

ABSTRACT TITLE: The role of Intelligent Speed Assistance Technologies in improving road safety: A review of the literature.

Presenter Details: Dr. Margaret Ryan, Centre for Innovative Human Systems, Trinity College Dublin and National Office for Traffic Medicine, Royal College of Physicians of Ireland and Road Safety Authority. Telephone +353 87 2818090. Email: margaret.ryan@tcd.ie

Background

The aim of this research was to examine and synthesise current knowledge in the field of Intelligent Speed Assistance (ISA), with an emphasis on the application of ISA technologies in on-road (field) trials. The review focuses on four key themes which emerge consistently in the ISA literature; safety and the impact on driver behaviour, attitudes and acceptance, impact on the environment and ISA implementation.

Crash risk and speeding

Road traffic crashes are a major cause of premature death and unnecessary injury globally: Currently over 1.35 million people are killed and 50 million are injured every year. Recently the EU developed an ambitious Road Safety Framework which reaffirms the EU's long-term goal of moving close to zero fatalities and serious injuries by 2050 (Vision Zero). As part of this strategy the Commission proposes to mandate vehicle safety and driver assistance features, including Intelligent Speed Assistance (EU Commission, 2018). The link between speeding, crash risk and the severity of crash outcomes is well-established. Since current approaches have not been successful in eradicating speeding, some advocate using more direct approaches and one of the most promising interventions that has emerged recently is the use of Intelligent Speed Assistance (ISA). These technologies help drivers to comply with the speed limit. The ISA concept has been developed and tested extensively over the past three decades including systems that advise drivers about safe speeds (*Advisory/Informative ISA*), warn them when they are exceeding the speed limit (*Supportive ISA*), or control the brakes or throttle to prevent speeding (*Mandatory/Limiting ISA*).

Effects on road safety

The safety effects of ISA technologies depend on the type of system used, the type of road environment and the penetration level of ISA equipment in the vehicle fleet (OECD/ECTM, 2006). Outcomes from a wide range of field trials conducted in Europe, North America and Australia are reported in this review. However, it is likely that the true effects of ISA will only emerge when a larger percentage of vehicles equipped with ISA are in circulation. Nevertheless, data modelling suggests that substantial reductions in fatalities and serious

injuries could be achieved following the introduction of *Mandatory* ISA, with lesser, but still significant reductions expected where *Advisory* and/or *Supportive* systems are used widely.

Driver acceptance is hugely important for promoting the widespread adoption of ISA since it is unlikely that any government would mandate it without strong public support. Whereas ISA was mostly approved by users, it also seems that those who would most benefit from ISA (e.g. young, male and/or inexperienced drivers), are least willing to use it. Research shows that the greatest benefits would be derived using *Mandatory* ISA albeit that this form of speed control has been shown to be least acceptable to drivers.

Environmental impact

Speed management strategies are consistent with other important EU and domestic policy goals related to the environment e.g. reducing CO₂ emissions, air pollution, and congestion. Some key studies in this review addressed the potential environmental impact of ISA technologies. The results indicate that the introduction of *Mandatory* ISA would result in fuel savings ranging from 1% to 11%. Overall, the evidence reviewed suggests that the introduction of ISA would result in reductions in fuel consumption and emissions.

Official support for ISA

Globally, the use of ISA as part of an overall speed management strategy has widespread support among network and safety institutes, government bodies and those who have a stake in this issue. Studies including the EU-funded PROSPER project showed that stakeholders including politicians, governmental institutes, research institutes, pressure groups and commercial groups regarded ISA as an effective safety measure.

Summary and conclusions

The findings in this review show that ISA technologies are effective in supporting drivers with managing speed. Experts agree that by restricting the vehicle to the posted speed limit, ISA provides one of the most effective strategies for reducing speeding, thereby improving road safety (ETSC, 2015). Technically, the widespread deployment of ISA to support speed management is now entirely feasible, cost effective and implementable in the short-term. Since ISA would clearly be easier, cheaper and faster to implement than autonomous driving, more effort should be focused on promoting and supporting the use of ISA technologies. This approach, when coordinated with existing measures, will undoubtedly help to achieve the targets set out in the new EU policy framework for road safety (2021-2030) which reaffirms the EU's long-term goal of moving close to zero fatalities and serious injuries by 2050 (Vision Zero).