

In-car safety technology

Survey report

Executive Summary

Over the summer of 2014 Rica (Research Institute for Consumer Affairs) carried out a survey of 471 motorists over 55 years old to identify views and experiences of new in-car safety technology. This survey was carried out by Rica and funded by Motability and GEM Motoring Assist.

Older drivers continue to use their vehicles long into their later years with 50% of our 85+ year old respondents stating they are not thinking of giving up driving. Many older people are concerned about safety whilst driving, citing their physical decline alongside the increased demands of busy roads as particular worries.

The majority of our respondents were:

- Not very aware of available technologies that might support safer driving in later life.
- Welcoming of in-vehicle information systems.
- Suspicious of fully autonomous technologies, except when used in an emergency.

The results from this survey support a broader investigation into in-car safety technology and older people. This further work reviews the key literature contributions from academia and positions them alongside expert opinions from industry and the third sector.

We believe there is a need to better understand the performance of in-vehicle information systems and the older population and propose usability evaluations as a means to achieve this.

Background

There is a shifting age demographic of the U K population, with people born in the baby boom years (1945 – 1965) reaching retirement and going on to live longer. These later years are increasingly being lived by people managing health concerns: we will see a growth of 32% by 2022 in older people with moderate or severe disability, and a 32%-50% rise in over 65s with chronic diseases¹.

Automobile technology is seeing a period of rapid development fuelled by the advances made in informatics, particularly in the fields of infrastructure, data management and ubiquitous computing. The potential for fully automated vehicles is slowly being realised with many manufacturers declaring this as a goal achievable within the next decade.

The path towards the autonomous vehicle is being made possible through developments of a series of in-car safety technologies, which can be classified under the following headings.

- Passive information systems to alert the driver of potential hazards (night vision or blind spot detection).

¹ National Travel Survey (2012). Department for Transport. 30 July 2013. Revised 19 September 2013



- Semi-autonomous systems which assist the driver by offering to take partial control (assistive parking or automated cruise control).
- Fully autonomous systems that take full control from the driver to avoid or minimise the effect of accidents (Intelligent speed adaption or collision avoidance).

Rica is interested in understanding the relationship between older drivers and the emerging in-car safety technologies. We are particularly interested in seeing what contribution these technologies can make towards keeping older people driving safely for longer.

Method

We promoted and circulated our survey through placing short articles in two magazines: Lifestyle Magazine August 2014 from Motability (readership c630K) and Good Motoring Magazine Summer 2014 from GEM Motoring Assist (readership c75K). Both of these publications are available in print and electronic formats. We also publicised our survey in the Rica Summer newsletters, on Rica's website and through social media.

Survey active from: 14th May 2014 through to 11th September 2014

Formats available: online, telephone and paper based (on request)

Responses: 471

We asked our respondents a few simple questions about their background and followed these with an enquiry into their understanding and opinion of in-car safety technologies. The survey questions all support the following overarching research questions:

Research Questions

1. What do people know about in-car safety technology?
2. What do people want from in-car safety technology?
3. What are people's stories for giving up driving?
4. What do people feel about in-car safety technology?

Key Findings

- 59% of those people surveyed could not name an in-car safety technology that might keep them driving for longer.
- Once the technology was explained 91% named one or more technologies to help keep them driving for longer.
- Technologies of most interest to our respondents were: collision avoidance, blind spot detection / monitoring and night vision.
- Majority of respondents prefer technologies where they retain some control.
- Those who have most concerns about in-car safety technology have little or no experience of them – those who have the technology are largely very positive.
- The bulk of respondents who were considering giving up driving cited restricted body movement as their reason.

- Most of our respondents who recently gave up driving have done so because of a decline of eyesight.
- 50% of over 85 year olds are not thinking of giving up driving.
- When making the decision to give up driving, it often is realised in a very short time-period of less than 3 months.

Results

We analysed the data by: age (55–64, 65–74, 75–84, 85 and over) and by whether or not respondents were thinking about giving up driving over the next 3 years. We used a mixture of quantitative and qualitative methods. The following are our results presented in the light of our research questions.

R.Q.1 What do people know about in-car safety technology?

On asking our respondents if they can think of an in-car safety technology that would keep them on the roads safer for longer, only 41% responded that they could. Later in the survey after 6 representative safety technologies were explained and a similar question asked, 91% of respondents chose one or more of the technologies mentioned as potentially contributing to keeping them driving safer for longer.

