The Parliament of the Commonwealth of Australia

Moving on intelligent transport systems

House of Representatives
Standing Committee on Transport and Regional Services

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Foreword

This inquiry began as an examination of the potential to use variable speed signs as a case study for intelligent transport systems (ITS) on selected portions of the Hume Highway, the Federal Highway and the F3 Freeway in New South Wales.

However, the committee soon found that variable speed signs were one, already well tested, element of an approach to improving transport safety and efficiency. Therefore, the committee concluded that there was no necessity to conduct additional studies of the usefulness of this single component of any intelligent transport system.

The committee discovered that there was, however, a larger, nationally more significant issue: the degree to which Australians have implemented ITS and grasped the opportunities the ITS sector offers.

There are clear benefits in using ITS as a means of controlling traffic. ITS leads to lower fuel consumption, better safety, and enhanced economic performance of industry. The committee also saw the export successes and further export opportunities.

ITS is likely to play an important role in the enhanced national security environment that had emerged over this past year; however, such matters were outside the scope of the inquiry.

The committee was impressed by examples of ITS in New South Wales and Queensland, and received information on ITS developments in Victoria. In each case, the road system in those jurisdictions has improved in efficiency, thereby reducing the need for additional road construction. As well, there has been increased safety and some of the technology developed has been exported.

The committee was disturbed, however, by the apparent lack of coordination of ITS at the Commonwealth level and the lack of a focused ITS administration to coordinate a national policy and a national system.

The committee discovered that important elements of a national ITS system, such as nationally consistent electronic toll standards, had not been implemented. As a result, the country faces a 21st century version of the infamous rail gauge problem that has plagued Australia's development since before Federation.

Moreover, given the current national security climate, the committee is concerned that there may not be within the Commonwealth administration, an acute appreciation of the benefits of ITS or, indeed, its necessity.

The apparent state of Commonwealth engagement in ITS is unlike the United States, the European Union or Japan. These countries have specific ITS administrations overseeing the implementation of ITS.

The committee noted the initiatives in transport funding proposed in the Auslink green paper, released by the Deputy Prime Minister, the Hon John Anderson, MP on 7 November this year. AusLink will expand the range of projects that are eligible for Commonwealth Government funding, to include ITS. However, Auslink proposes to treat ITS on a par with all other projects, rather than a crucial element requiring focused attention.

In view of the approach taken in other developed economies, the committee feels a more active, focused program should be developed. This program should promote the deployment of ITS within Australia and realise its potential, not only as a facilitating mechanism in road and traffic control, but its potential as an export product.

Maintaining international competitiveness, improving the safety and efficiency of our transport system and earning export dollars, motivated the committee to recommend the creation of an ITS bureau directly responsible to the Minister for Transport. This bureau would oversee the deployment of ITS in Australia, and ensure that the nation benefits from the export opportunities ITS offers.

As part of this more active approach, the committee believes there should be a coordinated approach to research and development, also administered by the proposed bureau.

The committee concluded that ITS should form a fifth category for road funding, in addition to the National Highway, Roads of National Importance, the Black Spots program and Roads to Recovery.

If Australia is to remain a competitive nation, benefiting from technology and exporting it to the world, we must remain at the cutting edge of innovation. We must remain eager to implement new, smarter approaches to old activities.

ITS represents a society doing just that. It represents a society moving forward confidently, ready to tackle the challenges of the future while seizing the opportunities that technology and innovation offer.

Paul Neville MP
Chair

Membership of the Committee

Chair	Mr Paul Neville MP	
Deputy Chair	Mr Steve Gibbons MP	
Members	Mr Peter Andren MP	Mr Frank Mossfield MP
	Mr Barry Haase MP	Ms Michelle O'Byrne MP
	Mrs Sussan Ley MP	Mr Alby Schultz MP
	Ms Kirsten Livermore MP[1]	Mr Patrick Secker MP
	Mr Stewart McArthur MP	

1 Ms O'Byrne, on leave from the House, was replaced on the committee by Ms Livermore from 20/8/2002 to 2/12/2002.

Committee Secretariat

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Inquiry Secretary	Dr Andrew Brien
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List of abbreviations

BCC	Brisbane City Council
BCE	Brisbane City Enterprises
BLISS	Brisbane Linked Intersection Signal System
DoTaRS	Department of Transport and Regional Services
ERTICO	European Road Transport Telematics Implementation Co-ordination Organisation
EU	European Union
FTL	Freight Transport Logistics
HERO	Highway Emergency Response Operations
ITS	Intelligent Transport Systems
	Transport systems that use information, communication and other forms of high technology, for the efficient and safe movement of goods and people.
ITS JPO	Intelligent Transportation Systems Joint Program Office
NOIE	National Office of the Information Economy
NRAWG	National Reference Architecture Working Group
NTTWG	National Ticketing and Tolling Working Group
PUFFIN	Pedestrian User Friendly Intelligent crossings
Ramp Metering	The practice of regulating the rate at which cars enter an urban freeway by means of traffic signals at entrance ramps.
RTA	Roads and Traffic Authority, New South Wales

SCATS	Sydney Coordinated Adaptive Traffic System
TEA-21	Transport Equity Act
TMC	Traffic Management Centre
VICS	Vehicle Information Communication System
VMS	Variable Message Signs
VSL	Variable Speed Limits

List of recommendations

1

Overview

Introduction

1.1 Over the years, Australians have used contemporary transport technologies within our borders or outside, to reduce the tyranny of distance, and by doing so, built our national community and the economic prosperity of the nation. It is fair to say that efficient and effective transport systems have been a pillar of Australia's social and economic development. It is also a fair assessment that Australia's continuing capacity to compete in the global market and the capacity of Australian businesses to compete in our domestic market and for us to maintain a national community will require efficient and safe transport systems.

1.2 The next stage is the use of Intelligent Transport Systems (ITS) – those transport systems that apply information, communication and other forms of high technology, to the efficient and safe movement of goods and people, across a suburb, across a city, across the continent, or across the globe. Intelligent Transport Systems are a fundamental element of a modern, industrialised economy as the railway and clipper ship were to the development of our economic prosperity in the 19th century, and steam powered vessels and the aeroplane were to our economic development in the century just past.

1.3 This report examines specific elements of intelligent transport systems, notes the impressive successes and unfolding potential of ITS, while identifying the major issues that need to be resolved to ensure that our transportation system becomes more intelligent and enables the nation to seize the opportunities of the future.

Inquiry background

1.4 On 27 June, 2002, the Hon John Anderson MP, Deputy Prime Minister and Minister for Transport and Regional Services, asked the House of Representatives Standing Committee on Transport and Regional Services to inquire into the potential to apply variable speed limits to the F3 Freeway and the Hume Highway between Sydney and Canberra as case studies of the effectiveness of intelligent transport systems (ITS).

1.5 The request arose out of a detailed briefing on transport and regional matters that the Minister had given the committee.

1.6 Specific terms of reference were not developed for the inquiry. However, in his briefing Minister Anderson indicated that ITS had the potential to play an important part in Australia's continuing economic development. Minister Anderson indicated that the role of ITS would depend upon ongoing innovation and sound policy co-ordinated between jurisdictions. As an example of innovation, Minister Anderson mentioned variable speed limit signs. Minister Anderson also indicated that the Commonwealth, states and territories had developed and pursued a national ITS strategy for a number of years and that a review of the success of this policy and related ones was worthy of examination.

