

Development and
Pilot Testing of the Driving
Check-Up: Expanding the
Continuum of Services Available
to Assist Older Drivers

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Title

Development and Pilot Testing of the Driving Check-Up: Expanding the Continuum of Services Available to Assist Older Drivers (*May 2018*)

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Foreword

Globally, the number and proportion of older drivers is on the rise. With a growing number of adults living longer and “aging in place,” the topic of safe mobility for older motorists needs to be a focus area. The current project thus sought to expand the available services to assist older drivers in remaining safe and active.

The current report described the rationale, development and pilot evaluation of the Driving Check-Up. It is a model program for driving schools intended to provide in-vehicle driving evaluations of older adults. Information presented in this document can be a useful reference for practitioners who work in the area of driver education and training.

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List of Abbreviations and Acronyms

AAA	American Automobile Association
AAAFTS	AAA Foundation for Traffic Safety
ADED	Association for Driver Rehabilitation Specialists
ADTSEA	American Driver and Traffic Safety Education Association
AGS	American Geriatrics Society
AOTA	American Occupational Therapy Association
CINAHL	Cumulative Index of Nursing and Allied Health Literature
DI	Driving instructor
DMV	Department of Motor Vehicles
DRS	Driver/Driving rehabilitation specialist
DSAA	Driving School Association of the Americas
ITRD	International Transport Research Documentation
OT	Occupational therapy/therapist
TRID	Transport Research International Documentation

1.0 Executive Summary

The goal of this project was to develop a program for driving schools to provide in-vehicle driving evaluations of healthy older adults. Based on a literature review and expertise from an advisory committee and other stakeholders, the Driving Check-Up was developed and pilot tested at six driving schools. This report summarizes the development process, the model Driving Check-Up program, results from pilot testing the program, and further recommendations for development.

The Driving Check-Up is designed to be part of a larger continuum of services available to assist older adults in their goal of remaining safe and active drivers. Based in driving schools, the Driving Check-Up will provide older adults with objective feedback aimed at improving safety and maximizing driving longevity through a one-hour evaluation of *key driving skills and abilities*. It is designed for healthy older adults living and driving in the community who seek objective information about their driving skills and knowledge; it is not an evaluation of *driver fitness*. In fact, if a health care provider has a concern about the older adult's driving safety, a referral should be made directly to a driver rehabilitation specialist. Thus, an essential component of the Driving Check-Up is the relationship between the driving school and driver rehabilitation/occupational therapy services to ensure that drivers identified with health-related concerns can be directed to the appropriate medical-based driver rehabilitation services. Thus, the Driving Check-Up serves as a "gateway" for directing older adults to the service option that best meets their needs.

The Driving Check-Up includes two phases: 1) a phone interview and decision to schedule and 2) a 60-90 minute in-person assessment consisting of an interview and screening for impairment in vision, cognition and motor abilities; an on-road drive in the school's vehicle; and a discussion of results from the Driving Check-Up that includes recommendations for remaining safe on the road.

The first component, the interview, includes a driving history and general health questions. The interview was designed to identify potential problems that may warrant further discussion and/or referral to a health care provider. Four screening tools are then administered in accordance with specific instructions and training, the results of which are used to determine who should proceed to the on-road component and who should be referred to their primary care practitioner or driving rehabilitation specialist. Next, the on-road component includes the more complex maneuvers that are the primary focus for older adults and that are typically part of driving instructors' established routes. The last component is a debriefing discussion with forms used to provide feedback on performance as well as information about safety resources or health care referral sources as needed.

This report explains each of the Driving Check-Up's components along with associated forms used to implement the program and scripts for the driving instructors to use with the older adult participants. This report also describes the evolution of the Driving Check-Up, including lessons learned over the course of the six pilot sites. Feedback from the driving instructors and older adult participants, along with observation of the team members, reinforced a number of emphasis areas in the final Driving Check-Up. These include:

- The recognition of driving instructors as teachers who want to assist drivers.

- The need for in-person training for appropriate program implementation.
- The need for the typical driving instructor to understand the differences between novice and experienced drivers in order to re-orient their approaches for working with older drivers.
- The importance of following clear protocols for screening of possible medical conditions from a liability perspective.
- Collaboration of the occupational therapist with driving rehabilitation experience as a key to the successful implementation of the Driving Check-Up.

Finally, the report highlights several important recommendations, including a study to evaluate the effectiveness of the Driving Check-Up program.

2.0 Introduction

2.1 Background and Need

With any service, there is usually a wide range of providers from which consumers select. It is best when all service options are available and the consumers can choose the most appropriate level of service for their individual needs. Driving instructors, driver rehabilitation specialists, and occupational therapists provide a distinctive array of driving services for older drivers, and just as with other kinds of services, the skills, knowledge, and expertise of these providers differ (Lane et al., 2014). This diverse set of services is best exemplified by a seminal document developed with funding from the National Highway Traffic Safety Administration by leaders in the American Occupational Therapy Association (AOTA) and the Association of Driver Rehabilitation Specialists (ADED) (see Appendix A). This document was developed over two years with input from key stakeholders to better describe the distinctions between programs in terms of training, outcomes and expectations in the area that is broadly described as driving evaluations and/or services.

The development of the Driving Check-Up is an expansion of the Community-Based Education section of this document, focusing in particular on describing (and expanding) the *Driving School* program type (see Appendix A). As developed, with the specially designed materials and driving instructor training, the Driving Check-Up can become the “go-to” program for older drivers who want to maintain their driving, as well as families who may be uncertain about the driving safety of their aging relatives. The vision of the program is that driving instructors will collaborate positively with older adult drivers using one-on-one skill appraisals as a first line of inquiry in assisting older adults in recognizing any age-related concerns or changes in their driving knowledge, skills or abilities, and identifying and/or accessing resources to help address these changes or concerns. Working in partnership with medically based or specialized services, the Driving Check-Up will be performed by trained driving instructors who can provide practical and reassuring feedback to the vast majority of healthy older drivers, while seamlessly identifying and directing older drivers with physical, visual or cognitive impairment to services (e.g., optometrist, physician, occupational therapy, driving rehabilitation specialist) that will appropriately address these impairments. Through the use of the Driving Check-Up, driving schools will provide the best service but not expose their business to liability by working outside of their training and education.

Thus, the goal of this project was the development and initial pilot testing of the Driving Check-Up, a model program for a driving-school evaluation of driving knowledge and skills for older adults. The specific objectives of the project included:

1. Identification and evaluation of current driving-school programs that assess older drivers' on-road performance.
2. Development and pilot testing of a model in-vehicle driving skills evaluation that could be implemented in driving schools or similar settings, appeals to a broad spectrum of older drivers and their families, and includes screening procedures for potential cognitive and other medical impairments.
3. Utilization of a framework for expanding collaborations and appropriate referrals among the various providers of on-road driving services (i.e., driving schools,

occupational therapists, driver rehabilitation specialists).

Driving instructors and driving schools are widely available in communities across the United States. Their programs have traditionally focused on educating young novice drivers. On the other hand, driving in the context of medical illness or diseases is routinely addressed by occupational therapists as part of instrumental activities of daily living (Dickerson & Niewoehmer, 2012). When clients have a medical issue impacting their driving, the occupational therapist usually determines if there is potential risk in resuming this activity as well as other complex tasks of daily living (e.g., budgeting, shopping, medication management) (Dickerson & Schold Davis, 2012). If there is potential or identified risk, the therapist may refer the client to a driver rehabilitation specialist, who is specifically trained and qualified to evaluate the individual's (medical) fitness to drive (Dickerson & Schold Davis, 2012; Stav, 2015).

The comprehensive driving evaluation, completed by a driving rehabilitation specialist, typically includes a battery of professional assessments to understand functional abilities related to driving (e.g., vision, cognition, physical, speed of information processing) and an on-road driving evaluation where the impairments identified in the clinical portion are observed in a functional context. In contrast to driving instruction, the emphasis of the comprehensive driving evaluation is on the capacity (or medical fitness) to drive, not road knowledge or driving habits. While the on-road driving evaluation is recognized as the gold standard for determining fitness to drive (Classen, Dickerson, & Justiss, 2012), the factors and challenges included in the medical on-road evaluation differ from an education-based measure of learning, typically done by the driving instructor. Additionally, the driver rehabilitation specialist follows an evaluation with a plan and individualized recommendations including intervention, training or driving retirement. Unfortunately, not all communities, health care providers, or driving schools know about the services of driving rehabilitation specialists.

With growing numbers of individuals living longer and wanting to “age in place,” (Rosenbloom, 2012) these older adults may look for services to allow them to remain in their communities by refreshing and staying current in driving skills and abilities. Unfortunately, a smaller group will be aging with medical conditions that will affect their individual capacity or fitness to drive. In both cases, there is an important need for more community-based programs to provide services for these distinct groups of older drivers and their concerned family members.

Over the past decade, a growing number of driving schools have responded to requests for evaluation by offering modified versions of their in-car evaluation services for experienced drivers. These range from simple “drive-alongs,” conducted by instructors with no training in aging or medically related fitness-to-drive factors, to broader driving assessments provided by trained instructors with access to occupational therapists, driving rehabilitation specialists or other medical professionals. However, it is critical to understand that assessing medical fitness requires specialized medical knowledge and a distinct skill set. There is potential risk to the driving instructor and potential liability exposure for the driving school if drivers with cognitive impairments or other high-risk medical issues are served without properly understanding their medically related risk related to driving (e.g., as an overlearned skill, drivers with dementia can appear to be “safe”). While driving instructors are generally well trained and qualified to evaluate

driving knowledge and skills needed to manage the mechanics of driving and the driver's ability to adhere to driving rules and regulations, it is beyond their scope and professional training to determine how medical conditions and/or the aging process may affect the capacity to safely operate a vehicle when facing unexpected demands. The Driving Check-Up is designed to respect professional education/training and areas of expertise to provide clear guidelines of service. Driving instructors are highly trained and skilled teachers with a teaching paradigm that focuses on student learning. A teacher's training involves identifying an issue with the new driver (e.g., poor lane maintenance, inappropriate gap acceptance, slow response to traffic) and teaching the driver, with practice, to gain that skill. Unfortunately, for the driver with impaired capacity to learn (i.e., cognitive impairment, dementia), teaching with the expectation of learning is not an appropriate strategy. Thus, the Driving Check-Up equips the driving instructor to appropriately serve the experienced driver and identify those requiring specialized services in response to their medical impairment.

A critical component of the Driving Check-Up model is to protect driving-school instructors from liabilities that could be associated with the failure to detect and appropriately advise a medically impaired driver. Three types of impairments are particularly relevant. Drivers with dementia or similar cognitive impairment pose the greatest threat to the driving instructors because symptoms may be masked with overlearned skills and/or verbose explanation; symptoms may also manifest intermittently, depending on timing of medications, sleep quality, or other factors. These cognitively impaired drivers often fail to recognize and/or report their own limitations (Dickerson et al., 2007; Wheatley, Carr, & Marottoli, 2014). Some visual impairments also pose risks, such as poor peripheral vision due to unrecognized glaucoma, poor central vision due to macular degeneration, and visual field cuts (e.g., homonymous hemianopsia from stroke) (Elgin, Owsley, & Classen, 2012). As with cognitive deficits, visual limitations may not be fully recognized or reported by drivers themselves. Episodic conditions, in which the driver might function well at a driving-school appointment but be unsafe on the road at other times, are a third type of medical condition with liability concerns. Examples of these include poorly controlled diabetes, epilepsy, untreated sleep apnea, or sedating medication. An important component of the Driving Check-Up provides the driving-school instructors with education about important driving safety (and liability) issues, providing screening materials so these medical conditions will not be missed and protocols for appropriate referrals.

Driving-school practice is typically focused on teens and/or novice drivers. However, there is potentially a unique and growing opportunity for driving schools to expand their services to the growing population of older adults who want and need to continue to drive (Ambrosio, Coughlin, Pratt, & Mohyde, 2012). An emphasis of the Driving Check-Up is to expand driving schools' scope of services to assist experienced older adult drivers in extending their safe driving years for as long as possible. This may be especially important for older women, who are more likely to prematurely retire from driving (Anstey, Windsor, Luszcz, & Andrews, 2006; Stutts, Wilkins, Reinfurt, Rodgman, & Causey, 2001), or who may need to assume the couple's driving responsibilities after their husband's illness or death (Wilkins, Stutts, & Schatz, 1999). Thus, for drivers who perform well, the Driving Check-Up should strengthen driving confidence. However, even older drivers who are healthy, competent, and confident behind the wheel stand to benefit from an objective assessment of their driving strengths and weaknesses, as well as personalized feedback to better prepare them to adapt to technological changes in vehicles, roadway changes (e.g., roundabouts, new

styles of traffic signals) and any age-related changes in their driving capabilities. All older drivers, regardless of their current driving abilities, can benefit from information about the continuum of services available to help ensure their continued safe driving as long as possible. Family members, too, may appreciate reassurance of their loved one's continued driving competency or, alternatively, awareness that medical or other functional impairments may be negatively affecting their driving and increasing their risk of injury to themselves and others.

2.2 Program Overview

The Driving Check-Up is designed as part of a larger continuum of services available to assist older adults in their goal of remaining safe and active drivers. Based in driving schools, the Driving Check-Up will provide older drivers with objective feedback aimed at improving safety and maximizing driving longevity through a one-hour evaluation of key skills and abilities. The program consists of a pre-drive interview and screening, on-road assessment, and post-drive discussion of performance and recommendations. An essential component of the Driving Check-Up is the relationship between the driving school and occupational therapy/driving rehabilitation specialist, ensuring that drivers identified with health-related concerns can be directed to the appropriate medically based driver rehabilitation services.

It is essential to understand that the Driving Check-Up is not an evaluation of driver fitness and does not offer a message of "pass or fail." Individuals facing changes from a medical condition or wondering if they are ready to return to driving should not be referred to this program. The Driving Check-Up offers a "gateway" for information when there is a question about driving. Using the *Spectrum of Driver Services* (See Appendix A), the driving school can direct the older driver and/or family member to the best service options for their individual issue.

The objectives of the Driving Check-Up for the client, the older adult, include being able to:

1. Receive objective feedback on current driving skills and knowledge based on observation of performance on the road.
2. Receive information about particular driving situations and maneuvers that pose a higher crash risk to themselves as for older drivers.
3. Receive information on further services to improve or enhance driving knowledge and skills.

For driving schools, the objectives of the program are to:

1. Increase the visibility of the driving school in the community by providing a service to older drivers.
2. Provide a service that highlights the expertise of the driving instructor to assess current driving skills and knowledge.
3. Provide an information gateway for older drivers and/or families to enhance safe driving.
4. Provide access to the most appropriate services for older adult drivers whose medical condition is a source of concern.
5. Expand enrollment in driving-school services based on outcomes from the Driving Check-Up.

This report documents the development and pilot testing of a model Driving Check-Up program for older adult drivers. Section 3.0 describes each component of the model program. Section 4.0 describes the approach followed in developing the model program and the supporting guidelines and forms needed for implementation, and Section 5.0 provides the results of pilot testing the model Driving Check-Up program at six sites across the country. A final Discussion and Recommendations section revisits some of the critical issues faced in developing the program, and highlights needs and recommendations for making the Driving Check-Up an available and valued service to older drivers.

3.0 The Driving Check-Up Program

The Driving Check-Up is intended to be part of a larger continuum of services available to assist generally healthy seniors in their goal of remaining safe and active drivers. Based in driving schools, the Driving Check-Up is a one-hour evaluation of key driving skills and abilities designed to provide seniors with objective feedback aimed at improving safety and maximizing driving longevity. The program consists of a pre-drive interview and screening for functional limitations, an on-road assessment, and a post-drive discussion of performance and recommendations. An essential component of the Driving Check-Up is the relationship between driving schools and driver rehabilitation/occupational therapy services, ensuring that drivers identified with medically related concerns can be directed to the appropriate medically based services.

The Driving Check-Up has been designed for approximately 60 minutes. Since the Driving Check-Up is designed for the relatively healthy older adult, the pre-drive interview and administration of screening tools is expected to take 10-15 minutes, the on-road component about 30 minutes, and the summary discussion about 15 minutes. In the case of an older adult who has difficulty with the screening tools or for whom an instructor flags a concern during the pre-drive interview, the time allocated for the on-road may be used to discuss recommendations and/or referral to the occupational therapy/driver rehabilitation specialist.

To facilitate the process and training for the driving instructors, each component has specific protocols and scripts (e.g., for scheduling appointments and administering the screening tools), scoring sheets, and handouts to support different outcomes and recommendations. The sections below present the model Driving Check-up program as finalized following the pilot testing. For each program component, we first review the objectives for that component, and then present the final materials and guidelines.

3.1 Components of the Driving Check-Up with Targeted Objectives

Scheduling Clients

Scheduling is an important first step in the process of the Driving Check-Up. The objectives for this component are to:

- Schedule the Driving Check-Up at a time a qualified (i.e., trained) instructor is available.
- Ensure the person calling to schedule the Driving Check-Up understands the nature of the service provided.
- Alert the client that he or she must possess a current license and will have their vision checked.
- Ensure the older adult is appropriate for the Driving Check-Up (e.g., not seeking a fitness-to-drive evaluation ordered by a physician or the state's licensing authorities).

The scheduling form below is designed to meet these objectives. It is intended for completion by office staff at the driving school, with any questions being referred to the driving instructor who is trained to administer the Driving Check-Up.

Scheduling a Driving Check-Up

Caller name: _____ Date: _____

Name of person for whom Check-Up is requested, if not caller: _____

Relationship of caller to this person: _____

1. Reason for Requesting the Driving Check-Up:

Confirm the Check-Up is what is wanted as opposed to lessons, new driver training, a "practice" DMV test, etc. Also use this opportunity to help determine whether a Driving Check-Up is appropriate for this individual.

"Can you tell me why you are wanting a Driving Check-Up?"

"Is there anything in particular that prompted your call today?" (DMV referral, recent health event, recent crash, doctor recommended, license renewal coming up, etc.)

Notes: _____

2. Understanding of the Driving Check-Up Program:

Inform caller of the goals of the Driving Check-Up, how it works (including use of the school's dual brake vehicle), and time and cost requirements. (Note differences for the Pilot Testing, including offering the service at no cost to the driver in return for their feedback and suggestions for improving the Program.)

"How familiar are you with the Driving Check-Up Program?"

Notes: _____

3. Recent Health Events Affecting Driving (if not already addressed):

Purpose is to help determine the appropriateness of the Driving Check-Up for the individual, and also to provide a 'heads-up' to the evaluator about what to expect. If the driving instructor is the one handling the call, he or she might want to probe for more detail.

"Have you experienced any recent changes in your health or vision that might affect your ability to drive safely, or to renew your license?"

"Has your doctor recommended you have a driving evaluation because of a specific health problem?"

- > If individual has serious medical issues and/or has been referred for a driving evaluation by the DMV/DMV Medical Review, or by their doctor, refer directly to your driving rehabilitation specialist or other qualified occupational therapist.
- > If scheduler is not comfortable making this decision, ask if the driving instructor who would be doing the Check-Up could call them back. *"Thank you for this information. Let me have the driving instructor call you back, so that we can make sure this is the best program for you before scheduling an appointment."*

Notes: _____

Figure 1a. Scheduling a Driving Check-Up Form (p. 1 of 2)

4. Driver's License Status and State Requirements for Driving:

"As you know, there are certain requirements that must be met before driving in (state).
Do you have a currently valid (state) driver's license?" Yes No

- > If respond "no," let them know that you can only provide the Driving Check-Up if they hold a currently valid license.

"Have you had your eyes checked since you last renewed your license to be sure you still meet State standards?" Yes No

"Has this been within the past year?" Yes No

- > If respond "no" to either question, let them know that their vision will be tested when they come in for the Check-Up, and that you will only be able to take them on the road if their vision meets State licensing standards.

Notes:

5. Specialized Vehicle Equipment:

"Has any specialized equipment been installed in your vehicle to assist you in driving?" Yes No

- > Drivers requiring specialized vehicle equipment to drive should be referred elsewhere unless the school has a program that evaluates drivers who require adaptive equipment in their own vehicles.

Notes:

6. Schedule the Appointment (if Check-Up appears appropriate for the driver):

Day: _____ Date: _____ Time: _____

"We usually give people a call to remind them of the appointment.
Could I have your phone number now?"

Phone: _____

"Will anyone else be coming with you to this appointment?" Yes No
(or if someone else is calling) "Will you be joining us for this appointment?"

Notes: _____

7. Appointment Confirmation and Reminders:

OK. We have you scheduled for _____. The name of the instructor you'll be seeing is _____.

Remember that you'll need to have a valid driver's license with you for us to take you out on the road.

Do you need directions to the school?

When you come, please bring with you any eye glasses you normally use for driving and also any glasses you use when reading. We look forward to seeing you!

Figure 1b. Scheduling a Driving Check-Up Form (p. 2 of 2)

Pre-Drive Interview (5-10 minutes)

The driving-school staff or driving instructor should warmly greet the older adult client, and family/friends if present, upon arriving for the Driving Check-Up. Once introductions are completed, the driving instructor should lead the client to a quiet part of the school where the pre-drive interview and screening component of the Driving Check-Up will begin. The pre-drive interview, although structured and scripted, should be done in a relaxed, conversational manner to put the client at ease. The objectives for the pre-drive interview are to:

- Confirm that the older adult has a valid driver's license and clarify any restrictions on the license.
- Obtain an emergency contact.
- Learn the older adult's reason(s) for seeking a Driving Check-Up.
- Obtain a brief driving history.
- Observe any potential issues that may flag an at-risk driver.
- Inquire about health issues that may warrant referral to a health care professional instead of proceeding with the Driving Check-Up.

Driving Check-Up Pre-Drive Information
(Recommend printing and making notes as needed during interview)

Driver's License Information

DL#, State: _____ Date Issued: _____ Date Expires: _____

Restrictions: _____

Notes: _____

Emergency Contact: *In case of an emergency, who can we call?*

Name: _____ Phone #: _____

Driving Questions:

(1) *What is your goal for today? What would you like to gain from the time we have together?*

(2) *How often do you drive, and where do you typically go? How important is driving to you? How much have you driven in this past month?*

(3) *Are there driving situations in which you feel uncomfortable, or that you prefer to avoid? Do you drive at night? In rush hour traffic? On the freeway?*

(4) *Has anyone expressed concerns about your driving? What are their concerns? Do you agree?*

(5) *Have you had any incidents while driving in the last year? (crashes, crunches and dents, violations, getting lost in familiar surroundings)*

Figure 2a. Driving Check-Up Pre-Drive Information Form (p. 1 of 2)

Health Questions

Now I'd like to ask you some health-related questions. These are similar to questions you might be asked by the DMV, since they address conditions that can affect your driving. The reason I'm asking is because I want to keep us both safe on the Check-Up drive.

(1) *Do you have any problems using your arms and hand, or using your legs and feet, to operate the controls on your car?* Yes No

Notes:

(2) *Do you have any problems turning your neck and shoulders, for example, to back up your car, or to check your blind spots when changing lanes?* Yes No

Notes:

(3) *Have you been told you have cataracts, glaucoma, macular degeneration, or other eye disease? If yes, can you tell me about that? What's the status of that now?* Yes No

Notes:

(4) *Do you take any medicines that make you sleepy or dizzy while driving?* Yes No

Notes:

(5) *Do you have any health problems that cause you to fall asleep at times when you need to be alert? If yes, can you tell me about that? Have you fallen asleep while driving?* Yes No

Notes:

(6) *Have you had any episodes of passing out, almost passing out, or not being able to think clearly – like a seizure or blackout or diabetic coma? If yes, can you tell me about that, and has it happened while driving? When is the last time that happened?* Yes No
(State standards may apply)

Notes:

(7) *Is there anything else I should know?* Yes No

Notes:

Any Cue Card Observations Here:

Figure 2b. Driving Check-Up Pre-Drive Information Form (p. 2 of 2)

Accompanying the pre-drive interview is a “cue card” (see Appendix B). This card was modified from previous work (Meuser, 2008) and designed as an observational tool for the driving instructor. The driving instructor should note any obvious behaviors that may suggest potential underlying medical conditions. The cue card organizes the observations into cognitive, sensory, and motor categories, but should not be used in any way as a diagnostic tool.

For the audience for which the Driving Check-Up is primarily designed, the pre-drive interview will take only a few minutes. If answers to the questions raise concerns about the older driver’s health and driving abilities, the driving instructor can choose not to continue with the on-road portion of the Driving Check-Up and instead make a referral to an appropriate medical professional (which is discussed in the post-drive discussion). In general, however, the interview is designed to provide useful background information for the remainder of the Driving Check-Up, including the screening tests and the post-drive discussion and recommendations.

For example, the older adult may report he or she has arthritis and has trouble turning his or her head. Depending on the outcome of the screening tests, this information offers good evidence to make a referral to the occupational therapist/driving rehabilitation specialist. On the other hand, it just may give the driving instructor more opportunity to suggest safety adaptations (e.g., use of adjusted mirrors to adapt to difficulty with turning the neck).

The driving instructors are asked to look at the license and note any restrictions. There are many types of restrictions that vary by state with some states not allowing any type of driving restriction other than corrective lenses. While a corrective-lenses driving restriction is relatively straightforward, other restrictions (e.g., use of hand controls, use of adaptive equipment, only driving during the day, only driving at certain speeds, etc.) suggest that there is a medical condition and the individual may need a direct referral to a medical professional. No restriction should be ignored; the driving instructor may need to call a driving rehabilitation specialist for consultation before proceeding to the on-road drive.

If an answer to one or more questions in the pre-drive interview seems significant (e.g., vision impairment, problems with hand/arm function, reporting passing out), the driving instructor can determine that the on-road component is not necessary or is unsafe. The driving instructor can collect more information by going on to the screening tools, or go immediately to the post-drive discussion and make a referral to the appropriate health care provider.

Screening Tests (5-10 minutes)

The Driving Check-Up utilizes four screening tests: one each for vision and motor, and two for cognitive processes. Each screening test has been carefully selected based on the review of the scientific literature, input from an advisory committee, and the results of the pilot evaluation. The protocols and directions have been designed for the driving instructor to use prior to the on-road component. Driving instructors require training for use of the screening tools, including observation of correct administration and scoring as well as practice with each tool. The screening tools are best completed in the following order: 1) visual acuity screen, 2) Rapid Pace Walk, 3) Snellgrove Maze Task, and 4) road sign test. The objectives for the screening portion of the Driving Check-Up are to:

- Justify the decision to go forward or not go forward with the on-road component of the Driving Check-Up.
- Determine if the older adult has an impairment in visual, motor or cognitive abilities that might affect his/her driving ability and/or safety.
- Offer evidence to the older adult to seek further information or evaluation with an appropriate health care provider if impairment becomes apparent with the screening protocols.
- Offer the older adult the opportunity to seek information, and potentially a comprehensive driving evaluation with an occupational therapist/driving rehabilitation specialist, if impairment is apparent with the screening protocols.

Vision Screen: Visual Acuity. The visual screen consists of a visual acuity chart, such as the Snellen eye chart or its equivalent, so that the driving instructor can ascertain that the older adult meets the visual requirements for licensing in the state. Below are the directions for this screen.

Preparation:

Post the eye chart on the wall in a well-lighted area without glare. Mark the required number of feet to measure 20/20 vision (typically 10 or 20 feet) with a piece of tape.

Identify the line on the chart corresponding to your state’s minimum visual acuity requirement for licensing.

Administration:

1. Ask the participant to put on any corrective lenses if used for driving.
2. Do testing with both eyes uncovered.
3. Ask the participant to read the letters on the line *above* the one for your state’s requirements, then the line *for* your state’s requirements.
4. The score is the lowest line the participant can read correctly. The participant must be able to identify at least half the numbers on a given line.

This screen is for distance acuity only. A passing score does not rule out other potential vision problems, such as loss of peripheral vision.

Record the score on the **Results of the Screening Tests** form.

Figure 3. Directions for First Screen: Vision - Visual acuity

The form for recording the *Results of the Screening Tests* is contained in Appendix C. In the case of the vision screen, if the vision standard is not met, the driving instructor can proceed with the rest of the screening tools but should not take the older adult on the road. The driving instructor can recommend that the older adult see his/her eye specialist. It is also an option that the Driving Check-Up be stopped at this point until the older adult can return and meet the standard for the vision screen.

Physical Screen: Rapid Pace Walk. The *Rapid Pace Walk* is a very brief screen of an individual's mobility. The description below explains the preparation for the Rapid Pace Walk and the specific directions for administering and scoring the test. It is important for the older adult to "practice" once to ensure the directions are understood.

Preparation:

Mark out a 10 foot walkway by placing two strips of colored tape 10 feet apart from each other on an area of floor clear from traffic. Have a stopwatch or other timing device like a cellphone.

Administration:

1. Have the person do a *Practice Walk*

Demonstrate and then have the participant practice the walk at a comfortable pace. Make sure participant understands the task.

Say: "*I want you to walk from this line of tape to the line ahead of you, turn around, and walk back here at a comfortable pace.*"

If appropriate, say: "*If you use a cane or walker, you may use it if you feel more comfortable.*"

2. Timed Walk

Say, "*Now I am going to time you. This time, I want you to go as fast as you feel safe and comfortable. Ready, begin.*"

Using your stopwatch, start timing when the participant picks up his or her foot, and stop timing when the last foot crosses the finish line.

The score is the total time to traverse the 10-foot path up and back.

Record on the **Results of the Screening Tests** form.

Figure 4. Directions for Second Screen: Rapid Pace Walk

As indicated on the *Results of the Screening Tests* form (Appendix C), while the protocol indicates that a score of more than nine seconds suggests that there may be an underlying physical impairment, not meeting the protocol in only this screen does not preclude the older adult from going forward with the on-road drive. However, the driving instructor should be aware the individual may have decreased response time and/or may have difficulty getting in and/or out of the vehicle.

Cognitive Screen: Maze Task. The first of two cognitive screens, the Snellgrove Maze Task is a brief screening tool standardized to identify individuals who may need further evaluation for cognitive impairment. It is not a diagnostic tool nor developed to determine

fitness to drive. However, it has been selected as a means to help differentiate between those older adults who can benefit from a Driving Check-Up and those who need another level of service.

The Maze Task has clear directions as outlined below.

Preparation:

You need a stopwatch, a pen, and a printed copy of the practice maze and maze task.

READ the instructions below verbatim. Record the person's name and date on the maze sheet.

Administration:

1. Present the *Practice Maze* in the correct orientation in front of the participant. You do not need to time the practice. Use the pen to point and say:

“I want you to find the route from the start to the exit of the maze. Put your pen here at the start (point to the start). Here is the exit of the maze (point to the exit). Draw a line representing the route from the start to the exit of the maze. The rules are that you are not to run into dead ends (point to a dead end) or cross solid lines (point to a solid line). Now start.”

Repeat the instructions if required, and correct any rule-breaks. Lifting the pen from the page is permitted. Make sure the participant understands the task.

2. Place the *Maze Task* in the correct orientation and say:

“Good, now that I know you understand the task, I am going to time you as you find the route from the start to the exit of the maze. Put your pen here at the start (point to the start). Here is the exit (point to the exit). Draw a line representing the route from the start to the exit of the maze. The same rules apply. Don't run into any dead ends (point to a dead end), or cross any lines (point to a solid line). Are you ready? I'm starting the timer now. Go!”

Do not repeat the instructions or correct any rule breaks. If questions are asked, say, “I can't give you any more help. Do the task as best you can.”

Errors: Going down a dead end or cutting across a line is an error. “Weaving” down the correct path is not an error. A “brush up” against a line on the correct path is not an error.

Stop the timer immediately upon completion of the task. If not completed in 3 minutes, discontinue.

Record: whether maze was completed, and if so, the number of seconds it took and the number of errors on the **Results of the Screening Tests** form.

Figure 5. Directions for Third Screen/Cognitive Screen #1: The Maze Task

With some older adults, the tendency may be to try to go too fast on the maze, making it difficult to score. In this case, the driving instructor can say, "Accuracy and speed are equally important."