Figure 1. All respondents – before technology explained

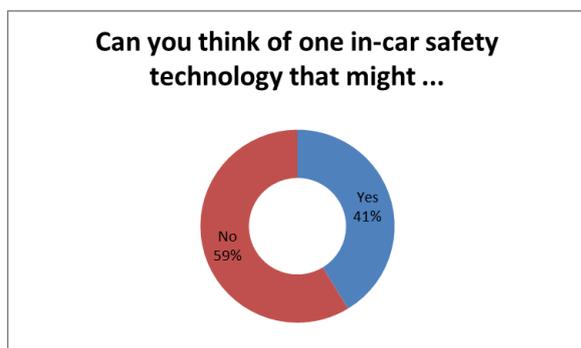
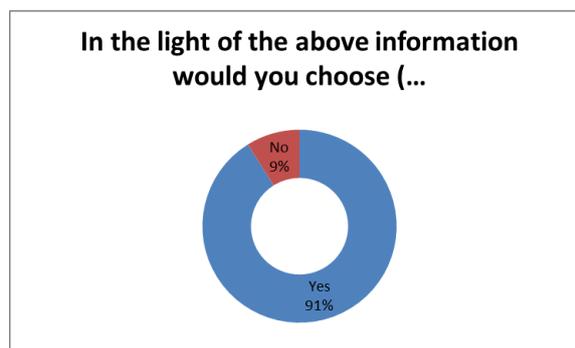


Figure 2. All respondents – after technology explained



Note: Although having an explanation of sample technologies placed in between similar questions about respondents' knowledge can be seen to refresh their memory of these technologies and what they do, it does indicate these technologies are not at the forefront of people's minds.

R.Q.2 What do people want from in-car safety technology?

The respondents throughout all but one age group showed remarkably similar choices of technologies to keep them driving safely in later life. There was little variance between the age group choices except for the 85+ year olds, who showed an increased preference for parking assistance and intelligent speed adaptation technologies.

The response to the question "In the light of the above information², would you choose (have chosen) any of the technologies to extend your driving time? (A maximum of 3 technologies can be selected)".

² The "above information" relates to a table describing the six representative technologies.

For all age groups: blind spot detection (22%), collision avoidance (21%) and night vision (20%), were all more popular than parking assistance (13%).

For 85 + years old: night vision (25%), parking assistance (19%), intelligent speed adaptation (19%) were the most popular.

Figure 3. All respondents – all ages

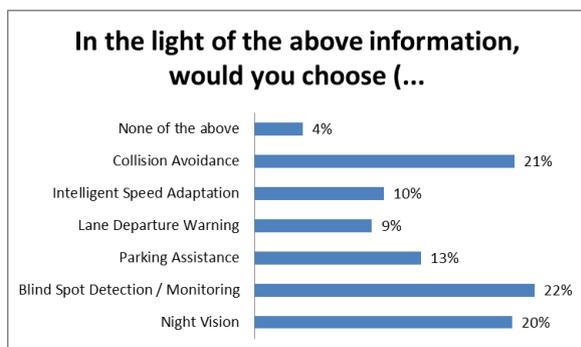
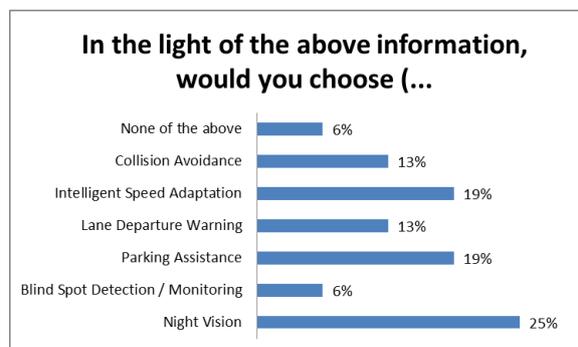


Figure 4. Respondents who were 85+ years old



We found in the qualitative data that parking assist is clearly of interest and positively talked about by a significant number of the survey respondents across all ages and situations. However across all respondents parking assist is only the 4th most desirable technology to keep people safer on the roads for longer.

When viewing all the survey respondents together, three of the top four technologies chosen to keep people driving safer for longer have a significant information system component to them. This preference for systems which keep the locus of control with the driver is supported in the qualitative data.

R.Q.3 What are the stories for giving up driving?

Quantitative findings

Of the people who have recently given up driving, the majority cite a decline of eyesight as the reason for doing so. However, of the people who are considering giving up driving sometime over the next 3 years, decline of eyesight is only the 5th most cited reason behind: restricted body movement, other, roads too busy and traffic too fast.

