium.

All of this may have led to different vernaculars used by scientists and practitioners when writing or speaking about traffic safety, which further hinders effective communication. The most obvious case in point is what is meant by evidence-based. For researchers, it is typically a randomized controlled trial. For practitioners, it is often a product that has been evaluated as useful by subject matter experts. For research-to-practice to occur, it is critical to develop abilities to address the lack of connection and communication between practitioner and research communities. Evidence-based, effective countermeasures must make it to the field more quickly. In addition to the above, for consideration the following measures (abilities) were proposed that would help researchers and practitioners communicate more effectively with one another and make real the transition of programs over what is commonly referred to as Valley of Death [15], the gap between research and practice:

- a) Researchers need to engage in design-thinking and user experience methods/frameworks developed in consumer technologies industries in order to bridge the Valley of Death — yes, even for behavioral or social science-based interventions;
- b) Researchers need to engage the end-user far sooner in their research planning process and before developing countermeasures. Partnership models from public health such as Community-Based Participatory-Research [16] and other formative research should occur to test hypotheses and early, minimally viable versions of the intervention before proceeding;
- c) Researchers and potential dissemination partners should engage each other using the Technology Transfer Template or similar tool from the technology transfer experience. This can help determine if a lab-based concept needs to be modified to address a real pain point of the organization that the researcher hopes will implement and/or pay for its dissemination;
- d) Researchers usually have their time funded by soft money grants that only cover their effort to conduct the research and not the necessary outreach effort to cross the Valley of Death. Thus connecting with stakeholders can become an unfunded nights-and-weekends-type activity and is hard to sustain. Researchers who are part of a Center might consider allocating their Center's administrative/indirect funds to invest in staff or consultants that can coordinate strategic communications with the right stakeholders and end-users for their work, or tap into university resources that can do some of the same;
- e) Until recently the National Safety Council was interested in disseminating their own programs. Their strategy has shifted to disseminating the research and programs of others that are in alignment with Vision Zero principles [17] through their extensive networks. It would help the National Safety Council if they had ready access to evidence-based programs in the research community. Additionally, researchers should now reach out directly to the National Safety Council; and

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<sup>2</sup> <https://www.ghsa.org/>

<sup>3</sup> <https://www.aamva.org>

<sup>4</sup> [www.adtsea.org](http://www.adtsea.org)

- f) Practitioners need to develop partnerships with scientists to help them confirm and address their own implementation pain points around traffic safety issues, to help set State Highway Safety Plan and Strategic Highway Safety Plan priorities, or to make the most of the parameters of an existing plan.

An important outcome of the Peer Exchange has been the initiation of an effort to pull together in one place descriptions of the evidence-based programs, similar to what NHTSA publishes with “Countermeasures That Work” [18]. The difference here is that the success of the countermeasures would not be solely determined by changes in the behaviors that NHTSA typically considers when evaluating a program (crashes, citations, seat belt use). Rather, laboratory-based behaviors that are known to be linked to crashes would also be considered (e.g., hazard anticipation, hazard mitigation, attention maintenance).

## **6.2 Legislation and Policy**

Where researchers want to have some impact on the legislative branch, introducing them to evidence-based programs, there were several suggestions provided by the practitioners. Perhaps the national organization which does the most outreach to state legislatures is the AAA. The National Transportation Safety Board is active in reaching out to state legislatures and also convenes stakeholder meetings on transportation safety initiatives. University Transportation Centers have a role as well.

Researchers could reach out to these organizations to extend their reach and impact:

- a) AAA’s framework for research-to-policy considers local AAA clubs as end-users who have autonomy over decisions on the priorities of their state-level advocacy. AAA’s national office and AAA researchers (AAA Foundation for Traffic Safety) collaboratively determine research and policy priorities that are of broader national significance;
- b) University Transportation Centers regularly produce white papers that should be useful to legislators.