Conduct of inquiry

1.7 In the light of the briefing provided by the Minister, the committee decided to conduct an inquiry that examined the contribution that specific technologies could make to the implementation of ITS and the contribution to the implementation of ITS that could be made by the Commonwealth. To do this the committee developed a series of 'inquiry points' that would guide, but not limit, the inquiry. The points are:

- The potential to apply variable speed limits on the F3 Freeway and the Hume Highway between Sydney and Canberra as case studies on the effectiveness of intelligent transport systems;
- The benefits and costs of applying variable speed limits to the F3 Freeway and the Hume Highway between Sydney and Canberra;
- Any limitations on applying variable speed limits to the F3 Freeway and the Hume Highway between Sydney and Canberra;
- The role of the Commonwealth in fostering the development of intelligent transport systems on other sections of the land transport

systems in Australia, in the light of the experience derived from the development of the F3 Freeway and the Hume Highway between Sydney and Canberra; and

- Whether the experience derived from the development of the F3 Freeway and the Hume Highway between Sydney and Canberra can be used to identify sections of the land transport systems in Australia that may benefit from intelligent transport systems.

1.8 The committee decided that a focused inquiry, involving industry, as well as research and development peak stakeholders would enable the inquiry to proceed efficiently. Consequently, the committee approached peak organisations, industry bodies and researchers for contributions to the inquiry. Apart from a public hearing, at which the Department of Transport and Regional Services appeared, the committee conducted inspections and briefings with key stakeholders in Sydney and Brisbane and received submissions.

Structure of report

1.9 Intelligent transport systems are often little noticed elements in Australia's complex and diverse transport system. ITS is so much a part of the accepted background of Australia's transport infrastructure that many users of transport systems are not aware of the contribution ITS makes to the efficient and economic movement of people, produce and products.

1.10 For these reasons, the report begins with a brief review of the nature of ITS and their present contribution to the economy and their potential contribution, not merely in transport efficiencies but also in export income. The report then goes on to examine the major issues that have emerged in this inquiry.

2

ITS in Australia: An overview

2.1 Intelligent transport systems have a long history in Australia. The first ITS systems were introduced in Australia in the early 1970s.[1] over the ensuing three decades, the Australian public, the transport industry and the economy has come to rely more heavily on the efficient operation of ITS. To place ITS in context, it is necessary to review briefly what intelligent transport systems are, what ITS technologies have been implemented in Australia and the benefits that ITS are likely to provide to Australia.

What are intelligent transport systems (ITS)?

2.2 ITS-Australia defined intelligent transport systems (ITS) 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.[2]

2.3 Intelligent transport systems (ITS) integrate currently available and emerging information, computer, communications and vehicle-sensing technologies into transport infrastructure and vehicles in order to monitor and improve the safety, efficiency, management and operations of vehicles and transport systems.

2.4 The 'currency' of an intelligent transport system is information. The information generated by an ITS is used by traffic system managers and users to make timely and informed decisions as to vehicle usage and

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1 'Intelligent Transport Systems: Potential benefits and immediate issues', Facing the Main Roads Lecture Series, Main Roads Western Australia, www.mrwa.wa.gov.au/projects/strategies/future/its_paper04.pdf; accessed: 26 September, 2002.

2 ITS-Australia, submission no. 3.

deployment, to reduce congestion, pollution and accident risk. The predicted outcome of ITS are improved efficiency, safety, and environmental performance of vehicles and transport systems.

2.5 Specifically, intelligent transport systems apply advanced technology to:

- integrate all aspects of different transport modes (rail, road, air and sea) into one integrated transport system, to attain improved traffic efficiency and reduced congestion;
- control traffic;
- inform drivers and operators of vehicles about traffic and road conditions and availability of services;
- efficiently operate public transport;
- automate payment of road use charges;
- handle emergencies and incidents;
- operate commercial fleets and freight interchanges; and
- monitor vehicle control systems to allow vehicles to detect moving obstacles and communicate with road-side infrastructure to improve and automate road-user and driving safety.

2.6 The specific technology involved in ITS can be applied broadly across the transport sector. Specific applications include:

- Public Transport Systems so that they use advanced technologies to improve safety, efficiency and effectiveness. Benefits for the public transport user include reduced delays, ticketing convenience and security, and accurate route and schedule information.
- Traffic Management Systems are concerned with the overall management of traffic. These systems deploy ITS technology in projects that endeavour to reduce traffic and freeway congestion and enhance safety. The technology is applied to traffic signalling systems, traffic safety and route and congestion management.
- Traveller Information Systems use ITS technology to better inform the traveller about road, environment and traffic information. These systems incorporate the use of advanced information and navigation technology to enhance driver safety and play a role in minimising freeway and traffic congestion.
- Commercial Vehicle Systems are involved with the management and operation of commercial vehicles. ITS technology is deployed to better manage and service the freight industry and minimise on-route

interference and delays while still maintaining the highest level of safety and cost efficiency. These systems play an important role in the management of truck fleets to improve efficiency.

- Vehicle Control Systems provide improved road safety by allowing the vehicle to assist the driver. Vehicles have been developed which monitor the ever-changing driving conditions and take necessary measures to avoid accidents.[3]
- Electronic Toll Collection utilises ITS technology to provide a cost effective way of collecting vehicle tolls. These systems deploy ITS technology to collect tolls efficiently and minimise delays thus reducing traffic congestion.[4]

ITS in Australia

2.7 The committee was told repeatedly that while Australia leads the world in certain aspects of ITS research[5], technology and the implementation of certain aspects of ITS, it trails behind in other areas.[6]

2.8 A range of ITS initiatives have been implemented by various governments in Australia. Some examples currently operating in Australia, include:

- Adaptive traffic control systems, to provide priority for road-based public transport vehicles;
- Freeway management and information systems, to reduce delays due to traffic incidents;
- Electronic fare collection systems, to improve the convenience of public transport travel and reduce system costs;
- Electronic Tolling;
- In vehicle navigation and information systems, to assist drivers and reduce unnecessary travel;

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3 Other innovations include driverless vehicles travelling at highway speeds. See http://www.qits.net.au/about_its.asp; accessed 11 November, 2002.

4 *About ITS*, http://www.qits.net.au/about_its.asp; accessed: 25 September, 2002.

5 Inspection and briefing, RTA Traffic Management Centre, Sydney; CSIRO and ITS-Australia briefings, Sydney. 'Intelligent Transport Systems: Potential benefits and immediate issues', Facing the Main Roads Lecture Series, Main Roads Western Australia, www.mrwa.wa.gov.au /projects/strategies/future/its_paper04.pdf; accessed: 26 September, 2002.

6 For example, the adoption of ITS by the freight logistics industry, the lack of a single, national traveller information number, and continuing problems with the interoperability of the different toll collections systems in Australia. These matters are canvassed later in this report.

- Vehicle location and scheduling systems, to reduce theft, improve roadside service, and improve efficiency of freight movement; and
- Advanced traveller information systems, to improve users' understanding and efficiency of use of public transport systems.

2.9 In addition, there are several ITS trials currently being conducted on Vehicle Collision Avoidance Systems, Remote Vehicle Guidance Systems and Automated Highway Systems. Other major ITS projects include a national tolling working group, a national trucking location and access study, an in-car driver awareness program, bus information systems and an urban freight study.

ITS Research and Development

2.10 A number of Australian universities and research organisations are involved in ITS research. These include: The University of Sydney, Monash University, Queensland University of Technology, The University of New South Wales, The University of South Australia, The Transport Systems Centre, and The University of Queensland.

2.11 The Intelligent Transport Systems (ITS) Research Facility has been established through an Australian Research Council Infrastructure Grant and contributions from a consortium of Australian universities, road and transport authorities and the private sector. The research facility provides basic research infrastructure needed to develop, test and evaluate ITS technologies and traffic management control strategies. Very few similar facilities exist around the world.