The Practice Maze and the Maze Task are illustrated below.

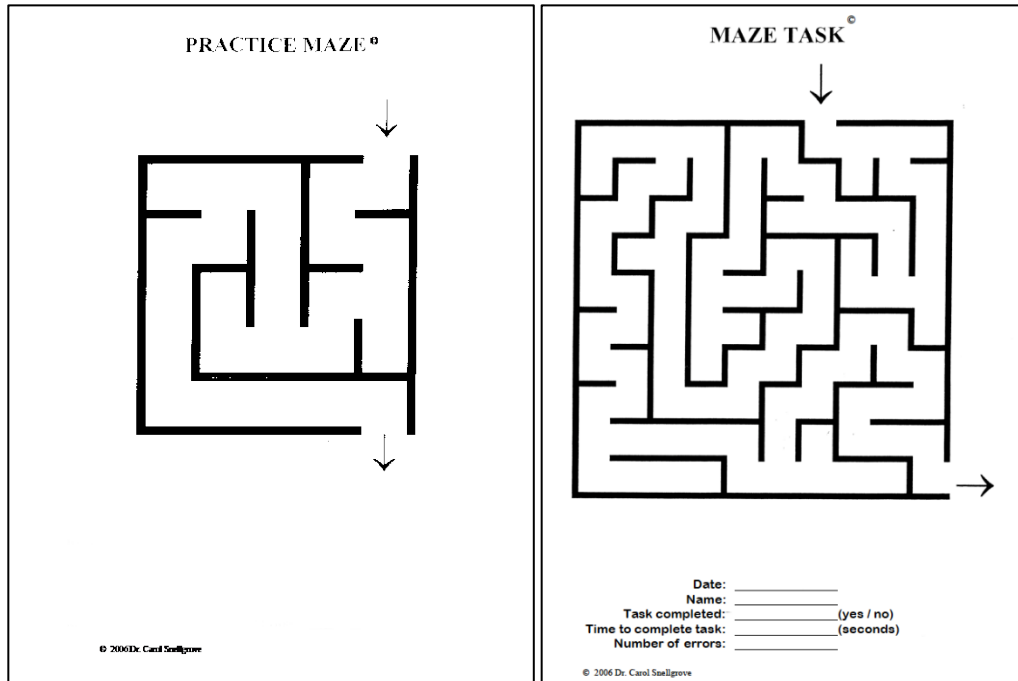


Figure 6. Practice Maze and Maze Task

If the older adult fails to meet the protocol of completing the maze in less than 60 seconds, or does complete it but has two or more mistakes, the older adult should not proceed to the on-road. However, results should be recorded and will likely be part of the discussion with the driving instructor.

Cognitive Screen: Road Sign Test. The second cognitive screen, the *road sign test*, is also being used as a brief screening test. Though unstandardized, the test has good face validity with older adults as well as driving instructors and has been used in various formats (Barco et al., 2015; Carr et al., 1998).

Below are the instructions for using the fourth screening tool in the Driving Check-Up. Also shown is a reference sheet that has been developed with both the correct answers and examples of incorrect answers.

Preparation:

Obtain a laminated deck of cards displaying the 12 traffic signs below. This is not a timed test.

Administration:

Directions:

“I am going to show you several traffic signs, one by one. For each, please tell me the name of the sign and what the sign tells you to do. A few of the signs you will need to know by the shape.”

For the signs with words, prompt: “What does that mean that you should do?”

If you are unsure what the participant means, say “Tell me more. What does it say you should do?”

Comments:

In most cases, a driver will either know the sign or not. If you get a wrong answer, do not have the driver guess repeatedly. Count it as incorrect.

Limit your prompting to the above.

Remember this is a test. Although you often teach the signs, do not do that here. No coaching, no hints, no gesturing!

Drivers do not need to cover all the details, but must demonstrate a basic understanding of the meaning of each sign.

Score is the total number of traffic signs (out of the 12) correctly identified.

Record the score on the **Results of Screening Tests** sheet.

Figure 7. Directions for Fourth Screen/Cognitive Screen #2: Road Sign Test








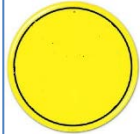



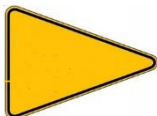
CORRECT ANSWERS			
	<p>Hill Ahead</p> <ul style="list-style-type: none"> ➤ Warning of hill or steep downgrade ahead. 		<p>No U-turn</p> <ul style="list-style-type: none"> ➤ You cannot make a turn around and go in the opposite direction on this road
	<p>Handicap Parking</p> <ul style="list-style-type: none"> ➤ Only vehicles with handicap stickers may park their vehicles in spaces marked by this sign. 		<p>Do not enter</p> <ul style="list-style-type: none"> ➤ Wrong-way entrance on one-way streets and expressway ramps.
	<p>Divided Highway</p> <ul style="list-style-type: none"> ➤ Start of a divided highway. Keep right. 		<p>Stop sign</p> <ul style="list-style-type: none"> ➤ You must come to a complete stop whenever you see this sign.
	<p>Vehicle may not stop, stand or park on the pavement. May include sidewalks as well as roadways. (Similar in meaning to “no parking any time” sign)</p>		<p>Railroad crossing</p> <ul style="list-style-type: none"> ➤ Railroad crossing ahead.
	<p>Vehicles may not stop, stand or park at any time in an intersection where this sign has been posted.</p>		<p>School zone or Pedestrian crossing</p> <ul style="list-style-type: none"> ➤ Entering a place where pedestrians and children may be crossing ahead.
	<p>Yield sign</p> <ul style="list-style-type: none"> ➤ Slow down and be prepared to give way or stop if necessary. 		<p>No passing zone</p> <ul style="list-style-type: none"> ➤ You cannot pass on this road.

Figure 8. Correct Answers for Road Sign Test








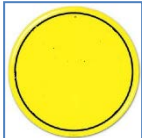



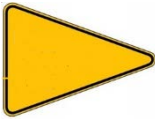
Examples of wrong or inappropriate answers			
	Caution, there are trucks on the road. Beware of the trucks. Truck roadway		No left turn.
	This spot is for those who are sick.		Stop
	There is a change in the road.		Yield
	Just reading it without any explanation.		
	Just reading it without any explanation.		
	You have to stop. You can go.		

Figure 9. Examples of Wrong or Inappropriate Answers for Road Sign Test

While the driving instructors have clear directions with this cognitive screen, they have more discretion with the answers and interpretations. First, the older adult is not only asked the name of the sign, but also what the sign means. The driving instructor is allowed to prompt with questions. If the older adult understands the sign, even if the absolute name of the sign is incorrect, that would not be considered a wrong answer.

The protocol (see the *Results of Screening Tests* form, Appendix C) indicates if the older adult names nine to 12 signs and/or describes the purpose of these nine to 12 signs correctly, the older adult can proceed with the on-road component of the Driving Check-Up, depending on results from other screens. If the older adult only describes or names six or fewer signs correctly, the protocols indicate that the older adult should not proceed to the on-road, as a different level of service is needed – specifically the driving rehabilitation

specialist. If the older adult correctly names or describes seven or eight signs, the driving instructor must consider this borderline score result in light of the other screening and interview results and decide if referral to an occupational therapist/driving rehabilitation specialist may be more appropriate for the client. That is, if there are any other indicators of concern from the interview or other screening tools (especially the Snellgrove Maze Task), the older adult should be referred to the occupational therapist/driving rehabilitation specialist.

Summarizing the Results of the Screening Tests. The *Results of the Screening Tests* form (Appendix C) summarizes the protocols for determining how to proceed to the on-road drive. Each screening test is important in the process and requires the driving instructor to call or provide a referral to the driving rehabilitation specialist if *any* of the screening results are in the “red zone,” which indicates the driver should not be taken on-road and needs a different level of service. Results in the orange box indicate caution in proceeding to the on-road drive. If all of the results are in the black (i.e., within normal range), the older driver can proceed. While the entire screening process is taken in totality, according to the protocols, the older driver does not proceed if he/she: 1) does not meet the state standard for vision, 2) scores less than 60 seconds with two or more errors on the Snellgrove Maze Task, 3) takes 61 seconds or longer with or without errors on the Snellgrove Maze Task, or 4) has six or more errors on the road sign test. Caution should be taken for those who take more than nine seconds on the Rapid Pace Walk and/or have four or five errors on the road sign test.

On-Road Drive (approximately 30 minutes)

The on-road drive with the qualified driving instructor is the keystone to the Driving Check-Up. For safety and liability concerns, this drive should take place in the driving school’s vehicle equipped with a dual brake and other safety features. The focus of the on-road drive is on situations in which older adults are at potentially greater risk of a crash, using the justification that if the older adult can successfully maneuver driving in the high-risk situations, he/she will manage the less risky and/or familiar roadway situations. The objectives of this component are to:

- Provide instructors with a sufficient sample of driving for adequate information and feedback.
- Assess the ability of the older driver to demonstrate appropriate driving behavior on five of the most high-risk maneuvers for older adults.
- Assess the older driver on their ability to navigate back to the driving school after completion of the route.
- Observe the older driver’s performance on any unique or new regional elements in the area.
- Observe the older driver for any poor or unsafe driving habits.
- Observe the older driver for any examples of critical errors or serious traffic and safety violations.

Since the driving school’s vehicle is being used, it is important to orient the older adult to the vehicle and allow the older driver to become familiar with the vehicle before testing. The drive is designed to start in a parking lot or on a quiet road for this vehicle orientation. Based on the driver’s response and behavior, the driving instructor decides whether to

continue with the rest of the route or to end the drive. For most healthy older adults, the route will consist of five high-risk maneuvers, mixed in with regular driving to observe typical driving behaviors and skills. The driving instructor can take notes with their regular driving forms, not take notes, or use the form below. Regardless, the *On Road Driving Check-Up Form* (see below) should be completed for the discussion after the drive. While mostly a checklist, the driving instructor should make comments as needed, especially on situational awareness and hazard recognition, or if the driver made any critical errors. Finally, one of three options summarizing overall driving performance is selected and recommendations listed, if appropriate.

It is also important to note that driving instructors should never use the phrase “safe to drive” when providing feedback to drivers. The appropriate terminology for use in documenting all results (positive or negative) from the Driving Check-Up is “on this day, on this drive, [this driver] demonstrated [e.g., effective driving abilities and driving knowledge, weaknesses that may put them at risk for a crash, mild impairment in driving skills, etc.]”

On Road Driving Check-Up Form

Name: _____ **Date:** _____

Driving School /Instructor Name: _____

Basic: Begin in parking lot/ NO traffic: vehicle orientation

Basic vehicle control: pull onto roadway, lane maintenance, vehicle position, and park.

Expectation: demonstrate safe roadway entry, lane maintenance, mirrors, signal use.

Comments:

Decision Point before continuing: Is the driving sample adequate for feedback?

Continue on road Sample sufficient

Exposure to the 5 most "High Risk Scenarios." Allow for repetition.

Check box if successfully demonstrated on this ride.

Please circle problem areas and provide additional explanation or comment.

	<p>1. Unprotected left turn, signalized intersection, traffic approaching head-on <i>Proper lane position (start and end), signal, safe gap selection, acceleration/braking, speed of movement.</i></p>
	<p>2. Left turn entering roadway from side street, driveway, or parking lot (no control or controlled by stop sign) <i>Proper lane position (start and end), signal, complete stop, scan both directions, safe gap selection, acceleration/braking, speed of movement.</i></p>
	<p>3. Right turn entering roadway from side street, driveway, or parking lot (no control or controlled by stop sign or yield sign) <i>Proper lane position (start and end), signal, complete stop (or yield), scan to left, safe gap selection, acceleration/braking, speed of movement.</i></p>
	<p>4. Merge left at entrance to limited access highway and/or Lane change right on multi-lane roadway <i>Visual scanning, blind spot check, gap assessment, signal, speed of movement.</i></p>
	<p>5. Following and leading while traveling on major roadway with traffic (to avoid a rear end collision) <i>Speed maintenance considering speed limit and speed of other cars, adequate following distance/space cushion, awareness of traffic behind, communicating intentions (e.g., signaling turns) to following vehicle, avoiding sudden braking or stopping.</i></p>

Figure 10a. On Road Driving Check-Up Form (p. 1 of 2)

On Road Driving Check-Up Form

Check if successfully demonstrated on this ride, or circle problem areas and provide additional comments:

- | | | | |
|---|---|---|--------------------------------|
| <input type="checkbox"/> Lane Maintenance | <input type="checkbox"/> Use of signal | <input type="checkbox"/> Acceleration/braking | <input type="checkbox"/> Merge |
| <input type="checkbox"/> Lane change | <input type="checkbox"/> Full stop | <input type="checkbox"/> Speed (too fast or slow) | <input type="checkbox"/> Yield |
| <input type="checkbox"/> Lane selection | <input type="checkbox"/> Mirror use | <input type="checkbox"/> Environmental awareness | |
| <input type="checkbox"/> Following distance | <input type="checkbox"/> Blind spot check | <input type="checkbox"/> Communication with other drivers | |
| <input type="checkbox"/> Other: _____ | | | |

Comments:

Strategic Elements: Check if successfully demonstrated on this ride OR provide additional comments under elements completed.

<input type="checkbox"/>	Nearing completion instruct: "Please return to the parking area where we began"
<input type="checkbox"/>	Last part of drive, give a 2-part instruction (if you can afford time for missed turn) and/or instruct "find way back to _____" [something on the route].

Elements completed: Successful/independent Required cues Required instruction

Comment on:

Situational Awareness:

Hazard Recognition:

Regional challenges: Check if successfully demonstrated on this ride, or circle problem areas and provide additional explanation or comments:

- | | | |
|--------------------------------------|--|---------------------------------------|
| <input type="checkbox"/> U-turns | <input type="checkbox"/> Pedestrian crossing | <input type="checkbox"/> K-Turns |
| <input type="checkbox"/> School Zone | <input type="checkbox"/> Railroad crossing | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Bike lanes | <input type="checkbox"/> Parking Lot | |

Describe any critical errors (e.g., serious traffic or safety violation, instructor intervention):

Overall Driving Performance:

- Entire drive completed well / consistently satisfactory
- Generally OK, but some safety concerns or inconsistencies**
- High-risk behavior(s) observed – Please complete referral forms if needed.**

Recommendations (including any strategies and resources shared):

-
-
-
-

Figure 10b. On Road Driving Check-Up Form (p. 2 of 2)

Post-Drive Discussion (10 minutes)

This last component is designed to end the Driving Check-Up in a positive and helpful manner for the older driver and/or family of the older driver. The objectives are to:

- Summarize and report the outcome of the Driving Check-Up in a clear, understandable and supportive manner.
- Offer useful information and/or resources to the older driver and/or family.
- Offer the name and information for an occupational therapist/driver rehabilitation specialist for specialized evaluation if needed.
- Reinforce the message to plan strategies to maintain driving fitness as well as to transition to other transportation options when needed.

The Driving Check-Up is primarily targeted for community-dwelling older adults without medical conditions that may impair driving. As such, the post-drive discussion may be a conversation about how to change bad driving habits (e.g., rolling stops, not using turn signals, failing to check blind spots), or how to manage or avoid busy intersections or roadways. The *General Feedback Form* (Outcomes Form 1) is designed to assist the driving instructor with this discussion with drivers who perform well (i.e., demonstrate no critical errors). The expected outcome of most Driving Check-Ups will be additional safety recommendations. This form offers room for these types of comments as well as generic recommendations for older adults and driver safety. The form is also a reminder that the Driving Check-Up can be done yearly to assist the older driver in understanding the impact of aging. Again, the appropriate terminology for use in documenting positive results from the Driving Check-Up is “on this day, on this drive, [this driver] demonstrated effective driving abilities and driving knowledge.”

Recommended Follow-Up to Today's Driving Check-Up: Outcomes Form 1

Thank you for your interest in driving safety! The *Driving Check-Up* is designed to take a brief look at the important skills, knowledge and actions we understand to be important to safely controlling a car. We are pleased to describe your *Driving Check-Up* as going well, but we don't want to stop there. One of the key talents we acquire as we age is recognizing subtle changes and accommodating them.

We encourage you to consider this Driving Check-Up as a first step in your *Transportation Planning*. If driving your car is your priority, then do everything you can to manage your health including your physical fitness, vision health, and mental quickness.

General recommendations include:

- Get fit! Regular exercise can maintain strength and flexibility needed to drive safely.
- Make sure to get annual vision checks
- Take medications only as prescribed and have regular check-ups with your primary care physician. Whenever there is a change in medications (e.g., stop, start, change amounts), ask your physician if this change may affect driving.
- Consider attending a CarFit event to make sure your car fits you properly.

Specific recommendations:

Here are a few suggestions and recommendations:

Thank you again for participating in our Safety *Driving Check-Up*. We encourage you to consider an annual *Driving Check-Up* as one step toward staying on the road as long as safely possible!

Regards,

Driving Instructor

Figure 11. Recommended Follow-Up to Today's Driving Check-Up: Outcomes Form 1

The *Specialized Feedback Form* (Outcomes Form 2) is designed for those older drivers who either did not meet the protocols to go on the road or had difficulty with one or more components on the road. As viewed on this form, there are specific boxes for any of the outcomes. For example, if the individual did not meet the vision protocols, the first box would be indicated with a potential rescheduling of the Driving Check-Up once the driver's vision problem has been resolved.

Recommended Follow-Up to Today's Driving Check-Up: Outcomes Form 2

Thank you for your interest in safety! Today's *Driving Check-Up* was designed to offer an evaluation of your driving skills.

When we tested your vision, you did not meet the state's driver licensing standards. We recommend you visit your eye-care specialist promptly and not drive until you have received their guidance. If your vision can be corrected to within state standards, we will be happy to reschedule your Driving Check-Up.

You had difficulty with one or more of the screening tests for information processing, raising a possibility of concern with your driving safety. This does not mean that you are not a competent driver. It only means that we feel a different level of service would be more appropriate to meet your needs at this time. A careful screening process has been developed and your response indicates that it would be more appropriate for you to seek an evaluation from a driver rehabilitation specialist, an occupational therapist, and/or your primary care physician.

The following conditions were mentioned during our meeting with you.
___ Stroke ___ Parkinson's disease ___ Traumatic brain injury ___ Multiple sclerosis
___ Advanced heart or lung disease ___ Epilepsy ___ Paralysis or loss of limb
___ Uncontrolled diabetes ___ Daytime sleepiness ___ Fainting, dizziness, vertigo
___ Untreated or difficult to manage eye disease ___ Other.

We recommend that you talk with your primary healthcare provider about the management of your condition, a recommendation about driving, and whether you would be best served to seek the services of an occupational therapist with driving rehabilitation expertise.

While on the drive today, we observed some high-risk behaviors that may put you at higher risk for a crash. This does not mean you are not a competent driver; the behaviors may be due to a known or unknown medical condition or changes to your physical, vision, or cognitive abilities due to aging. We feel a different level of service would more appropriate to meet your needs at this time. This is beyond our driving school's expertise and recommend that you see a driver rehabilitation specialist, an occupational therapist, and/or your primary care physician.

To err on the side of caution, we ask that you not drive until you have received further guidance as recommended above.

Driver's Signature & Date

Instructor's Signature and Date

Driving School to retain signed copy, provide copy for Check-Up participant and Project Director.

Figure 12a. Recommended Follow-Up to Today's Driving Check-Up: Outcomes Form 2 (p. 1 of 2)

Recommended Follow-Up to Today's Driving Check-Up: Outcomes Form 2

Our school recommends that you explore alternative driving services designed to address changes associated with aging or changes due to various medical diagnoses. Specialized Driving Rehabilitation Services are committed to assist you in your goal of continued driving and many changes can be addressed through specialized interventions that may include compensation strategies, adaptive aids or even equipment installed in the vehicle.

The driving rehabilitation specialist listed below has agreed to assist our customers as they explore their options. Be assured there is no commitment. When you contact the driving rehabilitation specialist it would be helpful if you could describe your experience with the driving school thus far.

Please contact:

Driving School to retain signed copy, provide copy for Check-Up participant and Project Director.

Figure 12b. Recommended Follow-Up to Today's Driving Check-Up: Outcomes Form 2 (p. 2 of 2)

The second box is for individuals who, for whatever reason, did not meet the protocols to go on the road. In this case, the time that would have been used to go on the road is shifted to a lengthier discussion time. The driving instructor needs to explain (just as outlined in the box) that not meeting the protocols does not mean the driver is not competent, but rather that the driver needs another type of evaluation. Where relevant, the driving school must include an occupational therapist/driving rehabilitation specialist's name and contact information on the second page, so the driver has the appropriate information to pursue a comprehensive driving evaluation. In addition, noteworthy medical conditions reported during the interview should be discussed, if applicable (third check box).

If the driver made one or more critical errors on the drive, the driving instructor should carefully intervene (fourth check box). The driving instructor needs to be able to differentiate between "bad habit" errors (which can be modified by learning) and mistakes as a result of a medical condition or advanced aging (e.g., slower processing, inattention, wrong lane). While both types of errors may lead to crashes, learning and/or feedback may rectify the first, while the latter typically requires further evaluation to determine the underlying cause. Thus, a referral to a driver rehabilitation specialist, physician or licensing agency may be warranted.

Finally, if 1) the driver does not meet the minimum standard for vision; 2) scores on all the screening tools suggest the older adult has significant motor, vision and/or cognitive problems; and/or 3) the older adult committed so grievous an error or series of errors that the driving instructor is uncomfortable with the driver continuing to drive, then the instructor should recommend a discontinuation of driving until further guidance is sought (fifth check box). While this should be a rare occurrence, it is important that the driving instructor be prepared. The discussion should include specific information as to why this box is checked and the referral information for the occupational therapist/driver rehabilitation specialist. It is also considered a best practice to use the emergency contact information number to contact a family member or friend to pick up the driver and take them home, if someone did not come with the driver to the appointment.

3.2 Key Features of the Driving Check-Up

Referring to the Occupational Therapist/Driving Rehabilitation Specialist

The program is designed to assist relatively healthy older adults in maintaining or improving their driving skills and knowledge; therefore, it is critical to have a process to address those older adults for whom the program is not appropriate. Thus, an essential component of the Driving Check-Up is the collaborative relationship of the driving school offering the Driving Check-Up program and a local occupational therapy/driving rehabilitation specialist. In preparing to offer the Driving Check-Up, the driving school needs to build a strong relationship with an occupational therapist who is a driving rehabilitation specialist. A meeting between these two entities is an essential part of the development and training process of the Driving Check-Up. The driving instructor(s) will receive information about the structure and process of the driver rehabilitation specialist's program. The driving rehabilitation specialists will gain an understanding of the Driving Check-Up, which will allow them to provide support as needed. In addition to serving as a referral source, the latter may also be providing expert "on-call" advice when more information may be needed, especially for those medically at-risk older adults. That close

relationship should be reflected with the driving rehabilitation specialist's name and information typed on the *Specialized Feedback Form*.

Liability

Liability is an important issue for all concerned. Driving schools must have the appropriate liability insurance to cover their vehicles, which is a primary reason the Driving Check-Up is designed for the older adult to be assessed in the driving instructor's vehicle.

A second important liability issue is practicing within the education or training of the driving instructor's profession. Driving instructors are highly trained in observing drivers and intervening when a safety risk becomes apparent. With novice drivers, any observed safety risk will be identified, discussed, and/or practiced in follow-up lessons. Moreover, there is an expectation novice drivers will make significant driving errors in terms of knowledge, skills, and abilities – mistakes from which they learn. In fact, it is not unusual for the novice driver to lose control of the vehicle or require direct intervention by the driving instructor. This is in contrast to the experienced driver with 30-50 years of practice driving. If the older adult driver loses control of the vehicle or needs direct intervention during the on-road component of the Driving Check-Up, there is likely an underlying reason that should be investigated through a more thorough fitness-to-drive process by a driver rehabilitation specialist.

Based on the experience in the pilot programs and in interviews with driving instructors (described in later sections), driving instructors are experts at identifying "bad habits." During the pilot evaluation of this project, feedback from the driving instructors to the older adult drivers was overwhelmingly focused on "bad habits" with frequent examples including failing to check blind spots, inconsistent use of a turn signal, and turning into the far lane instead of the near lane when making a right or left turn. While identifying these bad habits is well within the driving instructor's training and education, identifying and responding to unknown underlying processes that cause more significant mistakes (e.g., missed stop signs, wrong pedal use, not following directions) would often be out of the purview of the driving instructor. In these cases, the appropriate plan would be a referral to the client's primary care provider or the occupational therapy practitioner and/or driving rehabilitation specialist. In best practices of the Driving Check-Up, this process is formalized with a call to the driving rehabilitation specialist with the detailed outcomes (screening outcomes and on-road component) of the Driving Check-Up.

Appendix D is a *Release of Information Form* that can be used by the driving schools to assist in getting the older driver referred to the appropriate professional. This will assist with liability issues, as the driving instructor is identifying a problem and asks for permission to share it with an appropriate entity, either professional or family. If drivers deny permission to share results, even with their designated emergency contact or family member, then the driving instructor cannot legally share this information. It is one of the reasons it is critical to get the driver's license number as well as an emergency number of a relative, so that person can be called if necessary. However, if the older adult driver is deemed to be an unsafe driver, the driving school has an option (as does any concerned citizen) to report the driver to the state licensing office.

In an effort to protect the driving school, the use of the screening tools, with conservative protocols, is designed to prevent older adults with potential medical conditions and/or impairments that significantly affect driving from progressing to the on-road component. When an older adult does not perform well when tested with the screening tools, it is likely there is an underlying medical condition that needs to be investigated by a medical professional, which is not typically the driving instructor's area of expertise.

It is also important to reiterate that driving instructors should not use the phrase "safe to drive," even when the older adult performed well on the on-road component, since it is not a fitness-to-drive evaluation.

Training

Training for the Driving Check-Up is essential for appropriate implementation. There are several reasons for this. First, driving instructors are primarily teachers who instruct teens in how to safely operate a car (i.e., the operational and tactical levels of driving behavior). Their background and education is geared toward a young person's process of learning driving: first through lecture (knowledge base) and demonstration, followed by practice until minimal competence is achieved. For an older adult who is an experienced driver, the focus is on recognizing bad habits and/or learning new strategies to decrease crash risk. This requires a shift in mindset for the driving instructor. The training for the Check-Up highlights these differences and underscores the importance of structuring the driving interactions differently for the experienced driver. While not complex, the training is an important experiential process for the driving instructors, especially those who have never taken an experienced driver on the road. An example is the position of the hands on the wheel; while the new correct position is "8 and 4", many older drivers use the "10 and 2". While this might be a suggested change at the end of a Driving Check-Up for improved safety, it should not be a learning point drilled on, as with a new driver.

A second critical reason for training is to ensure the Driving Check-Up is performed according to its objectives, including that older drivers get referred to the appropriate service. This requires using the established process, applying the screening tools according to protocols, and maintaining the integrity of the Driving Check-Up as an evaluation of driving knowledge and skills, not an evaluation of fitness to drive. Additionally, the screening tools are not typical for driving instructors to administer or use. Therefore, it is important that training and practice using the tools be implemented and mandatory. While the procedures, instructions, and process are well planned and articulated, it became very clear from the pilot studies that training, including an experiential component (i.e., doing a Driving Check-Up with an older adult and trainer) and Q&A are essential to the driving instructor's understanding of the program.

A third essential need for training is for the driving instructor to gain information about the medically at-risk older adult. The majority of driving instructors have little or no knowledge about medical conditions, their effect on driving, and most importantly, how to interpret performance in light of a medical diagnosis when observing the driver making a critical error. The Driving Check-Up is not designed for the medically at-risk older adult, and thus, the training must include information so that driving instructors can recognize potential "red flags" that may indicate a medical issue. The training must also include how the driving instructor should handle the medically at-risk older adult — specifically, when

and how to refer to an appropriate service provider, such as an occupational therapist or driving rehabilitation specialist. The training is not designed to enable driving instructors to diagnose or interpret medical conditions, but to recognize and understand potential issues that may need to be addressed. For example, if an older driver demonstrates problems with traffic gap acceptance and appears to not understand the feedback offered, the instructor should not schedule additional lessons for practice; rather, the instructor should understand that there may be an underlying medical problem that is affecting the individual's driving and discuss this with the occupational therapy/driving rehabilitation specialist collaborator.

Finally, another essential need for training is the interaction and collaboration of the driving instructor(s) and the driving rehabilitation specialist. In many cases, driving instructors are not aware of the role, responsibilities, and/or education of occupational therapists and/or driving rehabilitation specialists. The training offers information about this specialty practice area and ideally provides a time for the driving rehabilitation specialist to meet with the driving instructor(s).

The designed instructor training for the Driving Check-Up is two days, with the first day consisting of the following topics: Introduction to the Driving Check-Up, description of each component of the Driving Check-Up, health conditions impacting driving, liability, referral process, using the forms and practice using the screening tools. The second day addresses the on-road component, making sure one of the school's driving routes is well-suited for the Driving Check-Up, and solidifying the relationship with a driving rehabilitation specialist, ideally through an on-site visit by the specialist on the day. It is also critical that each of the trained driving instructors have an opportunity to perform a Driving Check-Up with the opportunity to receive appropriate and useful feedback. Presentations have been structured around each topic and its associated forms used in the Driving Check-Up (See Appendix E for a sample training agenda).

Training Materials. Materials have been developed to assist with the training. PowerPoint presentations have been developed for each of the topics in the training outline: Introduction of the Driving Check-Up, Understanding Liability; Scheduling; Pre-Drive Interview and Communication, Primary Health Conditions, Screening, Observations and other Conditions, On-Road Component, and Post-Drive Discussion.

Additional resource materials include:

- Appendix F contains one-page documents that briefly describe what driving instructors might want to know about common medical conditions that impact driving. The topics include dementia, stroke, eye diseases, episodic medical conditions, other medical conditions, drowsy driving and sleep disorders, and medications.
- Appendix G is a document summarizing the crash characteristics common for older adults, providing justification for use of the five types of driving maneuvers in the on-road drive.
- A short video was produced to demonstrate the administration of each of the four screening tools. Appendix H contains illustrative screenshots of each screening tool being used with an older adult.

- NHTSA materials (e.g., fact sheets, videos) are easily accessible, free and useful as a supplement to the Check-Up training (see www.nhtsa.gov/road-safety/older-drivers)

Referral Process

Referring to the *Spectrum of Driver Services* (see Appendix A), the Driving Check-Up falls under the Community-Based Education section, specifically under the Driving School section. It is envisioned that the driving instructor offering the Driving Check-Up and the occupational therapy practitioner and/or driving rehabilitation specialist will have a true collaborative relationship, with the driving instructor referring the medically at-risk older adult to the driving rehabilitation specialist and the driving rehabilitation specialist referring appropriate older adults to the Driving Check-Up.

The *Spectrum of Driver Services* is essential to the process of referrals to both the Driving Check-Up as well as the occupational therapist and/or driver rehabilitation specialist. The driver rehabilitation specialist is medically trained and licensed to provide medical evaluation for fitness to drive while the driving instructors are experts in the operational aspects or mechanics of driving, rules of the road, and how to make driving decisions on the road (e.g., when to turn left or right, slow down, obey the rules). The Driving Check-Up is designed with protocols that require the driving instructor to refer to the medical professional when warranted — that is, when the older adult appears to have an impairment that may be medically based and should be seen by a medical professional, specifically one of the occupational therapists/driver rehabilitation specialists associated with the program. Conversely, if a driving rehabilitation specialist or occupational therapist sees a client who has no medical conditions impairing driving, but needs a “brush-up” on their skills or knowledge, it would be appropriate for the medical professional to refer the client for a Driving Check-Up and potentially some driving classes.

4.0 Development of the Driving Check-Up Program

Several activities were carried out to provide input into the development of the Driving Check-Up program. These include the formation of and consultation with an advisory committee, a review of the published literature, a survey of existing programs, and interviews with a sample of program providers. Each of the planned and formal activities of the project and their associated contributions are described in this section.

