

Older Drivers' Self-Regulation and Exposure

Appendix G – Functional Instrument Justification

This appendix provides an overview of the functional testing instruments to be used in this study and their relationship to study goals and traffic safety applications. It is important to note scores on these tests will be linked with and compared to each participant's driving performance and exposure data. The results will help NHTSA understand whether older drivers are appropriately self-regulating their driving relative to any deficiencies identified by the functional tests.

Domain	Description	Application to Traffic Safety
DrivingHealth® Inventory functional screening program		
Visual acuity and contrast sensitivity	Visual acuity refers to the clarity of vision. Contrast sensitivity refers to the ability of the visual system to distinguish bright and dim components (various luminance levels) of a static image within the field of view.	Lower visual acuity often increases the likelihood of accidents. Declines in contrast sensitivity make it difficult for drivers to drive in situations of low light, fog or glare, and during nighttime.
Simple and choice brake response time	Simple response time = The amount of time between an emergency braking event and a person's response – hitting the brake. Choice response time = The ability to inhibit an incorrect response under changing conditions.	In emergency braking events, longer brake response time in general requires larger following distance to avoid getting into crashes. More importantly, making impulsive errors / failing to inhibit incorrect responses can lead to dangerous errors of commission.
Working memory	A short-term memory system that supports drivers' situational awareness of the surrounding environment.	Decreased working memory makes it more difficult to apply all rules and regulations for safe driving, sign messages, route directions, and other trip information while simultaneously attending to traffic. Decreased working memory capacity might therefore place drivers at increased crash risk.
Visualizing missing information	The ability to recognize a whole object when only part is in view.	Helps a driver anticipate and respond earlier to emerging safety threats.
Visual search (with divided attention)	Attention is the awareness of selected elements of one's environment; divided attention is attention to multiple sets of elements so as to carry out multiple tasks concurrently.	A driver must rapidly and continuously scan the environment to detect and attend to the most safety-relevant stimuli, e.g., a traffic signals, signs, and road markings as well as other drivers, pedestrians, and cyclists.
Route planning	A preferred measure of executive function that includes planning, foresight, judgment and visual attention.	This ability is essential not only for navigation but for safely negotiating any complex traffic situation.