2.12 The facility will enable researchers to develop and evaluate advanced traffic management and advanced vehicle technologies to improve the safety and efficiency of the transport system. The facility comprises:

- An Intelligent Transport Systems Research Laboratory at the University of Queensland; and
- An Intelligent Vehicle Systems Laboratory at Griffith University.

2.13 The CSIRO, undertakes a range of research projects in ITS. Scientific skills areas involved in ITS research include simulation, process modelling, spatial & temporal optimisation, Artificial Intelligence planning, data engineering, and software engineering. Inter-divisional collaboration involves other CSIRO skill groups such as telecommunications. Many CSIRO activities are conducted in collaboration with the industry.

2.14 Specific ITS research conducted by the CSIRO includes a 'Transport Futures' project. This project aims to design new transportation technologies and practices needed for the 21st century.[7]

2.15 Developments already implemented include Safe-T-Cam™, a digital imaging system that automatically detects and classifies moving vehicles, identifying large vehicles and reading their number plates. Safe-T-Cam™ was developed by Telstra, the Roads and Traffic Authority of NSW (RTA), and CSIRO. Safe-T-Cam™ encourages drivers to comply with operating and road worthiness rules. It protects revenue by enforcing registration rules, improves the efficiency of enforcement activities, and facilitates traffic management by generating accurate information.[8]

ITS Business

2.16 Australian companies are involved in the development and commercialisation of ITS technology. For example, Saab-ITS is a Brisbane based joint venture company recently established by Saab-Systems and Brisbane City Enterprises (BCE), the commercial arm of the Brisbane City Council (BCC). Saab-ITS aims to develop and sell state-of-the-art traffic control systems worldwide.

2.17 Saab-ITS' core business is advanced operational software, intensive systems development, production and support for the intelligent transport market. Saab-ITS handles the international marketing and sales of BCE's two intelligent transport products: RAPID, the real-time advanced priority and information delivery for buses, and BLISS, Brisbane's linked intersection signal system.[9]

2.18 The program was developed and refined in Brisbane over the past 15 years and was recently delivered to the Johor Bahru traffic authority in Malaysia. The company has already been selected for an intelligent transport system contract in Auckland worth $5.5 million and is undertaking the implementation of a $3.5 million lane control system ('tidal flow') on Coronation Drive Brisbane for BCC.[10]

2.19 Another company developing and exporting ITS technology is the Mi Services Group of South Perth. Mi Services was involved in the custom development of complex software for projects such as Melbourne's

7 http://www.dbce.csiro.au/research/project.cfm?proj_id=31; accessed: 26 September, 2002.

8 http://www.csiro.au/promos/billiondind/contents/smart.htm; accessed 26 September, 2002.

9 RAPID facilitates bus priority at traffic signals and provides passengers with the latest information on the expected arrival time of their bus. BLISS is a computer program that monitors traffic volume at key intersections and changes the timing of traffic signals to ensure the most speedy and efficient traffic flow.

10 http://www.saab-its.com.au/about%20us.html; accessed 25 September, 2002.

CityLink Central Control System and the Perth Traffic Control Centre's traffic management and control system that integrates freeway ITS facilities (such as closed circuit television, incident detection and variable message signs) with urban traffic signal control.[11]

2.20 ITS have been developed and implemented in a number of Australian jurisdictions.

Queensland

2.21 A number of ITS projects have been implemented in Queensland, and others are under development. ITS projects implemented include:

- The Pacific Motorway, a world-class transport link between Brisbane and the Gold Coast, which encompasses a range of ITS applications.
- The Ship Reporting System, a world-first mandatory ship reporting system which monitors ship movement along Queensland's Great Barrier Reef.
- The South East Busway, a dedicated two-lane roadway stretching through Brisbane's south-east suburbs for the exclusive use of buses, utilising a range of ITS technologies.
- Coronation Drive as previously described;[12]
- STREAMS, the Queensland Department of Main Roads' integrated intelligent transport system. It is installed throughout Queensland and manages both freeways and more than 1000 signalised intersections. STREAMS provides ITS services including freeway and surface street traffic management, incident management, passenger information and driver information, traffic signal management - adaptive coordination plan selection, adaptive movement control, public transport priority and VIP and emergency vehicle priority.[13]

2.22 A number of ITS are under development in Queensland. These include:

- Intelligent Access System which will enable the Queensland Department of Main Roads and Queensland Transport to expand work on remote monitoring of heavy vehicles via satellite tracking to encompass an electronic compliance monitoring regime. This system will form a platform for a national approach.

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11 http://www.indtech.wa.gov.au/trade/awards/2001/mi.htm; accessed 26 September, 2002.

12 See 2.18, above.

13 http://www.mainroads.qld.gov.au/MRWEB/Prod/Content.nsf/; accessed 28 September, 2002.

- Maroochydore Parking Guidance System which will assist motorists to find parking around the Sunshine Plaza at Maroochydore, located on Queensland's sunshine coast.
- Mt Molloy Load Limit Information Sign which will provide timely and accurate information to motorists during times of wet weather.
- Palmerston Highway Heavy Vehicle Safety Advisory System which is designed to educate drivers about their behaviour and to influence them to drive more safely.

2.23 The CSIRO, advised the committee that ITS technologies under development in Queensland included: road flood warning, variable message and mobile telephone messages, combining Bureau of Meteorology data with that from flood plain and Queensland Main Roads road terrain data, to predict road availability and water hazards.[14]

New South Wales

2.24 A number of ITS systems have been installed in New South Wales, the most significant of which is Sydney Coordinated Adaptive Traffic System (SCATS). This system was commissioned in 1972. SCATS coordinates and controls over 3000 intersections by continually adjusting the phasing of traffic lights so that they respond to traffic flow and traffic incidents. The RTA advised the committee that SCATS is recognised as the world's leading traffic signal control system, being used in over 80 cities throughout the world.

2.25 The RTA is developing an enhanced software package, SCATS 2, to take advantage of modern software, hardware and communications technologies. This software will provide all of the functions of the existing system as well as new facilities to provide for future advanced traffic management needs, including provision for dynamic bus priority. Other ITS technologies in use in NSW include:

- The Safe-T-Cam™ system enables the identification of speeding or un-rested truck drivers by photographing and then 'reading' the numberplate.
- F6 Fog Detection System, which uses sophisticated detection systems and Variable Message.
- Signs (VMS) are used to advise motorists of poor visibility, excessive speed, and when a motorist is too close to the vehicle ahead.

14 Briefing, Sydney, 15 August, 2002.

- Electronic Toll Collection on, for example, the M2, M5, and the Sydney Harbour Bridge. Toll charges are levied electronically as vehicles pass through toll plazas. Manual toll-booths also exist.

2.26 Since 1998/99 incident management initiatives have included the expansion of closed circuit television coverage, automatic incident detection facilities, Variable Message Signs (VMS) and Variable Speed Limits (VSL). These initiatives commenced with the completion of the pilot M4 Motorway scheme.

2.27 The major traffic management resource within the RTA is the Transport Management Centre (TMC) situated in Sydney's inner South. The TMC enables the RTA to take an innovative and integrated approach towards the management of the NSW road network. The TMC also provides a command capability for managing the transport task of special events such as the Easter Show and the Olympic Games.

Victoria

2.28 A variety of ITS applications have been installed on the Victorian road system, by VicRoads[15]. These have included:

- Drive Time (a real time traffic information sign);
- Variable message signs;
- Incident detection systems;
- Ramp metering;[16]
- Freeway condition signs;
- Ice detection systems;
- Closed circuit television cameras; and
- Roadside speed check systems.