4.1 Literature Review

Methods

The focus of the literature review was on on-road (or behind-the-wheel) evaluations of senior drivers¹. While the review included examination of promising components of senior driving evaluations, such as pre-drive screening for functional impairment and procedures for observing and scoring driving performance, there was no attempt to carry out an exhaustive review of all driving evaluation tools and screening instruments, as these have already been thoroughly reviewed (Dickerson, 2014; Dickerson, Meuel, Ridenour, & Cooper, 2014; Betz et al., 2014; Classen, Dickerson, & Justiss, 2012). Rather, the primary rationale for this literature review was to assist the project team in identifying criteria for characterizing existing driving-school-based programs, and candidate protocols for incorporation into the model program.

The review initially searched for relevant studies in Transport Research International Documentation (TRID). TRID is hosted by the Transportation Research Board and combines the TRIS (Transportation Research Information Services) and ITRD (International Transport Research Documentation) transportation and safety databases. Search terms employed included various combinations of the following keywords and truncations (noted by the *):

- evaluat* OR assess*
- old* OR adult OR experience*
- driver
- driving school
- on road OR in car OR behind wheel

A similar search was carried out using Google Scholar, focusing more on the “on road” and “in car” search terms since these tended to yield the most relevant studies. To supplement these efforts, an East Carolina University Health Sciences librarian conducted an independent search on the topic, spanning the Medline, CINAHL, and PubMed databases. Project staff also searched for relevant recent older-driver publications in the Safety Lit database.

¹ For purposes of the review, the term “driving evaluation” was used, as health professionals and driving instructors universally use the term. However, it is a term that is used and defined differently by consumers, practitioners, and researchers, creating potential confusion among stakeholders. (See Dickerson, Schold Davis, & Staplin, 2014).

Because of the overlap in terminology (*evaluations of driver evaluation programs*), identifying relevant studies required sorting through many “false positive” hits, since there were many references in the literature to on-road driving evaluations that did not involve evaluations of the actual programs.

Results: Literature Review

Thirty-three studies were deemed relevant and included in the final review of evaluations of on-road evaluations of experienced older drivers (see Appendix I for citations). These included studies from the United States, Canada, Australia, New Zealand, and a few European countries. The majority of the evaluated programs were occupational therapy-based programs, typically involving a pre-drive clinical component. A smaller number of programs were developed for use in driver licensing settings for identifying or re-examining potential medically at-risk drivers; however, many of these programs also involved the specialized services of an occupational therapist (often in conjunction with a driving instructor) to conduct the on-road evaluation. The review also identified a few “review” and “consensus” articles. Importantly, no evaluations of driving-school-based programs were identified over the course of this review, although one of the studies (Cardimen, 1999) reported on an on-road assessment that was offered as an option to AAA’s Mature Driver Retraining Workshops held in Oakland County, Michigan.

Appendix J provides a brief summary of the on-road driving evaluation programs identified and their reported measures of reliability and validity of the on-road evaluations. Reliability refers to the extent to which the on-road evaluation yields stable and consistent results, and validity the extent to which it measures driving ability or fitness to drive. In general, the review found that on-road evaluation protocols tended to be reliable and valid tools for assessing driving: Reported measures of inter-rater and test-retest reliability were high, and outcomes of the assessments were significantly correlated with global assessments of fitness to drive and with other known correlates of driving fitness, especially cognitive status.

The literature was heavily oriented toward the more comprehensive driving evaluations offered by occupational therapists or driver rehabilitation specialists (DRS) and/or were developed to evaluate the medically at-risk drivers in licensing settings. As such, one might not expect a direct carryover to the proposed driving-school-based Driving Check-Up program that would target generally healthy older drivers. Nevertheless, the review suggested a number of attributes to consider in developing the program, including:

1. Occupational therapists with specialized training in driving rehabilitation typically conduct comprehensive driving evaluations within a larger framework that incorporates the following three components: 1) clinical (e.g., assessment of medical conditions; medications; driving history; visual, motor, and cognitive abilities; driving simulator performance), 2) in-vehicle (analysis of performance while driving a motor vehicle within the driving context), and 3) post-drive (e.g., providing results of the evaluation, offering recommendations for interventions). Although the Driving Check-Up program developed for driving instructors will necessarily focus on evaluating drivers’ behind-the-wheel skills, consideration should also be given to developing appropriate pre-drive and post-drive components.

2. The reviewed protocols all utilized a standardized test route. Since this project will be developing a road test for potential implementation by driving schools in urban and suburban/rural settings nationwide, this primarily involved identifying a set number of driving situations and/or required maneuvers. The route should also allow for observations across a range of traffic density and complexity levels. Since driving schools have standardized routes already established for their driver training programs, it will be important to consider how a route might be modified to meet the needs of the program, especially for driving schools and instructors inexperienced in the evaluation of older drivers. The reviewed studies contained many examples of such “maneuver” lists, and project teams have their own considerable experience to draw upon.
3. As an alternative to a completely standardized driving evaluation where the evaluator dictates each required move in sequence, several of the more recent studies reviewed recommended incorporating self-directed navigation tasks and scoring drivers on errors made.
4. Following from several of the reviewed studies, consider focusing the evaluation on a smaller subset of driving errors most strongly associated with test outcome and/or crash risk (e.g., intersection negotiation, lane position, speed maintenance, safety margin), especially related to older adults.
5. Standardize the scoring. There are many approaches to scoring a road test. Some of the studies in the literature used a simple pass/fail, while others used three-point, four-point, or even 10-point scales. Some based the overall score on a simple sum of errors, and others weighted errors based on severity. Some considered only critical or safety-related errors, while others also considered “routine” errors made by drivers of all ages. Regardless, maneuvers represent the tactical level of driving, and behaviors associated with a maneuver can and should be operationally defined for objective scoring.
6. Consider a “closed course” component. The literature was mixed on the benefits of a closed road component (i.e., low to no traffic) compared to an on-road evaluation. Having a portion of the Driving Check-Up take place out of traffic gives the examiner opportunity to detect possible dangerous situations, and gives the client time to familiarize themselves with the vehicle before venturing into traffic. Closed course time can also be spent evaluating certain tasks such as positioning the car in relation to the curb or backing out of a drive. At the same time, it should be remembered that the in-traffic maneuvers are much more valid indicators of driving competency, and time should be budgeted accordingly.
7. Include pre-drive screening, especially of cognitive abilities. While not a direct focus of this literature review, most of the described evaluation protocols incorporated some level of screening of driver functional abilities, especially related to cognition. For occupational therapists and driver rehabilitation specialists, the screening test outcomes can help guide the on-road evaluation, explain its findings, and suggest possible remedial actions. Driving instructors, however, may have limited expectations of the screening tests’ potential influence on the on-road assessment. However, the screens will be critically important for identifying drivers who may not be safe to take out on the road and who should instead be referred directly to an occupational therapist, vision specialist, or other professional. The literature review identified a number of cognitive screens that were associated with road test outcomes. This helped guide the subsequent selection of screening tools for

administration in a driving school setting.

As a final note, although an important goal of this review was to identify characteristics of an effective on-road assessment in order to guide the development of this component of our model driving-school-based program, there were many important questions such a review could not answer. These include:

- In what ways should the driving-school-based, on-road Driving Check-Up differ from a comprehensive driving evaluation? In what important ways should it not?
- What is needed to ensure that the protocol is feasible and practical for driving schools to implement and to ensure that it is acceptable and appealing to the target audience of generally healthy older adults?
- What additional training do driving instructors require to conduct on-road evaluations for older adults?
- What types of older adults can driving instructors competently assess, and which ones are best referred to a health care professional or driver rehabilitation specialist?
- What information is needed to differentiate between older adults who need different resources? What are important components that need to be in a decision tree for client triage?
- How can the results of an evaluation best be presented to the client?

For answers to these questions, the project team relied on subsequent planned activities, which included input from members of an advisory committee, interviews with driving-school instructors, and pilot testing of the Driving Check-Up.

4.2 Identification and Review of Existing Programs

Methods

To gather information about the current state of driving-school-based evaluation programs, the project developed a brief online survey (Appendix K). Four organizations represented on the advisory committee agreed to assist in distributing information about the project to their membership along with a link to the survey. The organizations were ADTSEA (American Driver and Traffic Safety Education Association), DSAA (Driving School Association of the Americas), ADED (Association of Driver Rehabilitation Specialists), and AAA. An email request with a link to an online survey was developed using *Qualtrics*, a browser-based survey software. It was designed to take 10-15 minutes and could be completed anonymously.

For schools offering evaluations, information was sought concerning frequency of such evaluations, collaborations with occupational therapists/driving rehabilitation specialists, type of vehicle used (e.g., instructor's dual brake, older adult's vehicle), use of a standardized form, any specialized training or qualifications for their instructors conducting the evaluations, specific components to an evaluation, typical time required, cost, and level of comfort in offering the evaluations. Schools responding that they did not offer evaluations were asked about their likelihood of offering them in the future, their perceived qualifications for doing so, and their knowledge of, and referral to, occupational therapists and/or driving rehabilitation specialists.

Results: Identification and Review of Existing Programs

A total of 151 driving instructors responded to the survey. Results from the survey were summarized and presented to members of the advisory committee at its initial meeting. Key findings included:

- While 62% of respondents said that their schools offered driving evaluations for licensed older drivers, the majority reported averaging two or fewer evaluations per month, although 16% averaged more than 10 evaluations per month.
- Although most respondents said that they were aware of evaluation services provided by occupational therapists and driver rehabilitation specialists, 43% said that their knowledge was limited, and very few had collaborative agreements in place.
- The majority of schools (77%) reported always using dual-brake vehicles for their evaluations.
- While most of the schools reported using a standardized form for recording driving behaviors during an on-road evaluation, 42% of the time this form was the same form used for younger drivers. Only 14% of schools used an entirely different form when evaluating experienced older adults.
- While most of the programs included an interview component, fewer incorporated tests of visual, cognitive, and physical function.
- Average length of time for completing just the on-road portion of the evaluation ranged from 50 to 59 minutes. Average time for the pre-drive assessments ranged from 21 to 40 minutes.
- The majority of respondents reported feeling comfortable evaluating older adults but were not comfortable dealing with older adults with cognitive problems. In response to an open-ended question about greatest challenges, there were many comments about cognitively impaired drivers.

The results assisted the project team in characterizing the state of existing driving-school-based older adult programs and served as a starting point for developing a more in-depth questionnaire for interviewing driving instructors about their programs.

4.3 Project Advisory Committee – Formation and First Meeting

Methods

An advisory committee was created to provide advice, guidance and assistance to the project. Nine committee members were selected in collaboration with AAFTS staff to complement and expand the expertise already represented by members of the core project team (Dickerson, Schold Davis, Stutts, Wilkins). Two physicians who served as consultants to the project were selected, both recognized experts in the field of older-driver safety and one of whom represented the American Geriatrics Society (AGS) on the committee. An additional researcher was invited as an expert in driver screening, assessment and cut-off scores.

Beyond these consultants, the project sought active involvement in and buy-in from key stakeholder organizations within the broader driver education and driver services

communities. These organizations included AAA, Driving School Association of the Americas (DSAA), American Driver and Traffic Safety Education Association (ADTSEA), and Association for Driver Rehabilitation Specialists (ADED). Another key stakeholder, the American Occupational Therapy Association (AOTA), was already well represented on the advisory committee by the project principal investigator and co-principal investigator.

The advisory committee was tasked with the following responsibilities:

- Participate in at least two in-person meetings to provide input and guidance to the project.
- Assist in identifying relevant existing programs.
- Review criteria for categorizing the various types of programs, assessing program strengths and weaknesses, and identifying best practices and tools for potential use in the model program.
- Clarify the specific goals and requirements for the model program, and consider possible program scenarios.
- Provide feedback on draft program materials.
- Provide input to the planned evaluation of the model program.
- Assist in developing criteria for driving instructors to implement the program.

Results: Formation and First Meeting of the Project Advisory Committee

The initial meeting of the advisory committee was held Sept. 3-4, 2015, at the AAA Foundation offices in Washington, D.C. A key goal was to ensure that everyone understood the project and the importance that their shared perspectives would lend to its success. Committee members were presented the results of the literature review and the online survey of driving schools. They were also asked to provide their thoughts regarding three potential components of the model program (i.e., on road, pre-drive component and post-drive component), as well as its potential name: the Driving Check-Up. The on-road component was discussed first since it was assumed this would be most familiar to the members, followed by the pre-drive component and the post-drive component. Prior to the discussion of the pre-drive program component, time was spent discussing medically at-risk drivers and hearing from the health professionals on the committee about medical conditions affecting driving and the current status of tools to screen for impaired driving abilities. Members of the committee participated in several activities to help prioritize the many potential elements of the model program that had been identified and discussed over the meeting.

Several points stood out from this initial advisory committee meeting. One is that the participants who were driving instructors were concerned about liability issues, especially in regard to working with clients with potential cognitive impairment. They wanted to be able to reliably identify these individuals so that they could refer them to more appropriate medical-based services. There was considerable discussion from all advisory committee members about the need for screening tests that are reliable, sensitive, relatively quick and easy to administer; have clear cut-points not requiring a judgment call on the part of the driving instructor; and would be acceptable to the target audience of generally healthy older adults. Committee members also indicated that driving instructors would appreciate guidance on what to watch for in their clients and responded positively to the idea of a “red

flag” card for cuing them to important observations. They recognized that most instructors would benefit from additional training on the effects of medical conditions and age-related functional impairments on driving and suggested that, at least for the initial rollout of the Driving Check-Up, only one or two of the most experienced instructors at a school be trained. Finally, committee members recognized that the on-road component of an evaluation should be different from that used with young beginning drivers and should focus on the leading causes of older driver crashes. Importantly, it should be an evaluation of driving skills and knowledge, not fitness to drive or training.

4.4 Driving Instructor Interviews

Methods

While the literature review and survey of driving instructors offered summary information, the project team recognized that interviews would be necessary to gather in-depth information about policies, procedures, and methods of current driving programs dealing with older adults. Members of the advisory committee assisted the project team in identifying driving schools and driving instructors who would be willing to participate in the planned telephone interviews to gather this more detailed information. Two-thirds of the online survey participants who provided evaluations to older drivers volunteered to participate in the phone survey, and from these, 35 instructors representing a cross-section of geographic location, school size, and program type were selected for interviewing. Several additional experts were also identified for interviews, including occupational therapists and driving rehabilitation specialists who had experience working with driving schools.

Twenty-six interviews were conducted over a two-month period in the fall of 2015. Interviews generally lasted 45-60 minutes. Each was unique, reflecting the experiences of the individual and his or her responses to questions. For example, if a driving school had a formal collaborative agreement in place with an occupational therapist or driver rehabilitation specialist, this would be a focus area for the interview. Other topics covered mirrored the perceived components and flow of a driving evaluation. The project team developed questions and used East Carolina University’s *Qualtrics* as a depository for the project team to summarize the interviews. Appendix L contains the questions that were posed to participants, as appropriate.

In addition to these formal interviews, two project team members (Dickerson & Schold Davis) attended the DSAA annual meeting held November 2015 in San Antonio, Texas, and spoke with a number of driving instructors and leaders in the field. From these summaries, interviews, and the meeting, the team determined a plan for outlining the issues and potential components for the Driver Check-Up program.

Results: Driving Instructor Interviews

Results of the interviews with driving schools currently offering some form of evaluation services for older drivers were summarized and shared among members of the project team. Highlights are described below:

Characteristics of Driving Schools. The driving schools that participated in these interviews identified themselves as addressing older drivers to some degree. The schools ranged in size

from a single instructor/occupational therapist to a staff of 30 instructors. Although a few of the schools specialized in evaluations for experienced drivers, for most, these older adult evaluations comprised a relatively small part of their overall business and were typically only conducted by the most experienced and qualified instructors. In the words of one instructor, “It’s not for everyone.” Although most of the instructors interviewed had been conducting evaluations for many years and felt comfortable performing this service, there was general agreement that instructors new to the field needed to have experience working with older adults and would benefit from additional training. Several of the instructors noted that working alongside an occupational therapist had been especially helpful to them.

Collaborative Agreements with Occupational Therapists. Schools that had either formal or informal agreements in place to work with occupational therapists were generally pleased with such arrangements, citing the helpfulness of the medical information accompanying the occupational therapist’s referral and their own increased understanding and appreciation of how medical conditions can affect driving. Several of the driving instructors, however, reported difficulties identifying occupational therapists interested in forming a partnership and navigating the paperwork requirements. Others simply acknowledged that they had no idea how to go about pursuing such a relationship. In contrast, at least one occupational therapist interviewed expressed concern that driving instructors working on their own might miss the presence of a medical impairment and recommend lessons to correct a driving problem that is not remediable.

Referrals and Scheduling. In addition to occupational therapists, the driving instructors interviewed reported that most of their clients came to them on their own or at the urging of their physician or family member. Very few indicated that they carried out “pre-screening” before scheduling an individual for an evaluation beyond letting them know that they needed to have a valid driver’s license in order to drive. Some of the driving instructors interviewed expressed reluctance to turn any driver away as long as they held a valid driver’s license and did not require specialized equipment installed in their vehicle to drive. However, if an instructor had a relationship with an occupational therapist/driver rehabilitation specialist, they might refer potentially medically impaired drivers directly rather than schedule them for an evaluation, or they might receive considerable information from the occupational therapist/driving rehabilitation specialist prior to scheduling.

Pre-Drive Practices. Several of the AAA-affiliated driving schools reported using a pre-drive interview form containing questions about driving frequency, recent issues with driving, nighttime driving, use of medications that might impact driving, and other health-related questions. While several of the other schools also incorporated some driving and health questions into their pre-drive activities, this was generally done informally. Some instructors noted that they preferred to have a “respectful conversation” with the driver rather than giving them a questionnaire to fill out on their own or working through a list of questions on a form. They reported that not only did this yield better information, but it also helped to build rapport. Instructors also relied heavily on observation to identify potential impairments before taking drivers on the road. With only a couple of exceptions, the majority of driving instructors used no specific tools to screen older adults for potential impairments.

On-Road Driving Practices. Procedures for conducting the on-road portion of a driving evaluation varied considerably across the schools. Some of the instructors reported traveling to an older adult's home and following a route of the older adult's choosing. Others, however, had older adults come to the driving school and followed a standardized route, although they might make exceptions at the older adult's request. For example, if the client indicated he never drove on expressways, they might omit this portion of the drive. Still other instructors employed a combination of standardized and self-determined driving routes. Although a few instructors allowed older adults to drive their own vehicle, most required that they drive one of the school's dual-brake vehicles. And while some instructors reported using the same evaluation form for older adults that they used for younger drivers, others worked from a different form more tailored to experienced drivers. Most of the instructors reported beginning their drives in a parking lot or on calm residential streets and progressing to more complex environments. Those might incorporate maneuvers or driving tasks specifically intended to challenge the driver, such as merging onto a high-speed highway. Most, but not all, instructors agreed that any feedback from the on-road portion of their driving evaluation should be withheld until the conclusion of the drive (i.e., the purpose of the drive was to evaluate, not to educate or train).

Post-Drive Practices. Although some driving instructors reported using a "points system" to score a client's driving performance, when communicating results of the evaluation to the driver they typically focused on the driver's observed strengths and weaknesses. Some instructors also provided their clients an overall "pass/fail" or "safe/unsafe" score, especially if they were referred by a physician or other medical professional, or if they were concerned about passing the DMV test to renew their license. Although written results might be made available at the time of the evaluation, these frequently were prepared afterward and mailed to concerned parties with the driver's approval. Most of the driving instructors interviewed indicated that they maintained copies of the results of their evaluations and any recommendations to the driver for five years or longer, depending on state requirements.

Liability Issues. Instructors were specifically asked if they were concerned about liability issues and about steps their schools had taken to manage potential liability. Issues mentioned included having good general liability and commercial liability policies; including the standard disclaimer, "at this time on this day" when reporting the results of an evaluation; documenting any discussion, recommendations, and referrals and keeping on file as required by state law; documenting any ways the road test was limited due to the driver's self-reported or self-imposed restrictions; and having a plan for extreme cases (e.g., calling a family member, calling a cab, taking the driver home yourself) and documenting appropriately.

Conclusion: Driving Instructor Interviews

Many of the driving instructors interviewed had considerable real-world experience in evaluating older adults' driving, and the occupational therapists interviewed all had experience working with driving instructors. Although they sometimes had different opinions and approached their jobs in different ways, their insights proved extremely useful in guiding the development of the Driving Check-Up. In addition, many of the instructors shared forms and other materials with us, including waiver and consent forms, specialized on-road evaluation forms, and sample letters or forms for communicating results of the

evaluation to the driver. While this group of experienced instructors did not always feel the need for detailed guidelines and forms themselves, they nevertheless agreed that such materials might be very helpful to instructors whose only prior experience was working with young novice drivers.

4.5 Project Advisory Committee: Final Meeting

Methods

Drawing from the literature review, online survey, feedback received at the initial advisory committee meeting, interviews with driving instructors, and additional feedback from members of the advisory committee and AAAFTS staff, the project team developed detailed descriptions of each component of the draft model program. The team also prepared some training materials for driving instructors wanting to implement the program, including information on medical conditions they might expect to encounter. All materials were sent to the two project consultants and to two driving instructor consultants to review prior to the final meeting of the advisory committee.

The primary objective of the advisory committee's second and last meeting was to provide feedback on the draft Driving Check-Up, provide feedback on training materials, and offer input into the pilot evaluation plan. In preparation for the meeting, a list of *Assumptions for the Driving Check-Up* was circulated to members of the committee prior to the meeting. These were discussed and modified with agreement by the committee members at the outset of the meeting (see Appendix M). Members of the project team then presented a draft version of components of the Driving Check-Up program. The program components drafted for review at the meeting included: scheduling the appointment, conducting the pre-drive interview and observation, administering selected functional screens, and conducting the on-road drive.

Results: Final Meeting of the Project Advisory Committee

The presentation of the various components facilitated lively discussion among the advisory committee members. Discussion of the basic assumptions assisted in ensuring that the committee members agreed on the basic premises of the Driving Check-Up and creating an open forum for providing constructive feedback on the draft components of the program.

Committee members provided specific feedback on the draft materials developed for scheduling persons for a Driving Check-Up and for obtaining additional driver history and health information during the in-office pre-drive interview. These aspects of the program benefited from the online survey — in particular, the phone surveys with driving instructors experienced in offering evaluations — and had been fairly straightforward to develop.

Recommendations regarding functional screens to be administered as part of the pre-drive component of the program proved more challenging, especially with respect to the cognitive screens. One issue was that cognitive screens with the most research evidence tend to be used by medical providers and may take longer than the 10 to 15 minutes planned for all screening in the Driving Check-Up. In the end, the project team narrowed its recommendations to four functional screens: (1) distance visual acuity, using a standard

Snellen eye chart; (2) the Rapid Pace Walk, a measure of general physical fitness; (3) the Snellgrove Maze Task, a cognitive test shown to be associated with fitness to drive; and (4) the road sign test, used by some DMVs but also an indicator of overall cognitive function. Since there was not a clear consensus of which cognitive screen would work best, it was decided to include two cognitive screens. After considerable discussion of these and other potential functional screens, members of the advisory committee recommended keeping all four of the tests in the pilot evaluation, recognizing that additional information was needed before any final decision.

There was also considerable discussion regarding the draft on-road component of the Driving Check-Up. At this point in its development, the on-road portion of the evaluation was presented as a three-step sequence consisting of basic maneuvers followed by dynamic assessment and feedback on more complex maneuvers, and, time permitting, assistance in addressing any personal driving challenges. However, some members of the advisory committee strongly recommended against including any learning task or feedback *during* the evaluation. There was also significant discussion about the need to evaluate all driving skills and maneuvers. However, it was clear that this was not possible since the intention was to keep the Driving Check-Up to 60 minutes. It was finally agreed to evaluate the high-risk maneuvers of older adults with the assumption that if the older adult driver were successful in these maneuvers, they would be able to perform easier maneuvers safely. The result gave the project team direction in making significant changes to the on-road component with a clearer focus on older-driver high-risk crash situations.

In addition to their feedback on the draft model Driving Check-Up program, members of the advisory committee also provided input into the planned pilot testing of the materials and related training needs for participating instructors. Given the short time frame before the pilot testing was scheduled to begin, advisory committee members recommended seeking out driving schools that could begin right away, had experienced instructors (although not necessarily experienced in evaluating older drivers), had access to sufficient numbers of older drivers who might be interested in participating in the pilot testing, and represented a cross-section of urban and more rural environments across the United States. Committee members also provided input regarding the types of information to gather from the driving instructors as well as participants in the program.

After this final meeting of the advisory committee, individual members continued to make themselves available to provide feedback on the draft program materials, assist with the pilot testing and assist with other tasks as needed.

4.6 Preparing Materials for Pilot Testing

Following the final advisory committee meeting, members of the project team worked to incorporate the committee members' feedback and recommendations into the revised Driving Check-Up materials. Significant time was spent in developing and preparing PowerPoint slides for training the instructors who would be participating in the pilot testing. At this stage, most of the draft program materials required only modest updates. These included the draft protocols developed for scheduling an appointment, observing clients once they came in for their evaluation, conducting the pre-drive interview, and administering the various screening questions. However, to address the advisory committee's concerns about focusing the on-road portion of the driving evaluation more

directly on situations posing the greatest crash risk to older drivers, members of the project team re-examined and updated an earlier analysis of national crash data that several of the committee members indicated they relied upon when testing older drivers (see Stutts, Martell, & Staplin, 2009). This activity led to the identification of five basic crash types that together accounted for 88% of all older driver multivehicle crash involvements, along with crashes in other situations (e.g., backing, merging onto freeways) that may occur with relatively low frequency but appear to pose special challenges to older drivers (see Appendix G). This information was incorporated into a revised on-road evaluation protocol.

A series of PowerPoint slides was developed for training driving instructors to implement the Driving Check-Up, again taking into account all of the recommendations of the advisory committee. The slides covered all components of the program, as well as more basic information such as the scope of the program, its target customers, establishing a mutually beneficial relationship with an occupational therapist or driver rehabilitation specialist, communicating with experienced older drivers, and managing liability issues. The slides also included an overview of common health and visual conditions that can impact driving

5.0 Pilot Testing of the Driving Check-Up Program

5.1 Methods

The objective of the pilot testing was to evaluate the initial developed program, materials, and training for the Driving Check-Up and inform the revision of the program. An iterative process was planned by staggering implementation across six pilot sites. This included immediate debriefings following each training and following the actual trial administration of the Driving Check-Ups with older adults on the second day of the trainings. Instructor training for the first three pilot sites and the last pilot site occurred on-site, while web-based training was employed for the other two sites. Each of the six sites was asked to recruit at least two driving instructors and 10 older drivers, with the goal of a total of 12 driving instructors and 60 older drivers offering feedback on the Driving Check-Up.

Site Selection

To seek appropriate pilot sites for the Driving Check-Up, an inquiry was sent to driving instructors and schools that expressed interest, from one of three sources: 1) our earlier interviews with driving instructors, 2) the DSAA meeting attended by two project team members and 3) driving instructors/schools associated with members of the advisory committee. Interested candidates were asked to complete a questionnaire to ensure their genuine interest and capacity to pilot the Driving Check-Up program (e.g., ability to recruit participants, the size of the school, dates available) as well as location of the school in the United States as we sought diversity of settings (e.g., urban or rural, state).

The six sites selected included urban settings (Baltimore, Maryland, and Houston, Texas), suburban (North Wales, Pennsylvania; Stuart, Florida; and Owings Mills, Maryland) and rural (Roseburg, Oregon) settings. The driving schools included AAA Driving Center, AAA-approved driving schools, private driving schools, and a community college program. The first on-site training was held in North Wales, Pennsylvania, but included staff from two area programs. The driving school in Baltimore expressed interest in the pilot programs so the decision was made to include both programs in this initial training. Five driving instructors were trained and four older drivers assisted with the training as participants. The second training was conducted in the rural community of Roseburg, Oregon, and included three driving instructors and three older drivers. To compare in-person and webinar based training, the Houston and Stuart pilot trainings were conducted via webinar. The webinars were scheduled for two consecutive mornings (half day) and the older adult participants were scheduled after the training was completed. This training involved four driving instructors with no participants during the training session.

Given that materials for the Driving Check-Up evolved, based on feedback, over the course of the pilot testing, it was determined that the final pilot site should involve on-site training and evaluation. Moreover, the full development team was involved in order to optimize input, observation and feedback on the near-final pilot materials. This final training was conducted in Owings Mills, Pennsylvania. The team trained five driving instructors, and three older adults were evaluated as participants.

Evaluation Processes

Formative Evaluation Process. The development team followed a formative evaluation process, gathering and evaluating feedback following each pilot. Minor revisions to the training format or forms used were made in an effort to continually improve trainee understanding, ease of administration and consistency in the interpretation of the results. This iterative process involved several components. The training team allowed time for questions and feedback following the classroom training portion and at the completion of the pilot by asking for feedback through a series of targeted questions about the educational materials and the Driving Check-Up forms. In addition, feedback was solicited about the clarity of directions, usability of the forms, and suggestions for how the forms could be improved. Feedback was compiled and reviewed by the team, and changes were implemented accordingly. The 11 older adults who completed the Driving Check-Up during the on-site training were interviewed as part of the formative evaluation process.

Summative Evaluations. Summative or final evaluations of the Driving Check-Up were done with the driving instructors after all the pilot-program data was collected. A final set of evaluation and feedback questions was created using the *Qualtrics* software and sent to all of the driving instructors who completed at least one Driving Check-Up. Eleven of the 15 eligible driving instructors responded (three driving instructors were excluded, as they were no longer employed by the driving school). It is important to note that due to the formative process, some of the forms were modified or developed in response to need; thus, the early sites (i.e., North Wales and Baltimore) could not evaluate use of these developed forms.

A similar survey using the *Qualtrics* software was designed for the older adult drivers to complete on tablet computers that were issued to the pilot sites. Unfortunately, this format (connecting to their internet and setting up the tablet) proved unfamiliar and uncomfortable for some of the driving instructors and some of the older adults at the first pilot site. Therefore, paper surveys were created and made available as an alternative to the *Qualtrics* on-tablet format. Once the completed surveys were sent to the principal investigator, they were entered in an electronic version. Thirty-six older adults completed the survey. The older adults who participated in the first three pilot studies on the day of training did not complete this questionnaire, as they were interviewed on-site by a team member.

5.2 Results

Each of the selected sites was asked to complete 10 Driving Check-Ups with older adults from their local community. This number included those older adults recruited and evaluated in the pilot training. While all sites had some difficulty recruiting, all but one site completed the 10 Driving Check-Ups. Specifically, the participant numbers are listed below:

- North Wales, Pa. – Seven completed (including two at training)
- Baltimore, Md. – 10 completed (including three at training)
- Roseburg, Ore. – 10 completed (including three at training)
- Houston, Texas – 10 completed
- Stuart, Fla. – 10 completed
- Owings Mills, Md. – 10 completed (including three at training)

Scheduling

As described in Section 3.1, scheduling is the first step in ensuring the participant is appropriate and prepared for participation. The scheduling protocols and forms were designed for office staff to complete.

Observations of the Project Team. For the pilot testing, participating schools needed to pre-schedule the older adult participants prior to the training. This required an exception to the protocol but resulted in a mixture of subjects for the pilot sites as no initial phone or intake screening was possible. Feedback indicated that the driving instructors felt this phone screening was useful, especially if they planned for office staff to handle the scheduling.

Driving Instructor Feedback. When asked who typically conducted the telephone interview to schedule the Driving Check-Up, the 11 instructors answered as follows: front desk worker: n=4; driving instructor (self): n=3; another driving instructor: n=1; and other” n=3. All 11 driving instructors indicated the phone screening components should remain as designed.

Older Adult Participant Feedback. Among the older adults who volunteered to complete a Driving Check-Up for this project, 27 (75%) reported that they scheduled the Driving Check-Up themselves, three (8%) said they did not schedule the Driving Check-Up themselves (with no further explanation), and six (18%) stated they were associated with the school, or were referred to the program by someone else (e.g., daughter, spouse). Older adult participant feedback was positive and did not indicate any need for modification to the form or process. The table below summarizes responses to the questions about scheduling from the older adults (not all 36 respondents answered all the questions).

