

# ★★★★★ Senior Safety & Mobility

## Use of Advanced In-Vehicle Technology by Young and Older Early Adopters: *Survey Results on Navigation Systems*

### Background

Built-in vehicle navigation systems are proliferating in the United States. Navigation systems use GPS signals and map databases to display maps and turn-by-turn driving directions. Routing functions are also being integrated within larger driver information systems (radio, CD player, HVAC, etc.), and the use of voice recognition technology is becoming more common as a means to interact with and control system functions.

One in eight Americans is 65 or older, and this proportion will continue to grow in the coming years. It is possible that new technologies such as navigation systems can assist older drivers to drive more safely with less stress, thus extending their safe driving years. It is also possible that navigation systems may cause unintended consequences, such as over-reliance on the technology or increased levels of distraction.

The research reported here was conducted as one part of a broader study to learn more about driver experience with several new and emerging in-vehicle technologies. The focus of this study is on how these technologies are being used and how well their capabilities and limitations are understood, with a particular emphasis on the experiences of older drivers.

### The Study

- Questionnaires were mailed to 10,000 owners of vehicles known to offer a navigation system as standard or optional equipment.
- Half of the surveys were mailed to persons aged 65 or older, and half were mailed to persons 25 to 64.
- Completed questionnaires were returned by 2,236 drivers including 1,494 who had a navigation system.
- Questions addressed driver acceptance of the navigation systems, perceived system effectiveness and usability, awareness and understanding of system capabilities and limitations, and behavioral adaptations which may occur with system use.
- Follow-up phone interviews were conducted with 83 participants.

### Key Findings

#### Drivers like their navigation systems

- A majority (88%) of those who currently have a navigation system said that if they purchased the same vehicle again, they would want to get the technology again.

#### How drivers learn to use navigation systems

- Most drivers reported learning how to use the navigation system from their owner's manual (65%) and by "On road experience . . ." (55%).
- Nearly half of the respondents (47%) said that they received instructions from the dealership, such as video, brochure, or demonstration.

#### Changes in driving behavior

- Vehicle owners with greater levels of experience driving the equipped vehicle (miles driven) were more likely than those with less experience to use their system frequently.
- If driving a vehicle without a navigation system, two out of three of drivers said they would change

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With the aid of a navigation system, some seniors may be more likely to take trips without relying on others.



their driving patterns by doing more route planning prior to their trips (66%), and a minority would go to fewer unfamiliar places (8%), drive less often at night (4%) and drive in heavy traffic less often (2%).

### Many drivers are not aware of the limitations of their navigation systems

- More than three of five (63%) said that they were not aware of any manufacturer's warnings or limitations about their navigation system.
- The most common warnings cited in vehicle owner's manuals relate to the potential for driver distraction, and the need for the driver to not rely only on the voice guidance from the system but to make sure that all maneuvers are made legally and safely.

### Navigation system interface usability

- Most respondents (84%) agreed or strongly agreed that there is a lower risk of getting lost with their navigation system.
- Most respondents (80%) agreed or strongly agreed that the navigation system does a good job re-routing them after missing a turn.
- The majority of respondents (65%) thought that the system was about right in terms of complexity and number of features.
- Three of four (76%) said that listening to voice directions reduces the amount of time they look at the navigation screen.
- Of those with navigation systems that accept voice commands, 64% found this feature useful.
- Of those answering, nearly half (47%) found it unacceptable to restrict the driver from manually entering a new destination address while the vehicle is moving, and 37% found it acceptable.
- Some drivers reported difficulties seeing the navigation screen due to sun glare (24%).

“Sun from the back or side can come in and wash out the (navigation system) screen.” (Male, 74)

### Perceived safety

- 45% of navigation system owners thought that using their system made them a safer driver, 52% thought that there was no effect on safety and 3% thought that it made them less safe.
- Some of navigation system owners (13%) said that their system had created new driving problems or safety concerns for them.
- Most respondents thought that using their navigation system was less distracting than using a map or road atlas (88%) or following printed directions (82%).
- The majority of drivers felt that navigation systems are not too distracting (80%), yet many drivers claim that they engage in the visually distracting task of entering destination information while driving (34%).

### Compared to younger respondents, older respondents with navigation systems...

- Reported using their navigation system less frequently (fewer times per week or month).
- Were less likely to read turn-by-turn directions on the navigation screen while driving.
- Were more likely to say that they have not yet learned how to use their navigation system.
- Were more likely to say that they would, “drive in heavy traffic less often” if they couldn't use their navigation system.

### Need for improvements

- The most frequently suggested areas for improvement of navigation systems were related to making the system easier to operate with faster data entry, adding or improving speech recognition capability, and providing a larger, easier to read, touch-sensitive screen.

### Conclusions

Most drivers with navigation systems stated that they would want these systems on their next vehicle. Many drivers feel their system makes them safer, and most said that their systems are not too distracting. While this suggests a safety benefit, it's important to note that most respondents were not aware of any system limitations, and some driver engage in the visually distracting tasks, including destination entry while driving. Further research is needed to determine the safety impact of navigation systems on drivers both young and old, especially with regard to long term changes in driving habits.

