



The Future

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using technology to improve safety: the emerging role of intelligent transport systems

Technological advances in transport commonly described as Intelligent Transport Systems (ITS) have the potential to greatly improve the safety, security and efficiency of road travel.

ITS Australia has defined intelligent transport systems as ‘The application of modern computer and communication technologies to transport systems, to increase efficiency, reduce pollution and other environmental effects of transport and to increase the safety of the travelling public.’

Benefits of ITS in Australia have been estimated, in 1999 values, to total at least \$14.5 billion by 2012. Of this amount, \$3.8 billion is estimated to be

savings due safety improvements. However, some ITS applications can also have some disbenefits: for example, driver distraction caused by inappropriate design of in-vehicle information systems.

ITS commonly used in Australia include airbags, adaptive cruise control, car navigation, telematics,

taxi camera and dispatch systems, incident detection systems, variable message signs, ramp metering, speed and red light cameras, weigh-in-motion devices to address vehicle overloading, Safe-T-Cam which monitors the road safety performance of trucks, and traffic management systems used in Australian cities.

Technology – the knack of so arranging the world that we don't have to experience it.

MAX FRISCH, SWISS WRITER

ITS may radically modify transport systems, particularly in terms of the extent to which they may change the role and the behaviour of the driver. It is presently impossible to predict all the ways in which our lives will be changed and only our imagination puts limits on that.

EUROPEAN TRANSPORT SAFETY COUNCIL, 1999

In November 1999, the Australian Transport Council (ATC), endorsed *e-transport*, the national strategy for ITS. This was the first national strategy for ITS in Australia. *e-transport* was commissioned and funded by Austroads (the association of Australian and New Zealand road and traffic authorities) and was a cooperative effort by federal, state and territory Transport Ministers, in consultation with users and industry,

to harness the potential of advanced technologies to improve Australia's transport systems. It was implemented over a three-year period under the auspices of Austroads and managed by ITS Australia.

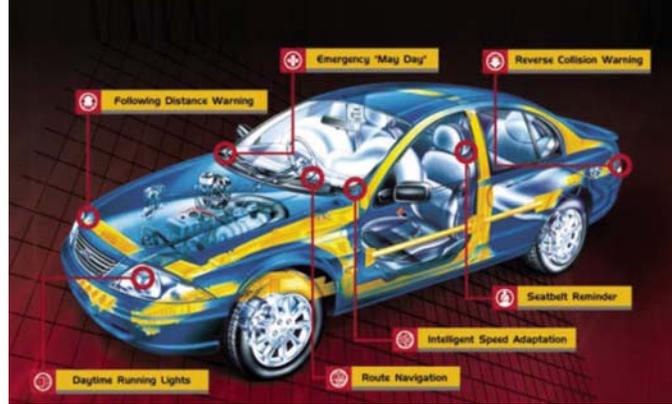
The Standing Committee on Transport (SCOT) – which comprises the heads of federal, state and territory transport agencies – has approved the

establishment of a special sub-committee to oversee the development of a new national ITS strategic plan. The sub-committee has recently conducted an extensive consultation process and is continuing to develop a new strategic framework and plan. The Department of Transport and Regional Services (DOTARS) has been actively involved in this process and continues to contribute to the development of the strategy.

ITS and road safety

The *National Road Safety Strategy 2001–2010* notes that ITS has considerable potential to improve road safety, particularly in the longer term. Although the long-term potential of such systems may be large, the strategy document made cautious assumptions about the fatality reductions that could be achieved by 2010 from such systems. Only 2 per cent of the targeted 40 per cent reduction in fatalities by 2010 was expected to be due to ITS. These benefits were expected to be provided by seat belt interlocks/warning devices (introduced in new vehicles from 2005) and alcohol interlocks (fitted to cars of convicted drink-drivers for two years).

ITS can improve road safety by reducing the possibilities for crashes to occur, by reducing the injuries associated with crashes, and by influencing the level of exposure of drivers to the road environment (such as alcohol detection and



interlock systems which prevent drivers from starting their vehicles if intoxicated). Systems with potential to improve safety include the following:

- intelligent cruise control (to maintain safe following distances)
- speed alerting and limiting systems
- alcohol detection advisory and interlock systems
- crash data (black box) recorders
- incident management systems (systems that detect incidents and provide warnings for avoiding secondary incidents)
- seat-belt reminder and interlock systems
- intelligent restraint systems (adjusts air bag deployment to suit occupants' physical characteristics)
- vision enhancement systems (improves visibility in the night and during adverse weather)
- emergency notification (Mayday) systems
- electronic driving licences (to reduce unlicensed driving and ensure that drivers adhere to their licence conditions)
- roadside speed control systems using variable speed limits
- urban traffic control systems
- electronic or global navigation satellite systems to monitor vehicles for speeding

It is critical for their success...that these [ITS] systems are tailored to the specific safety needs of road users and that human factors knowledge and principles are incorporated into the design, deployment and evaluation of these systems.

MA REGAN, JA OXLEY, ST GODLEY AND C TINGVALL, 2001

- on-road information alerting drivers to hazards ahead
- in-vehicle navigation systems
- in-vehicle collision avoidance systems
- in-vehicle sensors which detect driver fatigue
- lane tracking devices (which warn the driver when a vehicle drifts from its lane).

The Victorian Transport Accident Commission (TAC) *SafeCar* project involves the Monash University Accident Research Centre (MUARC)

and the Ford Motor Company. The project aims to identify and test ITS applications that have an impact on road safety and to incorporate them into a vehicle. The technologies included in the prototype car were chosen for their expected ability to reduce the chance of a crash occurring or the severity of outcomes if a crash occurs. The technologies being trialled are daytime running lights, following distance warning, emergency Mayday system, seatbelt reminder system, intelligent speed adaptation, route navigation, and reverse collision warning. The *SafeCar* serves to provide information to drivers and prevent unsafe driving, but does not assume control of the vehicle at any time.

An Austroads project – the Intelligent Access Project – is examining the feasibility of using vehicle tracking technologies to monitor the compliance of heavy vehicles in regard to access conditions set by jurisdictions, including speed, on Australian roads.

There is a need for more information on how drivers and road users adapt to ITS technologies and how these behavioural factors affect safety. Behavioural adaptation can occur in various ways, such as a driver taking more risks due to the perceived increase in safety provided by an ITS technology. The *SafeCar* project will examine behavioural adaptation effects over long periods.



We look at the present through a rearview mirror. We march backwards into the future.

MARSHALL MCLUHAN, CANADIAN COMMUNICATIONS THEORIST AND EDUCATOR, 1911–1980