Table 1. Older Adult Participants’ Responses about Scheduling (N=27)

	Definitely yes	Probably yes	Might or might not	Probably not	Definitely not
Do you feel that the interview on the phone was done professionally and worth your time?	19 (70%)	7 (26%)	1 (4%)		
	Extremely appropriate	Somewhat appropriate	Neither appropriate nor inappropriate	Somewhat inappropriate	Extremely inappropriate
Do you feel the interview questions on the phone were appropriate?	19 (70%)	4 (15%)	3 (11%)	1 (4%)	

Conclusion: Scheduling. The scheduling process or form was not modified and appeared to be effective in meeting its objectives.

Pre-Drive Interview

As described in Section 3.1, the pre-drive interview is a scripted and structured method of gaining important information about the participant including their license status, health status, driving history, and reason for wanting to complete a Driving Check-Up.

Observations of the Project Team. Overall, the project team observed the driving instructors completing the interview and using the pre-drive information form appropriately. However, there was one incident that facilitated a change to the form. At the first pilot site, there was an older adult who called seeking a “driving evaluation” just prior to the site visit and was thus recruited as a participant. This participant demonstrated a potential cognitive impairment and during the post-drive discussion would not disclose any personal contact information. Based on this experience, the team added the section on the pre-drive interview form that requires the participant to give an emergency contact name and number.

Driving Instructor Feedback. Ten of the 11 driving instructors indicated the components should remain as designed. One driving instructor indicated that questions concerning the driver’s license information and the participant’s goal for the Driving Check-Up should not be included. Additionally, one driving instructor responded “I don't know” for the question asking the emergency contact name and phone number.

Older Adult Participant Feedback. Older adult participant feedback was positive and did not indicate any need for modification to the form or process. The table below summarizes the questions and answers to the questions about the pre-drive interview from the older adult participants.

Table 2. Older Adult Participants’ Responses About the Pre-Drive Interview (N=36)

	Extremely comfortable	Somewhat comfortable	Neither comfortable nor uncomfortable	Somewhat uncomfortable	Extremely uncomfortable
How comfortable were you being asked and answering these questions (health)?	29 (81%)	5 (14%)	2 (6%)		
	Definitely yes	Probably yes	Might or might not	Probably not	Definitely not
Do you feel this was important information to be asked?	29 (83%)	6 (17%)			

One further question was asked of the older adults: Were there any questions that should have been asked? Most responded “no” or “no comment.”

Conclusion: Pre-Drive Interview. The pre-drive interview form was modified to include the emergency contact information. Otherwise, the pre-drive interview form and training process appeared to be effective in meeting their objectives.

Screening

The Driving Check-Up uses four screening tools to test vision, motor skills and cognition in order to ensure that the older adult participant meets the criteria to progress to the on-road component. Although the screening tools were carefully selected by the advisory committee, the pilot testing was critical to determine if the training of the driving instructors was effective so that they were able to use the screening tools and protocols appropriately.

Observations of the Project Team. Videos were created to demonstrate the administration of the screening tools. Once the videos were reviewed, the initial pilot planned only a brief time for actual practice in administering the tools. At the first pilot site, the team members observed that the driving instructors were very unfamiliar with the administration of medically related testing and tended to approach this portion with more of an educational paradigm, offering help or guidance to the older adults in an effort to help them succeed rather than allowing the errors to occur and thus be measured in the scoring. This occurred with older drivers who were having some difficulty (i.e., demonstrating some level of impairment) at the first pilot site. The project team noted that measurement of impairment was critical to the usefulness of the screening portion of the Driving Check-Up and also the safety of the driving instructor who would be potentially getting in the car with this driver. It was after this first pilot that stronger guidelines for the screening tools were developed. Additionally, training was amended to make sure more practice with the screening tools was added.

The road sign test was also discussed extensively at the pilot sites. The pilot used a standard set of road signs; this set is used by the Optec Vision Screener (<http://www.stereooptical.com/>) and at least some state licensing agencies (e.g., North Carolina). However, this set consists of a few signs that were not appropriate or typical for different parts of the country. For example, Oregon state law does not allow U-turns, so drivers in the state may not be aware of “no U-turn” signs and in Pennsylvania, a “no passing” sign is white rather than yellow as in the test. The project team recognized that the road sign set should be further explored. Despite the challenges to the identification of this sub-set of the signs, the driving instructors were clearly more comfortable with the road sign test than the Maze Task.

The Maze Task was not familiar to any driving instructors, and repeated use and training was important. At the second pilot site, it was observed that the standardized instructions lacked clarity. Some of the older adult participants interpreted that speed was critical, leading them to complete the maze so quickly that more than two errors were made. This resulted in the question, “Were the errors a reflection of impairment as scored, or simply a sloppy or hasty approach?” Based on the judgment of the project team members, it certainly appeared to be more “sloppy” errors than cognitive errors. Thus, after consultation with the Maze Task’s developer Dr. Carol Snellgrove, the instructions were revised to indicate that “accuracy and speed were equally important.” With this added instruction, the protocols included permission to offer feedback during the practice maze when drivers were observed erring because they were hasty.

Both the vision acuity screen and Rapid Pace Walk were quickly learned following the video training, and scoring was likewise consistent. Although all driving instructors agreed the vision screen was critical, there was less agreement on the contribution of the score from the Rapid Pace Walk. However, since it was quick and easy, there was not much discussion.

One of the observations of the first pilot site was that there was not a clear place on the forms to summarize the results of the screening tests. The project team realized that the scores alone did not assist the driving instructor in making a decision about stopping or moving onto the on-road portion of the Check-Up. Based on this feedback and observation, the *Results of the Screening Tests* form was developed and incorporated into future pilot sites.

Driving Instructor Feedback. The table below illustrates the perceived usefulness of the screening tools by the driving instructors. Overall, the majority of the driving instructors indicated they felt the screening tools were useful or extremely useful. The Rapid Pace Walk was seen as the least useful, with one instructor observing that this skill can be seen as the person walks in the door. There were two instructors who indicated the Maze Task was not at all useful and two who felt the road sign test was not at all useful or slightly useful.

Table 3. Driver Instructors’ Responses about Usefulness of Screening Tools (N=11)

	Not at all useful	Slightly useful	Moderately useful	Very useful	Extremely useful
Vision: Distance acuity			2 (18%)	4 (36%)	5 (46%)
Rapid Pace Walk		2 (18%)	3 (27%)	4 (36%)	2 (18%)
Cognitive: Maze Task	2 (18%)		1 (9%)	5 (46%)	3 (27%)
Cognitive: Road sign test	1 (9%)	1 (9%)	1 (9%)	5 (46%)	3 (27%)

Older Adult Participant Feedback. The table below summarizes the responses of the 36 older adult participants who completed the program feedback survey, with respect to the screening tools and process.

Table 4. Older Adult Participants' Responses about the Screening Tools (N=36)

How useful do you think the following screening tools were:	1- Not at all useful	2- Slightly useful	3- Moderately useful	4- Very useful	5- Extremely useful
Vision test	1 (3%)			12 (33%)	23 (64%)
Rapid Pace Walk	2 (6%)	1 (3%)	8 (22%)	12 (33%)	13 (36%)
Maze Task	1 (3%)	1 (3%)	6 (17%)	9 (26%)	18 (51%)
Road sign test	1 (3%)	1 (3%)	2 (6%)	5 (14%)	27 (75%)
	1- Extremely Un-comfortable	2- Somewhat un-comfortable	3-Neither comfortable nor un-comfortable	4- Somewhat comfortable	5- Extremely comfortable
How comfortable were you completing the tasks?			1 (3%)	5 (14%)	30 (83%)
	1-Not useful at all	2- Slightly useful	3- Moderately useful	4- Very useful	5- Extremely useful
Do you think the screening tools were useful?		1 (3%)	1 (3%)	9 (26%)	24 (69%)

Almost all of the older adults felt that the vision acuity screening was very or extremely useful. For the two cognitive screening tools and Rapid Pace Walk, the responses varied, although only one or two found the screening tools not at all useful.

Conclusion: Screening. Generally, the screening tools appeared to be considered useful to the older adult participants as well as the driving instructors. Overall, the older adult participant feedback was positive and did not indicate any need to change. As indicated above, based on the observation of driving instructors screening participants, the *Results of the Screening Tests* form (Appendix C) was designed and used so that instructors could easily refer to this analysis form to determine whether to proceed to the on-road.

While a few driving instructors suggested additional changes, a majority of driving instructors offered suggestions that included making changes to the road sign test to include only signs that are more common, and/or eliminate ones not applicable in a given state (e.g., a “no U-turn” sign in Oregon, where U-turns are illegal). Since the road sign test is not a standardized assessment, it would seem appropriate to make this modification and select more nationally recognized signs. This recommendation was confirmed based on feedback from the driving instructors. At the final evaluation, the project team turned to the expertise of the driving instructors and asked for their input on which signs should be changed. Based on these responses, the program should consider deleting the following signs: “Hill ahead,” “No parking on pavement,” “Do not block intersection,” railroad crossing (with no words), and “No passing zone” (with no words). Interestingly, the other sign with only symbols and no words (school zone or pedestrian crossing) was not indicated by any of the instructors as a sign to be potentially removed, and yet older adults often missed this identification. There were several other signs endorsed by the driving instructors that would be adequate replacements (e.g., “Lane ends, merge left,” merging from right, intersection ahead, “Construction ahead,” no right turn). Thus, we recommend that the ones listed above to delete should be replaced by the list of adequate replacements.

On-Road Drive

The on-road drive focuses on those situations in which older adults are at greatest risk of a crash, rather than testing all the skills and abilities as is typically done with novice, young drivers. The objective of this short 30-40 minute drive is to provide a sufficient sample of driving for information and feedback on critical skills needed on five of the most high-risk maneuvers for older adults.

Observations of the Project Team. The *On-Road Driving Check-Up Form* was considered a first draft when used at the first pilot site, as there continued to be debate at both advisory committee meetings about what driving skills and maneuvers should be included. As with all driving schools, the first driving school pilot site followed a specific driving route developed by the school as the most effective and efficient considering traffic and geography. Accordingly, the project team planned to incorporate the driving school's expertise in developing the route-planning criteria that programs would use to design the on-road portion rather than dictate a specific route. Thus, while an initial form was designed and ready for the first pilot, the project team members were intent on using this first site to continue shaping the form criteria and areas for scoring that would become part of the Driving Check-Up.

The project team actively participated in the on-road drives of the pilot by riding along and observing both driver and instructor. The team found that riding with the driving instructor and the older driver participant during the pilot testing added valuable insight into how best to structure the on-road component, scoring criteria and form. Of specific importance was the addition of a strategic element, not typical of the skills required of a novice inexperienced driver. The experienced older driver needed to be offered challenge by the inclusion of a "strategic element" (i.e., wayfinding or self-navigation) on the scoring form. Initially, the team considered this to be an essential component of the program and dedicated time and discussion to explore realistic options at the first two pilot sites. What was discovered is that this element offered a dramatic alteration to how driving schools operate. The driving instructors follow established routes, with known and anticipated elements in both maneuvers and time expected until completion. There are numerous logistical challenges involved in asking the driver to complete an open-ended wayfinding element that is essentially untimed and could potentially take the driver off the route, into challenges unanticipated by the driving instructor that may offer few options for the driver to get back on route in a timely manner. Furthermore, the means to present a wayfinding element were complicated. For example, a request to turn right at Elm Street was considered unfair if the driver was unfamiliar with the local roads. Thus, through discussion and feedback with the driving instructors, the team made the strategic element an option rather than a required element. The team recommended that the element be placed at the end of the route with an open-ended question, "Can you find your way back to the office?"

Driving Instructor Feedback. In evaluating the on-road drive, the instructors were told that this was the main focus of the Driving Check-Up. However, since the Driving Check-Up is designed to be one hour in total with the on-road drive taking only about 30 minutes, only the most critical maneuvers for safety should be included. With this in mind, the driving

instructors were asked to indicate the importance of each of the driving tasks or maneuvers to be in the Driving Check-Up.

Table 5. Driver Instructors’ Responses About the Importance of the Critical Driving Maneuvers (N=11)

Driving Task or Maneuver	Not at all important	Moderately important	Very important	Extremely important
Vehicle orientation	1 (9%)	1 (9%)	2 (18%)	7 (64%)
Driving in the parking lot to see basic vehicle control	1 (9%)	1 (9%)	2 (18%)	7 (64%)
Unprotected left turn at signalized intersection			2 (18%)	9 (82%)
Left turn entering roadway from side street, driveway or parking lot			2 (18%)	9 (82%)
Right turn entering roadway from side street, driveway, or parking lot			3 (27%)	8 (73%)
Merging left onto highway	1 (9%)	3 (27%)	1 (9%)	6 (55%)
Lane change on multilane roadway			1 (9%)	10 (91%)
Following other traffic	1 (9%)		1 (9%)	9 (82%)
Strategic element (e.g., return to parking lot where we began)		2 (18%)	2 (18%)	7 (64%)
Interaction with other traffic*				9 (100%)
Parking *		1 (12%)	4 (44%)	4 (44%)

Note: * only nine responses to this question.

In a final evaluation of the Driving Check-Up, the driving instructors were shown the *On-Road Driving Check-Up Form* and asked about each component on the form. They were asked to choose among the following with regard to the component: “Yes, include;” “No, do not include,” or “Don’t know.” Almost all driving instructors indicated that all components should remain on the form. Only one driving instructor indicated “do not include,” on five items out of 19.

Older Adult Participant Feedback. When asked if the on-road component of the Driving Check-Up was useful, 29 respondents, or 81%, indicated they were extremely satisfied; six, or 17%, indicated they were somewhat satisfied, and one, or 3%, indicated extreme dissatisfaction. The older adult participants were reminded on the post-evaluation survey that the on-road (driving) component was designed to target the driving maneuvers that pose the highest risk for crashes for older adults. They were then asked if that was reflected on their drive. Thirty-one, or 86%, said yes; two, or 6%, said no; and three, or 8%, said maybe. The respondents were asked to state why or why not. Following are the comments from respondents:

- “Certain things I did not do but knew; it reminded me to do them as I drive.”
- “Very easy.”
- “Extremely helpful and reinforced good driving habits.”
- “Highlighted areas where improvement could be made to be a more alert & responsive driver.”
- “Because it demonstrated my total awareness of my surroundings and movement of nearby vehicles.”
- “Speed checked. Turning/changing lanes was addressed.”
- “Addressed all situations that could occur.”

- “A good mix of highway and street driving, with several opportunities to merge and other maneuvers.”
- “I did many various maneuvers to get the feedback.”
- “Very little traffic.”
- “You can always learn something new.”

Conclusion: On-Road Drive. Overall, the critical maneuvers to be observed on the on-road portion of the evaluation were seen as important or very important by most of the driving instructor respondents and the on-road component was valued by most of the older adult drivers. Interestingly, the final evaluation of the *On Road Driving Check-Up Form* had no comments or suggested changes, and all respondents indicated it should remain as developed. This is very likely because of the approach used by the project team to gather feedback and integrate driving instructor expertise into the form throughout the pilot sites. The concepts of demonstration of “new learning” in the on-road drive and evaluation of performance at the strategic level of driving behavior were eliminated, making driving knowledge and skills for the older driver the focus of the Driving Check-Up. This is solidly in line with the expertise of the driving school/instructor.

Post-Drive Discussion

The post-drive discussion was carefully designed for the driving instructor to present a summary of what was observed throughout the checkup with the older adult driver and/or family in a positive and helpful manner. This discussion may include additional resources and guidance such as referral information for specialized evaluation, if needed. In most cases, it is expected that this conversation will be pleasant, factual and lasting five to 10 minutes, offering information to assist the older adult in extending their safe driving years. However, when a medically at-risk older adult does not meet the criteria for completing the on-road portion or in instances where the driver proceeds onto the road and subsequently requires verbal or physical intervention by the driving instructor, the planning and approach to this more difficult conversation is critically important. In both cases, it is likely the post-drive discussion will take time and skill on the part of the driving instructor.

Observations of the Project Team. For the first pilot site, there were no specific forms designed to guide the debriefing, and the directions were simply to review the *On-Road Driving Check-Up Form* with the older adult driver. What was learned from the first site (and future sites) was that when the older adult had a successful Driving Check-Up, the driving instructor had no difficulty with communicating the results to their participant and appeared to be comfortable and able to complete this component within the short timeframe. However, at the first site, there were two participants who did not meet screening criteria to go on the road. Since it was the first pilot site, the project team decided to allow both of these older adults to continue to the on-road component. Both of the drivers demonstrated significant safety and judgment issues on the road, with one needing the instructor to take the wheel to avoid an imminent crash. Both of these post-drive discussions required the project team leaders to take the lead to convey feedback reflecting risk and the need to not drive until a more complete medically based evaluation could be completed in an effort to understand the underlying cause of these unacceptable and dangerous performance errors.

Based on this experience at the first site, additional forms were developed (see Section 3.1 Post-Drive Discussion: the *Outcome Forms*). The outcome forms were used at the second pilot site with minor revisions for the final pilot sites. With use of the outcome forms, the driving instructors are provided structures, protocols and directions to present feedback and supportive guidance to older adult drivers who require follow-up with a medical professional.

Driving Instructor Feedback. On the final evaluation of the Driving Check-Up, nine of the 11 driving instructors (82%) used the *Outcomes Form 1: Recommended Follow-Up to Today's Driving Check-Up*. The two who did not performed the majority of the Driving Check-Ups at the first two sites. Although they were sent the forms after development, there was no follow-up in terms of how to use the forms. Six (60%) of 10 driving instructors (one did not answer this question) used *Outcomes Form 2: Recommended Follow-Up to Today's Driving Check-Up*, while four did not. At least one of the instructors used this form incorrectly; he/she thought the intention was to review all the options with the older driver, checking off each box once the respective option was discussed. This was one of the instructors trained via webinar; thus, this has implications for training (discussed later).

On the evaluation of the Driving Check-Up, the driving instructors were shown both outcomes forms and asked about each component on the forms. They were asked to indicate, for each component: “Yes, include;” “No, do not include;” or “Don’t know.” Almost all driving instructors indicated that all components should remain on the form. Only one driving instructor indicated that the first paragraph on *Outcome Form 1* should not be included.

Older Adult Participant Feedback. The older adult participants were asked about the post-drive discussion and indicated their level of agreement with specific statements.

Table 6. Older Adult Participants’ Responses About the Post-Drive Discussion (N = 36)

The post-drive discussion was...	5 - Strongly agree	4 - Somewhat agree	3 - Neither agree nor disagree	2 - Somewhat disagree	1 - Strongly disagree
Useful to me	33 (92%)	2 (6%)		1 (3%)	
Accurate reflection of my performance	34 (94%)	2 (6%)			
Done professionally	36 (100%)				
Reflective of what happened in the Driving Check-Up.	35 (97%)			1 (3%)	
Complete; all my questions were answered.	36 (100%)				
A nice wrap-up of the Driving Check-Up.	35 (97%)		1 (3%)		

Overall, this discussion was seen as useful, accurate, done professionally, and a nice finish to the Driving Check-Up.

Conclusion: Post-Drive Discussion. The post-drive discussion is a critical component of the Driving Check-Up, especially for the individuals who potentially need a referral to a driving rehabilitation specialist or other services. The addition of the outcome forms has improved

the process, adding structure to what the driving instructor should cover in the post-drive discussion. However, this process needs further evaluation with more participants, since the driving instructors used the Outcome Form 2 less frequently (or not at all) and neither form was used appropriately by all driving instructors. Additionally, after the first pilot study, there were no older adult participants who did not meet the protocol criteria for continuing with the on-road component, so Outcome Form 2's use has not been fully evaluated.

Collaboration With Driver Rehabilitation Specialist

An essential component of the Driving Check-Up is the collaborative relationship between the driving school offering the program and a local occupational therapist/driving rehabilitation specialist. The goal is for older adults who reveal a significant impairment on the pre-drive interview, demonstrate problems with one or more of the screening tools (particularly the cognitive screens), and/or make significant errors during the on-road drive to be referred to the services of a driving rehabilitation specialist who can appropriately determine fitness to drive and can establish a rehabilitation plan that may include transition to other transportation options.

Observations of the Project Team. For the first two on-site training pilots, a driving rehabilitation specialist (DRS) was contacted and the project team arranged to have the DRSs come to the driving school on one of the two days of training. The DRS described their program and the group discussed how the DRS would be able to collaborate with the driving instructors. This discussion during the training was fruitful and specific procedures were clarified on how referrals would work between the DRS and driving instructors. In addition, both DRSs indicated calls with any questions were always an option. It was clearly expressed by most of the driving instructors on-site that they appreciated the knowledge base of the DRS and looked forward to working with them on this and other projects.

For the webinar pilot sites (n=2), the principal investigator used a conference call with a DRS in the area of each of the driving schools to introduce the DRS and the driving-school contact. While the conference calls were productive and useful, there was no further contact with the DRS during the pilot evaluation, as far as the project team was aware.

The last pilot site was scheduled with a large number of driving instructors. Since the driving school indicated they already had contacts with DRSs, the site was asked to invite one of the DRSs to attend part of the training. Unfortunately, that visit was canceled and the project team members relied only on the instructor's description of the programs and the value of the DRS.

Driving Instructor Feedback. On the final evaluation form, the driving instructors were asked how important the interaction with the DRS was as part of the training. Only seven of the 11 respondents answered this question, summarized in the table below:

Table 7. Driving Instructors’ Responses About the Importance of the DRS Involvement in the Training

Answer	Count
Not at all important	
Slightly important	2 (29%)
Moderately important	2 (29%)
Very important	3 (42%)
Extremely important	
Total	7

Older Adult Participant Feedback. No feedback was sought from the older adults about the driving rehabilitation specialist because none of the older adults who completed the surveys were referred to the driver rehabilitation specialist.

Conclusion: Collaboration with Driver Rehabilitation Specialist. In the case of this element of the Driving Check-Up, the observations of the project team members and the driving instructors somewhat differed. While all of the driving instructors who responded saw meeting with the DRS during the training as at least slightly important, only 42% viewed it as very important. One explanation may be that the driving instructors do not have any experience to see the value of the DRS until they work more with older adults and may need the resources and expertise of the specialist. With the exception of the first on-site pilot (in which two individuals were referred), there were no subsequent consultations or referrals to the DRS. While this may be because there was no need for any referrals to the DRS, it is the project team’s perception that meeting in person with the DRS is essential to ensure the collaborative design of the Driving Check-Up. The in-person meeting not only helps driving instructors become familiar with the DRS and processes, but can also help the DRS to understand and recommend the Driving Check-Up to appropriate older adults seeking such services.

The project team considers the resource and collaboration of the occupational therapist or DRS an essential component of the Driving Check-Up. Without a method of referring a medically at-risk older adult to appropriate services, the driving school could potentially at best miss an opportunity to educate the older adult on needed services and, in a worst-case scenario, expose their driving school to potential liability by “treating” or serving needs beyond their scope of training.

Training

The project team worked diligently on the concept, materials and training for the Driving Check-Up. As with all components of the Driving Check-Up, the training was an iterative process across the six pilot sites. In the initial plan, there were to be two face-to-face pilots and the rest would be done through electronic means. However, the first site in Pennsylvania (a driving school in a suburban area) was convenient for one of the other selected sites, so the training was done in-person collaboratively at the first two sites. The third site, in rural Oregon, also had in-person training. Training for the next two sites was conducted via webinar over two days with the final site having face-to-face training. This last site had face-to-face training because the project team wanted to comprehensively observe the use of the final forms and Driving Check-Up protocols with older adults.

The webinar training differed from the in-person training in three major respects: 1) project team members were not able to observe the practice or use of the screening tools, 2) there was no opportunity for modeling or for offering feedback for any of the actual Driving Check-Ups, and 3) as discussed, there was no face-to-face collaboration with a DRS.

Observations of the Project Team. As discussed earlier, the first pilot site offered key insight regarding what aspects of the program worked and which ones needed further development. As highlighted, many of the forms and processes were enhanced to strengthen the training and usefulness for the driving instructors. The second pilot site resulted in a more effective and efficient training with the benefits of updated materials and forms. In terms of the PowerPoint slide decks, these did not change significantly, but were continually edited and updated with any form changes, new pictures, or examples to better illustrate key points. By the time of the webinars, the slide decks were complete.

The primary question for the project team was whether the use of a webinar was adequate for training the driving instructors compared to the face-to-face training. While the PowerPoint mini-lectures and discussion went well aided by the use of *WebEx*, the online video meeting made it challenging to evaluate the outcomes, since none of the project team members were on-site to observe performance strengths, challenges, and outcomes. The driving instructors at the two driving-school sites reported practicing with the screening tools and asked appropriate questions throughout the training. However, there was limited discussion about the actual Driving Check-Ups with older adult drivers, since the Check-Ups were scheduled for after rather than during the training.

Driving Instructor Feedback. Four of the driving instructors who completed the final driving instructor evaluation received their training via webinar and seven received their training in person. The instructors were asked to indicate the ways driving instructors can be adequately trained to conduct a Driving Check-Up. The table below shows the driving instructors' answers. They were asked to check all that apply.

Table 8. Driver Instructors' Responses About Adequate Methods of Training for Driving Check-Up (N=11)

Method of Training	Count
In person	11 (100%)
Interactive web based (real time with Q&A)	7 (64%)
Web based tutorials (not interactive)	4 (36%)
Manual	5 (45%)
Other	2 (18%)

The driving instructors were asked if they felt the length of the training was adequate. One instructor (9%) thought it was too short and one (9%) thought it was too long, but the majority (n=9, 82%) felt it was just the right amount of time.

In seeking information about the specific training components, in the final evaluation the driving instructors were asked to indicate if there was too much, not enough, or the right amount of information for each topic. Since the evaluation was at the end of the project and

it had been several months since some driving instructors had their training, “do not recall” was included as a response.

Table 9. Driver Instructors’ Responses About Adequacy of Time for Topics in Training (N=11)

Topic in Training	Right amount of information	Too much information	Not enough information	Do not recall
Introduction and background of the Driving Check-Up	8 (73%)	1 (9%)		2 (18%)
The spectrum of driver services	8 (73%)	1 (9%)		2 (18%)
Liability	7 (64%)		1 (9%)	3 (27%)
Scheduling the Driving Check-Up	8 (73%)	2 (18%)		1 (9%)
Pre-drive interview	9 (82%)			2 (18%)
Health conditions	9 (82%)	1 (9%)		1 (9%)
How to do screening	8 (73%)		1 (9%)	2 (18%)
How to do observations and the cue card	8 (73%)		1 (9%)	2 (18%)
Justification for an on-road that is different	6 (55%)		1 (9%)	4 (36%)
Process and components of on-road	8 (73%)	1 (9%)	1 (9%)	1 (9%)
Communicating results	8 (73%)		1 (9%)	2 (18%)
Working with the driver rehabilitation specialist	7 (64%)	1 (9%)		3 (27%)

Overall, a majority of the driving instructors indicated that the training in each of the topics contained the right amount of information. It may be that the topics of justification for an on-road that is different, working with the DRS and liability need to be highlighted more, as they were not recalled by at least one-fourth of the driving instructors.

Conclusion: Training. In terms of the training, 82 percent of driving instructors felt the length was just right and a majority indicated that the included information was the right amount and useful. All the driving instructors indicated that face-to-face training would be adequate with seven (64%) also agreeing that an interactive webinar is adequate. This number dropped significantly to four (36%) saying that a web-based tutorial without the interactive feature would be adequate. Five driving instructors (45%), or almost half, thought a manual would be adequate. This is interesting since the project team found that very few of the driving instructors reported that they read any of the preparatory materials or health information data that were offered.

It is difficult and beyond the scope of the current report to compare the training between the two styles (e.g., in-person, webinar); however, based on their responses, the driving instructors felt they were adequately trained. The majority of driving instructors who were trained in person indicated they valued the face-to-face training. Unfortunately, there was no individual who did both trainings to compare the differences. Although there did not appear to be any significant problems manifest in the outcomes of the Driving Check-Ups at the two types of sites, there was one webinar-trained site at which one of the forms was used inappropriately (as discussed earlier). As soon as it was noted, the instructor was provided with the correct information. However, the project team expressed that training needs to be face-to-face, even if only for the second day so that the trainers can see that the screening tools are administered appropriately, all the forms are used effectively, a

collaborative meeting occurs between the driving instructors and a DRS, and one or two Driving Check-Ups can be directly observed.

General Feedback on Driving Check-Up

Observations from the Project Team. The project team felt the training went well at the first pilot site. The first site had five older adult participants, with two of them demonstrating some deficits in motor and/or cognition. This was a busy school, also serving novice driving-school customers at the same time. Focusing on administration, observation of the instructors, discussion and feedback was challenging in a physically shared space. Nevertheless, this site offered an excellent learning experience with most of the tools and materials revised based on realistic feedback and resultant learning. With each subsequent training, the team developed a deeper understanding of the functionality of a driving school with its restrictions and potentialities.

Driving Instructor Feedback. The 11 driving instructors who responded indicated that of the 53 Driving Check-Ups completed by them, 12 were done with another person (likely during training) and 41 were done individually.

When asked the average length of a Driving Check-Up (excluding the training) from the pre-drive interview to the post-drive discussion, the driving instructors responded as shown in the table below:

Table 10. Average Length of Driving Check-Ups

Time	Count (%)
1-9 minutes	1 (9%)
20-29 minutes	1 (9%)
30-39 minutes	0 (0%)
40-49 minutes	3 (27%)
1 hour - 1 hour, 9 minutes	1 (9%)
1 hour, 10 minutes - 1 hour, 19 minutes	4 (36%)
1 hour, 20 minutes - 1 hour, 29 minutes	1 (9%)
Total Responses	11

The driving instructors who did more than one Driving Check-Up were also asked about the range of duration of the Driving Check-Ups.

Table 11. Average Length of Shortest and Longest Driving Check-Up for Driving Instructors Who Completed More Than One (N=7)

Shortest	Count
30-39 minutes	2 (29%)
50-59 minutes	3 (43%)
1 hour - 1 hour, 9 minutes	2 (29%)
Longest	Count
50-59 minutes	2 (29%)
1 hour, 10 minutes – 1 hour, 19 minutes	2 (29%)
1 hour, 20 minutes – 1 hour, 29 minutes	1 (14%)
1 hour, 30 minutes – 1 hour, 39 minutes	2 (29%)

Based on this information and the fact that there is a learning process, it seems likely that an hour to an hour and 15 minutes will be a good estimate of time for the Driving Check-Up. In fact, the driving instructors were asked what would be a good time estimate for a single Driving Check-Up. Responses were as follows:

Table 12. Driving Instructors Estimated Time for Driving Check-Up (N=11)

Time	Count
1-9 minutes	1 (9%)
40-49 minutes	2 (18%)
50-59 minutes	2 (18%)
1 hour - 1 hour, 9 minutes	2 (27%)
1 hour, 10 minutes – 1 hour, 19 minutes	3 (27%)
1 hour, 30 minutes – 1 hour, 39 minutes	1 (9%)

Finally, the 11 driving instructors were asked how likely they would be to offer Driving Check-Ups in the future:

Table 13. Likelihood of Driving Instructors Offering Driving Check-Ups in the Future (N=11)

Answer	Count
Extremely unlikely	
Somewhat unlikely	
Neither likely nor unlikely	1 (8%)
Somewhat likely	5 (46%)
Extremely likely	5 (46%)

The driving instructor who indicated they were “neither likely or unlikely” stated that the reason was because “it would be difficult to fit into [the] schedule at this time.”

Asked to make any final comments, five of the 11 driving instructors responded. The comments were:

- “Thank you for the opportunity to participate in this pilot. It gives me much more confidence that we are meeting customers’ needs.”
- “Thanks for including me in this...I learned a lot and feel that I lacked expertise in this area. Please contact me if you move further with this project as I would like to be involved.”
- “We were only the 2nd training, so there are parts of it that I can't give specific feedback on right now, however, we gave feedback at the time of the training, both verbally and written. I think that driving instructors (people who have specifically been trained to instruct others in driving and the extra pieces this requires of an instructor, such as extra searching for the student/client) should be the primary ones this training is given to.”
- “It's a good program. I'll be interested to know when it's put out to the public for use. Some of your answers are a little to (sic) black and white. Answers are too narrow. It needs more gray.”