## **6.3 Programming and Planning**

Researchers can engage better with state and federal agencies that fund and administer programs as well as organizations that fund or advocate for novice driver crash avoidance skills tests and training programs. As a start, researchers could also reach out to practitioners and to administrators in executive branches of government. Researchers should not feel constrained to target their information activities to only the legislative branch of government. Additional suggestions included the following:

- a) Academic scientists should proactively seek State Highway Safety Plan funding for scaling of their programming. State Highway Safety Offices (SHSO’s) need to know scientists have something to offer in an already developed format. Since practitioners don’t usually attend scientific conferences or have access to scientific journals, an extra lift is needed from scientists to be proactive. The Governors Highway Safety Association is the national member organization that supports cross fertilization of programs and priorities for State Highway Safety Offices;
- b) Researchers should actively engage in relationship building with state and federal research and program technical staff who provide continuity between administrations;
- c) Researchers should also familiarize themselves with 403 funding available from NHTSA via grants.gov; these funds may be available for researchers directly or these may be opportunities to partner with SHSO’s in the execution of these funds [19].
- d) Public-private partnerships can provide the ability to disseminate tests and training programs using a state’s existing platforms and the funding to cover the cost of the effort, reducing the cost to tax payers and Department of Transportation; and

- e) Federally-funded activities should be initiated to create spaces where research and practitioners can have meaningful interaction on research to practice.

## **7 Examples of Research to Practice**

Three research-based solutions were presented during the Peer Exchange that are overcoming barriers to implementation: ACCEL (Accelerated Curriculum to Create Effective Learning), novice driver hazard anticipation, hazard mitigation and attention maintenance training program that has been shown to reduce crashes [5]; Ready Assess, a simulated driving assessment that predicts success on the road exam, and Share the Keys, a parent-teen intervention based on research on what makes for effective graduated driver licensing programs. All three described having to pivot from their original innovation to either address a practitioner Pain Point or to get traction with those with the Ability to disseminate the solution.

### **7.1 ACCEL**

ACCEL is in the process of being introduced as the next generation of novice driver education programs offered by the AAA, delivered in the classroom as a standard component of their curriculum, delivered over the internet, or delivered as part of an immersive, virtual reality based training program. In this case a practitioner from AAA reached out to a researcher at University of Massachusetts because the AAA Foundation for Traffic Safety (AAA FTS) had funded part of his research to develop a combined novice driver training tool (ACCEL) that built on already existing hazard anticipation training programs (RAPT), hazard mitigation training programs (ACT) [20], and attention maintenance training programs (FOCAL) [21]. The ACCEL training program when evaluated on a driving simulator reduced significantly the risky behaviors of novice drivers in each of the three areas which were targeted [5]. Additionally, one component of this program (hazard anticipation training) had already proven effective at reducing actual crashes among male, teen drivers [22]. The other two components had effects on behaviors which were known to affect crash risk.

In order to pivot ACCEL from a laboratory based intervention with very few bells and whistles into an AAA program that maintained the effectiveness of the intervention, but was better suited for broad dissemination, individuals associated with the intervention and the AAA had to devote 100s of hours into making sure that the scalable version that was being developed by the AAA did not change the effectiveness of the training. Too often an organization that wants to scale a proven researcher's intervention will make changes to the original, laboratory based intervention that no longer keep the intervention's integrity intact. Key to this pivot was the AAA's clear commitment to making sure that the scalable version did not alter in any way that could be foreseen by researchers or the AAA the effectiveness of the intervention (ACCEL).

### **7.2 Ready Assess™**

A CHOP research team developed and validated a laboratory-based simulated driving assessment that safely exposes drivers to common crash scenarios and measures their skill in avoiding crashes [4]. They validated the technology by showing that it could differentiate drivers according to skills and experience. In an initial pivot to translate this technology to real world application, the team created a spin-out company called Diagnostic Driving, Inc., to develop the virtual driving test (VDT) technology as a commercial grade mobile delivery system that does not require expensive fixed-based driving simulators. The commercial product, Ready Assess™, makes VDT available for broad deployment in non-research settings.