2.29 In 2002, VicRoads installed a computer controlled dynamic speed limit system on the Western Ring Road in Melbourne. This system will monitor traffic congestion and calculate the best traffic speed that will optimise

15 VicRoads is the registered business name of the Roads Corporation, a Victorian statutory authority. VicRoads is responsible for maintaining and improving the condition and performance of Victoria's 22,240 km of arterial roads and 4924 bridges and major culverts. VicRoads also develops road safety programs, registers vehicles and licenses drivers. http://www.vicroads.vic.gov.au/vrne/vrninte.nsf/; accessed: 26 September, 2002.

16 Ramp metering is the practice of regulating the rate at which cars enter an urban freeway by means of traffic signals at entrance ramps. It is an increasingly common traffic management technique in metropolitan areas with extensive freeway networks. http://www.its.umn.edu/sensor/2001/spring/virtualmicroscope.html; accessed 24 October, 2002.

traffic flow. The speed limits will be transmitted to drivers via a series of 80 roadside electronic signs. VicRoads also advised the committee that the Geelong Road Project would also incorporate a number of ITS applications. This project was due for completion by the end of 2002.[17]

Western Australia

2.30 Successive Western Australian administrations have implemented ITS policies and as a result, a number of ITS technologies have been installed in Perth.[18] These include:

- Computerised Traffic Control Signals which are based on the SCATS system in Sydney. This system monitors traffic flow, adjusts the timing and coordination of traffic signals and reports signal faults 24 hours per day. The first traffic signals were connected to SCATS in 1983 (on the Albany Highway), and the coverage has continued to grow to the extent that all traffic signal installations in the State (approximately 730 sites) are now connected.
- CCTV - Monitoring systems. Closed circuit television cameras (CCTV) have been installed throughout the metropolitan area as part of the development of Perth's Intelligent Transport Systems. The cameras – so far 41 have been installed – provide valuable real time information on road and traffic conditions to the trained operators at the Traffic Operations Centre, who monitor them 24 hours per day. Video images from the various camera sites are also broadcast on this web site as part of Traffic and Road Information.
- Traffic Operations Centre. A modern, purpose-built facility that manages the Perth metropolitan road network and the control systems associated with the Graham Farmer Freeway tunnel.
- Variable Message Signs (VMS) are used to deliver on road information to motorists in real time. The types of VMS range from simple one or two line message signs to fully variable signs that can include graphical displays pertaining to traffic conditions, current freeway travel speeds and road safety messages.
- Traffic and Road Information is an internet based system that allows users to obtain road information and report faults. Information that can be obtained via the web site include: images from CCTV cameras, congestion status, freeway speeds, traffic and roads conditions reports, and roadworks.

17 VicRoads, submission no. 2.

18 http://www.mrwa.wa.gov.au/traffic/its/; accessed 28 September, 2002.

- HERO - Highway Emergency Response Operations. The aim of HERO is to improve the safety and efficiency of Perth's freeways by minimising disruption to traffic caused by incidents.
- Weigh In Motion System, Fremantle. This system uses an electronic scanner and automatic weighing equipment to weigh trucks, monitor speeds and identify the vehicle. Vehicles carrying containers into and out of the port of Fremantle register the legal capacity of the load and have an electronic tag fitted to the windscreen. The system helps prevent damage to roads and vehicles.[19]
- Trialing New Technologies. Main Roads Western Australia has trialed a number of new ITS technologies. These include: Video Traffic Detection where video cameras are used to detect the movement of vehicles on roads and freeways. Video detectors can replace more conventional systems that usually use inductive loops to register vehicle movement. Another technology trialed is intelligent pedestrian crossing signals that automatically cater for all users. Pedestrian User Friendly Intelligent (or PUFFIN crossings) automatically detect the presence of pedestrians crossing the road and will allocate extra time to the walk phase if needed.

Other ITS innovations

2.31 Australiawide Loading Pty Limited (since 2001 known as FR8solutions communications) was established in 1999 to provide a telephone & teletext based freight matching system for truck operators. The system provides one contact point rather than multiple agents scattered throughout the country, and so delivers economies of scale. Australiawide Loading is a free service for the truck operators, who indicate their availability up to a month in advance. More than 50,000 operators have access to the system.

2.32 Australiawide Loading uses the technology of the world wide web and communication with the vehicles by mobile phone, and employs a unique matching system that provides access to the entire client base on a 24 hour, 7 day a week basis.[20] FR8solutions communications was established as an initiative of the National Office of the Information Economy (NOIE).

2.33 The committee was briefed on the 'driverless trucks' at Tarong Coal Mine. The coal mine has six driverless trucks that transport coal to dumping

19 Andrew Garrett, *Intelligent Transport Systems: Potential Benefits and Immediate Issues*, Facing the Main Roads Lecture Series, Main Roads Western Australia, www.mrwa.wa.gov.au/projects/strategies/future/its_paper04.pdf; accessed: 26 September, 2002.

20 http://www.alis.com.au/About.aspx; accessed 25 September, 2002.

stations and also travel to refuelling stations as needed. The roads they travel are not fenced off, but are open to the passage of other vehicles, including cars and trucks, as well as pedestrians. The trucks use global positioning systems, anti collision sensing. All systems on the driverless trucks are triply redundant. The benefits of these 'intelligent' vehicles include reduced engine wear, and longer tyre life. Tyres for the trucks are $US10,000 each. Driver controlled trucks use two sets per truck per year; the tyres on the driverless trucks last three years.[21]

2.34 'Milk link' is a demonstration project, funded under the e-transport national strategy, to replace paper-based farm and quality management systems involved in milk production, with records maintained on hand-held computers. The records involve not only production data but also animal data, such as vaccination and other health records. These records are searchable and easily transferable to milk processors and other interested parties.[22] Dairy foods processors can then use information about the quantity of milk produced on any one day to dispatch the right number of milk tankers of the right size at the right time. This better matches transport infrastructure to the task at hand leading to more efficient use of trucks, and fuel.

Not all good news

2.35 Transport industries have been slow to adopt ITS, according to DoTaRS. The department reported that, even though the appropriate uptake of E-commerce by the Freight Transport Logistics (FTL) industry is a cornerstone on which future advances in seamless logistics management will be made, according to figures issued by NOIE only 50% of the 30,690 road freight operators have an internet connection. It appears that freight operators perceive a lack of business benefit from current E-commerce systems when weighed up against the costs of investing and updating the technologies.[23]

2.36 DoTaRS also reports that another factor reducing the adoption of ITS revolves around the confusion whether E-commerce systems will offer the industry a durable solution that will meet their future needs. Overall, DoTaRS paints a stark picture:

> The fragmented nature of the FTL industry frequently gives rise to delays and misunderstandings between participants which

21 Mr Colin Jensen, Briefing, Brisbane 13 September, 2002.

22 ITS - Australia, submission no. 3.

23 'Linking Ahead', Industry Steering Committee Discussion Paper, Australian Freight Transport Logistics Industry Action Agenda; http://www.dotrs.gov.au/transinfra/aftliaa/linking_ahead.htm; accessed 11 November, 2002.

> escalate along the supply chain. A key example of this is the lack of coordination of vehicle movements in and out of the port interface, leading to congestion and delays that affect shippers, importers and the end customers. Stevedores have introduced vehicle booking systems (VBS) to address this problem and improve the scheduling of vehicle movements. These have had a positive impact on this issue, however, they rely heavily on the cooperation of road transport operators who often lack the facilities to comply with the system and/or meet the associated expenses. [24]

Benefits of Intelligent Transport Systems

2.37 The proponents of ITS claim that ITS will lead to more efficient use of the transport system and fewer accidents. Reducing the costs associated with the transport system, and the number and severity of accidents will result in lower transport costs for industry and lower costs of operating a transport system for the community. The specific benefits of a more efficient transport system include:

- Reduced traffic congestion and reduced costs associated with congestion. For example, reduced travel time, reduced fuel use, lower environmental costs and reduced pressure to build more roads;
- Improved competitiveness and performance of the freight/logistics systems and increased efficiency of vehicles using the road system (less fuel consumption per kilometre, increased payload and fewer vehicles operating unloaded or partly loaded);
- Increased patronage of the rail system, which leads to lower transport costs and less pressure to build expensive transport infrastructure; and
- Reduced costs associated with vehicle use and ownership, such as theft[25] and journey planning.[26]

Is ITS needed?