Figure 5. All respondents – thinking of giving up driving

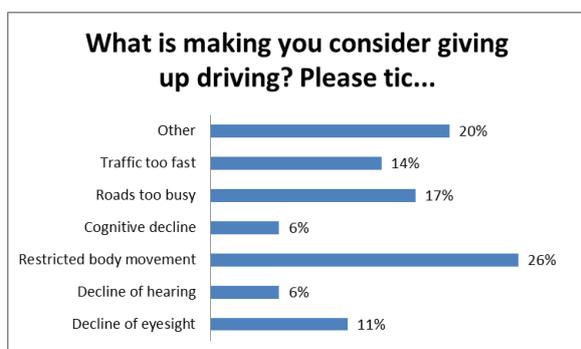
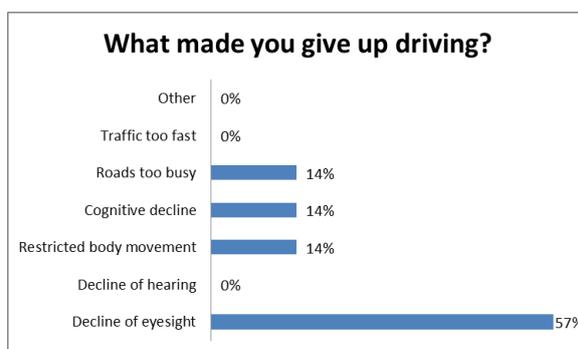


Figure 6. All respondents – gave up driving



Note: the 'other' option recorded conditions such as Multiple Sclerosis, Parkinson's or fatigue.

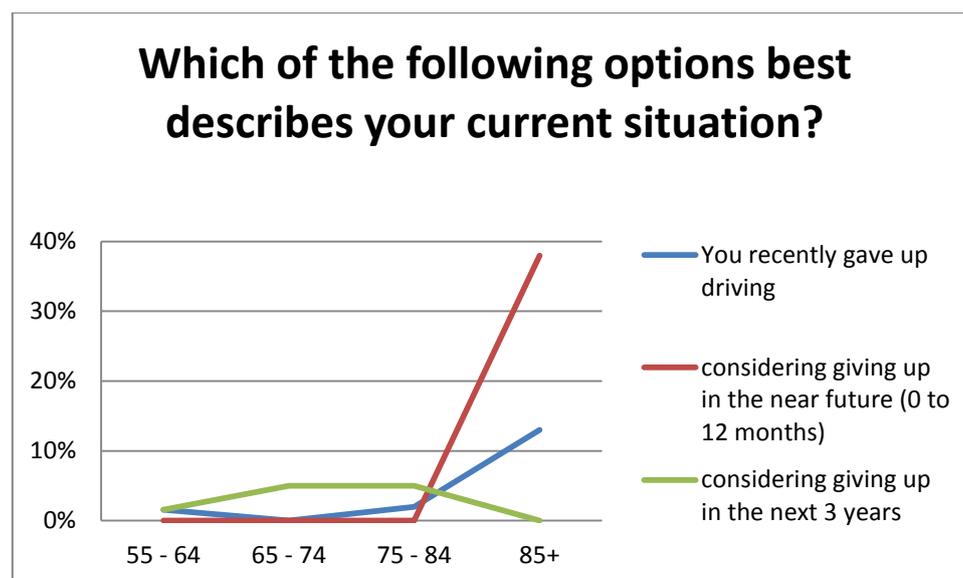
Of those people who have recently given up driving or are considering giving up driving, restricted body movement and decline in eyesight are given as the top two reasons.

When asking the question whether people were thinking of giving up driving in the next year or between 1 and 3 years from now there is an interesting difference in how these figures are distributed over the four age groups within the study.

Fig 7. Table showing results from question “Which of the following options best describes your current situation?”

	55 – 64 (n=195)	65 – 74 (n=200)	75 – 84 (n=68)	85+ (n=8)
You recently gave up driving	2%	0%	2%	13%
Considering giving up in the near future (0 to 12 months)	0%	0%	0%	38%
Considering giving up in the next 3 years	2%	5%	5%	0%
not thinking about giving up driving	97%	95%	94%	50%

Fig 8. Graph of current situation data



The three numbers highlighted in Fig 7 are of interest. These figures suggest that when the actual time comes to give up driving *you know* that now is the time; perhaps because of a greater more noticeable decline in health, by having an accident or near miss whilst driving. This hypothesis is supported by some earlier research at Rica involving workshops with older people, which informed the ‘Driving safely for life³’ guide.

³ The driving safely for life guide is specifically designed to help older drivers think about their driving and make the right decisions to stay safe and independent. The guide is available online <http://www.rica.org.uk/content/driving-safely-life> and in print.