- “I feel in-person training would be most effective due to the level of detailed information and interaction required.”

Based on this data, informal feedback from the pilot sites, and informal conversations with driving instructors, there are driving instructors and schools who are interesting in offering this program. While it seems very likely the pilot sites will implement the program, it is more difficult to gauge interest from the other driving schools because they may or may not have a clear understanding that the Driving Check-Up is not an evaluation of fitness to drive.

Older Adult Participant Feedback. The older adults were asked a number of questions about their perceptions of the Driving Check-Up. The table below illustrates their responses.

Table 14. Older Adult Participants’ Perceptions of the Driving Check-Up (N=36)

	5- Extremely satisfied	4- Somewhat satisfied	3-Neither Satisfied or Dissatisfied	4- Somewhat Dissatisfied	1- Extremely Dissatisfied
Overall, how satisfied were you with the Driving Check-Up?	28 (78%)	1 (3%)	1 (3%)		6 (17%)
	5- Extremely likely	4- Somewhat likely	3-Neither likely or unlikely	2- Somewhat unlikely	1- Extremely Unlikely
How likely would you be to recommend the Driving Check-Up to a friend or family member?	27 (75%)	3 (8%)	1 (3%)	1 (3%)	4 (11%)
	Much more time is needed	Somewhat more time is needed	Length of time was about right	Somewhat less time is needed	Much less time is needed
How was the length of the Driving Check-Up?	24 (69%)	9 (26%)	1 (3%)	1 (3%)	

There were six (17%) participants who indicated on the first question that they were *extremely dissatisfied* with the Driving Check-Up, and five (14%) indicated they would be *extremely* or *somewhat unlikely* to recommend it to a friend. However, at least one older adult later reported having read the question incorrectly during an on-site visit and put a check in the first box, which indicated extreme dissatisfaction, when he actually meant to say “extremely satisfied.” Thus, it is possible those boxes were checked by mistake, since overall results indicated there were only one or two persons who did not find components useful (see Older Adult Participant Feedback above). Specifically, the older adults were asked to check all the terms that best described their experience with the Driving Check-Up. The table below illustrates the overwhelmingly positive responses.

Table 15. Older Adult Participants' Responses Describing the Driving Check-Up (N=36)

Adjectives	Number of responses	Percent
Valuable	30	83%
Informative	29	81%
Worthwhile	32	89%
Organized	26	72%
Interesting	25	69%
Focused	17	47%
Imaginative	3	8%
Comfortable	6	17%
Fun	11	31%
Creative	7	19%
Challenging	2	6%
Difficult	1	3%
Too Long	1	3%
Too Short	1	3%

Moreover, when asked what the respondent liked the most and the least about the Driving Check-Up, there were multiple positive comments and only a few that indicated significant dissatisfaction. Specifically, when asked what they most liked about the Driving Check-Up, older adults responded:

- “Reminded me of things I took for granted, but did not do.”
- “Competent driving instructor and appropriate driving skills needed.”
- “Being familiar with location.”
- “Information concerning sidewalks was very useful.”
- “Nice and smooth.”
- “I was in control of car.”
- ”The instructor was informative.”
- “Calmness and demeanor of instructor.”
- “The instructor was very good at what he does.”
- “Feedback from instructor.”
- “Clarification of ‘stop line.’ Clarification of lane into which you are turning left (inside vs. outside).”
- “Enjoyed the car and the experience. Instructor did an outstanding job of directing and evaluating.”
- “Hands on ability to correct or eliminate bad habits and replace with good ones; just driving.”
- “Helpful information.”
- “Learned a lot from signs.”
- “Discussion of distance behind car.”
- “That it verified what I thought of my own driving skill.”
- “Learned new information.”

- “The different scenarios you are given.”
- “Variety of driving situations.”
- “The care (sic) I was driving was not mine.”
- “Good information in car.”
- “Very useful information on a problem I noticed myself.”
- “The evaluation was most welcome.”
- “I liked all of it. It was relevant.”
- “It was on the road and measured real life situations.”
- “The driving part.”

Conversely, participants were also asked what they did not like about the on-road component. Most indicated nothing (n=24, 67%), while six offered comments:

- “The car.” (n=2)
- “Kind of nervous.”
- “Largely academic — did not need. Did not teach me anything or showed (sic) examiner anything.”
- “I was comfortable with the driving test. There was nothing I didn't like.”
- “Could have been longer.”

Finally, the older adults were asked what they might recommend as a change to make the Driving Check-Up more useful or interesting to them. Again, 24 older adults (67%) stated it was great or that they would change nothing, or made a similar comment. Seven offered the following suggestions:

- “Maybe a little longer test with more difficult things to do.”
- “Just a few more signs — ex. School bus and school bus laws about stopping.”
- “Possibly some freeway driving, especially in Houston.”
- “Need a mindfulness component.”
- “Driving on an interstate or roads with higher speed limits.”
- “Sign identification step could be improved.”
- “Test not geared for my needs or skills.”

Conclusion: General Feedback on Driving Check-Up. The project team believes the materials and training tools for the Driving Check-Up up are evidence-based, adequate, and appropriate for a face-to-face training, and that both driving instructors and the older adult participants learned a great deal from the project. An interesting comment from one of the driving instructors at the last pilot site was that he kept forgetting that these were experienced drivers and was also reminding them to do operational tasks (e.g., how to turn the car, when to turn) instead of remaining quiet and observant. This comment is illustrative of the fact that the Driving Check-Up is “new” to driving instructors, training is important, and clearly, the “drive-alongs” as part of the training are essential to having a successful program.

6.0 Discussion

Developed over the course of two years, the Driving Check-Up was designed to provide older adults with objective feedback aimed at improving safety and maximizing driving longevity through a one-hour evaluation of key driving skills and abilities. The program consists of a pre-drive interview, on-road assessment, and post-drive discussion of performance and recommendations. The project team brought together diverse backgrounds in research with both clinical and professional experience in the areas of older adults and/or driving and transportation. The development process was guided by an advisory committee with members selected for their range of knowledge and expertise (e.g., physicians, driving instructors, transportation research experts), and feedback following administration at six pilot sites. The Driving Check-Up was designed for community-living older adults who want to have a trained driving instructor evaluate their driving knowledge and skills. The Driving Check-Up is not for older drivers who are considered medically at-risk. An essential component of the Driving Check-Up model program is the establishment of relationships between the driving school and an occupational therapist/driver rehabilitation specialist, ensuring that drivers identified with health-related concerns can be directed to the appropriate medically based driving rehabilitation services. The following discussion highlights and reviews key principles and features of the Driving Check-Up program.

6.1 Designed for Driving Schools

The Driving Check-Up is designed as part of a larger continuum of services (see Appendix A) available to assist older adults in their goal of remaining safe and active drivers. Based in driving schools, the Driving Check-Up will expand the number and type of available services at the community level. This unique program expands options for older adults to seek expert guidance toward their goal of remaining on the road more safely and for a longer period of time. Additionally, since there are driving schools in almost all communities, these experts can expand their services to become the gateway for community-dwelling older adults who want to continue to drive safely.

6.2 Training is Required

Driving instructors are teachers and typically teach novice drivers (e.g., teenagers) in classrooms and in vehicles. Considering the hierarchy of driving behaviors, the focus for new driver learning begins at the operational (e.g., steering, changing gears, using pedals) and tactical (e.g., when to slow or speed up, turning, obeying traffic signals) levels of driving. A new driver going out in the vehicle (especially early in the training) is learning how to handle a vehicle in a complex environment, making multiple mistakes in both handling the car and in obeying the rules correctly. The driving instructor has been trained to respond quickly and calmly, reinforcing the new learning by continued practice until the new driver has integrated the skills. An experienced driving instructor has complete control of the vehicle both by verbally instructing the novice driver on what to do, where to do it, and how to do it and by always remaining at the ready to physically intervene to avoid a collision or risky maneuvers.

In contrast, the Driving Check-Up focuses only on key areas of concern for the experienced aging driver. The experienced driver, who may have driven for more than 50 years, is likely

skilled at the foundational operational and tactical levels of driving. Thus, training driving instructors to administer a Driving Check-Up requires a change in mindset in preparation for serving the unique needs of older adult drivers. The instructors must acknowledge and understand the contribution of experience and the long-term “habits” older drivers may exhibit that may not be consistent with the “learning checklist” compliance expected from the new learner. The Driving Check-Up’s focus is on knowledge of rules of the road and driving skills, and designed to specifically target the traffic maneuvers that research indicates may pose the greatest risk for older adults, such as navigating unprotected left turns or responding to yield signs. Interestingly, while the project team understood these differences when designing the program, observations at the pilot sites strongly reinforced how these differences manifested in evaluating the knowledge and skills of the older driver. For example, driving instructors were very descriptive (prescriptive) in their directions, wanting to remain on their designated route, rather than examining more strategic-level skills (i.e., problem solving or route finding). When asked about this, driving instructors explained how their routes were carefully designed and timed. Going “off route” could potentially lead into unexpected issues and more importantly, could require additional on-road time, not calculated into their tight teaching schedule. Additionally, one of our driving instructors stated clearly that driving instructors do not teach wayfinding or navigation, noting that this experience comes later with practice. As one driver education specialist noted, with only limited hours to teach “the basics, we expect parents to teach navigation or wayfinding.” Thus, this higher-level driving skill (i.e., strategic level of driving) is not routinely evaluated or taught by driving instructors. Therefore, the pilot sites served an essential purpose. Through the observations and knowledge gained during the pilot studies and the feedback gathered from the evaluation tools, the final Driving Check-Up model offers a tool that emphasizes the expertise of the driving instructor, while offering training that acknowledges the uniqueness of working and collaborating with the older experienced driver. One of the other key preparatory skills included in the training of driving instructors was the process for building their appropriate response when identifying a medically at-risk driver and offering alternative programs through referral.

6.3 Importance of Identifying the Medically At-Risk Driver

A medically at-risk driver is a person, of any age, who has a medical condition or conditions that could affect driving performance, and therefore requires screening and evaluation to determine if their medical condition affects their fitness to drive. While screening by any trained professional serves a valuable role, further evaluation for the driver with a medical condition should be conducted by a health care professional with experience and knowledge of that medical condition. This distinction is essential to ensure a driver is restricted as necessary for safety, but not over-restricted — that is, told “do not drive” just because of a medical condition.

For the older adult who is not considered medically at-risk or impaired in any other manner, driving errors may rightfully be attributed to 1) “bad habits” (e.g., not using turn signals, rolling through stop signs, no head checks), or 2) unfamiliarity with a particular area (have not driven this road before) or new roadway design (e.g., roundabout, double left turn) — factors that can be identified through a Driving Check-Up and addressed through follow-up training. During the pilot testing, it was observed that driving instructors may be hesitant to believe that “problems” cannot always be successfully addressed through additional training or practice maneuvers. While this teaching paradigm is appropriate and

true with novice drivers and older drivers with bad habits alike, it is unlikely to be true for older drivers suffering from underlying medical impairments. Older adults with medical impairments are more likely making driving errors because of a loss of underlying processes such as ability to see (e.g., loss in acuity), respond quickly (cognitive slowing) or remember recent instructions such as reminders to use turn signals or return to a previous location (cognitive impairment). Practice performing the maneuvers will likely not improve the driver's safety, because training alone cannot address the underlying issue. The Driving Check-Up was designed in two parts beginning with the screening tools to identify those who may be medically at-risk (action to refer) from the generally healthy community-dwelling older adult driver.

6.4 Use of Screening Tools

The Driving Check-Up is not an evaluation of driver fitness and should not be used as an evaluation of individuals facing changes from a medical condition and now wondering if they are ready to return to driving or can safely continue driving. A key component was designing mechanisms to ensure the appropriate audience receives the Driving Check-Up. Thus, a major task of the project was to determine if and what screening might be used. Through the literature reviews and most importantly, the advisory committee's expertise and discussion, the consensus was that the Driving Check-Up should not be considered any form of a medical review, and that the screening tests included would offer a method of screening out individuals facing a major medical problem for which the Driving Check-Up is not designed. The final model program includes several levels of screening. First, the scheduling interview was designed to screen out individuals specifically looking for fitness-to-drive or comprehensive driving evaluation services by including screening questions (see Section 3.1, Scheduling Clients). The first three questions gather information to determine eligibility for a Driving Check-Up. Next, the pre-drive interview (see Section 3.1 Pre-Drive Interview) is designed to gather any specific information that may indicate an underlying medical condition. Four screening tools were selected for inclusion in the model to assist in identifying underlying impairments – one screening tool each for vision and motor, and two for cognition.

Throughout the pilots, both the driving instructors and older adult drivers saw the visual acuity screen as very useful. The Rapid Pace Walk was not considered as useful, but also was not described negatively by either group. The two cognitive tests were generally seen as useful by both groups, with two individuals not in agreement. While we planned to eliminate one of the cognitive screens following the pilot studies, the project team members concluded that the two cognitive screening tools were useful. Using any medically related screening tool requires a level of familiarity with test administration and adherence to testing protocols. Our pilot sites encountered challenges in the administration of both of the selected cognitive screening tools. For example, during the second pilot, we encountered challenges related to the senior drivers' approach to the task. One subject interpreted the maze instructions as a challenge to go as fast as possible, and performance reflected mistakes (errors) clearly due to being sloppy, and not cognitive impairment. The project team clarified this interpretation with the test's developer Dr. Carol Snellgrove, and the instructions were expanded, complete with examples. We also encountered unexpected responses to the road signs test, creating questions on scoring. A list of appropriate answers including examples of wrong answers was added to the training materials.

Despite the recognition that additional clarity was needed for training on the use and scoring of the in-office screening tools, the results did appear to identify those older adults with impairments that would likely affect their driving. On the first pilot, the scores for two drivers did not meet criteria to go on the road. But because this was a pilot study, the project team decided to proceed with the on-road component. The on-road portion reflected potential safety concerns for both drivers and intervention by the driving instructor was required. Both of these subjects were referred to medical services. This reinforced the team's hypothesis that by following the (now) established protocols, these individuals would have been appropriately and safely served through referral.

6.5 Referrals

An essential component of the Driving Check-Up is the relationship between the driving school and occupational therapist/driver rehabilitation specialist to ensure that drivers identified with health-related concerns can be directed to the appropriate medically based driver rehabilitation services. The Driving Check-Up is a first step in addressing questions about driving safety. Using the *Spectrum of Driver Services* (See Appendix A), the driving school can direct the older driver and/or family member to the best service options for their individual issue.

The project team believes that the Driving Check-Up can become an important and essential component of the *Spectrum of Driver Services*. Specifically, it can be the entry point for older drivers and family members who are concerned about an older adult's driving or for older adults who want to take the initiative to enhance driving skills in order to extend their driving lifetime. The key is making sure that the right person receives the right service at the right time. This means that the Driving Check-Up must be used as designed, as an evaluation of driving knowledge and skills and not a measure of driving capacity or medical fitness to drive. In behavioral terms, the driving instructor evaluates the operational (i.e., how to use the elements of the vehicle) and the tactical (i.e., following the rules of the road; Transportation Research Board, 2016). For medical fitness to drive, the occupational therapist with expertise in driving rehabilitation evaluates an individual's medical condition and associated impairments, and strategic abilities (i.e., wayfinding and higher-level decision making) in addition to operational and tactical behaviors. This is a critical message all stakeholders need to understand and appreciate.

6.6 Liability

The issue of liability is closely related to the issue of referral. A reputable professional driving school has liability insurance on each of their vehicles and staff (driving instructors), as mishaps or crashes are a potential hazard of the position. Thus, vehicle liability is not the issue.

The question of liability for administration of the Driving Check-Up includes training and competence. Evaluation of medically related risk falls outside of the driving instructors' skill or educational background. The Driving Check-up was deliberately designed to avoid resulting in a pass/fail or an attribution of "safe (or unsafe) to drive." It is designed as an evaluation of knowledge of rules of the road and driving skills and abilities, which are the expertise of the driving instructor. The questions driving programs need to ask are about driving instructors' competence to deliver a specialized service. Would the training of a

driving instructor be considered sufficient if their medically impaired client “passed” the driving school’s test and was subsequently in a crash? Might the evaluator be liable? It depends. While any driving evaluation claims to only reflect “one moment” in time and we understand that many fit drivers have crashes, the answer may still be “no.” Recognizing an increased crash rate for medically at-risk drivers, especially those with cognitive impairment, it is especially important that the medical needs are addressed by a health care provider trained to assess medical fitness to drive. It must be considered that if a driving instructor without the specialized medically related training and education performs a driving evaluation on a person with a medical condition, he or she may be working outside their skill level and potentially face a liability risk.

An important component of the Driving Check-Up model program is protecting driving-school instructors from the liabilities of failing to detect and appropriately advise a medically impaired driver. Drivers with dementia or similar cognitive impairment likely pose the greatest challenge and danger to the driving instructors because these cognitively impaired drivers often fail to recognize and/or report their own limitations. Some visual impairments also pose a risk including: poor peripheral vision due to unrecognized glaucoma, poor central vision due to macular degeneration (occurring over time), and visual field cuts (e.g., homonymous hemianopia) following a stroke. Many of these medically challenged drivers may not fully recognize or report their limitations. The Driving Check-Up incorporates screening tools, occupational therapy/driving rehabilitation specialist partnership, and methods of communication and referral to encourage access to the older adult driver’s health care provider if he or she does not currently meet the criteria to go on the on road or critical errors are observed that may place the driver and others on the road at risk. As discussed, if an experienced older driver demonstrates errors in some of the basic maneuvers (e.g., missing stop signs, changing lanes suddenly, poor lane maintenance), there may be an underlying medical condition that needs to be addressed.

Thus, the Driving Check-Up, as designed with screening tools and training, should refer any individuals with questionable health conditions or those who demonstrate impairment during the interviews, screening or on-road component to an appropriate service — a driving rehabilitation specialist, occupational therapist, primary care provider, or eye care provider — to reduce crash risk and/or liability for the driving school/instructor.

7.0 Conclusions and Recommendations

In summary, the Driving Check-Up was designed to be part of a larger continuum of services available to assist generally healthy older adults in their goal of remaining safe and active drivers. Based in driving schools, the Driving Check-Up is a one-hour evaluation of key driving skills and abilities designed to provide older adult drivers with objective feedback aimed at improving safety and maximizing driving longevity. The program consists of a pre-drive interview and screening for functional limitations, an on-road assessment, and a post-drive discussion of performance and recommendations. An essential component of the Driving Check-Up is the relationship between driving schools and driver rehabilitation/occupational therapy services, ensuring that drivers identified with medical-related concerns can be directed to the appropriate medically based services.

As described in prior sections, the six pilot sites contributed to significant revisions and clarifications in the model program. The advisory committee was pivotal in assisting the project team in identifying and revising components resulting in a program offering interview forms, and processes for conducting screening and on-road experiences. The project team considers this project a good start, but there are issues that need to be considered, researched, and/or resolved before a major launch of the Driving Check-Up program. The project team has the following recommendations:

1. The road sign test was considered generally useful. However, there are clear concerns with the expected interpretation of some of the signs used in the pilot. We recommend an expert group be convened to determine an improved list of signs (nationally recognized and generalizable) and further study the older driver's capacity to name the signs and describe their meaning.
2. The Rapid Pace Walk was generally described as useful in the final surveys. However, there were comments from specific driving instructors who wondered if it might not be necessary as they can observe motor limitations when the person walks in the door. Additionally, because this test was not used as a "no-go" for proceeding to the on-road portion, it should be evaluated for its contribution to the decisions of the Driving Check-Up.
3. The protocols for the screening tools (outlined in Appendix C: *Results of Screening Test*) for proceeding or not proceeding to the on-road component need to be vigorously tested. This would best be done with concurrent comprehensive driving evaluations for all participants at multiple levels to determine if the screening tools and protocols capture the medically at-risk older adults who should be referred to a medical professional.
4. The training in administration of medically sensitive screening tools introduces a new skill set for the driving instructor. Adherence to testing protocols is critical when offering a brief test to ensure its validity. Further understanding of the training required to consistently and accurately interpret test results should be further studied.
5. The meaning and implications of on-road errors made by the experienced driver vary in significance and importance from those made by the new learner. Is the presence of these "bad habits" a reason for more lessons? Further study to understand observable on-road behaviors and their relationship to safety is needed.
6. The Driving Check-Up needs to be assessed in a more rigorous manner to examine whether it meets the objectives as designed. This should include utilizing the

Driving Check-Up as designed (i.e., training, protocols, referrals to driving rehabilitation specialist) with a large group of older adults and evaluating the outcomes. It would be ideal to monitor long-term outcomes to determine if obtaining a Driving Check-Up lengthens an older adult's safe driving lifetime.

7. Another study may be needed to determine the best approach to selecting or preparing driving schools and instructors to offer the program.
8. Physicians or primary care providers are an important group of stakeholders that benefit from understanding the essential difference between the expertise of the driving instructor in terms of driving knowledge/skills and a driving rehabilitation specialist who evaluates fitness to drive. A flow chart should be developed to illustrate how primary care providers should differentiate services, referring some for a comprehensive driving evaluation and others for a Driving Check-Up. Understanding and following this flow chart would require additional education and marketing materials as a part of the implementation and evaluation of the Driving Check-Up model program.
9. One of the limitations of this project and specifically our pilot sites was the recruitment of older adults. Although the pilot sites were in areas with many older adults, actual recruitment was difficult. While the reasons that sites had difficulty with recruitment were not investigated, a number of factors likely contributed, including: a general reluctance on the part of older drivers to seek a driving evaluation, the fact that the services were not widely advertised, the limited time frame for scheduling participants, and/or the lack of tools to market to the target population (e.g., brochures or a website). For the future, it will be important to consider such things as cost, lack of insight into the objective of the Driving Check-Up, and lack of knowledge of the benefits.
Pilot participants were paid volunteers, sometimes recruited through personal connections, and they may not be representative of those who will ultimately seek checkups. In the real world, some calls to schedule checkups may be precipitated by a crash or a family concern, and these drivers may be much more likely to need referral to the medically based driver rehabilitation specialist. Our limited pilot testing does not answer the questions of how many of the Driving Check-Up callers will not be healthy older adults or how effectively the driving schools will manage the need to refer them, either prior to scheduling or during a checkup. Thus, since healthy older adults are the target population for the Driving Check-Up, the use of the screening tools and training process should include a group of older adults with a range of abilities and health and who are not related to the driving instructors or schools. These issues also relate to point 6 above, concerning the need for a more systematic and rigorous evaluation of the program.
10. Liability is a complex topic and needs further study. Since current driving-school practices are likely focused on novice drivers, it would be important for schools to explore if and how their approach to liability issues may need to be expanded to cover the Driving Check-Up. Moreover, this needs to be done state by state.
11. Finally, as discussed in Section 5.0, training appears to be best done on-site (face-to-face). There are in fact important distinctions in how to use the Driving Check-Up or whom to use it with that were illuminated in the face-to-face trainings. Additionally, we found that some driving schools did not have the appropriate equipment to make the webinar interactive, which is necessary to enable interactive learning that is best for the Driving Check-Up.

References

- Anstey, K. J., Windsor, T. D., Luszcz, M. A., & Andrews, G. R. (2006). Predicting driving cessation over 5 years in older adults: Psychological well-being and cognitive competence are stronger predictors than physical health. *Journal of the American Geriatrics Society*, *54*(1), 121-126.
- Anstey, K.J., J. Wood, H. Caldwell, G. Kerr and S.R. Lord (2009). Comparison of self-reported crashes, state crash records and an on-road driving assessment in a population-based sample of drivers aged 69-95 years. *Traffic Injury Prevention*, *10*, 84-90.
- Arno, P. and S. Boets (2003). Elderly driver's integrated assessment methodology. AGILE (AGed people Integration, mobility, safety and quality of Life Enhancement through driving) Deliverable D.5.1 (European Union).
- Baldock, MRJ (2008). Best practice criteria in practical driving tests of medically referred drivers. *CASR Report Series, CASR013*. Centre for Automotive Safety Research, The University of Adelaide, Australia.
- Barco, P. P., Carr, D. B., Rutkoski, K., Johnson, A., Wallendorf, M.J., Vernon, K, Babulal, G.M., Xiong, C., & Roe, C. M. (2015, November). Traffic sign identification and driving in preclinical Alzheimer's Disease. Poster presentation at the Gerontological Society of America annual meeting, Orlando, Florida.
- Berndt, A.H., E. May and P. Darzins (2015). On-road driving assessment and route design for drivers with dementia. *British Journal of Occupational Therapy*, *78*(2),121-130.
- Betz, M.E. Dickerson, A.E., Coolman, T., Schold Davis, E., Jones, J., & Schwartz, R. (2014). Driving rehabilitation programs for older drivers in the United States. *Occupational Therapy in Health Care*, *28*, 306-317.
- Brown, Y.M. (2003). Practical assessment of fitness to drive and mobility related research. Behavioural Research in Road Safety, Seminar, 13th, 1-12.
- Camp, B.J. (2013). The overall program effects of California's 3-Tier Assessment System pilot on crashes and mobility among senior drivers. *Journal of Safety Research*, *47*, 1-8.
- Camp, B.J. (2010a). California's Three-Tier Driving-Centered Assessment System – Process analysis. Sacramento, California Department of Motor Vehicles: Research and Development Branch.
- Camp, B.J. (2010b). California's Three-Tier Driving-Centered Assessment System – Outcome analysis. Sacramento: Sacramento, California Department of Motor Vehicles: Research and Development Branch.
- Cardimen, F.P. (1999). Evaluation of the 1999 mature driver retraining workshop program. Prepared for the Traffic Improvement Association of Oakland County, Michigan, by Stuart Packard and Associates, Waterford Township, MI.

Classen, S., Dickerson, A.E. & Justiss, M. (2012). Chapter 9: Occupational therapy driving evaluation: Using evidence-based screening and assessment tools. In Maguire & Schold Davis (Eds.) *Driving and Community Mobility: Occupational Therapy Strategies Across the Lifespan*. Bethesda: AOTA Publishing, 221-279.

Dobbs, A.R. (2005). The development of a scientifically based driving assessment and standardization procedures for evaluating medically at-risk drivers. Paper presented at the Canadian Multidisciplinary Road Safety Conference XV, Fredericton, NB, Canada, June 2005.

Dobbs (2013). Accuracy of the DriveABLE cognitive assessment to determine cognitive fitness to drive. *Canadian Family Physician*, 59(3):156-161.

Drivers Medical Group DVLA (2008). Literature search on how the results of on road driving assessments in drivers with dementia relate to a clinician's opinion regarding 'fitness to drive'. Prepared for the Drivers Medical Group, U.K. Driver and Vehicle Licensing Agency (DVLA), Swansea by the Aggressive Research Intelligence Facility, West Midlands Health Technology Assessment Collaboration.

Dickerson, A.E. (2014). Screening and assessment tools for determining fitness to drive: A review of the literature for the pathways project. *Occupational Therapy in Health Care*, 28, 82-121.

Dickerson, A.E., Meuel, D.B., Ridenour, C., & Cooper, K. (2014). The predictive validity of screening and assessment tools for driving: A systematic review. *American Journal of Occupational Therapy*, 68, 670-680.

Dickerson, A. E., Davis, E. S., & Staplin, L. (2014). Can clinicians, researchers, and driver licensing officials build a shared vocabulary? *Occupational therapy in health care*, 28(2), 188-193.

Elgin, J., Owsley, C., & Classen, S. (2012). Chapter 8. Vision and driving. *Driving and Community Mobility: Occupational Therapy Strategies Across the Lifespan*. Bethesda, MD: American Occupational Therapy Association, 172-220.

Finn, J. (2004). Driving evaluation & retraining programs: A report of good practices. Bethesda, MD: The American Occupational Therapy Association. Prepared under cooperative agreement with NHTSA.

Hennessy, D.F. (2013). 3-Tier December 2013 JSR report: Wrong question, omitted failed quality control. (Response to Camp, 2013). Personal communication.

Hoggarth, P.A., C.R.H. Innes, J.C. Dalrymple-Alford and R.D. Jones (2013). Prospective study of healthy older drivers: No increase in crash involvement or traffic citations at 24 months following a failed on-road assessment. *Transportation Research Part F*, 16, 73-80.

Hoggarth, P., C. Innes, J. Dalrymple-Alford, et al. (2011). On-road driving assessment errors associated with pass and fail outcomes for older drivers with cognitive impairment. In *Proceedings of the Sixth International Driving Symposium on Human Factors in Driver Assessment, Training and Vehicle Design, Lake Tahoe, CA, June 27-20, 2011*.

Hoggarth, P., C. Innes, J. Dalrymple-Alford, J.E. Severinsen and R.D. Jones (2010). Comparison of a linear and a non-linear model for using sensory-motor, cognitive, personality, and demographic data to predict driving ability in healthy older adults. *Accident Analysis and Prevention*, 42, 1759-178.

Hunt, L.A., C.R. Murphy, D. Carr, J.M. Duchek, V. Buckles and J.C. Morris (1997). Reliability of the Washington University Road Test: A performance-based assessment for drivers with dementia of the Alzheimer type. *JAMA Neurology / Archives of Neurology*, 54, 707-712.

Insurance Institute for Highway Safety. (2013). Older people: 2013. Retrieved from <http://www.iihs.org/iihs/topics/t/older-drivers/fatalityfacts/older-people/2013>

Justiss, M.D., W.C. Mann, W. Stav and C. Velozo (2006). Development of a behind-the-wheel driving performance assessment for older adults. *Topics in Geriatric Rehabilitation* 22(2), 121-128.

Kay L., A. Bundy, L. Clemson and N. Jolly (2008). Validity and reliability of the on-road driving assessment with senior drivers. *Accident Analysis and Prevention*, 40, 751-759.

Keall, M.D. and W.J. Frith (2004). Association between older driver characteristics, on-road driving performance, and crash liability. *Traffic Injury Prevention*, 5, 112-116.

Korner-Bitensky, N., I. Gelinas, M. Man-Son-Hing and S. Marshall (2005). Recommendations of the Canadian Consensus Conference on Driving Evaluation in Older Drivers. McGill University, Montreal, Quebec, Canada.

Korner-Bitensky, N. and S. Sofer (2009). The DriveABLE Competence Screen as a predictor of on-road driving in a clinical sample. *Australian Occupational Therapy Journal*, 56, 200-205.

Kowalski, K. and H. Tuokko (2007). On-road driving assessment of older adults: A review of the literature. Victoria, British Columbia: University of Victoria, Centre on Aging. Report prepared for the Justice Institute of BC.

Lane, A., Green, E., Dickerson, A. E., Davis, E. S., Rolland, B., & Stohler, J. T. (2014). Driver rehabilitation programs: Defining program models, services, and expertise. *Occupational Therapy in Health Care*, 28(2), 177-187.

Langford, J., J. Charlton, M. Bohensky, J. Irving, L. Martin and B. Fildes (2009). Older Driver Model Assessment Program: Stage 4 – Validation of screening tests to assess at-risk older drivers. *Austroroads Research Report AP R336/09*.

Mallon, K. and J.M. Wood (2004). Occupational therapy assessment of open-road driving performance: validity of directed and self-directed navigational instructional components. *The American Journal of Occupational Therapy*, 58, 279-286.

Meuser, T. M. (2008). License renewal policy & reporting of medically unfit drivers: Descriptive review & policy recommendations. In *AAA Foundation for Traffic Safety Conference*.

National Highway Traffic Safety Administration. (2015). Chapter 2: Crashes. *Traffic safety facts 2013: A compilation of motor vehicle crash data from the Fatality Analysis Reporting System and the General Estimates System*, 63-77.

Odenheimer, G.L., M. Beaudet, A.M. Jette, M.S. Albert, L. Grande and K.L. Minaker (1994). Performance-based driving evaluation of the elderly driver: Safety, reliability, and validity. *Journal of Gerontology: Medical Sciences*, 49(4), M153-M159.

