Research Need Statement 655

I. Need Statement Champions and Information

I.A. Need Statement Champion Information

I.A.1. First and Last Name of Research Champion: Derek Leuer
I.A.2. Research Champion's Office: Office of Traffic Engineering
I.A.3. Research Champion's Phone Number: 651-234-7372
I.A.4. Research Champion's Email: derek.leuer@state.mn.us

I.B. Research Co-Champion

I.A.1. First and Last Name of Research Co-Champion:
I.A.2. Research Co-Champion's Office:
I.A.3. Research Co-Champion's Phone Number:
I.A.4. Research Co-Champion's Email:

I.C. Research Needs Title (115 Characters): Identification and Assessment of Preventative Methods to Mitigate Cognitive and Physical Declines Which Influence Driving Performance of Older Drivers

I.D. Project Sponsor: MnDOT Research Program

II. Research Need Background and Description

II.A. Research Need Background

II.A.1. Describe the problem or opportunity.

Older drivers represent the second-highest group, after teens, for fatal crashes by number of licensed drivers. Minnesota's rural population is disproportionately older and in the coming decade, the need to support seniors to age in place will become more and more critical.

In the coming years, an aging population will likely lead to an increased proportion of older drivers as well as an increased likelihood of drivers with declined cognitive, vision and physical abilities (DPS, 2019). As such, it is important to consider preventative methods that may mitigate such cognitive and physical declines in older adults that may improve driver fitness and safety. Acknowledging there are a broad range of preventative methods and practices that may mitigate cognitive and physical declines in older drivers

which may influence vehicle control skills and driving performance, an inventory and review of these preventative methods is needed to understand the range of opportunities relative to preventive methods and practices as a first stage of this research.

Based on review of the first stage findings, a second stage of the research will be to select one of the preventative methods/practices for detailed study of implications on older driver vehicle control skill and driving performance. This may lead to future research regarding the effectiveness of additional preventative methods/practices.

One approach, which may be selected for the second stage of this research, may be through a mindfulness-based yoga program for older drivers. Yoga is considered a mind-body practice and may have beneficial effects on cognitive functioning for adults with mild cognitive impairments (Brenes et al., 2019). A research study could evaluate the impact of a mindfulness-based yoga intervention to improve cognitive function and increased mobility in older drivers. The results would provide accessible and self-directed preventive methods for older drivers to increase their safety and mobility, such as improving attention, memory and physical abilities (e.g., turning your head more easily while crossing an intersection, reaction time when braking).

II.A.2. If applicable, describe how this project will build on previous research.

There are a number of active and recently completed studies that address various aspects of older driver behavior and performance.

II.A.3. If applicable, include the title/s or previous research.

II.A.4. What is the objective of the proposed research?

This research is an opportunity to synthesize completed and ongoing research and to investigate a preventative method or practice that may mitigate cognitive and physical declines in older drivers and influence vehicle control skills and driving performance. This research could contribute to safer operating conditions on Minnesota roadways.

III. Strategic Priorities, Benefits, and Expected Outcomes

Section III. is for MnDOT sponsored and co-sponsored projects only; all LRRB projects proceed to section IV.

III.A. MnDOT Strategic Priorities

Instructions: Briefly describe how the project aligns with the following MnDOT Research Strategic Priorities. Complete all that apply.

III.A.1. Innovation & Future Needs:

IIIA.2. Advancing Equity:

III.A.3. Asset Management:

III.A.4. Safety:

May result in safer roadway operating conditions by raising awareness, understanding and use of preventative methods and practices for all drivers. Older Drivers and an identified focus area within the Strategic Highway Safety Plan.

III.A.5 Climate Change & Environment:

III.B. Expected Outcomes

Instructions: Check all expected direct outcomes of this research.

- ☐ New or improved technical standard, plan, or specification
- ☒ New or improved manual, handbook, guidelines, or training
- ☐ New or improved policy, rules, or regulations
- ☐ New or improved business practices, procedure, or process
- ☐ New or improved tool or equipment
- ☐ New or improved decision support tool, simulation, or model/algorithm (software)
- ☐ Evaluation of a new commercial product
- ☐ New or improved technical standard, plan, or specification
- ☐ Other. Please specify below:

III.C. Expected Benefits

Instructions: Select all expected benefits that may be realized if the findings and recommendations from this research is adopted or implemented

III.C.1. Construction Savings Choose an item.

III.C.2.Decrease Engineering/Administrative Costs Choose an item.

III.C.3. Environmental Aspects Choose an item.

III.C.4. MnDOT Policy Choose an item.

III.C.5. Lifecycle Choose an item.

III.C.6. Operations and Maintenance Savings Choose an item.

III.C.7. Reduce Risk Choose an item.

III.C.8. Reduce Road User Cost Other reduced road user cost. Please describe below.
Ultimately could reduce insurance costs if life changing crashes are reduced.

III.C.9. Safety Reduction of crash frequency and severity
Older drivers are a focus area in the Strategic Highway Safety Plan (SHSP). As a large portion of the population continues to age, a primary tactic identified in the SHSP is keeping drivers proficient while driving. This research could be directly applicable to that target, with the goal of preventing and reducing fatal and serious injury crashes, especially as related to older drivers.

III.C.10. Technology Choose an item.

III.C.11. Other, please describe below:

IV. Technical Advisory Panel

Instructions: Please list the name and affiliation of individuals to consider for the Technical Advisory Panel.

Minnesota Department of Health

Minnesota Department of Human Services

Department of Public Safety - Driver and Vehicle Services (DVS)

Department of Public Safety - Office of Traffic Safety(OTS)

AARP

Your assigned Project Advisor is available to answer questions and provide guidance (assigned by the Office of Research & Innovation).
Your Project Advisor is: Brent Rusco (651)366-3767 brent.rusco@state.mn.us