Selected participants' responses

ID 4. Female who lives in the suburbs and is over 84 marked a decline in eyesight and the roads being too busy as reasons for stopping driving. She now uses public transport that she records as being practical to use, being within 200 metres of where she lives. She thinks blind spot detection / monitoring might have helped keep her driving longer but was unaware of this technology before being informed of it by this survey.

ID 163. Male between 55 and 64 years old who lives in the suburbs and gives a decline in eyesight and restricted body movement as reasons for giving up driving. He cites public transport as being not very easy to use being a distance of between 200 metres and 1 kilometre away from his home. He has the support of a partner or friend who drives him about when needed. Although he was not aware of any of the technologies discussed prior to doing the survey, he thought that blind spot detection / monitoring, lane departure warning and collision avoidance would all have kept him driving safely on the roads for longer.

ID 369. Male between 75 and 84 years old lives in a rural setting with reasonably good public transport links, which are between 200 metres and 1 kilometre from his home. He gave up driving 29 years ago and uses a powered wheelchair to get about. He would like a joystick controller for a car, which would make driving accessible for him. He feels blind spot detection, parking assistance and collision avoidance would all have helped him stay on the roads safer longer.

ID 387. Male between 55 and 64 years old lives in the suburbs with reasonably good public transport links between 200 metres and 1 kilometre from his home. He records decline of eyesight as the reason for him ceasing to drive and has a friend or partner who drives for him. He feels that blind spot detection / monitoring may have kept him driving for longer. "I have limited vision in my left eye so I don't always see cyclists coming on the inside".

ID 392. Female aged between 55 and 64 who lives in the suburbs and although her nearest public transport point is within 200 metres it is not very practical for her to use this. It was a decline in her eyesight which caused her to stop driving, and her partner or friend now drives for her. She does not indicate any of the in-car technologies as potentially helping her to continue driving.

R.Q.4 **What do people feel about in-car safety technology?**

Over half our respondents said they had no concerns about in-car safety technologies. The following three themes of competence, trust and distraction all emerged from the qualitative data.

Competence

A significant concern seen in this survey revolved about the competence of the driver. People value the capability of the *good* driver highly and feel that a *good* driver is the best form of in-car safety equipment. This point is further developed by some.

"If the driver is not capable of driving without these aids then they shouldn't be driving"

"I think I would probably consider myself unfit to drive if I needed any of the aids listed"

There was also a worry about over reliance on these technologies, which might lead to a gradual decline in driver skills.

“I feel if drivers get to rely on these systems their driving will deteriorate as they as they will rely on the vehicle to get them out of trouble”

Trust

Behind many of these concerns is a mistrust of the computing to make the right choice, each and every time on the behalf of the driver, in what can often be highly complex dynamic situations. Our survey shows many drivers recording a need to feel in control of these systems promoting the design of simple driver overrides.

“As long as they can be overridden if necessary they will be useful safety considerations”

“I am in favour of any warning systems but prefer to be in control of the vehicle”

Distraction

A feature of in-car safety technology systems which was often raised in the feedback was the worry that they can be distracting. This distraction might take the attention of the driver away from the road and onto the system interface. Comments such as the following were not uncommon:

“Impressive but more like an aircraft cockpit than a car when it comes to all the bells, buttons and gismos which I think can be a distraction and hinder safety”

“My only concern is too much technology can sometimes get very confusing, especially for older drivers”

“I do not like technology on this form, the more complicated things are the harder it is to concentrate on driving”

It is notable that the concerns mentioned about in-car safety technology came from people without experience of these technologies. Those who currently have the technology were a lot more positive towards it.

Conclusions

Our survey shows that older people’s attitudes towards in-car safety technology are cautiously accepting with a preference for information and semi-autonomous systems. As drivers directly experience these technologies first-hand they become less critical and more tolerant, often remarking on how they would want similar technologies in their next purchase.

Older people will push back the time for surrendering their driving licence often choosing to do this in the 1 to 3 year time frame. However when looking at the data from the 85+ cohort, those who are considering giving up driving do so within a relatively short time frame of 0 to 12 months. This suggests some forcing motivation to give up driving such as an accident, near miss or rapid decline in health.



Whilst this survey uncovers much about older people's attitudes towards new and emerging in-car safety technology, it fails to reach in significant numbers drivers who have given up driving completely.

Recommendations

The potential of these technologies to positively help support older people driving for longer and safer is clear. However if these technologies and their HMIs (human machine interfaces) are not sensitive to the capabilities of the older community, their usefulness will be hindered.

A way of ensuring such designs successfully align themselves with the older community would be to undertake usability studies with older people as a cohort in their own right. This is increasingly done in other spheres of product design especially where the products are used by significant numbers of older people.