Ott, B.R., G.D. Papandonatos, J.D. Davis and P.P. Barco (2012). Naturalistic validation of an on-road driving test of older drivers. *Human Factors*, 54(4), 663-674.

Patomella, A.H., K. Tham, K. Johansson and A. Kottorp (2010). P-Drive on-road: Internal scale validity and reliability of an assessment of on-road driving performance in people with neurological disorders. *Scandinavian Journal of Occupational Therapy*, 17, 86-93.

Richardson, E.D. and R.A. Marottoli (2003). Visual attention and driving behaviors among community-living older persons. *Journal of Gerontology: Medical Sciences*, 58(9), 832-836.

Rosenbloom, S., Coughlin, J. F., & D'Ambrosio, L. A. (2012). The travel and mobility needs of older people now and in the future. *Aging America and Transportation: Personal Choices and Public Policy*, New York: Springer, 39-56.

Selander, H., H.C. Lee, K. Johansson and T. Falkmer (2011). Older drivers: On-road and off-road test results. *Accident Analysis and Prevention*, 43, 1348-1354.

Shechtman, O., K.D. Awadzi, S. Classen, D.N. Langford and Y. Joo (2010). Validity and critical driving errors of on-road assessment for older drivers. *American Journal of Occupational Therapy*, 64(2), 242-251.

Sommer, S.M., P. Arno, M. Strypsten, G. Eeckhout and S. Rothermel (2003). On-road assessment methodology and reference road test. AGILE (AGed people Integration, mobility, safety and quality of Life Enhancement through driving) Deliverable D.4.3 (European Union).

Staplin, L., K.H. Lococo, J. Stewart and L. E. Decina (1999). Safe Mobility for Older People Notebook. *DOT HS 808 853*. Washington, DC: NHTSA.

Stefano, M.D. and W. MacDonald (2003). Assessment of older drivers: Relationships among on-road errors, medical conditions and test outcome. *Journal of Safety Research*, 34, 415-429.

Stutts, J., Martell, C., & Staplin, L. (2009). *Identifying behaviors and situations associated with increased crash risk for older drivers*. (No. HS-811 093).

Stutts, J., Wilkins, J., Reinfurt, D., Rodgman, E., & Van Heusen-Causey, A. (2001). The premature reduction and cessation of driving by older men and women. *Project G*, 7.

Transportation Research Board. (2016). Taxonomy and Terms for Stakeholders in Senior Mobility, *Transportation Research Circular, Number E-C211*, Washington, D.C.
<http://onlinepubs.trb.org/Onlinepubs/circulars/ec211.pdf>

Vlahodimitrakou, Z., J.L. Charlton, J. Langford et al (2013). Development and evaluation of a Driving Observation Schedule (DOS) to study everyday driving performance of older drivers. *Accident Analysis and Prevention*, 61, 253-260.

Wheatley, C. J., Carr, D. B., & Marottoli, R. A. (2014). Consensus statements on driving for persons with dementia. *Occupational therapy in health care*, 28(2), 132-139.

Wilkins, J., Stutts, J., & Schatz, S. (1999). Premature reduction and cessation of driving: Preliminary study of women who choose not to drive or to drive infrequently. *Transportation Research Record: Journal of the Transportation Research Board*, (1693), 86-90.

Appendix A: Spectrum of Driver Services

Spectrum of Driver Services: Right Services for the Right People at the Right Time

A description consumers and health care providers can use to distinguish the type of services needed for an older adult.



	COMMUNITY-BASED EDUCATION		MEDICALLY-BASED ASSESSMENT, EDUCATION AND REFERRAL		SPECIALIZED EVALUATION AND TRAINING
Program Type	Driver Safety Programs	Driving School	Driver Screen	Clinical IADL Evaluation	Driver Rehabilitation Programs (Includes Driver Evaluation)
Typical Providers and Credentials	Program specific credentials (e.g. AARP and AAA Driver Improvement Program).	Licensed Driving Instructor (LDI) certified by state licensing agency or Dept. of Education.	Health care professional (e.g., physician, social worker, neuropsychologist).	Occupational Therapy Practitioner (Generalist or Driver Rehabilitation Specialist* [#]). Other health professional degree with expertise in Instrumental Activities of Daily Living (IADL).	Driver Rehabilitation Specialist [#] , Certified Driver Rehabilitation Specialist*, Occupational Therapist with Specialty Certification in Driving and Community Mobility*.
Required Provider's Knowledge	Program specific knowledge. Trained in course content and delivery.	Instructs novice or relocated drivers, excluding medical or aging conditions that might interfere with driving, for purposes of teaching / training / refreshing / updating driving skills.	Knowledge of relevant medical conditions, assessment, referral, and / or intervention processes. Understand the limits and value of assessment tools, including simulation, as a measurement of fitness to drive.	Knowledge of medical conditions and the implication for community mobility including driving. Assess the cognitive, visual, perceptual, behavioral and physical limitations that may impact driving performance. Knowledge of available services. Understands the limits and value of assessment tools, including simulation, as a measurement of fitness to drive.	Applies knowledge of medical conditions with implications to driving. Assesses the cognitive, visual, perceptual, behavioral and physical limitations that may impact driving performance. Integrates the clinical findings with assessment of on-road performance. Synthesizes client and caregiver needs, assist in decisions about equipment and vehicle modification options available. Coordinates multidisciplinary providers and resources, including driver education, health care team, vehicle choice and modifications, community services, funding / payers, driver licensing agencies, training and education, and caregiver support.
Typical Services Provided	1) Classroom or computer based refresher for licensed drivers: review of rules of the road, driving techniques, driving strategies, state laws, etc. 2) Enhanced self-awareness, choices, and capability to self-limit.	1) Enhance driving performance. 2) Acquire driver permit or license. 3) Counsel with family members for student driver skill development. 4) Recommend continued training and / or undergoing licensing test. 5) Remedial Programs (e.g., license reinstatement course for teens / adults, license point reduction courses).	1) Counsel on risks associated with specific conditions (e.g., medications, fractures, post-surgery). 2) Investigate driving risk associated with changes in vision, cognition, and sensory-motor function. 3) Determine actions for the at-risk driver: • Refer to IADL evaluation, driver rehabilitation program, and / or other services. • Discuss driving cessation; provide access to counseling and education for alternative transportation options. 4) Follow reporting / referral structure for licensing recommendations.	1) Evaluate and interpret risks associated with changes in vision, cognition, and sensory-motor functions due to acute or chronic conditions. 2) Facilitate remediation of deficits to advance client readiness for driver rehabilitation services. 3) Develop an individualized transportation plan considering client diagnosis and risks, family, caregiver, environmental and community options and limitations: • Discuss resources for vehicle adaptations (e.g., scooter lift). • Facilitate client training on community transportation options (e.g., mobility managers, dementia-friendly transportation). • Discuss driving cessation. For clients with poor self-awareness, collaborate with caregivers on cessation strategies. • Refer to driver rehabilitation program. 4) Document driver safety risk and recommended intervention plan to guide further action. 5) Follow professional ethics on referrals to the driver licensing authority.	Programs are distinguished by complexity of evaluations, types of equipment, vehicles, and expertise of provider. 1) Navigate driver license compliance and basic eligibility through intake of driving and medical history. 2) Evaluate and interpret risks associated with changes in vision, cognition, and sensory-motor functions in the driving context by the medically trained provider. 3) Perform a comprehensive driving evaluation (clinical and on-road). 4) Advise client and caregivers about evaluation results, and provides resources, counseling, education, and / or intervention plan. 5) Intervention may include training with compensatory strategies, skills, and vehicle adaptations or modifications for drivers and passengers. 6) Advocate for clients in access to funding resources and / or reimbursement. 7) Provide documentation about fitness to drive to the physician and / or driver-licensing agency in compliance with regulations. 8) Prescribe equipment in compliance with state regulations and collaborate with Mobility Equipment Dealer [^] for fitting and training. 9) Present resources and options for continued community mobility if recommending driving cessation or transition from driving. Recommendations may include (but not restricted to): 1) drive unrestricted; 2) drive with restrictions; 3) cessation of driving pending rehabilitation or training; 4) planned re-evaluation for progressive disorders; 5) driving cessation; 6) referral to another program.
Outcome	Provides education and awareness.	Enhances skills for healthy drivers.	Indicates risk or need for follow-up for medically at-risk drivers.		Determines fitness to drive and provides rehabilitative services.

#DRS – Health professional degree with specialty training in driver evaluation and rehabilitation. *CDRS – Certified Driver Rehabilitation Specialist-Credentialed by ADED (Association for Driver Rehabilitation Specialists). +SCDCM – Specialty Certified in Driving and Community Mobility by AOTA (American Occupational Therapy Association).

[^]Quality Approved Provider by NMEDA (National Mobility Equipment Dealers Association).

Spectrum of Driver Rehabilitation Program Services

A description consumers and health care providers can use to distinguish the services provided by driver rehabilitation programs which best fits a client's need.



Program Type	DRIVER REHABILITATION PROGRAMS Determine fitness to drive and / or provide rehabilitative services.		
Levels of Program and Typical Provider Credentials	<p>BASIC</p> <p>Provider is a Driver Rehabilitation Specialist (DRS)[#] with professional background in occupational therapy, other allied health field, driver education or a professional team of CDRS or SCDCM with LDI^{**}.</p>	<p>LOW TECH</p> <p>Driver Rehabilitation Specialist[#], Certified Driver Rehabilitation Specialist[*], Occupational Therapist with Specialty Certification in Driving and Community Mobility[^], or in combination with LDI.</p> <p>Certification in Driver Rehabilitation is recommended as the provider for comprehensive driving evaluation and training.</p>	<p>HIGH TECH</p> <p>Driver Rehabilitation Specialist[#], Certified Driver Rehabilitation Specialist[*], Occupational Therapist with Specialty Certification in Driving and Community Mobility[^].</p> <p>Certification in Driver Rehabilitation is recommended as the provider for comprehensive driving evaluation and training with advanced skills and expertise to complete complex client and vehicle evaluation and training.</p>
Program Service	<p>Offers driver evaluation, training and education.</p> <p>May include use of adaptive driving aids that do not affect operation of primary or secondary controls (e.g., seat cushions or additional mirrors).</p> <p>May include transportation planning (transition and options), cessation planning, and recommendations for clients as passengers.</p>	<p>Offers comprehensive driving evaluation, training and education, with or without adaptive driving aids that affect the operation of primary or secondary controls, vehicle ingress / egress, and mobility device storage / securement. May include use of adaptive driving aids such as seat cushions or additional mirrors.</p> <p>At the Low Tech level, adaptive equipment for primary control is typically mechanical. Secondary controls may include wireless or remote access.</p> <p>May include transportation planning (transition and options), cessation planning, and recommendations for clients who plan to ride as passengers only.</p>	<p>Offers a wide variety of adaptive equipment and vehicle options for comprehensive driving evaluation, training and education, including all services available in Low Tech and Basic programs. At this level, providers have the ability to alter positioning of primary and secondary controls based on client's need or ability level.</p> <p>High Tech adaptive equipment for primary and secondary controls includes devices that meet the following conditions:</p> <ol style="list-style-type: none"> 1) capable of controlling vehicle functions or driving controls, and 2) consists of a programmable computerized system that interfaces / integrates with an electronic system in the vehicle.
Access to Driver's Position	Requires independent transfer into OEM [^] driver's seat in vehicle.	Addresses transfers, seating and position into OEM [^] driver's seat. May make recommendations for assistive devices to access driver's seat, improved positioning, wheelchair securement systems, and / or mechanical wheelchair loading devices.	Access to the vehicle typically requires ramp or lift and may require adaptation to OEM driver's seat. Access to driver position may be dependent on use of a transfer seat base, or clients may drive from their wheelchair. Provider evaluates and recommends vehicle structural modifications to accommodate products such as ramps, lifts, wheelchair and scooter hoists, transfer seat bases, wheelchairs suitable to utilize as a driver seat, and / or wheelchair securement systems.
Typical Vehicle Modification: Primary Controls: Gas, Brake, Steering	Uses OEM [^] controls.	<p>Primary driving control examples:</p> <ul style="list-style-type: none"> A) mechanical gas / brake hand control; B) left foot accelerator pedal; C) pedal extensions; D) park brake lever or electronic park brake; E) steering device (spinner knob, tri-pin, C-cuff). 	<p>Primary driving control examples (in addition to Low Tech options):</p> <ul style="list-style-type: none"> A) powered gas / brake systems; B) power park brake integrated with a powered gas / brake system; C) variable effort steering systems; D) reduced diameter steering wheel, horizontal steering, steering wheel extension, joystick controls; E) reduced effort brake systems.
Typical Vehicle Modification: Secondary Controls	Uses OEM [^] controls.	<p>Secondary driving control examples:</p> <ul style="list-style-type: none"> A) remote horn button; B) turn signal modification (remote, crossover lever); C) remote wiper controls; D) gear selector modification; E) key / ignition adaptations. 	<p>Electronic systems to access secondary and accessory controls.</p> <p>Secondary driving control examples (in addition to Low Tech options):</p> <ul style="list-style-type: none"> A) remote panels, touch pads or switch arrays that interface with OEM[^] electronics; B) wiring extension for OEM[^] electronics; C) powered transmission shifter.

#DRS - Health professional degree with specialty training in driver evaluation and rehabilitation, *CDRS – Certified Driver Rehabilitation Specialist – Credentialed by ADED (Association for Driver Rehabilitation Specialists). +SCDCM – Specialty Certified in Driving and Community Mobility by AOTA (American Occupational Therapy Association) ^OEM – Original Equipment installed by Manufacturer.
 **LDI-licensed driving instructor.

Driver Rehabilitation Programs: Defining Program Models, Services, and Expertise.
 Occupational Therapy In Health Care, 28(2):177-187, 2014

Appendix B: Cue Card

Observation Cue Card for Driving Check-Up

The presence of these behaviors may suggest potential underlying medical conditions to be considered during the Check-Up.

Cognitive observations

- Appears confused / disoriented
- Inattentive / easily distracted
- Slow to respond to questions
- Speech or language is difficult to understand*
- Forgetful; Repeats statements/questions
- Poor comprehension of instructions

Sensory observations

- Glasses appear broken
- Driver reports needing new glasses
- Struggles to read text*
- Appears to have difficulty hearing questions
- Appears to have impairment in peripheral vision

Motor observations

- Unsteady
- Slow, shuffling gait
- Balance problem in standing/walking
- Uses a cane or walker
- Difficulty lifting legs
- Limited range of motion (head/neck, arms)
- Tremor (hands/head)
- Appears generally frail and weak
- Tires easily
- Uses oxygen

*Clarify that English is native language and/or literate.

Modified from: Meuser, et al., (2008). *Medical Fitness to Drive & A State Voluntary Reporting Law: Characteristics of Reported Older Drivers & Safety Outcomes*. AAA Foundation for Traffic Safety: Washington, DC.

Appendix C: Results of the Screening Tests

Participant Name: _____ Instructor: _____ Date: _____

VISION SCREEN PROTOCOLS: Visual Acuity Results: _____/_____ Comments:

Check appropriate box below.		
	State standard met	Proceed with Driving Check-Up.
	State standard not met	Continue with screening tests but do NOT take on-road. Should be seen by his/her eye care specialist.

PHYSICAL SCREEN PROTOCOLS: Rapid Pace Walk

Time to Complete: _____ Seconds Comments:

Check appropriate box below.		
	9 seconds or less	Proceed with Driving Check-Up.
	More than 9 seconds	Proceed with Driving Check-Up; Be aware that individual may have decreased response time and/or difficulty getting into & out of the vehicle.

COGNITIVE SCREEN PROTOCOLS: Snellgrove Maze Task

Completed? Yes No Time to Complete: _____ Seconds Number of Errors: _____

Comments:

Check appropriate box below.		
	Less than 60 seconds with 0 or 1 errors	Proceed with Driving Check-Up.
	Less than 60 seconds with 2 or more errors	Complete the road sign screen, but driver should not be taken on-road. Needs a different level of service.
	61 seconds or longer, with or without errors	Complete the road sign screen, but driver should not be taken on-road. Needs a different level of service.

COGNITIVE SCREEN PROTOCOLS: Road Sign Test

Number of signs (out of 12) correctly identified: _____ Comments:

DECISION POINT (check appropriate box at left)		
	9-12 correct	Proceed with Driving Check-Up.
	7-8 correct	Use discretion in deciding whether to take on-road. Proceed with caution; Consider referring for a different level of service.
	0-6 correct	Driver should not be taken on-road. Needs a different level of service. <u>Call your Driver Rehabilitation Specialist.</u>

Call your Driver Rehabilitation Specialist with any result of the screen that is in the “red zone.”

Appendix D: Release of Information Form

Driving Check-Up Release of Information Form

Do you grant us permission to share, verbally or in writing, the results of your *Driving Check-Up* with others of your choosing?

(Circle your response)

YES or NO

If you answered/circled YES above, please list the names and phone numbers

of those persons here:

Name and Phone Number

- | | |
|----------|-------------------------------------|
| 1. _____ | Family Member(s) |
| 2. _____ | Other(s) |
| 3. _____ | Physician |
| 4. _____ | Occupational Therapist |
| 5. _____ | Driver Rehabilitation
Specialist |

Driver's Signature

Date

Driving Instructor's Signature

Date

Appendix E: Agenda for On-Site Training for the Driving Check-Up

First day

- 9:00-9:15 Introduction of Team and Participants
- 9:15-9:45 Introduction, Significance, and Context of the Driving Check-Up Program
- 9:45-10:00 Understanding Liability
- 10:00-10:20 Scheduling for the Driving Check-Up
- 10:20-10:30 Break
- 10:30-10:30 Pre-Drive Interview and Communication with Seniors
- 10:55-11:30 Primary Health Conditions
- 11:30-12:00 Screening
- 12:00-1:00 Lunch
- 1:00-1:30 Screening Practice/Discussion
- 1:30-1:55 Observations (Cue Card) Other conditions
- 1:55-2:20 On Road Justification
- 2:20-2:30 Break
- 2:30-3:30 On Road Component and Communicating Results
- 3:30-5:00 Discussion of On Road and Plan for Participants
- 5:00 Dinner and plans for next day.

Second Day

- 9:00 Driving Rehabilitation Specialist
- 10:00 First participant of pilot; Interview of 1st participant; debrief of drive
- 12:00 Lunch
- 1:30 2nd and 3rd participants and Interview of participants; debrief of drive
- 4:00 Summary and evaluation of program

Appendix F: Common Medical Conditions that Impact Driving

WHAT DRIVING CHECK-UP INSTRUCTORS NEED TO KNOW ABOUT DEMENTIA

Dementia is a syndrome or group of illnesses that cause cognitive impairment (e.g., impairments in memory, language, attention, spatial ability, reaction time) and functional decline (e.g., impairments in driving, managing finances, cooking). It is a common condition in advanced age and the prevalence may be as common as 10% for those over age 65 years, increasing to almost 50% over age 85 years. (This is 50% of persons over 85 years old, not necessarily 50% of drivers over 85 years old, as some have stopped driving.) Approximately 5-10% of dementias may have a reversible or treatable component (e.g., sedating medication, vitamin deficiency, low thyroid). However, the majority of dementias are irreversible and progressive.

The most common progressive dementia is Alzheimer's disease. This disease typically impacts short-term memory early in its course, but other presentations such as difficulty using words, impaired attention, and/or impaired judgment are also possible. There are other specific types of dementias, and referral to the physician (e.g., primary care, neurology, geriatrics, psychiatry) for a diagnosis can be important to rule out treatable causes and to provide a specific diagnosis for the patient and family. Diagnosing an untreatable dementia is important since eventually driving will become unsafe.

People with dementia may appear better than they really are, and they often rely on past experiences and overlearned information. They may accurately recall things that happened long ago, can do tasks in familiar environments, and may retain appropriate social interactions. They may be able to tap into procedural memory (e.g., riding a bike), which tends to be preserved in the early stages. Brief encounters with a person with dementia may not reveal impaired decision making, impaired spatial skills, or slow reaction time that could result in unsafe driving. In addition, people with dementia do not do well with novel problem solving, learning and recalling new information, thinking on their feet, and dividing their attention or shifting their attention between different stimuli. Some of the most critical aspects of driving fall into these categories. The screening tasks and some elements of the model road test will attempt to sample these problem areas.

Due to their memory impairment, persons with dementia may be unable to give you an accurate history during the interview. They may answer your questions but forget key events. For example, they may honestly tell you they have not had a crash or ticket in many years, when in fact there was such an event, which they've simply forgotten. Similarly, persons with dementia may not be fully aware of their limitations and lack insight into their impairments. For these reasons, when dementia is a concern, it can be helpful to include any accompanying family members while you're interviewing the driver. By the time people with dementia are having problems with activities like bill paying and meal preparation, they may well be at risk for unsafe driving. Finally, if the family is present and can be included in the feedback and recommendations, use this opportunity. The driver with memory impairment may forget what you've said, and the driver who lacks insight may disbelieve or deny negative feedback. Providing written feedback is also helpful. Drivers with very early dementia may be able to drive safely for a time, but they should be rechecked about every six to 12 months, since their condition is progressive.

If you observe some confusion and there is no history of a previous physician evaluation, referral back to the primary care physician, a neurologist, geriatrician or psychiatrist is appropriate. Occupational therapists who are based in driving programs are typically experienced in evaluating drivers with dementia, and they may be in the best position to provide a driving recommendation. Finally, many websites for organizations such as the Alzheimer's Association and the American Occupational Therapy Association are excellent sources of information.

Helpful Websites:

Alzheimer's Association Caregiver Support; <http://www.alz.org/care/alzheimers-dementia-and-driving.asp>
Driving Programs with Occupational Therapists, AOTA; <http://www.aota.org/olderdriver>

WHAT DRIVING CHECK-UP INSTRUCTORS NEED TO KNOW ABOUT STROKE

Drivers with a Past History of Stroke: Some studies have indicated that only 30% of stroke victims return to active driving. Most stroke patients that start driving again do so without a formal evaluation. Therefore, if you are seeing someone with a history of stroke, you or your referral to an OT driving program may be very helpful.

Some “stroke-like” events totally resolve, and we usually refer to these as transient ischemic attacks or TIAs. A history of a TIA by itself should not preclude driving or participation in the Driving Check-Up. It is also possible that you may see someone who *claims* to have had a TIA, but whose symptoms never truly resolved and who still has subtle deficits. Referral to a driving rehab specialist would then be appropriate.

Strokes and their long-term symptoms will vary depending on the location of the brain that has been impacted. Not all stroke-related disabilities will be apparent as you observe people in the office; i.e., stroke after-effects are not limited to the well known one-sided paralysis, facial droop, and so on. For instance, visual deficits can occur that may impair part or all of a visual field. Sometimes these deficits are accompanied by insight, e.g., the patient is aware of the deficit. However, one of the most dangerous situations you may face as a driving instructor is to take a stroke patient who is unaware of part of their visual field deficit on the road. We call this inattention or neglect. This may be hard to detect and in general, it is critical to refer this driver to an OT who can detect these subtle deficits that could put you or your client at risk. In some cases of visual deficit, the patient who has awareness can be taught compensatory techniques that can result in safe driving. On the other hand, some states prohibit driving with this condition.

Cognitive deficits from stroke can be varied, including short-term memory loss, impaired attention, impaired judgment or insight, impulsivity, or loss of receptive or expressive language abilities. Not all of these deficits may result in unsafe driving, but these drivers should be assessed by a health professional with expertise in rehabilitation and driving. If the patient’s cognition is intact, many muscle or motor deficits can be addressed by vehicle modification and equipment.

The timing of an appropriate evaluation for a history of stroke can vary depending on the location and severity of the injury. If the stroke deficits improve over time, the majority will do so between three to six months. Someone who has had a very recent stroke should not be too discouraged by early limitations, as they may improve, especially with active rehab. Although the majority of gains do occur in the first six months, a significant minority of stroke patients may have some improvement out to one year, perhaps even longer. Thus, re-evaluation at a later date may be appropriate. It will be up to the driver’s physician or therapist to determine when these improvements may have plateaued and when may be the optimal time to evaluate them. Most stroke patients will have had therapy depending on their deficits, and physical therapists, occupational therapists and/or speech therapists may be part of the interdisciplinary team. In general, driving evaluations should occur once the therapists have worked with their client and maximized their potential.

Helpful Websites:

http://www.strokeassociation.org/STROKEORG/LifeAfterStroke/RegainingIndependence/Driving/Driving-After-Stroke_UCM_311016_Article.jsp#.VofemTac-hR

<https://strokefoundation.org.au/About-Stroke/Help-after-stroke/Stroke-resources-and-fact-sheets/Driving-fact-sheet>

WHAT DRIVING CHECK-UP INSTRUCTORS NEED TO KNOW ABOUT EPISODIC MEDICAL CONDITIONS

Some medical conditions cause intermittent impairments of consciousness or thinking on an occasional or irregular basis that can make driving dangerous. Chances are good that you would not observe an episode during a Driving Check-Up. However, if a driver has one of these conditions, it is important to realize that what you see during the checkup is not all there is to know about this person's driving safety. The driver's physician will be in the best position to determine if the situation has been diagnosed, is stable, and/or would preclude driving. State licensing authorities often have specific requirements that apply to self-reporting by the driver and how well controlled the condition must be in order to grant driving privileges. You may already be aware of these conditions and your state's requirements, since these conditions are not limited to older drivers. Clients should be urged to discuss these symptoms with their physician, if they are not already doing so. The following list represents some but by no means all of these episodic conditions.

Seizures: A seizure is one event, whereas epilepsy usually refers to two or more (recurrent) events. Seizures can be considered sporadic electrical storms in the brain. Generalized tonic clonic seizures are easily recognized, begin with stiffening of the arms/legs and followed by jerking motions, and may last two to three minutes. Some seizures are far less obvious. For example, partial complex seizures impact only one area of the brain and may cause more subtle movements, but also impair the person's state of consciousness and ability to respond to their surroundings. Some but not all persons with epilepsy will be able to become seizure-free with close physician management and careful medication compliance. Most states require at least a six- to 12-month period of being seizure-free before being allowed to operate a motor vehicle.

Narcolepsy: Narcolepsy is characterized by sudden onset of "sleep attacks" which may not be suppressible and which may last from seconds to minutes. Narcolepsy may also cause loss of muscle tone, inability to move or speak, and brief hallucinations. Treatment is available, but the proper diagnosis must be made, and not every patient will become episode-free. Most states require episodes to be controlled for up to 12 months before driving privileges are allowed.

Hypoglycemia: Hypoglycemia is a state of abnormally low blood sugar. While all diabetics who need insulin are at risk, most of the risk occurs with those on insulin rather than oral medication. A person with hypoglycemia may have blurred vision, impaired attention, slowed reaction time, rapid heartbeat, fatigue, headache, sweats, shaking, tingling, or pale skin. Patients who are unaware that they are becoming hypoglycemic and unable to take corrective action are at greater risk.

Fainting: The medical condition for this term is syncope. There are many conditions that can cause someone to lose consciousness. The common faint or vasovagal episode can be brought on by emotional stress, heat, elimination, or genetic predisposition. Older adults may faint due to cardiac conditions such as heart rhythm abnormalities, or due to medication-related drops in blood pressure. Older adults with unexplained recurrent falls could be having "near fainting" and should not drive until their physician can evaluate them.

Vestibular disorders/Dizziness: Various conditions cause lightheadedness or possibly the "room spinning around" (vertigo). These acute conditions can be a one time event (e.g. viral illness) or perhaps recurrent (e.g. Meniere's, benign positional vertigo). The patient should not drive until their physician can evaluate them and the condition is stabilized. States may have specific regulations on driving with these conditions.

Anxiety or Panic Attacks: Panic attacks can impair attention and cause a person to "lock up" and be unable to respond quickly and effectively. Anti-anxiety medications may be useful but may also increase the risk for motor vehicle crashes. Counseling is also an option. The driver should discuss this with their physician.

Websites: CMA/Austrroads; <https://www.cma.ca/En/Pages/drivers-guide.aspx>, <http://www.austrroads.com.au>

WHAT DRIVING CHECK-UP INSTRUCTORS NEED TO KNOW ABOUT EYE DISEASES

There are over 24 million people in the United States with cataract, 7 million with diabetic retinopathy, 2.7 million with glaucoma, and over 2 million with age-related macular degeneration.

Glaucoma: The most common form of glaucoma is open-angle glaucoma where too much pressure builds in the eye and damages the retina. It develops slowly over time and often without any noticeable loss in vision. Persons of advanced age, African-Americans, and diabetics are at increased risk. Since visual acuity or sharpness is maintained until late in the disease, peripheral vision loss can occur without the person's awareness early on. Hazy or blurred vision, eye and head pain, halos around lights, vision loss, redness or pain in the eye, or narrow tunnel vision may be symptoms. Problems when driving may result since objects coming in from the side (e.g. cars, bikes, pedestrians) may not be detected quickly. Generally, glaucoma is treatable/preventable if detected early, but if untreated, vision loss is permanent. Referral to an optometrist or ophthalmologist is in order, and most states require their opinion on driving if visual field loss has occurred.

Macular Degeneration: The most common form is dry macular degeneration which develops slowly over time. It is caused by a thinning of the macula, the area of eye responsible for sharp vision and reading. Persons of advanced age, Caucasians, those with a family history, smokers, diabetics, and possibly those with increased sun exposure are at increased risk. Straight lines may become distorted and central vision may become impaired. There may be a need for brighter light when reading, difficulty in recognizing faces, and decreased intensity or brightness of colors. Problems when driving occur in central vision and may result in difficulty seeing objects coming head on, and difficulty reading traffic lights or overhanging signs that are in the central visual field. Vision loss is permanent. Referral to an optometrist or ophthalmologist is in order and most states require their opinion on driving safety if visual acuity loss has occurred.

Diabetic Retinopathy: This is a diabetic complication caused by blood vessel damage to the retina, usually in both eyes. It develops slowly over time and often without noticeable loss in vision. Diabetics who have had the disease for many years or have had poor control are at increased risk. They may have blurred or fluctuating vision, impaired color vision, dark/empty areas in the visual field, loss of acuity, and spots or floaters. Driving problems may especially occur at night or when reading signs. Vision loss is permanent.

Cataract: Cataract is a clouding of the lens of the eye and results in impaired vision not unlike trying to see through a foggy, cloudy windshield. It develops slowly over time and often without any noticeable loss in vision. Advanced age, diabetes, alcohol or sunlight excess, obesity, steroid use, family history, and history of high blood pressure are risk factors. Objects may look blurry, bright light may be bothersome, glare is more intense, night vision is often worse, and double vision can be a problem. Thus, problems when driving may occur when traveling in tunnels or situations of increased or decreased glare/contrast sensitivity. Night driving may become very difficult or impossible. Vision loss is not permanent and can easily be treated by cataract removal and lens implants, and successful surgery has been shown to improve driver safety.

Presbyopia: Presbyopia is farsightedness caused by loss of elasticity of the lens with aging. It occurs around age 40 or later when people develop blurred near vision and have difficulty reading or working up close such as on a computer. The most common corrections are by the use of bifocal or progressive lenses, contact lenses, readers/cheaters, or surgery. However, surgical correction can make objects distorted at night and may impact night driving. In general, difficulty with near vision is not as critical when driving, although reading instruments in the car may become a challenge.

Websites: <http://www.nhtsa.gov/people/injury/olddrive/cataracts/>,
<http://www.nhtsa.gov/people/injury/olddrive/Glaucoma/Index.htm>,
<http://www.nhtsa.gov/people/injury/olddrive/Macular/Index.html>

WHAT DRIVING CHECK-UP INSTRUCTORS NEED TO KNOW ABOUT OTHER MEDICAL CONDITIONS

Cardiovascular Diseases

Coronary artery disease is very common in the U.S. and many people have risk factors for atherosclerosis such as elevated cholesterol, hypertension, diabetes, obesity, smoking, and sedentary lifestyle. Most of these conditions by themselves do not preclude driving from participating in the Check-Up. Once a patient has had a heart attack, bypass surgery, or coronary artery stent placement, they may be at risk for further acute events, but these events are usually rare and the driving risk is low for the average noncommercial driver. On the other hand, if someone's disease progresses to the later stages of congestive heart failure (symptoms with minimal or no exertion), this may make it difficult to safely operate a motor vehicle. Cognitive abilities may be impaired by low oxygen or low blood supply, and evaluation from the physician and/or OT is key.

