

Rapid deployment of Intelligent Speed Adaptation in New South Wales – The story of Speed Adviser

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Abstract

Speeding is a contributing factor in around 40% of all fatal crashes in New South Wales. Australian road safety research suggests that Intelligent Speed Adaptation (ISA) technology has the potential to reduce fatal and serious injury crashes by around 19%. Last year the European Transport Safety Council released the results of a comprehensive assessment of eight different driver support technologies that showed that Intelligent Speed Assistance (ISA) would save the most lives in Europe. In February 2014, Transport for NSW released its own smart phone ISA application, Speed Adviser. This makes NSW the first jurisdiction in the world to provide ISA technology free of charge to its drivers and riders. Over 80,000 downloads of Speed Adviser have been recorded since the application became available, which makes this one of the most rapidly deployed road safety technology countermeasures in history. Speed Adviser is an early indication of the potential benefit of smart phone based road safety countermeasures.

Extended Abstract

Australia's National Road Safety Strategy states that speed is highly implicated in a large proportion of serious casualty crashes. Measures that address speed can also mitigate the severity of crashes no matter what was the original cause. Speeding is a contributing factor in around 40% of all fatal crashes in New South Wales (TfNSW 2015).

Despite the clear evidence that complying to appropriately set speed limits reduces the risk of being involved in an injury related crash, speeding is a major behavioural issue for road safety agencies and authorities.

Intelligent Speed Adaptation (also known as Intelligent Speed Assistance) technology refers to in-vehicle systems which assist drivers to keep to or below the speed limit. By using Global Navigation Satellite System (GNSS) technology and on-board maps which are linked to a speed zone database, the ISA system 'knows' where the vehicle is and what the speed limit is for that road at all times. The ISA system warns drivers via visual and audible feedback if they exceed the speed limit, and/or prevents the vehicle from exceeding the speed limit.

Following an extensive 1.9 million kilometre trial of the technology in NSW throughout 2009 and independent modelling by the Centre for Automotive Safety Research in Adelaide, it was found that the deployment of ISA had the potential to reduce fatal and serious injury crashes across Australia by around 19% and save 200 lives a year on the Nation's roads (Wall 2011).

In April 2014, the European Transport Safety Council released a comprehensive assessment of eight different driver support technologies which showed that Intelligent Speed Adaptation (ISA) would save the most lives (ETSC 2014). The

ETSC stated that ‘assisting’ ISA, that warns drivers of speed limits and assists the driver to adapt to the correct speed, should be introduced on all professional vehicles such as vans, lorries and buses as part of the EU’s ongoing review of general vehicle safety rules, and, in time, for all new vehicle types.

In February 2014, the NSW Roads Minister launched Speed Adviser, an advisory ISA smart phone application running on the IOS and Android mobile operating platforms. The application cost around \$90,000 to build and was developed from the ground up by in-house developers working for Roads and Maritime Services and Transport for NSW.

The deployment of ISA through a smart phone application by a Government based road safety agency is a world first. The application is provided free of charge. Speed Adviser includes a database of all speed zones in New South Wales and covers more than 225,000 km of road network length. Over 81,000 downloads of Speed Adviser were recorded in the first 14 months since the application became available, which makes this one of the most rapidly deployed road safety technology countermeasures in history.

Speed Adviser took more than two years to develop, with careful attention paid to the Human Machine Interface (HMI). A key challenge facing developers was making the application an effective speeding countermeasure whilst minimising distraction from other critical tasks associated with driving.

Due to privacy concerns expressed around tracking of road users by Government road safety enforcement agencies, at the time of the initial ISA trial, it was decided at the outset that the Speed Adviser application would not collect any live data from users. This required all speed zone data to be built in to the application as it would not be able to be downloaded as the vehicle travelled along the network. This meant the application required a minimum of 250Mb of space to be installed on the smart phone. It also required the phone to be connected to a wireless network for the initial download and subsequent updates. This decision has also limited the frequency of speed zone updates that can be made to the application. There have been three updates to the application made since its initial launch on iOS and five updates on the Android platforms.

Feedback from users of the application has been generally very positive. Out of the 65 reviews posted on Google Play, 38 have rated the application four stars or above. In iTunes 17 out of 33 customers have rated the application at four stars or above. The following comments were posted by customers that rated the application four stars or above:

- NSW Government’s best gift to motorists, ever!
- This app is great especially where there are multiple speed zones, entering a road and there are no speed signs and when it is easy to miss a speed sign in heavy traffic.
- Safe Driving heard about it from a listener on ABC what a great idea.

- Great app . How often have you just wondered what the speed limit is? Now you can know all the time.

Of the customers that rated the application 2 stars or below their dissatisfaction related to the following areas:

- wanted the app to display their current speed rather than warning them to slow down
- battery power used by the phone when running the app
speed zone accuracy
- the absence of any tolerance to speeding before a warning was issued
issues associated with sound warnings when using other apps or Bluetooth networks..

A number of user recommended changes have been implemented since the launch of the initial application. These have included:

- allowing users to adjust the volume of warnings
- providing advanced warnings of school zones
- adding a quit button to allows users to shut down the app more easily
- providing limited variable speed zone information

From February 2014 until June 2015 only 25 issues relating to speed zone accuracy have been received by Transport for NSW through our application support email account.

The initial methodology chosen to launch the Speed Adviser application had a major impact on downloads of the application across smart phone platforms. When the app was originally launched it was only available on the iOS platform through iTunes. It was eight weeks before an Android version of the application was released on Google Play. An analysis of downloads across both platforms indicate 21 iOS users for every single Android user. Download statistics show that 13,300 users subscribed to the application on iTunes on the night that the exclusive story went to air on Channel 9 News. Whilst paid on-line marketing of the application has continued throughout the year, it is clear that the promotion of the app via a news network exclusive was a very powerful call to action for customers.

One of the biggest advantages of using smart phone platform to deliver a road safety technology countermeasure is related to cost effectiveness. The initial ISA device trialled in NSW in 2009 cost around \$1,500 to install in a vehicle and a further \$10 per month data charge for each device. Research conducted as part of the NSW ISA trial showed that participants that valued having an ISA device would not be willing to pay more than \$249 to have the system installed in their vehicle (RTA 2011). Through the use of smart phone technology, Transport for NSW has been able to provide ISA free of charge to drivers, an impossible task only four years ago.

In 2010 when the NSW ISA trial was completed about 24 per cent of mobile phone users owned a smart phone. By 2017 this is predicted to grow to 80 per cent. (Statista 2015). With the computing and sensing capability of smart phones improving year by year, the opportunities to develop new road safety applications are continuing to evolve for road safety agencies. The smart phone of 2020 will have a range of sophisticated sensors including location technology that can read a users facial expressions and as well as locate their position to within 10 cm.

This means that the smart phone or wearable device of the future will be able to detect and warn the driver that they are becoming drowsy or are unwell, following too closely to the vehicle in front, or about to collide with a pedestrian. Should a crash happen the smart phone will call emergency services for help and even provide first responders with information on the types of injuries and current condition of vehicle occupants.

The potential for distracting drivers through smartphone applications is a growing issue for road safety agencies. The challenge for road safety professionals and legislators is to manage the risks of smart phones whilst maximising the safety benefits of these sophisticated small computers. Speed Adviser is an early indication of the potential benefit of smart phone based road safety countermeasures.

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