2.38 There is considerable evidence collected from within Australia, and abroad, that ITS can produce considerable reductions in accident rates and

24 *Transport Infrastructure Policy*, http://www.dotrs.gov.au/transinfra/aftliaa/linking_ahead.htm' accessed: 25 September, 2002.

25 ITS - Australia, submission no. 3.

26 ITS - Australia, submission no. 3; Mr Colin Jensen, Briefing, Brisbane, 13 September, 2002; *E-transport: The national strategy for intelligent transport systems.*

improvements in transport efficiencies. There is also strong evidence that reductions in accidents and improvements in efficiency will produce significant financial savings to the community, largely through the more focused use of existing transport infrastructure and through reducing the need to build more, larger roads.

2.39 For example, the committee was advised by ITS - Australia that ITS is estimated to provide a benefit/cost return of 10:1, while Mr Colin Jensen advised the committee the cost to benefit ratio was in the range 4.8:1 to 19.0:1, with the lower estimations being 'considered conservative'.[27] In *e-transport: The national strategy for intelligent transport systems*, benefits were estimated to total, in net 1999 value terms to 2012, at least A$14.5 billion. This was reported to be consistent with reducing the total costs of road accidents, congestion and vehicle emissions for the year 2012 by at least 12%, compared to the situation of not using ITS.[28] Specific savings were estimated as:

- $3.5 billion in efficiency savings;
- $3.8 billion in savings from safety; and
- $7.5 billion in savings from reduced congestion and lost time.

2.40 By 2012, it is estimated that additional community and economic benefits of at least $3.8 billion per annum, excluding export income, will be produced if ITS are implemented.[29]

2.41 These savings can be put in context when various other measures of the transport system are taken into account. For example, in the period January to August, 2002, 1,143 people died on Australian roads and in the year September 2001 to August, 2002, 1,749 people died as a result of road accidents. While the human misery from road accidents is incalculable, the monetary cost of crashes is in the order of $15 billion per annum (1996 data).[30] A reduction of just 10% in the number killed on the road, reduces the human and financial costs enormously.

2.42 Annually, some 139,000 vehicles are stolen, resulting in an average cost of $8,100 per insurance claim, with a cost to the community estimated at around $1 billion before the costs of lost production and inconvenience are included.[31]

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27 ITS-Australia, submission no. 3; Mr Colin Jensen, Briefing, Brisbane, 13 September, 2002.

28 *E-transport: The national strategy for intelligent transport systems*, p. 1.

29 Booz Allen & Hamilton, *Intelligent Transport Solutions for Australia*, summary report, Sydney: 1998.

30 Australian Transport Safety Board, http://www.atsb.gov.au/road/index.cfm; accessed 25 September, 2002.

31 ITS - Australia, submission no. 3.

2.43 There is clear evidence of considerable inefficiencies in the Australian transport system. In 1998 it was reported by the CSIRO that traffic congestion levels were increasing by 8% per annum. The CSIRO also reported that traffic congestion has negative impacts on transport efficiency, road safety, human health and the environment. The CSIRO states that 'In Australia, congestion, malfunctions and transport delays are estimated to cost over $5 billion per annum in travel time and vehicle operating costs'.[32]

2.44 This may well be an underestimate. In a keynote speech to the Tourism and Transport Industry Leaders' Summit, 26 September, 2002[33], the Deputy Prime Minister and Minister for Transport, the Hon John Anderson MP, reported that at present congestion cost the Australian community around $13 billion per annum and that this would rise to over $30 billion per annum over the next fifteen years or so, if we continue to manage transport as we do at present.

2.45 Intelligent transport systems are expected to reduce greenhouse emissions and thereby produce considerable positive environmental outcomes. ITS does this by improving traffic flows and vehicle management, leading to reduced fuel consumption. It is estimated that ITS will produce fuel savings of between 2% and 13% and reduce emissions by between 5% and 15%.[34] Putting this in context, in 1998 Australia's transport sector contributed about 12% to the total of Australia's greenhouse gas emissions, with road transport accounting for 81% of these emissions. It is estimated that a reduction of road transport related emissions by 20% would reduce Australia's total greenhouse gas emissions by almost 2%.[35] Mr Colin Jensen supported these figures and advised the committee that projected benefits from ITS include:

- E-tags (aka: E-Zpass) reduced delays 85%; saved approximately 4.5 million litres of fuel each year, 130,000 kg of volatile organic compounds and 20,800 kg of nitrogen oxides;
- Traffic signal improvements reduced fuel consumption by 2% - 13%.[36]

32 CSIRO, *ITS-Connect – A Nationwide Approach to Intelligent Freight Transport*, http://www.dbce.csiro.au/innovation/2000-10/its_connect.htm; Booz Allen & Hamilton, *Intelligent Transport Solutions for Australia*, summary report, Sydney: 1998.

33 http://www.ministers.dotars.gov.au/ja/speeches/2002/AS26_2002.htm; accessed 11 November, 2002.

34 Booz Allen & Hamilton, Intelligent Transport Solutions for Australia, summary report, Sydney: 1998.

35 'Intelligent Transport Systems: Potential benefits and immediate issues', Facing the Main Roads Lecture Series, Main Roads Western Australia, www.mrwa.wa.gov.au/projects/strategies/future/its_paper04.pdf; accessed: 26 September, 2002.

36 Briefing, Brisbane, 13 September, 2002.

2.46 Relatively cost effective ITS technology can produce considerable positive safety outcomes. For example, collision warning systems are reported to reduce road accidents by between 33% and 40%.[37] This would appear to be supported by information published by the European Union, which is implementing a large ITS strategy. The EU has reported that the use of the variable message signs on motorways has reduced rear-end collisions by 30% (in fog by 85%); advanced driver assistance and anti collision systems have reduced accidents by around 50%.[38]

2.47 Although comparisons with overseas jurisdictions are not simple or direct, a range of Japanese, European and Unites States estimates suggest that ITS applications will reduce road accidents by 20% - 40%, and reduce urban travel times by around the same amount.

2.48 Freeway management systems in the United States are reported to have reduced accidents by between 24% to 50%, while handling 8% - 22% more traffic, at speeds 13% - 48% faster than the pre-existing, pre-ITS conditions. Japanese estimates indicate that investment in appropriate systems could reduce the road toll by 20% and expressway congestion by 70%.[39]

2.49 Safety improvements were also highlighted in briefings the committee received. Mr Colin Jensen indicated that ITS was found to improve safety:

- Red-light violations down by 20%-75% at different control points;
- Ramp-metering reduced accidents by 15% - 50% and reduced freeway travel times by 22% saving 25,121 hours;
- Real-time video monitoring on buses reduced assaults by 33%;
- Global positioning systems reduced emergency response times by 20%.[40]

2.50 Mr Jensen also indicated that adaptive signals reduce delays by between 14% - 44%, and that if 15% of vehicles staggered departure times by 20 minutes, there was a reduction of 80% in delays from congestion. Mr Jensen also reported an example from Florida where, when the toll was changed to higher rates during peak periods (the so called 'value-time pricing' approach), 20% of vehicle operators adjusted departure times.