Musculoskeletal Disabilities

Drivers who have lost a limb or who have decreased function of a limb may benefit from referral to an OT or driver rehab specialist for vehicle modifications. Other good candidates for OT referral include diabetics who have neuropathy with muscle or sensory loss, and older adults with restricted range of motion and/or painful joints from osteoarthritis. Medications, when prescribed appropriately, can improve range of motion and power and not cause unsafe driving, so the driver should discuss this with the physician. Lastly, persons with acute injuries, fractures, or surgical repair should be advised by doctor on when to resume driving.

Respiratory Diseases

Chronic obstructive pulmonary disease is common in the U.S., and many others have chronic bronchitis or emphysema, sometimes due to smoking. Many other Americans have asthma, but with low driving risk, as acute asthma attacks while driving are rare when the disease is well controlled. These conditions would not preclude participating in the Check-Up. However if a driver's disease has progressed to advanced COPD or end stage asthma (symptoms with minimal or no exertion), their ability to drive safely may be compromised. Drivers with advanced respiratory disease should consult their physicians about its effects on driving.

Other Neurological Diseases

Dementia and stroke are addressed elsewhere. This section touches on two other neurologic conditions. Parkinson's disease can impact both cognition (e.g., reaction time and visuospatial ability), and motor skills (e.g., stiffness, tremor). Symptoms can fluctuate widely, even within a day, depending on response to medication. The medications are not without side effects, including some concern about sudden daytime sleepiness. The physician and driver rehabilitation specialist are appropriate referrals.

Traumatic brain injuries (TBI) can impact attention, memory, language, spatial ability, impulsivity, and divided attention. They can be the result of motor vehicle accidents, falls, assaults, shootings, explosions, sports injuries, etc. Young men are the highest risk group, but all age groups are represented. As with stroke, deficits will vary depending on severity, brain area injured, time since injury, and so on. These drivers should be assessed by a health professional with expertise in rehabilitation and driving.

Psychiatric Illness

Many of your clients may have had lifelong or new onset depression, generalized anxiety disorder, bipolar disorder, schizophrenia or even a combination of conditions. If these illnesses are stable and under treatment, they often will not impact driving or increase risk for a crash. However, if the patient is unstable and/or not compliant with medication, or the medication is simply not effective, the patient may have difficulty operating a motor vehicle. This could be due to the psychiatric illness itself and/or possibly the side effects of the medication the patient is taking to treat the condition. Referral back to the physician will be important for any perceived side effects or psychiatric exacerbations.

Websites:

https://www.transport.tas.gov.au/licensing/information/assessing_fitness_to_drive/musculoskeletal_conditions_and_driving

WHAT DRIVING CHECK-UP INSTRUCTORS NEED TO KNOW ABOUT DROWSY DRIVING AND SLEEP DISORDERS

As driving instructors are well aware, drowsy driving is widespread, and the risks have been likened to the risks of drunk driving. Older and medically at-risk drivers are by no means the highest risk group. Young drivers have the greatest risk, due to lifestyle choices that might be summarized as “burning the candle at both ends.”

However, there are chronic medical conditions that lead to drowsy driving, and the odds are that some of our Driving Check-up clients will have them. Probably the most common disorder that is undiagnosed and undertreated even when diagnosed is obstructive sleep apnea. During sleep, as the throat muscles relax and the airway closes, breathing repeatedly starts and stops, the sleeper semi-awakens repeatedly, and sleep is nonrestorative. As a result, there is excessive daytime sleepiness, drowsy driving, and increased crash risk. It is estimated that 3-7% of the U.S. population has obstructive sleep apnea, with higher rates among males, the overweight, middle-aged to older people, and smokers. If diagnosed, OSA is treatable, especially with a CPAP breathing machine. Other sleep disorders may include insomnia from chronic medical conditions, restless legs, and periodic limb movement disorder. Poor-quality sleep brings on many additional health risks, so a client who complains of excessive sleepiness behind the wheel may have much to gain by discussing this with their physician.

MEDICATIONS

There have been many studies and much press coverage on the negative impact of medications on older adult drivers. However we must also consider the potential of medications to *improve* driving skills. For example, cardiac and pulmonary medicines may enable adequate blood pressure and oxygen, which result in better cognitive functioning. Similarly, medications may provide older adults who suffer from joint disease with the strength and flexibility they need to drive. That being said, there are many prescription and over-the-counter medications that have the potential to increase the risk of impaired driving. Driving instructors cannot realistically be expected to evaluate a driver’s medications for risks and benefits. If a driver tells you that their driving is negatively impacted by medicine-related sleepiness, dizziness, etc, they should be strongly urged to take ALL their medicines (including over-the-counter) to their primary physician for a discussion of this concern.

Appendix G: Crash Characteristics Handout

A 2009 National Highway Traffic Safety Administration publication¹ reports on an analysis of 2002-2006 national FARS (Fatality Analysis Reporting System) and GES (General Estimates System) data to identify behaviors and situations associated with increased crash risk for older drivers. The information that follows draws from this report as well as an updated descriptive analysis of these two databases using the most recent three years (2011-2013) of available data. As in the earlier study, analyses were restricted to crashes involving passenger cars, utility vehicles/other light trucks, pickups, and vans.

The goal of this document is to identify the specific situations (“crash types”) that present the greatest risks to drivers ages 65 and older. The results that follow primarily reflect analyses of the GES database, which is a representative sampling of all police-reported crashes in the U.S.

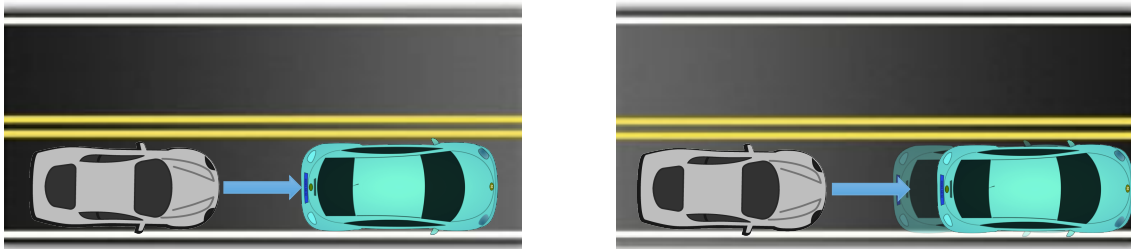
The results also focus greatest attention on multi-vehicle rather than single-vehicle crashes. Across all age groups, about 36% of fatal crashes are multi-vehicle collisions and 64% are single-vehicle collisions; however, for injury crashes, as well as for ALL reported crashes, these percentages are reversed: 68% multi-vehicle, and 32% single-vehicle ([Traffic Safety Facts, 2013](#), Table 29). For older adults, the relative percentages of multi-vehicle crashes (and especially those multi-vehicle crashes occurring at intersections) is even higher (IIHS Older People 2013).

Multi-Vehicle Crashes

The five crash types highlighted below represent **88%** of all older driver involvements in multi-vehicle crashes.

1. **Rear End Collisions** involving two (or more) vehicles traveling in the same direction on the same roadway.

34% of all crashes
5% of fatal crashes



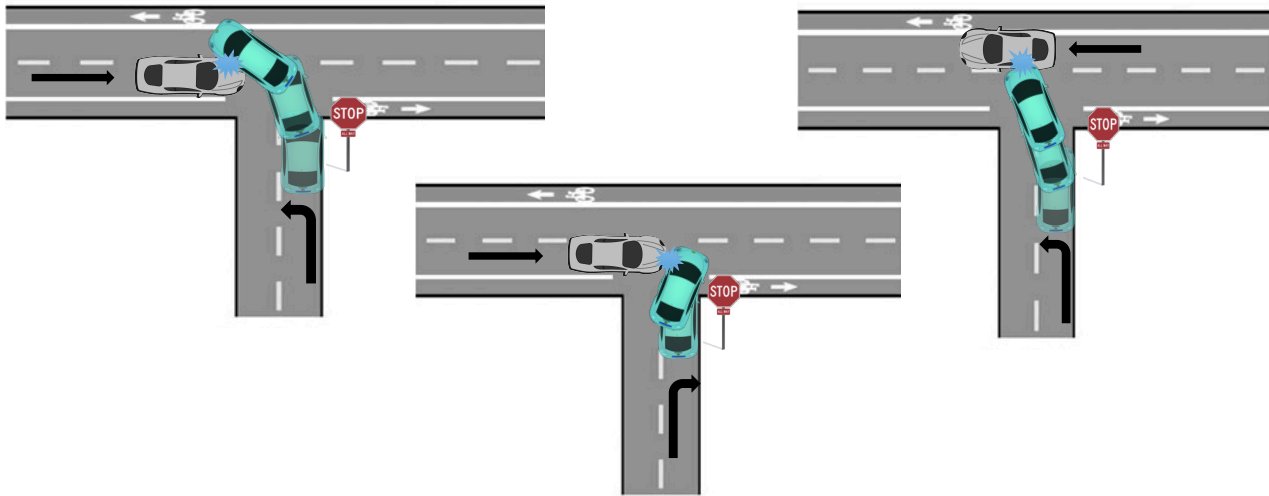
Description: Rear-end collisions are the most common crash type across all age drivers, and older drivers are no exception. Two-thirds of older drivers’ rear end collisions involve a moving vehicle striking the rear of a stopped vehicle; however, a third involve a moving vehicle striking the rear of a vehicle that is either decelerating or traveling at a slower speed. In all three scenarios, the older driver’s vehicle is much more likely to be the struck vehicle than the striking vehicle.

Situations that might result in this type of crash: In addition to simply being stopped at a traffic signal or stop sign when rear-ended, older drivers may be at increased risk of being rear-ended when (1) slowing or stopping in a yield situation; (2) turning right onto a roadway in front of

oncoming traffic; and (3) in general, slowing or stopping unexpectedly in traffic. They may also be the *striking* vehicle in such crashes if they have slowed reactions and have not left adequate cushion between them and the vehicle they are following.

- 2. Turn Into the Path** of a vehicle when moving from one trafficway to another.

**16% of all crashes
11% of fatal crashes**

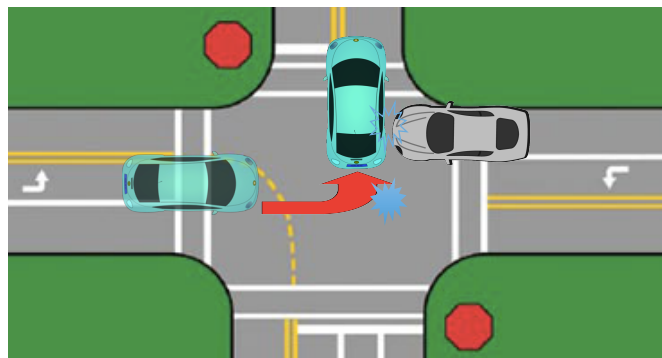


Description: This crash type involves a vehicle turning left or right into the path of a vehicle traveling on another roadway. The most common scenario is the first one above, in which a vehicle turns left into the path of another vehicle approaching from the left. However, this crash type can also involve a right turning vehicle. In all these configurations, older drivers are much more likely to be the turning vehicle than they are the vehicle proceeding straight ahead.

Situations that might result in this type of crash: These types of crashes may be especially likely to occur when older drivers are entering a main roadway from a side roadway that either has no traffic control (e.g., a driveway) or is controlled by a stop or yield sign. Inadequate scanning, poor gap judgment, and slowness in execution may all contribute to such crashes.

- 3. Turn Across the Path** of a vehicle when moving from one trafficway to another.

**15% of all crashes
15% of fatal crashes**



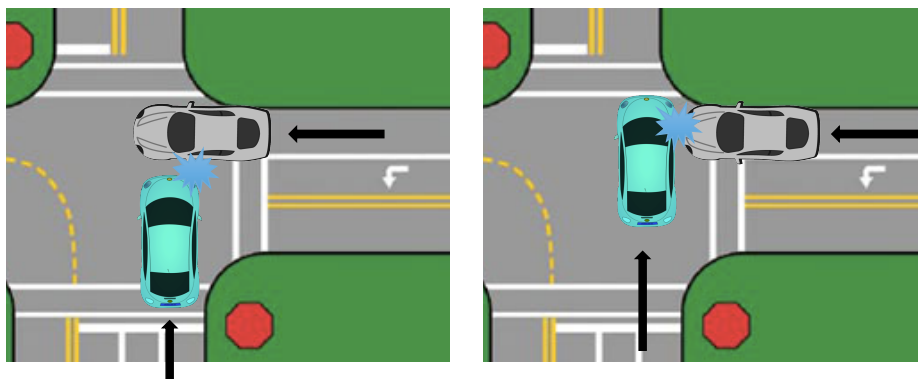
Description: While this crash type can involve vehicles traveling in either the same or opposite

initial directions, in the vast majority of such crashes, the vehicles are traveling in opposite directions (i.e., approaching one another), and one driver turns left in front of the other vehicle (see diagram above). In these crashes, the older driver’s vehicle is nearly twice as likely to be turning left as it is proceeding straight ahead.

Situations that might result in this type of crash: While most likely to occur at intersections, left turn across path collisions can also occur midblock, e.g., when turning into a driveway or shopping center. Inadequate scanning, poor gap judgment, and/or slowness in execution may again be contributing factors.

4. Vehicles Proceeding Straight through an intersection on intersecting paths.

**12% of all crashes
21% of fatal crashes**

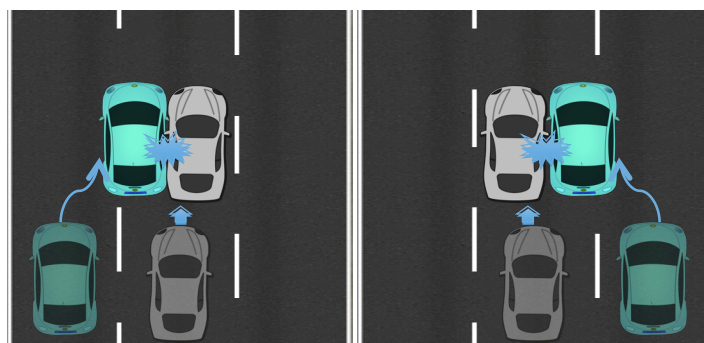


Description: For this crash type, neither vehicle is turning, and the older driver is just as likely to be the striking as the struck vehicle. The two scenarios diagrammed above occur with about equal frequency (i.e., striking from the left vs. striking from the right). These crashes tend to be especially severe in terms of injury to the involved vehicle occupants.

Situations that might result in this type of crash: While no “fault” status is conveyed by these diagrams, possible “at fault” collision scenarios here would include failure to stop (or yield) for a traffic signal, stop sign, flashing light or other traffic control device.

5. Angle or Sideswipe Collisions involving two vehicles traveling in the same direction on the same trafficway, with one vehicle moving into the travel lane of the other vehicle.

**11% of all crashes
3% of fatal crashes**



Description: This crash type typically occurs on a multi-lane roadway and involves a vehicle moving either right or (slightly more often) left into the path of a vehicle traveling in an adjacent travel lane. Older drivers involved in such collisions are about 40 percent more likely to be the ones that are changing lanes or merging.

Situations that might result in this type of crash: While this crash type is most often associated with improper lookout when changing lanes or merging with traffic, it can also occur when a driver inadvertently swerves or “drifts” out of his or her travel lane (e.g., if not paying attention, distracted, or drowsy). Older drivers are under-represented in crashes occurring on entrance or exit ramps, although reduced exposure at such locations is likely a factor.

In addition to the five primary crash types described above, other situations that the data suggest may pose challenges for older drivers, but which occur with considerable less frequency, include:

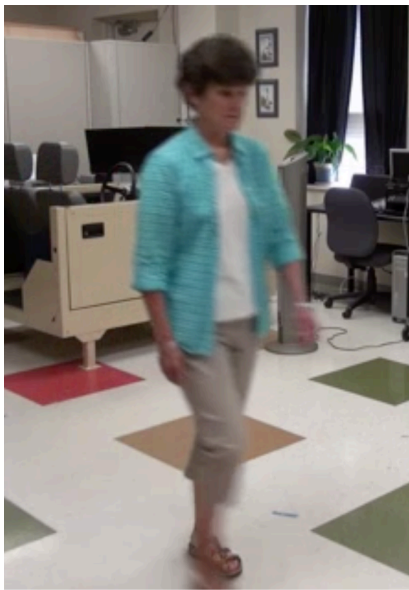
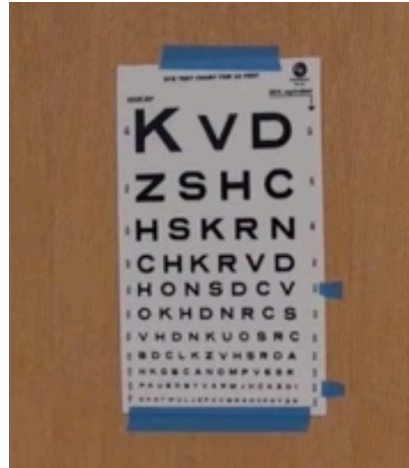
- Roadways with **two-way continuous left turn lanes**.
- **U-turns** (although U-turns represent less than 1% of older driver pre-crash maneuvers).
- **Merging** onto a highway (although again the overall frequency of crashes involving mergers is low).
- **Backing**, as well as **exiting a parking space**.

Single Vehicle Crashes

Finally, with respect to single-vehicle crash involvements, analysis of GES and FARS crash data show that older drivers are less likely than younger or middle-age drivers to be involved in right or left roadside departure collisions, and when they are involved, their collisions are less likely to be due to a loss of vehicle control or traction. Nevertheless, the roadside departure crashes had serious consequences for the older driver, as evidenced by an increased representation in fatal crash involvements. Together, right and left roadside departure crashes represented one-fourth of all older driver single-vehicle collisions, but over half of their fatal single-vehicle collisions.

The most frequent single-vehicle crash type for older drivers involved a forward impact, most often striking a pedestrian or animal (33%) or a parked vehicle (11%) without leaving the roadway. Older drivers were also twice as likely as younger or middle-age drivers to be involved in backing collisions (8%), although these collisions seldom resulted in a fatality.

Appendix H: Illustrative Screenshots of Screening Tools



Appendix I: References Included in Literature Review of Evaluations of On-Road Driving Evaluations

Anstey, K.J., J. Wood, H. Caldwell, G. Kerr and S.R. Lord (2009). Comparison of self-reported crashes, state crash records and an on-road driving assessment in a population-based sample of drivers aged 69-95 years. *Traffic Injury Prevention*, 10:84-90.

Arno, P. and S. Boets (2003). Elderly driver's integrated assessment methodology. AGILE (AGed people Integration, mobility, safety and quality of Life Enhancement through driving) Deliverable D.5.1 (European Union).

Baldock, MRJ (2008). Best Practice Criteria in Practical Driving Tests of Medically Referred Drivers. CASR Report Series, CASR013. Centre for Automotive Safety Research, The University of Adelaide, Australia.

Berndt, A.H., E. May and P. Darzins (2015). On-road driving assessment and route design for drivers with dementia. *British Journal of Occupational Therapy*, 78(2):121-130.

Brown, Y.M. (2003). Practical assessment of fitness to drive and mobility related research. *Behavioural Research in Road Safety*, Seminar, 13th, pp 1-12.

Camp, B.J. (2013). The overall program effects of California's 3-Tier Assessment System pilot on crashes and mobility among senior drivers. *Journal of Safety Research*, 47:1-8.

Camp, B.J. (2010a). California's Three-Tier Driving-Centered Assessment System – Process Analysis. Sacramento: California Department of Motor Vehicles, Research and Development Branch.

Camp, B.J. (2010b). California's Three-Tier Driving-Centered Assessment System – Outcome Analysis. Sacramento: California Department of Motor Vehicles, Research and Development Branch.

Cardimen, F.P. (1999). Evaluation of the 1999 Mature Driver Retraining Workshop Program. Prepared for the Traffic Improvement Association of Oakland County, Michigan, by Stuart Packard and Associates, Waterford Township, MI.

Classen, S., Dickerson, A.E. & Justiss, M. (2012). Chapter 9: Occupational Therapy Driving Evaluation: Using Evidence-Based Screening and Assessment Tools. In

Maguire & Schold Davis (Eds.) *Driving and Community Mobility: Occupational Therapy Strategies Across the Lifespan*. Bethesda: AOTA Publishing, (pp.221-279).

Dobbs, A.R. (2005). The development of a scientifically based driving assessment and standardization procedures for evaluating medically at-risk drivers. Paper presented at the Canadian Multidisciplinary Road Safety Conference XV, Fredericton, NB, Canada, June 2005.

Dobbs (2013). Accuracy of the DriveABLE cognitive assessment to determine cognitive fitness to drive. *Canadian Family Physician*, 59(3):156-161.

Drivers Medical Group DVLA (2008). Literature Search on How the Results of On Road Driving Assessments in Drivers with Dementia Relate to a Clinicians Opinion Regarding 'Fitness to Drive'. Prepared for the Drivers Medical Group, U.K. Driver and Vehicle Licensing Agency (DVLA), Swansea by the Aggressive Research Intelligence Facility, West Midlands Health Technology Assessment Collaboration.

Finn, J. (2004). *Driving Evaluation & Retraining Programs: A Report of Good Practices, 2004*. Bethesda, MD: The American Occupational Therapy Association, Inc. Prepared under cooperative agreement with NHTSA.

Hennessy, D.F. (2013). 3-Tier December 2013 JSR Report: Wrong Question, Omitted Failed Quality Control. (Response to Camp, 2013). Personal communication.

Hoggarth, P.A., C.R.H. Innes, J.C. Dalrymple-Alford and R.D. Jones (2013). Prospective study of healthy older drivers: No increase in crash involvement or traffic citations at 24 months following a failed on-road assessment. *Transportation Research Part F*, 16:73-80.

Hoggarth, P., C. Innes, J. Dalrymple-Alford, et al. (2011). On-road driving assessment errors associated with pass and fail outcomes for older drivers with cognitive impairment. In *Proceedings of the Sixth International Driving Symposium on Human Factors in Driver Assessment, Training and Vehicle Design*, Lake Tahoe, CA, June 27-20, 2011.

Hoggarth, P., C. Innes, J. Dalrymple-Alford, J.E. Severinsen and R.D. Jones (2010). Comparison of a linear and a non-linear model for using sensory-motor, cognitive, personality, and demographic data to predict driving ability in healthy older adults. *Accident Analysis and Prevention*, 42:1759-178.

Hunt, L.A., C.R. Murphy, D. Carr, J.M. Duchek, V. Buckles and J.C. Morris (1997). Reliability of the Washington University Road Test: A performance-based

assessment for drivers with dementia of the Alzheimer type. *JAMA Neurology / Archives of Neurology*, 54:707-712.

Justiss, M.D., W.C. Mann, W. Stav and C. Velozo (2006). Development of a Behind-the-Wheel Driving Performance Assessment for Older Adults. *Topics in Geriatric Rehabilitation* 22(2):121-128.

Kay L., A. Bundy, L. Clemson and N. Jolly (2008). Validity and reliability of the on-road driving assessment with senior drivers. *Accident Analysis and Prevention*, 40:751-759.

Keall, M.D. and W.J. Frith (2004). Association between older driver characteristics, on-road driving performance, and crash liability. *Traffic Injury Prevention*, 5:112-116.

Korner-Bitensky, N., I. Gelinas, M. Man-Son-Hing and S. Marshall (2005). Recommendations of the Canadian Consensus Conference on Driving Evaluation in Older Drivers. McGill University, Montreal, Quebec, Canada.

Korner-Bitensky, N. and S. Sofer (2009). The DriveABLE Competence Screen as a predictor of on-road driving in a clinical sample. *Australian Occupational Therapy Journal*, 56:200-205.

Kowalski, K. and H. Tuokko (2007). On-Road Driving Assessment of Older Adults: A Review of the Literature. Victoria, British Columbia: University of Victoria, Centre on Aging. Report prepared for the Justice Institute of BC.

Langford, J., J. Charlton, M. Bohensky, J. Irving, L. Martin and B. Fildes (2009). Older Driver Model Assessment Program: Stage 4 – Validation of Screening Tests to Assess At-Risk Older Drivers. Austroads Research Report AP R336/09.

Mallon, K. and J.M. Wood (2004). Occupational therapy assessment of open-road driving performance: validity of directed and self-directed navigational instructional components. *The American Journal of Occupational Therapy*, 58:279-286.

Odenheimer, G.L., M. Beaudet, A.M. Jette, M.S. Albert, L. Grande and K.L. Minaker (1994). Performance-based driving evaluation of the elderly driver: Safety, reliability, and validity. *Journal of Gerontology: Medical Sciences*, 49(4):M153-M159.

Ott, B.R., G.D. Papandonatos, J.D. Davis and P.P. Barco (2012). Naturalistic validation of an on-road driving test of older drivers. *Human Factors*, 54(4):663-674.

Patomella, A.H., K. Tham, K. Johansson and A. Kottorp (2010). P-Drive on-road: Internal scale validity and reliability of an assessment of on-road driving

performance in people with neurological disorders. *Scandinavian Journal of Occupational Therapy*, 17:86-93.

Richardson, E.D. and R.A. Marottoli (2003). Visual attention and driving behaviors among community-living older persons. *Journal of Gerontology: Medical Sciences*, 58(9):832-836.

Selander, H., H.C. Lee, K. Johansson and T. Falkmer (2011). Older drivers: On-road and off-road test results. *Accident Analysis and Prevention*, 43:1348-1354.

Shechtman, O., K.D. Awadzi, S. Classen, D.N. Langford and Y. Joo (2010). Validity and critical driving errors of on-road assessment for older drivers. *American Journal of Occupational Therapy*, 64(2):242-251.

Sommer, S.M., P. Arno, M. Strypsten, G. Eeckhout and S. Rothermel (2003). On-road assessment methodology and reference road test. *AGILE (AGed people Integration, mobility, safety and quality of Life Enhancement through driving) Deliverable D.4.3 (European Union)*.

Staplin, L., K.H. Lococo, J. Stewart and L. E. Decina (1999). *Safe Mobility for Older People Notebook*. DOT HS 808 853. Washington, DC: NHTSA.

Stefano, M.D. and W. MacDonald (2003). Assessment of older drivers: Relationships among on-road errors, medical conditions and test outcome. *Journal of Safety Research*, 34:415-429.

Vlahodimitrakou, Z., J.L. Charlton, J. Langford et al (2013). Development and evaluation of a Driving Observation Schedule (DOS) to study everyday driving performance of older drivers. *Accident Analysis and Prevention*, 61:253-260.

Appendix J: Brief Summary of Literature Review Findings (Handout for Advisory Committee Meeting I)

“Evaluations” of On-Road Driving Evaluations

There are many forms an evaluation can take, depending on what it is that is being evaluated and what one wants to learn or gain from the evaluation. For example, when evaluating an intervention program, one may want to examine the extent to which the program achieves its objective (outcome evaluation), or the time, costs and resources required to implement the program (process evaluation). For this particular review, our focus was on evaluation of a particular assessment tool: the on-road driving evaluation. For evaluation studies of this type, the primary outcome measures of interest are the tool’s reliability and validity. Reliability refers to the degree to which the tool yields stable and consistent results. Validity refers to the extent to which it measures what it purports to measure — in this case, driving ability or fitness to drive. But there are many “subtypes” of both measures, as described and reported below.

Reliability of On-Road Evaluations

The two types of reliability measures most often reported in the reviewed literature were **test-retest** reliability (the extent to which the road test yields the same results when repeated on the same person at a later time), and **interrater** reliability (the extent to which different administrators of the test agree). In most cases, the latter is based on comparisons of overall road test scores (e.g., a pass vs. a fail outcome), but can also be extended to cover consistent scoring of individual test items (e.g., whether both administrators identified the same scanning behavior or lane keeping errors). A third type of reliability, **internal consistency** reliability, refers to the extent to which individually scored items agree with the overall outcome for the test instrument. Ideally, one wants a high level of correlation among the individual test items to show that they are all measuring the same underlying construct, in this case, driving ability.

Reliability in an on-road evaluation is important for obvious reasons. Clients need to know that if they go to a different provider, or are tested by a different examiner, on a different day, the advice about their driving will be the same. But even driving evaluations that cover a set route and that involve the same maneuvers scored in the same way will not be 100% replicable. This is because of inherent variability in the testing environment (e.g., traffic density, weather conditions, actions of other vehicles on the road) as well as in the individuals both taking and administering/scoring the exam.

U.S. Literature

A number of the studies reviewed reported reliability ratings for on-road driving evaluation protocols. Included among these were two early test protocols – the Washington University Road Test (Hunt et al., 1995) and the Harvard Medical School road test¹ (Odenheimer et al.,

¹ Here and elsewhere, we have created “names” for otherwise unnamed road tests, based on the affiliation of their developers.

1994). Both protocols were developed in the U.S. in the early 1990s, and in addition to having evaluators provide an overall pass/fail rating of a driver's performance, identified a standard set of very specific driving behaviors for observing and scoring. For the WURT, reported inter-rater reliabilities (measured using Cronbach's α) were .85 when comparing investigator (an occupational therapist) and driving instructor global ratings, and .96 when comparing the two investigator (i.e., occupational therapists) ratings. This suggests that one's background and experience in administering driving evaluations may affect the outcome. For the Odenheimer study, inter-rater reliability was higher for the closed course portion of the evaluation (.84) than for the in-traffic portion of the evaluation (.74), suggesting that the more complicated the behaviors being assessed, and the more variable the traffic environment, the greater the variability in scoring. Also of interest is that the reported test-retest reliability (post one month) for the WURT was higher for the quantitative performance ratings (kappa = .76) than for the more subjective global ratings (kappa = .53). The authors noted that, for their three-point global ratings (safe, marginal, and unsafe), almost all of the changes involved a shift either into or out of the marginal category at the one-month follow-up assessment.

Two more recent on-road test protocols developed in the U.S. with published reliability ratings are the Yale University (Richardson & Marottoli, 2003) and University of Florida (Shechtman et al., 2010; Justiss et al., 2006) on-road assessments. The Yale protocol is a modified version of the Connecticut DMV's usual road test for drivers referred for medical review. The test uses the same 36 items (scans to sides, uses mirrors, grants right of way) but scores them using a three-point (major errors/unsafe, minor errors, good/no errors) rather than a two-point (pass/fail) system, following standardized scoring criteria. The 36 test items demonstrated high internal consistency ($\alpha = .88$) and high interrater reliability (intraclass correlation coefficient, or ICC = .99 for the global score, and individual kappas for each of the 36 items all > .91). Ratings were made independently by two "driving evaluators," alternating between sitting in the front and rear passenger seats of the test vehicle.

The University of Florida Behind-the-Wheel Driving Performance Assessment for Older Adults has received perhaps the greatest attention as a potential "model" on-road driving evaluation protocol, drawing as it did from a 2003 International Older Driver Consensus Conference. Like the other protocols in this review, it was developed primarily as a tool for use by occupational therapists/driver rehabilitation specialists conducting comprehensive driving evaluations. Evaluators score 91 specific maneuvers on a four-point (0-3) scale that takes into account the severity of any errors. The Florida protocol is designed to be scored by a single person – no separate back seat scorer is required, which makes it more usable. The earlier cited study by Justiss et al. (2006) cites interrater and test-retest (post one week) correlation coefficients of 0.94 and 0.95, respectively. No details were provided on the number and qualifications of the raters.