Their first big customer, the Ohio Bureau of Motor Vehicles (OBMV), wanted to determine if Ready Assess™ could be used to predict which drivers would fail the on-road test and possibly put at risk the license examiners. To address implementation pain points of OBMV staff, additional key features of Ready Assess™ include a self-directed workflow for the customer, plug-and-play technology for the OBMV staff workflow, and a software-as-a-service delivery model that runs on standard and affordable hardware for BMV administrators. Ohio's pilot program has been running smoothly in 5 driver licensing centers and is accurately predicting customers' failure on the road exam [23]. The next pivot planned is to provide automated feedback to OBMV customers on their driving that includes recommendations for additional practice driving.

### **7.3 Share the Keys**

A community-based training program, initially titled the *New Jersey Parent/Teen Driver Orientation* and later renamed *Share the Keys*, was designed to engage the community (e.g., parents, teens, educators, and law enforcement) in the teen driving process and, in particular, to help parents understand how personal parenting styles and engagement may impact teen crash risk and compliance with the GDL restrictions. The need to combine best parenting practices with the GDL process was emphasized in a study published by the Centers for Disease Control and Prevention [24]. With this in mind, the program was initially developed by a team from NJDOT and Keane State University which used behavior change theory and research from CHOP on the impact of parents on teen driving behaviors and crash risks [25]. Parenting styles categorized as authoritative and authoritarian were identified as being more likely to be associated with safe teen driving behaviors than parenting styles categorized as permissive or uninvolved. Thus, the former two parenting styles were the focus of some of the program material. Additional parent-teen components have since been incorporated including a parent-teen driver contract [26].

Having completed the development of Share the Keys, NJDOT was ready to scale Share the Keys as a community-based program. However, resources were a real constraint. In a significant pivot, NJDOT was able to take advantage of new laws in New Jersey that allow for public-private partnership to deliver public safety programs. Through a licensing agreement, New Jersey Manufacturer Insurance Group partnered with the State of New Jersey and also Pennsylvania SADD to deliver Share the Keys in two states.

Evaluations of the program have now been completed. One evaluation in particular is deserving of mention [9]. As a community-based program, local representatives from traffic safety and law enforcement worked with school officials and driver education teachers to present programs in their communities. The evaluation process was built into the program as a pre-survey administered at the beginning of the session, a post-survey completed directly afterward, and a voluntary follow-up survey completed on line or mailed, beginning six months to a year later. The program itself was 90 minutes in length, consisting of 26 slides and ten videos embedded in a Six Step Model for interventions developed by Winston and Jacobsohn [27]. Parents' enforcement of the GDL restrictions remained high throughout (86% during baseline, 80% one year later). However, there was no indication that the two safety related parenting styles (authoritarian and authoritative) increased in frequency over the course of the year. It was hoped that such would be the case. Further research was proposed.

## 8 Conclusion

The goal of this Peer Exchange was to inform the development of countermeasures that can be deployed widely and cost effectively in actual practice to reduce the crash risk for novice drivers. This required that practitioners provide scientists with an understanding of what is needed to take evidenced-based novice driver tests and training programs (and remedial training programs) and move them into practice; and 2) that scientists provide practitioners with an overview of the evidence-based tests and training programs which have largely been untouched in practice even though widely available in peer-reviewed, academic journals.

The recommendations put forward by the Peer Exchange can be used by practitioners and by researchers to improve systems and personal practice that will help remove barriers to implementation. In particular, the “Common Themes on Abilities to Deliver, Scale and Sustain the Solutions” section has clear recommendations for follow-up, one of which is already underway (development of a companion to the NHTSA volume, “Countermeasures That Work”). The willingness of scientists to pivot in their development process to address the pain points of practitioners and those with ability to get solutions to those who need it was demonstrated in Examples of Research to Practice. These pivots included investments of time by researchers and practitioners (to take a barebones program into a scalable program that would appeal to users), investment in startup companies to take the research into the realm of practice, and investments in changing the legislative process. Key to action and follow up is for those with the Ability to create opportunities for scientists and practitioners to connect and network to do so.