2.51 The savings to business and ultimately the consumer of implementing ITS are predicted to be considerable. For example, a 1999 study conducted by

37 ITS-Connect – A Nationwide Approach to Intelligent Freight Transport, http://www.dbce.csiro.au/innovation/2000-10/its_connect.htm

38 *e-Europe: An Information Society For All*, Communication on a Commission Initiative for the Special European Council of Lisbon, 23 and 24 March 2000.

39 *e-transport: The national strategy for intelligent transport systems*, p. 1.

40 Briefing, Brisbane, 13 September, 2002.

the National Office of the Information Economy (NOIE) estimated that Woolworths could save up to $1 billion per annum through the appropriate implementation of E-commerce to automate its transactions with transport providers.[41]

2.52 Against this background are predictions surrounding increased transport infrastructure use in the years ahead. By 2012, the amount of freight transported is predicted to double[42] and by 2020, traffic is predicted to increase in volume by 50%.[43]

2.53 The importance of improved efficiencies in the transport system for the national economy is brought out clearly when the place of the transport system in national prosperity is understood. About 1960 million tonnes of freight are transported around Australia each year and about 496 million tonnes of freight are exported from Australia each year. Australians drive an estimated 181 billion kilometres each year.[44]

2.54 NOIE reports that the *road* transport industry *alone* accounts for 3.5% of Australia's GDP or some $14.692 billion and employs 2.6% of the Australian workforce or 223 500 people.[45]

2.55 The road transport industry plays an important role in the final value/cost of many other goods and services. For example, the road transport industry adds $6.70 per $100 of final output for milk and meat. NOIE notes that 'improving the efficiency of this [the road transport] sector through greater effective use of e-commerce has the potential to flow through to efficiencies in other sectors [of the economy]'.[46]

2.56 The logistics industry is a major pillar of economic prosperity, not only in this country, but abroad.[47] DoTaRS reports that the:

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41 *Trucks Online: National road transport scoping study*, Commonwealth of Australia, 1999, p. v.

42 *Background Briefing*, 'Rail, Road and Money', 28 April, 2002, ABC Radio National.

43 The Warren Centre, submission no. 1, attachment, "Moving People – Executive summary", a report in the Sustainable Transport in Sustainable Cities Project.

44 http://www.bte.gov.au/docs/trnstats02/trnstats.htm; accessed 30 September, 2002.

45 *Trucks Online: National road transport scoping study*, Commonwealth of Australia, 1999, pp. 2-3.

46 http://www.noie.gov.au/projects/ecommerce/Sector/Transport/; accessed 26 September, 2002.

47 The Logistics Association of Australia defines logistics as: '… the cost effective process of planning, implementing and controlling the efficient movement and storage of raw materials, finished goods, services and related information from point of origin, through manufacturing, warehousing and distribution to the end user for the purposes of conforming to customer requirements.' On this account, freight transport logistics is the science or management of the movement of freight and is essentially the process that ensures that the right resources are positioned in the right place, at the right time, in the right quantity and quality, and at the right price. Excerpted from: *Transport Infrastructure Policy*, http://www.dotrs.gov.au /transinfra/aftliaa/linking_ahead.htm' accessed: 25 September, 2002.

> … OECD estimates that logistics activities (including customer interfaces, supplier interfaces, transportation, warehousing and materials handling, materials planning, information systems and management) comprise 11-16% of world gross domestic product (GDP). Applying a similar proportion to the Australian economy it would mean that logistics activities are worth between $62 billion and $80 billion for the Australian economy.

2.57 DoTaRS says that the *transport* component of this contribution can be estimated from the National Accounts. The National Accounts, 1998-1999 estimated that transport industries involved in *direct* provision of infrastructure and service contributed around $19.8 billion, or 3.4% towards GDP. *Total* transport related activities (including storage, management and intelligent transport systems) contributed $31.4 billion annually, accounting for around 5.3% of total GDP in 1998-99.[48]

2.58 In 2000-2001 transport specific businesses contributed 4.9% or $31 billion to GDP and these figures excluded transport activity performed by other businesses. The transport sector provided 423,000 jobs, or 4.6% of total employment in 2000—2001.[49]

2.59 The Australian Freight Transport Logistics (FTL) industry is highly dependent on technology at every level of operation, from the delivery of services - including the movement, packaging and monitoring of goods - to business management and commercial transactions. DoTaRS states that:

> … the future competitiveness of the FTL industry will significantly hinge on how well the industry embraces new technologies to improve the efficiency of operations across all transport modes and provide value added logistics services.[50]

2.60 Adopting policies and implementing technologies that lead to more efficient transport and logistics industries are crucial to Australia's prosperity. As DoTaRS notes:

> The highly fragmented nature of the Australian Freight Transport Logistics industry is proving counter-productive in achieving a seamless logistics practice, and will affect Australia's international competitiveness in global market terms. Overseas buyers and sellers will increasingly look towards a transparent and integrated

48 http://www.dotrs.gov.au/transinfra/aftliaa/linking_ahead.htm' accessed: 25 September, 2002.

49 http://www.bte.gov.au/docs/trnstats02/trnstats.htm; accessed 30 September, 2002.

50 http://www.dotrs.gov.au/transinfra/aftliaa/linking_ahead.htm' accessed: 25 September, 2002.

> intermodal transport system, which will deliver their goods through seamless demand/supply chains.[51]

2.61 'Spin-off' benefits are anticipated from developing ITS in Australia. ITS is information, technology-based and typically involves high levels of value-adding. Information, technology-based industries are rapidly developing sectors of the global economy and it appears that there are emerging export opportunities for ITS technology. Proponents of ITS claim that the development of ITS systems in Australia will generate exports in skills and high technology products, such as computer software and systems to the Asian and other export markets. There is some evidence of this already, with SAAB-ITS and the New South Wales Road and Traffic Authority exporting locally developed ITS technology to many cities abroad.[52]

2.62 The evidence, from within Australia and also from abroad, is that ITS can provide considerable economic and social benefits at a relatively modest cost, while also providing substantial export opportunities.

51 *Transport Infrastructure Policy*, http://www.dotrs.gov.au/transinfra/aftliaa/linking_ahead.htm'; accessed: 25 September, 2002.

52 See Chapter 4.

3

The application of variable speed limits to the F3 and the Hume Highway between Sydney and Canberra

3.1 In this chapter the specific issue of using the F3 and Hume Highway as case studies for variable speed limits will be examined.

The F3

3.2 The F3 freeway runs from Sydney to Newcastle. It is 128km long and was completed in 1999, although work commenced on sections of it in the 1960s. The F3 is part of the major transport route between Sydney, the central and north coast, up to Brisbane and forms an integral element in the transport system of the eastern seaboard.

3.3 The F3 has had a significant effect on population distribution to the north of Sydney. Before the F3, the only way to gain access to areas north of Sydney such as the Central Coast and Newcastle was by way of the two-lane road Pacific Highway or via rail. The completion of the F3 brought about increased residential development along the Central Coast and reduced the time taken to transport freight between Brisbane and Sydney. The F3 is one of the busiest National Highway corridors, carrying more than 60,000 vehicles daily.[1]

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1 The Hon. John Anderson MP, 'Federal Government Keeps New South Wales Moving', Media Release, 14 May, 2002; and http://www.dotrs.gov.au/transprog/road/nat_hwy/corridors/syd_bris.htm; accessed 30 September, 2002.

The Hume Highway

3.4 By 2006, Commonwealth investment in national roads will achieve a four-lane divided highway over much of the distance between Melbourne and Noosa Heads, on the Sunshine Coast in Queensland.[2]

3.5 In his letter to the committee, Minister Anderson indicated that the Hume Highway between Canberra and Sydney should be considered as a potential case study into ITS. The stretch of highway that runs from the Hume Highway turn-off to Canberra, is known as the Federal Highway.

