

Traffic Safety Facts

Vehicle Safety Research Notes

DOT HS 811 072

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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 safer 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 people 65 or older, and half were mailed to people 25 to 64.
- Completed questionnaires were returned by 2,236 drivers including 1,494 who had navigation systems.
- Questions addressed driver acceptance of the navigation systems, perceived system effectiveness and usability, awareness and understanding of system capabilities and limitations, and behavioral adaptations that may occur with system use.
- Follow-up phone interviews were conducted with 83 participants.

Built-in vehicle navigation systems use GPS signals and map databases to display maps and turn-by-turn driving directions.



“I would never buy a car without a navigation system now [. . .] it’s like air conditioning, once you use one you never get another car without it.”
– (Male, 61)

“Recently it took me to the wrong place, ten blocks away, ending up in a cemetery. I’m a little distrustful of it.”
– (Male, 81)

Key Findings

Drivers like their navigation systems

- A majority (88%) of those who currently have navigation systems said that if they purchased the same vehicles 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 systems from their owner’s manuals (65%) and by “On road experience . . .” (55%).
- Nearly half of the respondents (47%) said that they received instructions from the dealerships, such as videos, brochures, or demonstrations.

Changes in driving behavior

- Vehicle owners with greater levels of experience driving the equipped vehicles (miles driven) were more likely than those with less experience to use their systems frequently.
- If driving a vehicle without a navigation system, two out of three of drivers said they would change 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 systems.
- 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 systems.
- Most respondents (80%) agreed or strongly agreed that the navigation systems do a good job re-routing them after missing turns.
- The majority of respondents (65%) thought that the systems were 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 screens.
- Of those with navigation systems that accept voice commands, 64 percent 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 percent found it acceptable.
- Some drivers reported difficulties seeing the navigation screens due to sun glare (24%).

Perceived safety

- Forty-five percent of navigation system owners thought that using their systems made them safer drivers, 52 percent thought that there was no effect on safety, and 3 percent thought that it made them less safe.
- Some of navigation system owners (13%) said that their systems had created new driving problems or safety concerns for them.
- Most respondents thought that using their navigation systems were less distracting than using maps or road atlases (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 systems less frequently (fewer times per week or month).
- Were less likely to read turn-by-turn directions on the navigation screens while driving.
- Were more likely to say that they have not yet learned how to use their navigation systems.
- Were more likely to say that they would “drive in heavy traffic less often” if they couldn’t use their navigation systems.

Need for improvements

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

Conclusions

Most drivers with navigation systems said they would want these systems on their next vehicles. Many drivers feel their systems 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 drivers 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.

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This Vehicle Safety Research Note is a summary of the technical research report: *Use of Advanced In-Vehicle Technology by Young and Older Early Adopters. Survey Results on Navigation Systems* (DOT HS 810 927). This report can be downloaded free of cost on the Vehicle Safety Research section of NHTSA’s Web site (www.nhtsa.gov).



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