"Safe Driving for Longer for Seniors: Can Emerging Technologies Play a Role?"

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As part of the author's doctoral study this paper is based on literature review findings. The aim of this paper is to inform conference that whilst driverless cars will become a reality at some stage in the future, many technological products are now available in modern vehicles cars for all drivers. These products have the potential to assist senior drivers; however there are challenges that remain for us all. This paper is intended to highlight those challenges for stakeholders to work collaboratively by producing products for seniors to prevent inequality in our society.

Ageing and age related health problems are a huge challenge facing the western world and it is anticipated that the majority of drivers will be aged 65 and over. Driving is a complex task requiring physical and cognitive skills for safe driving. There are a number of key sensory, psychomotor and cognitive functions that decline with age, and research has found a relationships exists between a number of skills considered important for driving safely and functional decline (*Janke, 1994, Horswill, Anstey, Hatherly & Wood, 2010; Selander, Lee, Johansson & Falkmer,*). In theory these emerging technologies have a huge potential to assist senior drivers with maintaining safe driving for longer and retain independent community mobility. This is good for mental health & well-being. The Intelligent Transport System (ITS) is designed to provide drivers with information and assist with the task of driving by compensating for any functional impairment such as night vision and object distance (*Eby & Molnar, 2012*).

In practice there are several challenges faced by seniors in order for them to obtain full benefits of these technologies.

Some of these are as below

- Poor user interface design – this could prevent seniors accessing technologies due to limitations. (*Mark S, Young, Bunce, 2011*)

- ITS and ADAS systems can cause distraction, cognitive overload and confusion hence the requirement for behaviour adaptations. (*Simões and Marta Pereira, 2009*)
- Seniors may not understand the limitations of new technologies (*Meyer, 2009*)
- Many seniors may never accept emerging technologies due to concerns with regards to security breaches, hacking and compromising of privacy (*McBride, 2015*)
- Limited evidence from research in the area of "human driver re-engagement," drivers will be required to engage in other tasks whilst the vehicle is driving autonomously and swiftly re-engage almost instantaneously at the vehicle's request. Cognitive science research on distracted driving suggests that this may pose a significant safety challenge (*RAND, 2016)*

Emerging technologies have the potential to make a significant difference for seniors, provided there is a determined effort by stakeholders to work on the following areas:

- The use of 'positive role models' may overcome senior negative attitudes, as this has been proven with the use of computers (*Dawns, 1993*).
- Innovation and product design: considering the specific needs of senior drivers due to a decline in physical abilities, cognition and vision (*RICA, 2014*)
- There is an urgent need to ratify 'The Vienna Convention 1966' and amendments in other legislation e.g. 'The Third Directive, 2006/126/EC' for the enablement of greater technological advancement and tested in a 'real world experience' and **not,** in a laboratory in providing assurance for all drivers (including seniors) on product safety and reliability.

In summary, in order for seniors to gain full access and advantage from new and emerging technologies, it needs a collaborative approach from all stakeholders including users themselves, to be part of the solution.