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FACT SHEET

Keeping Older Adults Driving Safely: A Research Synthesis of Advanced In-Vehicle Technologies

Seniors face serious driving safety and mobility issues.

Background

- As the aging population continues to grow, the personal automobile will increasingly be the preferred mode of personal mobility.
- Advanced in-vehicle technologies have been proposed as potential ways to keep older adults driving for as long as they can safely do so, by taking into account the common declines in functional abilities experienced by older adults.

Objective

- The purpose of this report was to synthesize the knowledge about older drivers and advanced in-vehicle technologies, focusing on three areas: *use* (how older drivers use these technologies), *perception* (what they think about the technologies), and *outcomes* (the safety and/or comfort benefits of the technologies).

Methods

- A systematic literature review was conducted on previously published studies on the 16 technologies most likely to benefit older drivers.
  - o Many types of research methods were represented, including: questionnaires, focus groups, structured interviews, crash record analysis, naturalistic driving, and simulated driving studies.
  - o Included studies of drivers of all ages for technologies with limited literature.
- Three categories of systems were assessed: crash avoidance, in-vehicle information, and other (ex: adaptive cruise control, drowsiness/fatigue warnings).
- Articles were identified through a comprehensive search of bibliographic databases and reviewed for appropriateness; 298 articles met the inclusion criteria.

Key Findings

- The technologies studied have varying degrees of usability and value for older adult drivers, the highest of which are featured in a table (see table on pp. 2-3)

Conclusions

- Advanced in-vehicle technologies can help extend the period over which an older adult can drive safely.
- Vehicle manufacturers, dealers, and others need to explore new ways of training drivers to use in-vehicle systems.

High Value In-Vehicle Technologies for Older Drivers

Technology	Use	Perceptions	Outcomes	Overall Value for Older Drivers
Forward Collision Warning/ Mitigation	• Nearly all drivers always keep the system on • Older drivers pick longer headways	• System rated positively • Some concerns about false alarms	• Faster reaction times to forward threats • Potential crash reduction of up to 20% • Helps prevent crashes • Little negative behavior adaptation	High
Parking Assist: rearview display	• Most drivers always keep system on • 10-14% of glances go to rearview display while backing • Warnings received at least once per week	• 95% want system in next vehicle • 30% report frequent unnecessary alerts when there is nothing behind vehicle	• Helps drivers notice obstacles behind them • Improves ability to fit squarely in parking spaces • 55% reported system relieves stress • Combining backup video display with obstacle detection warnings enhances benefit	High
Parking Assist: cross traffic warning	• All drivers turn system on • All experience alerts	• Considered useful • Up to one-third report unnecessary alerts, mostly in bad weather or with stationary objects off to the side • Up to 15% report failed alerts at least once, when another vehicle is approaching from behind very quickly • Reduces feelings of stress • Increases feelings of safety while backing up	• Helps prevent collisions when backing up • No changes in backing up behaviors	High
Parking Assist: semi-autonomous parking assistance	• No information identified in literature	• Positive ratings	• Reduced mental workload • Reduced stress • Improved parking behavior • Improved parking without the system	High

Navigation Assistance	• Frequent use • Take longer and have more difficulty than younger drivers learning to use system • Have more difficulty than younger drivers reading displays • More frequently use system with a "co-navigator" passenger	• Highly regarded	• Particularly helpful in wayfinding • More frequent travel during times and on roadways that would normally be avoided • Increased feelings of safety, confidence, attentiveness, and relaxation	High
Automatic Crash Notification	• Does not require user input	• No information identified in literature	• High potential for fatal crash reduction	High
Adaptive Headlights	• 7% of owners not aware of system • System does not require driver input	• System considered to improve safety • Large percentage prefer system to standard headlight systems • More willing to drive at night with system	• 5-10% decrease in liability claims • Potential 2-5% crash reduction • Potential reduction of 2,700 pedestrian-related crashes per year • 18% report better visibility	Moderate to high
Blind Spot Warning	• Frequent use • Use of system led to less frequent signal use	• Concerns about false alarms in bad weather • Some reported it to be distracting • Overconfidence in system	• Prevents crashes • Less frequent turning of head to check blind spot in 1/3 of participants • Increased situational awareness	Moderate (High when coupled with other collision warning systems)

For more information on this study and the AAA Foundation's other traffic safety research and materials, please visit AAAFoundation.org.

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