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## 10 APPENDIX

### 10.1 Agenda: TRB Novice Driver Crash Avoidance: Research to Practice Workshop

Monday, August 14, 2018

#### **Welcoming Remarks and Introductions**

Flaura Winston, Don Fisher, Suzanne Hill, & Angie Byrne

#### **Research and Practice Priorities**

*What are evidence-based programs?*

Research presented by: Brian Tefft

*Road to Zero: Novice Drives*

Practice presented by: Jenny Burke

#### **Attention Maintenance and Training**

*Attention maintenance and training programs: What works?*

Research presented by: Johnathan Ehsani

*Utilizing corporate-state partnerships to distribute evidence-based programs*

Practice presented by: Violet Marrerro

#### **Changing Teen and Parent Behaviors**

*Leveraging Smartphone Technology and Behavioral Economic Interventions to Prevent Teen Driver Crashes*

Research presented by: Kit Delgado

*Mandating Parent GDL Orientation*

Practice presented by: Kevin Borrup

#### **Discussion #1: What needs to be done to implement a particular intervention?**

Facilitated by: Kendell Poole

#### **Lunch**

#### **Hazard Anticipation Training**

*Training and testing Hazard Anticipation: An overview*

Overview presented by: Anju Pradhan

*The NHTSA California RAPT Trial*

Research Presented by: Dennis Thomas

*Implementing Hazard Perception Training in a National Program: Classroom, Internet & VR*

Practice Presented by: Bill Van Tassel

#### **Using State Licensing Centers to Identify Unsafe Drivers**

*Evaluating the Effectiveness of a Virtual Driving Test for Predicting Road Exam Readiness*

Research Presented by: Venk Kandadai and Flaura Winston

*Implementing Virtual Driving Test at State Licensing Centers*

Practice Presented by: Don Petit

#### **Discussion #2: Which Interventions Currently Available are of Interest to the States?**

Facilitated by: Brett Robinson

#### **Break**

#### **Developmental Disabilities and Crash Risk**

*Driving with Developmental Disabilities: How Recent Scientific Developments Can Inform Practice*

Research Presented by: Allison Curry

#### **Brian Injury and Teen Driver Issues**

*Tests of Cognitively Impaired Populations*

Research Presented by: Maria Shultheis  
*Driver Education, Students with Special Needs, and Drivers with Physical or Medical Concerns: Current Practices in Michigan*

Practice Presented by: Tom Bryant

**Discussion #3: Addressing Challenges for Research-Based Projects Becoming Practice**

Facilitated by: Angie Byrne

**Break**

**Peer Influences and Social Pressure**

*Leveraging Social Influence to Improve Young Driver Safety*

Research Presented by: Shannon Roberts

*How peer programs are promoted to youth leaders and get delivered at the NGO level*

Practice Presented by: Rick Birt

**What are we Missing?**

*Racial and Ethnic Disparities*

Presented by: Federico Vaca

*Examining the Role of Mental Health in Young Drivers*

Presented by: Kate McDonald

**Discussion #4: Key Priorities for Novice Driver Crash Avoidance Research to Practice**

Facilitated by: Suzanne Hill

**Briefing on Next Day**

Flaura Winston and Don Fisher

**Tuesday, August 15, 2018**

**Perspectives**

Introduction: Don Fisher

*Federal Perspectives*

Presented by: Rory Austin

*AAA and AAA Foundation for Traffic Safety Perspectives*

Presented by: Rich Romer

**Breakout Groups**

All participants

**Break**

**Report Out**

All participants

**Next Steps**

Flaura Winston

**Adjourn**

## 10.2 Peer Exchange Attendees

Omar Ahmad

Deputy Director, National Adv. Driving Simulator

University of Iowa

Rory Austin

Chief, Injury Prevention Research  
National Highway Traffic Administration

Rick Birt

President and CEO  
SADD

Kevin Borrup

Associate Director, Injury Prevention Center  
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Tom Bryant

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Jennifer Burke

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Venk Kandadai

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Diagnostic Driving

Bernardo Kleiner

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Violet Marrero

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