Several other U.S. on-road evaluation protocols were identified during this review, but none with published reliability ratings. The California 3-Tiered Driving Centered Assessment (Camp, 2013, 2010), as well as a recent study by Ott et al. (2012) comparing road test results with naturalistic driving data, will be discussed in the section on validity. A report on an Oakland County, Michigan, program (Cardimen, 1999) in which an optional drive test was added to its AAA Mature Driver Retraining Workshop offerings was also included in the review. However, specific evaluation results were limited to follow-up survey responses from participants, and in

particular their reaction to the Useful Field of View testing that preceded the on-road drive (nearly half reported some apprehension with regard to the testing, and one in five said that they found the method of testing, using a computer, difficult). No feedback was reported for the on-road portion of the workshop, although several survey respondents commented on the value of this optional component to the standard driver safety workshops.

Studies Outside the U.S.

The U.S. has not been alone in seeking a “model” on-road drive test protocol for identifying potential at-risk drivers. There have been significant studies in Australia, Canada, New Zealand, and several European nations. Most of this work has been focused on evaluations of the validity of these test protocols. However, Kay et al. (2008) report on the psychometric properties of an on-road test typical of that used to evaluate medically referred drivers in Australia. The test was conducted in a dual brake vehicle, covering a standard route and using a standard form for recording and scoring errors. Errors were weighted based on their severity (ultimately “1” for habitual errors, “2” for hazardous errors, and “5” for critical errors). As is typical in Australia, the test was administered by a driving instructor sitting in the front passenger seat for safety, with performance scored by an occupational therapist sitting in the back seat. When comparing results, this study had good interrater reliabilities for most of the errors scored.

Similarly, in a New Zealand study using a non-standardized test route, Hoggarth et al (2011) reported generally high levels of agreement between occupational therapists and driving instructors in independently scoring a list of 29 specific driving errors. This study is significant because it suggests that in the absence of a standardized test route, an error checklist can improve a road test’s ability to identify at-risk drivers. Additional results for both these studies are reported in the validity section below.

Cautionary Comment Regarding Reported Reliability Findings

At least one author urged caution in interpreting the generally high reliability findings reported in the literature for on-road driving evaluations. Ott et al. (2012) observed that the high interrater results reported in a number of studies may not generalize, since they were based on a small number of raters from the same research team working in the same geographic area. Developing an on-road evaluation protocol that can be reliably implemented by driving instructors with diverse qualifications, motivations, and experiences in diverse urban, suburban and rural settings will be challenging; however, clear and standardized course requirements and scoring procedures should greatly facilitate the process.

Validity of On-Road Evaluations

As with reliability, there are also many ways to measure an instrument’s validity, or how well it captures what it purports to be measuring. Two often reported measures are **construct validity**, the extent to which the tool measures a single theoretical construct (e.g., driving safety), and **concurrent validity**, the extent to which results from the tool correlate with other measurements known to tap into the same construct (e.g., cognitive tests that also predict driving performance, DMV test scores). Other measures of validity are **predictive validity**, the extent to which the

tool is able to predict future (or past) performance (such as crash involvement) and **content validity**, the extent to which individual items scored on the tool agree with the overall score. **Face validity** is also an important test measure, but one that is typically not evaluated for on-road driving assessments since these clearly have high face validity with respect to real world driving performance.

A driver's global or overall pass/fail performance on a road test was generally considered to be the gold standard measurement of fitness to drive². Most developers of new, standardized on-road protocols want to know the extent to which their more objective and quantitative test scores agree with the criterion measure of an evaluator's global performance rating. Ideally, a cutoff point is established in the range of possible test scores that maximizes the test's sensitivity and specificity. In this context, sensitivity is the test's ability to correctly identify drivers who would receive a global "fail" rating, while specificity is its ability to correctly identify drivers who would receive a global "pass" rating. The issue is balancing between the two qualities so that you do not have too many false positives (individuals who are flagged as at-risk drivers when they are not) or false negatives (those who are flagged as fit to drive, when they are not). But while this approach to establishing the validity of a new on-road drive test protocol represents the ideal, many of the evaluations included in this review have taken different approaches, including some that have attempted to relate drive test performance to past or future crash involvement, and others that have assessed the extent to which select screening tools are themselves able to predict drive test performance (the goal being to determine whether a drive test is needed). Thus, a range of study types and evaluation measures were found in this review.

U.S. Literature

All of the studies cited above also reported on the validity of their respective road tests. For the WURT, the correlation between the evaluator's road test score and driving instructor's global rating was .60 (Hunt et al., 1997). For the Harvard Road Test the same correlation was .74 for the in-traffic portion of the road test, but only .44 for the closed course portion of the test (Odenheimer et al., 1994). The University of Florida road test's reported correlation was .84, based on the same evaluator both providing a global rating and scoring the road test (Justiss et al., 2006). Follow-up efforts to develop optimal cutoff scores for the Florida road test produced a sensitivity of 0.91 and specificity of 0.87 for agreement with the global pass/fail score (Shechtman et al., 2010). These results offer evidence that standardized approaches for evaluating on-road driving performance adequately reflect the "gold standard" of a global assessment of fitness to drive. Although agreement is highest when the same evaluator is scoring both aspects of the road test, the validity still holds when a driving instructor's global scores are compared to the more objectively determined scores of a trained evaluator (who may or may not be an occupational therapist).

² It should be noted that some in the research community question the notion that on-road drive tests represent the "gold standard" for assessing fitness to drive, since no drive test is completely and truly replicable (for example, there will always be differences in the testing environment, the administration of the test, and drivers' reactions to the test situation.), and since, by definition, standardized road tests cannot adequately address the strategic aspects of driving (for example, by allowing drivers to choose their own travel routes). Nevertheless, when conducted by a trained and experienced practitioner, and in conjunction with other pre-drive functional ability assessments, they represent the best available tool for individual decision-making regarding fitness to drive.

Many studies also reported agreement between the standardized road test scores and various clinical measures known to correlate with road test performance. For example, Hunt et al. (1997) reported a high correlation with dementia status; Odenheimer et al. (1994) moderate to strong correlations with the MMSE, traffic signs, complex reaction time, and other clinical tests; and Richardson and Marottoli (2003) high correlations with visual attention, Trails B, and visual memory cognitive tests. And as noted earlier, there is a large body of literature examining the potential usefulness of select screening instruments and assessment batteries for identifying potential high risk drivers that have used on-road performance as an outcome variable for validating the screening test(s).

This approach essentially describes evaluation efforts that have occurred over the course of the development of California's Three-Tiered Driving-Centered Assessment System, where performance on the screening tests was evaluated against performance on the drive test (most often California's Supplemental Driving Performance Evaluation) as well as prior and subsequent crash and violation rates (Camp et al., 2010). Although earlier reported results appeared promising, results for the much larger and more variable sample of drivers participating in the real-world piloting of the Three-Tiered System failed to show any overall reduction in crash rates associated with implementation of the program (Camp, 2013). However, there continues to be disagreement over the expected outcomes for the program and reasons for its apparent failure. To our knowledge, no other U.S. evaluations of on-road testing protocols have examined crashes and/or violations as indicators of a road test's predictive validity. As with most studies like this, the rarity of crashes makes it difficult to link to driving evaluation outcomes.

A somewhat different approach to evaluating, and improving, a standardized road test was taken by Ott and his colleagues at Brown University (Ott et al., 2012). The authors carried out a factor analysis to clarify the constructs measured by an on-road exam (in this case, the Rhode Island Road Test, which is a variation of the Washington University Road Test) versus what could be captured in naturalistic driving video. The authors reported that while the RIRT scores clustered on just one dimension that was "dominated by driving awareness items (spatial, environmental, traffic, and signage)," the scored naturalistic driving video yielded two dimensions of approximately equal importance: one capturing the driver's ability to respond to traffic, and the other proper lane keeping. The authors concluded that "adequate road test performance requires a more restricted set of driving skills than those required for naturalistic home driving," and recommended that road testing of older drivers might be improved by incorporating more emphasis on lane keeping along with self-directed driving (Ott et al., 2012).

Studies Outside the U.S.

Australia and New Zealand

Australia and New Zealand have been especially active in research to develop more reliable and valid road testing procedures for experienced older drivers. In these countries (as well as in other countries outside the U.S.), the research has been more directly driven by the needs of driver licensing authorities to ensure the continued driving competency of a rapidly growing population of older drivers. However, since occupational therapists are often involved in any required

driving assessments in these countries, much of the research parallels that conducted in the U.S., where driving assessments are typically handled privately and outside of DMV settings.

In one Australian study, the types of errors associated with passing or failing the VicRoads driver review road test were examined (Stefano & Macdonald, 2003). Errors related to intersection negotiation, maintenance of position and speed, and safety margin were the most strongly associated with test outcome, and not surprisingly, they were also the most likely to require examiner intervention. Further examination of the data showed that while involvement in a recent crash was not associated with passing or failing the road test, certain contributing factors to the crash (such as failure to obey a road law) were related.

Three additional Australian studies directly examined the psychometric properties of road tests. Mallon and Wood (2004) evaluated a standardized on-road assessment protocol similar to that being used at a major rehabilitation center. The protocol involved scoring seven components of driving (e.g., blind spot observations, braking-acceleration, lane positioning) at 106 sequential locations/maneuvers representative of real-world driving (intersection negotiation, merging, lane changing, etc.). Results showed a high degree of correlation between the driving instructor's global safety rating and the occupational therapist's test scores ($r = 0.76$). Furthermore, the ability of the road test to discriminate between groups of drivers based on age and presence of visual impairment was greatest for those driving test tasks involving self-directed navigation.

Kay et al. (2008) examined a "typical" Australian fitness-to-drive road test, and reported a sensitivity of .81 and specificity of .95 for predicting global pass/fail based on an optimized cutoff score. While all drivers shared some common errors, such as failure to check blind spots when changing lanes, unsafe drivers also had particular difficulty negotiating intersections and lane changes. And in a third Australian study, Antsey et al. (2009) compared results from an on-road drive test (the same as that used in Mallon and Wood, above) to both state-reported and self-reported crash involvement. While no agreement was shown with the state crash records, drivers who self-reported involvement in a crash in the previous five years were twice as likely to receive a failing score on the road test.

On-road tests that are appropriate for generally healthy older drivers may not effectively discriminate among drivers with dementia. A recent South Australia study was carried out "to identify a salient range of on-road driving tasks and maneuvers that sufficiently challenge the performance capacity of drivers with dementia in order to identify safe or unsafe drivers" (Berndt, May & Darzins, 2015). Driving errors on a total of 110 tasks or maneuvers were tallied, and results compared for those drivers who passed and those who failed the road test. This comparative analysis resulted in the identification of 80 on-road tasks or maneuvers that were deemed to present sufficient challenge for inclusion in an optimal road test. It is suggested that this list of maneuvers can be used by occupational therapists to ensure that their routes are sufficiently challenging.

Finally, researchers at Monash University in Australia and elsewhere are working to develop an Older Driver Model Assessment Program. Similar to the California Three-Tiered Driving-Centered Assessment, the Australia Older Driver Model Assessment Program is geared to developing driver licensing agency capabilities to identify and assess potential high-risk drivers.

Research activities for the Australia Program have been underway since 2000, with support from Austroads, the association of Australasian (Australian and New Zealand) transport and traffic agencies. Efforts have been slowed, however, by an inability to identify screening tests that adequately predict crash risk. In a recent report Langford et al. (2009) noted that none of the identified screening tests was significantly associated with recent at-fault crash involvement. Several of the tests were associated with performance on an on-road drive test when the test was scored by an occupational therapist; however, when scored by the driver assessor with the licensing agency there was no association between the screening tests and drive test outcome. The specific drive test used in the research was a modified version of New Zealand's Older Driver On Road Test, a test that was originally required for all drivers ages 80 and above, but is currently used for drivers who have been identified as medically at risk. Typically, this road test would be administered and scored by a specially trained driving assessor (not an OT).

In New Zealand, Hoggarth and his colleagues have advanced a similar line of research. Given that most on-road evaluations are not standardized, the researchers sought to identify a subset of errors associated with passing or failing a road test that could form the basis for reliable scoring (Hoggarth et al., 2011). Working with a sample of cognitively impaired older drivers, they were able to identify eight specific errors (e.g., decreased awareness of other road users, lack of scanning techniques, inappropriate gap selection) that had good interrater reliability and predicted failing the road test. The authors noted that such an approach to road testing could help "bridge the gap" between researchers who prefer a standardized assessment and practitioners who prefer greater flexibility in test administration. More recently, Hoggarth et al (2013) reported on a prospective study of generally healthy older drivers to determine whether those who failed New Zealand's Older Driver On Road Test were at increased risk of crashing or being cited for a traffic offence over the subsequent 24 months. Like Antsey et al (2009) before him, Hoggarth et al. failed to find a significant association between road test results and subsequent involvement in a police reported traffic crash, or a crash plus traffic citation. These results contrast with some earlier reported findings from Keall & Frith (2004) which had appeared to suggest an association between road test performance and crash risk. As part of their evaluation of New Zealand's practical drive test requirement for all drivers age 80 and above, the authors reported that for each failure of the drive test there was a 33% increase in the odds of subsequent crash involvement.

Canada

Older driver researchers in Australia and New Zealand have partnered with CanDrive, a research program established in 2002 to improve the safety and quality of life of Canadian older drivers. One of CanDrive's current projects is to develop an evidenced-based tool for health care professionals that will help identify older drivers who are at increased risk for at-fault crashes. The project entails following a target population of 900+ older adults over five years. Also related to this partnership, Vlahodimitrakou et al (2013) published an evaluation of a protocol for observing and scoring the driving performance of drivers operating their own vehicle, driving a route of their choosing. The Driving Observation Schedule, or DOS, is described as a procedure for "monitoring individual driving behavior;" however, it bears many similarities to other Australasian drive tests, being based on set driving scenarios and objective scoring of behaviors observed. One big difference is the incorporation of an in-vehicle device to automatically record metrics such as vehicle position, speed, and distance travelled. Preliminary data based on a

sample of 33 drivers showed overall good psychometric characteristics for the driving observation protocol.

The DriveABLE On-Road Evaluation, or DORE, was developed by Alan Dobbs, a University of Alberta psychologist (Dobbs, 2005). DriveABLE was originally intended to evaluate the driving safety of cognitively impaired drivers. More recently, Dobbs has developed the DriveABLE Cognitive Assessment (DCAT), a computerized screening battery for predicting performance on the DORE (Dobbs, 2013). However, the validity of both the DORE and the DCAT have been questioned. This controversy has proven difficult to resolve, in part because the DriveABLE test protocols are proprietary and details about scoring have not been made available to outside researchers (see Korner-Bitensky and Sofer, 2009, and follow-up responses by Bedard and others to the publication of Dobbs, 2013).

Finally, it should be noted that a Canadian Consensus Conference on Driving Evaluation in Older Drivers was held in 2004. Recommendations from this conference, including those for the on-road portion of a driving evaluation, are presented in Korner-Bitensky et al, 2005. However, this consensus report is not included in this literature review since no evaluation results were presented.

Europe

In the United Kingdom, on-road driving assessments are offered to the public at a series of “Mobility Centres” spread across England, Scotland, Wales and Northern Ireland (<http://www.mobility-centres.org.uk/>). A 2003 report by Brown describes the “practical assessment of fitness to drive” offered by the Mobility Centre at the Department for Transport in Crowthorne. The assessment includes a total of 20 exercises on both closed circuit and in-traffic routes, each designed to target specific skills needed for driving. In the absence of any ethical way to obtain crash data for drivers who perform poorly on the assessment and who subsequently are encouraged to stop driving, the Centre is looking to driving simulators as one possibility for measuring the validity of their practical driving assessment.

Lastly, two Swedish studies were included in the review. One described the development of an on-road version of the Performance Analysis of Driving Ability, termed P-Drive on-road (Patomella et al., 2010). The tool is intended for use by specially trained occupational therapists tasked with evaluating drivers with neurological disorders (stroke, dementia, mild cognitive impairment). A detailed manual provides instruction in how to set up a standardized test route and score the test’s 27 items on a four-point scale. This evaluation involved five occupational therapists from three different clinics using the tool. Results showed P-Drive on-road to be a valid and reliable instrument with “potential to become a clinically useful assessment tool for on-road driving tests.” However, due to extensive training requirements, it does not appear to be a suitable instrument for use in driving school settings.

A second Swedish study, published shortly afterwards, examined the driving errors of older drivers *without* cognitive impairment (Selander et al., 2011). The P-Drive on-road and another on-road assessment protocol (Ryd On-Road, or ROA) were both used to rate driving performance. In general, results from both road tests were only weakly correlated with selected cognitive tests (Trails, Stroke Driver Screening Assessment, UFOV), a finding that may not be

surprising given the generally healthy nature of the sample. However, 1 in 5 drivers still failed the road test, often for making errors that could be described as “normal driving behavior” (in particular, controlling speed and obeying speed limits). The authors recommend that such information on normal driving errors be taken into consideration when designing road tests for drivers with cognitive impairments or other declining competencies.

Summary and Implications for the Current Project

This literature review targeted evaluations of on-road assessments for older drivers. It included studies carried out in the U.S., Australia, New Zealand, Canada, and several European countries. In general, the review showed the evaluation protocols to be reliable and valid tools for assessing fitness to drive: reported measures of interrater and test-retest reliability were high, and outcomes of the assessments correlated significantly with global assessments of fitness to drive and with other known correlates of driving fitness, especially cognitive status.

However, care should be taken in extending the results of this review, and the programs characterized in it, to our envisioned Senior Driver Check-Up program. With just one exception,³ the evaluation protocols identified and described in these studies were all developed for one of two audiences: occupational therapists, or driver licensing agencies (and in this latter situation, they might still be implemented by an occupational therapist). They were also generally, and sometimes explicitly, intended for use evaluating drivers with known or suspected impairments, especially cognitive or neurological impairments. This is a quite different audience than one might expect to voluntarily participate in a “driving Check-up” offering, and has implications for the range of driving behaviors that should be observed and scored.

³ The on-road drive test included as an option to the AAA Mature Driver Retraining Workshops offering in Oakland County, Michigan (Cardimen, 1999).

Appendix K: Abbreviated Instructions and Questions from Driving Instructors Survey

Hello Driving Instructor,

East Carolina University recently received funding from the AAA Foundation for Traffic Safety to develop a model program for evaluating experienced senior drivers. This model program will be developed as a positive "Driving Check-Up" for senior drivers, designed to be administered by driving instructors.

As a first step, we want to know what driving schools may already be doing evaluations with older adults (or why not). We would like to identify and describe existing programs, looking for best practice ideas as well as concerns from the driving instructors who are the experts in providing this service.

Please help us by completing the brief survey below. It should take less than 10 minutes of your time. If you feel there is someone else at your driving school who is more qualified to complete the survey, please forward it to him or her to complete.

- 1) Does your driving school offer on-road / in-car / behind-the-wheel driving evaluations for already licensed older drivers? (Not referring to refresher lessons, safety classes, or driver training.) [Yes/No]
- 2) How many evaluations with senior drivers does your school conduct per month? [2 or fewer evaluations; 3-5 evaluations; 6-10 evaluations; More than 10 per month]
- 3) Does your school refer senior drivers to an occupational therapist or certified driving rehabilitation specialist for driving evaluations? [Yes/No/Not Sure]
- 4) Are you aware of evaluation services provided by occupational therapists or certified driving rehabilitation specialists? [Yes/No/Yes, but limited knowledge]
- 5) Do you have a collaborative agreement with one or more occupational therapists or driver rehabilitation specialists? [Yes/No/Not Sure]
- 6) How do senior drivers typically come to you for a driving evaluation (not lessons or training)? (Check all that apply)
 - Referred by physician
 - Referred by an occupational therapist
 - Come on their own, or at the urging of family members or friends
 - Referred by licensing authorities or the courts
 - Other, please list
- 7) For those referred by a medical professional, does the older driver usually understand the reason for the referral? [No/Yes/Sometimes]
- 8) For those drivers who come on their own or at the urging of family members / friends, what circumstances do they report as the reason to seek a driving evaluation? (Check all that apply)
 - Concerned about a possible decline in their driving ability.
 - Returning to driving after an illness or other medical event.
 - Returning to driving after a loss of a spouse or transportation provider (who was the primary driver).
 - Uncomfortable after a relocation or unfamiliar with the area.
 - Recently involved in a crash.
 - Fear they may not be able to renew their license.

- Prove to their adult children they are still able to drive.
 - Other, please describe
- 9) What vehicle do you use for the evaluation?
- Dual brake driving school vehicle
 - Driver's own vehicle
 - Varies, depending on the driver.
 - Other
- 10) Do you use a standardized form for observing and recording driving behaviors during the on-road portion of the evaluation? [Yes/No/Sometimes]
- 11) Is your evaluation form for seniors different or the same as you use for young drivers? [Same/Somewhat Different/Completely Different]
- 12) How is the senior evaluation form different from the evaluation form for novice drivers? [Open Ended]
- 13) What does a typical senior evaluation conducted at your school entail? For each task, indicate whether it is always done with senior drivers, done most of the time with senior drivers, or sometimes done with senior drivers.
- Pre-drive interview re: driving concerns, crash history, driving frequency, etc.
 - Pre-drive interview re: medical history, use of medications, or medical concerns prompting this visit.
 - Vision check (acuity, visual field, etc.)
 - Cognitive testing (speed of processing, memory, decision-making, etc.)
 - Physical function testing (muscle strength, range of motion, etc.)
 - Testing understanding of parts of the car (e.g., brake, accelerator, mirrors)
 - Understand of vehicle controls (e.g., temperature, wipers, lights)
 - Knowledge testing on driving laws and rules of the road
 - Traffic signs recognition testing
 - On-road test drive
 - Discussion of the results of the evaluation with the driver
 - CarFit 12 point evaluation
 - Review of state licensing requirements
 - Written results of the evaluation for the driver and/or concerned third party.
 - Other
- 14) When you evaluate a senior, what is the average length of the time required? [response scale: 0 to 90 minutes, in 15 minutes increment or not applicable]
- Pre-drive: Interviewing, checking vision, other assessments.
 - On road component (BTW)
 - Post drive: Conveying results
- 15) How much do you generally charge for this service (excluding discounts)? [response scale: 0 to 400, in \$50 increments or not applicable]
- Complete Evaluation, if it includes more than an on-road component.
 - On-road component only.
- 16) Do the driving instructors who conduct evaluations for seniors receive any specialized education or training in working with or evaluating seniors? [Yes/No]

- 17) How comfortable are you in evaluating older drivers: [Continuous response scale from 0 - Very uncomfortable to 100 - Very comfortable]
- With potential vision problems such as declining vision or visual field loss.
 - With physical problems like arthritis or neuropathy.
 - With potential cognitive problems or early dementia.
 - Who are recovering from a stroke, heart attack, or other medical condition.
- 18) What have you found to be the most challenging or concerning aspect about evaluating older drivers? [Open Ended]
- 19) What would you say is the biggest pitfall or problem you've encountered in evaluating older drivers? [Open Ended]
- 20) Is there any information, guidelines, training, option for referral, etc. you can think of that would improve your level of comfort in offering in-car skills evaluations to older drivers? [No/Yes, please identify what might be helpful]
- 21) Please tell us your main reason(s) for not offering this service. [Identify as a main reason, contributing reason, or not a reason]
- No demand at present for such a service.
 - Prefer working with young novice drivers.
 - Do not think it would be profitable for our school.
 - Do not feel qualified to evaluate or instruct older drivers.
 - There are adequate services for seniors in my area.
- 22) Since you do not do senior evaluations, does your school refer senior drivers to an occupational therapist or certified driving rehabilitation specialist for evaluation if warranted? [Yes/No/Not Sure]
- 23) Are you aware of evaluation services provided by occupational therapists or certified driving rehabilitation specialists? [Yes/No/Yes, but limited knowledge]
- 24) Does your school have a collaborative agreement with one or more occupational therapists or driver rehabilitation specialists for driving evaluations? [Yes/No/Not Sure]
- 25) How likely are you to offer on-road evaluations (not just training or lessons) for older drivers in the future? [5-point Likert, Very Unlikely to Very Likely]
- 26) Do you feel you have the information and skills required to offer older drivers evaluation for seniors with medical conditions or recovering from a medical condition? [Yes/No/Not Sure]
- 27) To what extent do you feel you have the information, knowledge and skills required to offer evaluations for senior drivers when they present the following issues? [Scale ranging from 0 – Not at all to 10 – To a great extent]
- Potential vision problems such as declining vision or visual field loss.
 - Physical problems like arthritis or neuropathy.
 - Potential cognitive problems or early dementia.
 - Recovering from a stroke, heart attack, or other medical condition.
- 28) What additional training or knowledge would be helpful if you wanted to offer this service? [Open Ended]
- 29) As an indication of the size of your school, how many cars / driving instructors does your school operate? [0 to 30, in increments of 6]
- Cars
 - Driving Instructors (full time)

- Driving Instructors (part time)
- 30) What is your position in the driving school?
- Sole proprietor/partner/owner
 - Managerial level employee
 - Non-managerial employee
 - Other

Appendix L: Questions from Driving Instructor Interviews

- 1) How long has your school been evaluating senior drivers?
- 2) How many instructors on your staff provide this service?
- 3) You indicated in your online survey that your school has a collaborative agreement with an OT or DRS. Can you explain to me how this works? (e.g., OT does clinical, DI does BTW; OT refers to DI for training)
- 4) What is your biggest source for referrals?
 - OT
 - physicians
 - licensing personnel
 - family members
 - self referral
 - Other
- 5) (if get referrals from OTs) How do you physically get referral? What's included in referral? "Heads up" for potential issues? What info does OT want from you?
- 6) Physicians: What info do physicians provide? What do you know before seeing driver? What info does physician want from you?
- 7) (if get referrals from licensing personnel) What info do licensing personnel provide? What do you know before seeing driver? What info does physician want from you?
- 8) Family/on their own: Is it fair to say you don't know as much about them? Do you do anything to get information before appt.? Does this differ from other client populations?
- 9) Are any calls that you decide not to schedule an appt. or to refer elsewhere? If so, why?
- 10) Are there any circumstances where you'd request a family member/friend be present? Why?

Pre-Drive Component

- 11) Evaluation done in school, at home, where?
- 12) Do they have any kind of liability forms? (check all that apply)
 - Liability
 - Sharing of information with family
 - Sharing information with physicians or health care professionals
 - DMV
 - Release for information
 - Other
- 13) Does driver complete any forms? Waiver? Consent forms to share information?
- 14) Do they report to anyone? [No/Yes, who?]
- 15) Before in-car, do instructors observe driver for possible impairment? Use a checklist or is it informal?
- 16) Driver interview - What is on it? Specific form? Would you share a copy of form?
- 17) Medical history interview - What kind of questions? Separate form? Would you share a copy of form?
- 18) Traffic signs test - separate from knowledge test? How are signs presented?
- 19) Vision screens - what aspects are tested? How is it done? Any special materials/equipment? Form from eye doctor?

- 20) Cognitive screens - What measures do you use? Special materials/equipment?
- 21) Physical screen - What do they assess? What tools are used?
- 22) After doing pre-check, do you ever decide an individual shouldn't be taken on road? If yes, what do you do?

On-Road Component

- 23) What do they use:
 - Dual brake driving school
 - Driver's own vehicle
 - Varies
 - Other
- 24) Other information
- 25) Any information important on public roads or closed course.
- 26) Standard Form? [Specific to older drivers/Same for all drivers]
- 27) For in-traffic, do you direct driver along some combination of
 - Standardized route
 - Different routes
 - Let driver determine destinations
 - Combination
- 28) What are easy vs hard tasks for senior drivers? Are both included in evaluation? At what point do you insert hard tasks?
- 29) If driver doesn't drive on freeways/heavy traffic, do you test them in these situations? Why?
- 30) Do you do anything to challenge driver? (Distraction, navigate back to destination, etc.?)
- 31) If doing an evaluation, do you hold off on coaching/feedback until end? Prefer teaching throughout evaluation? Why?
- 32) If addressed car parts/vehicle controls: How do you do this? Why?
- 33) Does eval. check how well driver "fits" in his/her vehicle? If yes, what do you do?
- 34) What do you base judgement on to determine if driver passed on-road evaluation? Do you use point system? If yes, how?
- 35) Is anything else about on-road portion you feel we should consider?

Post-Drive Component

- 36) When driver referred to you by OT/physician, who makes final decision? What info do you provide back to referring OT/MD? What feedback do you give driver?
- 37) If driver comes on own or at urging of family, is your feedback approach different? What results do you give driver? Are eval. results shared with anyone?
- 38) Is there form you use for communicating results? If yes, willing to share? If no, how provide written feedback? Is copy of results provided to anyone else?
- 39) Able to provide results to driver right away?
- 40) If uncertain about driver's ability - what do you do?
- 41) If someone should NOT be driving, what do you do? If report to DMV, does paperwork at registration acknowledge this might happen? [Yes/Np]
 - Talk with family
 - Inform the individual's physician

- report to licensing authorities
- if you report to licensing authorities, do you acknowledge in the paperwork at registration.
- Other

42) If driver is too unsafe to drive home but came alone to appointment?

43) Do you provide drivers/families info about community mobility alternatives? Do you see this as your role?

44) Do you worry about liability issues? How do you protect yourself?

45) What do you recommend for record-keeping? How long do you keep records?

46) Instructors receive special training: Are there special qualifications instructor needs to eval. seniors? If specific materials mentioned, ask about availability to project

47) What do we need to do to make model program something seniors seek?

48) Additional information not captured elsewhere.

Appendix M:

Assumptions for the *Driving Check-Up* Program for Older Experienced Drivers

- A. The purpose of the *Driving Check-Up* program is to enable experienced older drivers to obtain professional feedback on their behind-the-wheel driving performance in a non-threatening and supportive environment. The program does not evaluate an individual's medical fitness to drive.
- B. The model program and associated training is designed for the typical driving school and driving instructors who have primarily worked with teens, but express an interest in expanding services to healthy, community-living older adults/seniors. The typical driving instructor does not have any medical education or training.
- C. An important secondary goal of the *Driving Check-Up* program is to build partnerships between driving schools and health professionals, and in particular driving schools and occupational therapists/driver rehabilitation specialists. Such partnerships will serve as a mutual benefit to both, as well as a direct benefit to senior drivers. Establishing a working relationship with a local OT/DRS will be a necessary foundation for each program site.
- D. The recommendations included in a recent AAAFTS LongROAD report addressing older adults' preferences for communications with their healthcare providers about driving also apply to their communications with driving instructors. Of particular importance is treating older drivers with respect and empowering them to make their own informed (rather than forced) decisions about driving whenever possible.
- E. The primary purpose of the "Pre-Drive Component" in the *Driving Check-Up* is to determine whether the *Driving Check-Up* is the appropriate service for the driver, or whether the driver should be referred elsewhere (e.g., to their doctor, a vision specialist, or a driving rehabilitation specialist). Although the Pre-Drive component includes checks of cognitive, visual and physical abilities, as well as some questioning about medical conditions and symptoms as related to driving, they are not intended to be used in making decisions about licensing or medical fitness to drive.
- F. Driving instructors are educators, and the *Driving Check-Up* should be an educational experience for its participants, focusing on *self-awareness*; what can the senior do to improve skills, abilities, and/or knowledge in order to preserve or enhance their driving. In addition to receiving feedback on their driving skills, seniors should come away from the session having learned something new about themselves, their vehicles, and/or the driving environment that can positively affect their driving safety. The *Driving Check-Up* may also open the door to follow-up training and/or classroom educational experiences for the driver.
- G. Driving schools and instructors who want to offer *Driving Check-Ups* will require some level of training, especially if they do not have prior experience working with older drivers. The training should be standardized, and schools should be certified providers of the service. In addition to guidance on how to set up and conduct the on-road portion of the evaluation (which will be significantly different than with a novice driver), the training will need to include clear-cut administration and scoring instructions for all screening measures, along with decision trees. Driving instructors should not be asked to administer lengthy or complicated screens, nor to interpret clinical tests.
- H. The standardized Model Program training should also include some information about the effects of selected medical conditions on driving. The goal is not to turn driving instructors into healthcare providers, but to alert them to possible safety concerns and facilitate appropriate referrals.
- I. In order to make the *Driving Check-Up* accessible to a broad audience, its length should be kept to 60-75 minutes.