3.6 A major element of this, the Hume Highway, is the main thoroughfare between Sydney and Melbourne. From Ashfield in Sydney's south-west, the Hume runs through the Southern Highlands, bypassing towns such as Camden, Moss Vale and Mittagong that were once on the highway. The freeway standard road continues into the New South Wales highlands, bypassing Goulburn, Gunning and Yass. From Yass to Albury, the road slowly descends to the Murray River valley to the Victorian border. Within New South Wales, about 415 km of the 520 km of Hume Highway south of Liverpool is dual carriageway.

3.7 The Hume Highway links Australia's two largest cities, and as such it is a major interstate transport corridor. It carries road freight worth about $20 billion annually and is used by 10 million people every year. The highway provides a vital link to regional freight networks, and for the transport of rural produce from some of the nation's most significant agricultural regions. Daily traffic levels vary considerably – from around 80,000 vehicles per day at the southern edge of Sydney, to a low of about 4,700 vehicles per day between Tarcutta and Holbrook in southern New South Wales. Traffic levels on the Hume Highway in Victoria average 20,000 vehicles per day, while about 66,000 vehicles per day use the highway north of Melbourne. Commercial and heavy transport vehicles comprise between 16–40 per cent of the traffic stream, depending on the location.

3.8 Fatalities on specific stretches of the Hume Highway for recent years are:

Table 1: Fatalities on selected portions of the Hume Highway

Stretch	Period	Number of fatalities
Liverpool – Yass	1997	18
Liverpool – Yass	2000	7
Ashfield – NSW to Victorian border	Year to August 2002	15

2 Hon John Anderson MP, Address at the Official Opening of the ACT-Sutton Section of the Federal Highway, 12 September 2000; http://www.ministers.dotars.gov.au/ja/speeches/2000/as12_2000.htm; accessed 30 September, 2002.

3.9 Most of the Hume Highway, including all of the 294 km in Victoria, is built as a four-lane dual carriageway. About 100 km of the Hume Highway in New South Wales is single carriageway, the majority (some 88 km) being a section south of the Sturt Highway junction through Albury to Wodonga. Total vehicle numbers are expected to grow by between 4,000 and 15,000 per day by 2015.[3] This will affect traffic numbers between Sydney and Canberra.

3.10 The Federal Highway begins 10km west of Goulburn at the Hume Highway. From this point the dual carriageway heads south-west, bypasses Collector, continues on around Lake George and climbs up into the ACT where it ends at Canberra.

3.11 More than 12,000 vehicles use the 77 kilometre-long Federal Highway each day of which 15 per cent are commercial vehicles. Average annual daily traffic volumes are expected to increase to around 13,370 by 2010. This represents a yearly growth rate of 3.6 per cent.[4] In 1997, there was one fatality on the Federal Highway while in 2000, 4 fatalities occurred.[5]

3.12 The route is a vital road transport link from Sydney via the Hume Highway to Canberra and the surrounding region. The task of converting the Federal Highway into a dual carriageway was completed in 2000. This upgrading was designed to cater to projected traffic volumes for the next two decades.

Variable speed limits (VSL)

3.13 Experience abroad indicates that on congested roads VSL can have a beneficial effect on traffic flow and safety. On the M25 in England, speed limits were adjusted in response to the level of congestion. The M25 is one of the most congested freeways in England and one of the busiest motorways in Europe, with more than 700,000 journeys made daily.[6] Using variable message signs (VMS) and loop detectors measuring traffic density and speed, speed limits were lowered in increments as congestion

3 http://www.dotars.gov.au/transprog/road/nat_hwy/corridors/syd_melb.htm; accessed 30 September, 2002.

4 http://www.dotars.gov.au/transprog/road/nat_hwy/corridors/canberra.htm; accessed 22 September, 2002.

5 NSW Government (Roads and Traffic Authority, Road Safety Strategy Branch), *Road Traffic Accidents in NSW – 1997: Statistical statement year ended 31 December, 1997*, Sydney: 1999. and *Road Traffic Accidents in NSW – 2000: Statistical statement year ended 31 December, 2000*, Sydney: 2001.

6 Department for Transport (UK), 'A New Deal for Trunk Roads in England, Regional Leaflets: M25 London Orbital Motorway'; http://www.dft.gov.uk/itwp/trunkroads/leaflets/londono.htm; accessed 13 November, 2002.

increased. Speed cameras were used to enforce the speed limits, resulting in 26,000 fines.

3.14 The study found that motorists were more inclined to keep to their lane when a 'faster lane' no longer existed. They were also more inclined to keep to the inside lane and to keep proper distances between successive vehicles, resulting in smoother traffic flow which actually increased average travel times of traffic. Results show that traffic accidents decreased by 28 per cent during the 18 months of operation.[7]

3.15 Vicroads advised the committee that it supported VSL because:

> Dynamic, real time variable freeway speed limits have the potential to provide significant benefits in terms of efficient traffic flow and road safety improvements.[8]

3.16 The Hume Highway and the Federal Highway are important transport routes and it is apparent that these routes will need to be maintained to a high standard if they are to continue to play the crucial part in Australia's transport infrastructure that they do now.

3.17 However, witnesses, submissions and stakeholders providing briefings to the committee were divided as to the benefit of using these stretches of highway as case studies in the effectiveness of variable speed limits. ITS-Australia advised the committee that further case studies were unnecessary:

> VSS [Variable speed signs] … are now in use in hundreds of highways around the world and have been used in Australia in many projects such as the Westgate Bridge in Melbourne, the Domain and Burnley tunnels in Melbourne and many others. There really is no need to investigate the use of stand alone ITS technology such as VSS.[9]

3.18 The Warren Centre advised the committee that VSL would seem to have greater application to urban freeways, such as the eastern end of the M5 Freeway leading to the Hume Highway, where there are high traffic flows and other problems that may impede traffic flow. [10] While the committee accepted this point, it should not be to the exclusion of certain major corridors, such as the Hume Highway, where specific stretches may benefit from the application of VSL.

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7 http://www.benefitcost.its.dot.gov/ITS/benecost.nsf/ID/8FD5EA 59EFFF390F852569610051E25B; accessed 26 September, 2002; cited in Submission no. 3.

8 VicRoads, submission no. 2.

9 ITS - Australia, submission no. 3.

10 The Warren Centre, submission no. 1.

3.19 A report prepared for the US Federal Highway Administration concluded that:

> … due to its high cost, VSL should be implemented in areas where environmental and/or traffic conditions resulted in significant fluctuations in the desired speed.[11]

3.20 This would appear to be supported by the experience in England on the M25, referred to previously. This is a view provided in testimony. DoTaRS advised the committee that only very specific situations – high traffic flows and adverse conditions – make VSL cost effective, because the technology is expensive:

> Certainly the international experience, particularly, in Europe, has been that VSL systems have been found to be cost-effective on roads where there is fairly high traffic volume and where there are frequent periods of extremely adverse weather conditions like heavy fog. Obviously, the combination of high traffic density and heavy fog, for example, is the kind of situation that will lead to severe traffic problems. In those kinds of circumstances, it appears to be a very cost effective treatment.[12]

3.21 There is little doubt that the Hume and the Federal Highways, as well as the F3, have high traffic flows and experience adverse weather conditions. High winds are a feature of the F3 near the Hawkesbury River, and fog is a common occurrence near Lake George on the Federal Highway and Goulburn, on the Hume Highway. Nevertheless the road conditions and road capacity are such that vehicle operators can usually adjust their speed to the conditions.

