SAFETY-RELATED ITS – WHAT IS IT LIKELY TO ACHIEVE IN AUSTRALIA?

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INTRODUCTION
This project originated as a follow-on to an earlier Austroads project which developed an overview of road safety trends in rural and remote Australia. Among the recommendations were research into a number of specific intelligent transport systems (ITS) applications. In the course of developing a project to address these issues, it was recognised that there was a need to document progress in safety-related ITS and to coordinate its future development more effectively, and that these considerations applied to all applications, not just rural and remote situations. The project did not attempt to deal with ITS which is entirely vehicle-based, and these issues are discussed only where relevant to the main theme or in relation to action which is required by road authorities to ensure their effectiveness. Neither does the project attempt to deal with ITS applications which are not directly related to safety. However, it is recognised that it is essential to ensure that road-based safety-related ITS is fully aligned with wider developments in ITS in Australia and overseas.

The aims of this project were to:
- review current developments in infrastructure-based safety-related ITS and variable message signs (VMS)
- document the current status of the development and deployment of these systems in Australia and New Zealand
- identify future research and development needs, including the need for systems which may not yet have been developed
- outline a possible R&D strategy for Austroads in this area.

METHOD
The project proceeded by means of:
- a literature review, covering a range of infrastructure-based safety-related ITS material published after 1997
- workshop discussions with road authorities and a range of other stakeholders.

A proposal and recommendations for a way forward were developed.

LITERATURE REVIEW
So far as possible, each technology reviewed was described in terms of the underlying sensor and processing technology, applications, and the results of evaluations.

Developments reviewed included:
- intersection warning systems
- collision detection systems (which capture a video record of the last few seconds before a collision)
- vehicle-activated speed warning
- vehicle activated advisory signs for trucks
- point-to-point speed enforcement and monitoring
- fixed speed cameras
- variable speed limits
- weather alerts
- level crossing treatments
- vulnerable road user protection
- variable message signs.

Vehicle-based ITS technologies which require some action from road authorities or to ensure they operate effectively also attracted some attention. They included roadway and lane departure systems (requiring good standard of line marking), intelligent speed adaptation (requiring up to the minute documentation of speed zoning) and ecall (requiring a call center capable of coordinating emergency services).

WORKSHOP DISCUSSIONS
Prior to the workshop, all participants were sent an early draft of the literature review, and a suggested agenda for the day with key questions, to orient them to the project objectives and stimulate issues and questions in their minds. Discussion was flexible and followed the experiences and concerns expressed by the groups rather than a rigid order imposed by the facilitator.

The road authorities were developing and trialing systems for a number of different applications. It was also evident that there was relatively little contact between the individuals working in the different authorities. There was also a great deal of concern that up to the present, systems had developed in isolation with little reference to emerging standards in ITS. People working directly in the area were well aware of the advantages in integrating roadside safety ITS with in-vehicle ITS, and the urgent need to get ready for the widespread availability of ITS in new vehicles.

CURRENT INITIATIVES AND RESEARCH AND DEVELOPMENT STRATEGY
Four current developments are likely to shape the way in which infrastructure based safety related ITS, develops in the future. They are:
- the Austroads Network Operations Task Force which coordinates ITS issues
- the conditional allocation of bandwidth in the 5.9 GHz range to enable vehicle to vehicle and vehicle to infrastructure communication
- the Australian Intelligent Speed Assist Initiative
- the Australian Dedicated Short Range Communication cluster, a loose collaboration of industry, government and other stakeholders to pursue the dedicated spectrum issue, and to coordinate the work that needs to be done to make vehicle-to-vehicle and vehicle-to-infrastructure communication a reality.
To address these issues, Austroads should consider the development of an infrastructure-based ITS research and development plan. The key elements in the plan should be:

- a technology transfer element which ensures road authority employees and contractors are familiar with the relevant design, reliability and quality standards
- resolution of existing technical issues
- preparing to interface with in-vehicle ITS
- investigating which information about road condition to give drivers as part of an integrated advisory system and how best to prioritise it.

REFERENCES