3.22 The committee notes that variable speed limits (VSL) are already operating in Australia, mainly limited to motorways (the M4 and M5) and tunnels, as well as General Holmes Drive in Sydney.[13]

3.23 The committee was also advised that VSL will be used on the Western Ring Road in Melbourne. The system being installed here is a real time, dynamic system. This road carries about 100,000 vehicles per day, 15per cent of which is heavy traffic. The high traffic flow on this 26 km stretch of divided carriageway results in traffic congestion and accidents.

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11 DoTaRS, submission no. 5. The report estimated VSL to cost between US$0.4 and US$1 million per kilometre.

12 *Transcript of Evidence*, pp. 5 and 12.

13 DoTARS, submission no. 5.

3.24 The committee notes that all these roads carry high volumes of traffic and without adequate management these roads are vulnerable to congestion problems.

3.25 Apart from specified areas on the Hume Highway, Federal Highway and the F3, widespread application of VSL across the country is unlikely to be a prudent use of taxpayer funds, unless the cost of the key component – variable message signs – can be drastically reduced and the use of VSL is finely targeted.

3.26 Moreover, sufficient data exists from the application of VSL to stretches of road in Australia and abroad, to enable the identification of the areas of road where VSL will be effective. The committee concludes therefore, in the light of information already available, that further cases studies, using the Hume and Federal Highways and the F3 are unnecessary.

3.27 Although the weight of evidence did not support using the F3 and the Hume and Federal Highways as further case studies for VSL, the submissions and briefings did support studies that bundled together different ITS technologies in a coordinated manner.

3.28 For example, Raytheon proposed to the committee a study program to evaluate a wide range of ITS technology. Raytheon proposed that it would integrate, as a minimum, these components into an 'Automated Active Highway Traffic Management System':

- Centralised management system;
- Latest technology variable speed limit signs;
- Adjusted automated notice signs;
- Traffic flow sensors;
- Weather sensors;
- Time of day/sunlight sensors;
- Digital speed violation cameras; and,
- Traffic monitoring cameras.[14]

3.29 The system that Raytheon proposed was described by the company as an 'exportable, automated highway traffic flow management system'.[15] The committee believes that the integrated system Raytheon proposed should be investigated. In acknowledging this, the committee saw the potential involvement of a number of Australian technology sectors and the

14 Raytheon Australia, submission no. 4.

15 Raytheon Australia, submission no. 4.

possible application of integrated ITS to other frequently used highways and expressways.

3.30 The Warren Centre supported a study of ITS in general rather than a narrowly focused study of one ITS technology:

> The case study of ITS application on the F3 and the Hume Highway between Sydney and Canberra is strongly supported. However, it is recommended that the … [committee] … broaden the case to study all appropriate ITS measures for these routes.[16]

3.31 DoTaRS expressed caution in using the F3 and Hume as case studies. Instead, DoTaRS supported a broad study of ITS technologies, integrated into a comprehensive ITS system, provided cost effectiveness could be established[17]

3.32 The committee notes that existing traffic management systems have specific components that could be installed on either the F3 or the Hume and Federal Highways, in order to test an *integrated* ITS system. Such technology can be obtained from, for example, the ITS infrastructure already in place in Queensland, New South Wales and Victoria.

3.33 An example of such technology is variable message signs (VMS). The committee was advised that these signs are manufactured locally, powered by solar panels, with a generator backup, the messages are programmed and the sign status monitored remotely via a GSM mobile telephone network. The committee was advised that small signs cost as little as $9,000 and larger signs cost as much as $130,000.[18] Information obtained by the committee indicated that a 2.5m by 2.2m sign used by road construction companies costs about $55,000 to manufacture. The relatively modest cost of such signs, combined with remote management, would suggest potential use in 'black spots' in rural areas and on long stretches of highway likely to induce fatigue in drivers.

3.34 The committee also notes that some integrated ITS technology has been installed on portions of the F3, as a result of Commonwealth funding of more than $3 million. The F3 electronic driver aid system uses a number of cameras along the F3 between Sydney and the New South Wales Central Coast to detect crashes and congestion, while overhead variable message boards convey instantaneous advice and instructions to road users. Targeted at the 17 km stretch between Berowra and Mt White, the cameras are linked to a central traffic management centre. Up-to-the-minute

16 The Warren Centre, submission no. 1.

17 Submission no. 5; *transcript of evidence*, p. 2.

18 Mr Colin Jensen, Briefings, Brisbane, 13 September, 2002.

information on weather conditions, safety or speed changes are relayed via the electronic message signs.[19]

3.35 There is an opportunity to install additional, integrated ITS technology on the Hume and Federal Highways and the F3. However, it should be finely targeted. For example, speed is a major cause of accidents on our roads. Perhaps increasing the number of Safe-T-Cams™, extending their operation to cover cars and motor bikes, in addition to trucks, and using significant sections of the major arterial highways in New South Wales and Queensland (for example, the Newell or the New England) as testing grounds, might lower speeds and save lives. This suggestion is in accord with recommendation 21 of the report *Beyond the Midnight Oil: Managing the Fatigue in Transport* tabled by the House of Representatives Standing Committee on Communication, Transport and the Arts in October, 2000. That committee recommended that the Minister for Transport and Regional Services should seek Australian Transport Council approval for the Australia-wide introduction of the Safe-T-Cam™ system.

3.36 Other measures might include so called 'low tech' applications such as in road serrations to warn motorists when they are veering off the roadway. Additional studies are required. However, the Hume and Federal Highways and the F3 are vital elements of the national highway system. They need to be maintained at a high ITS standard and they also provide a firm foundation to test integrated ITS non-urban road infrastructure.

3.37 The committee recognises that Commonwealth does not have the primary responsibility to maintain state and local government roads. The committee recognises, however, that cases arise where national safety interests require Commonwealth encouragement to ensure the application of ITS to specific areas of road infrastructure . An example is the provision of seed funds to use ITS technology in specified locations, particularly variable message signs to vary the speed on significant state highways and major arterial roads to match the weather conditions and manage congestion.

3.38 Such special circumstances generate the need for a new category of road funding. The committee feels that this additional category of funding should be modest and similar in size to the funds allocated by the Commonwealth for the Black Spots Program. The committee also recognises that the bulk of funds appropriated under such a program would be directed to outer metropolitan and rural road systems carrying arterial traffic.

19 http://www.dotars.gov.au/transprog/road/nat_hwy/corridors/syd_bris.htm; accessed 30 September, 2002.

3.39 The allocation of funds, the committee believes, would involve a balance between those areas which, on the evidence, are already dangerous and those which may be revealed to be dangerous when a safety audit is conducted.

3.40 To enhance the implementation of ITS, the committee suggests that the Commonwealth portion of the funding should be seed funding, while state and local authorities should provide significant contributory funding to enhance the implementation of ITS on roads for which these agencies are normally responsible.

Recommendation 1

3.41 **The Committee recommends that the Hume Highway, the Federal Highway and the F3 not be used as case studies for variable speed limits.**

Recommendation 2

3.42 **The Committee recommends that, in addition to the National Highway, Roads to Recovery, Roads of National Importance and the Black Spots Programs, the Commonwealth establish a fifth category, a regional ITS program, to provide for the allocation of seeding funds for the implementation of integrated ITS and that as part of this program funds should be made available for selected arterial roads, and provided on the basis of:**

- **demonstrated need;**
- **existing quality of road;**
- **the significance of the arterial nature of the road; and**
- **benefit/cost analysis.**

The seed funds be made available to state and local authorities on a competitive, benefit/cost basis to encourage appropriate and cost effective ITS signage on significant state highways and major arterial roads.

Recommendation 3

3.43 **The committee recommends that the government designate as a 'National ITS Corridor', certain roads of national significance, such as the Hume Highway, the Federal Highway and the F3, and that**

- **such corridors have installed on them appropriate and cost effective ITS technology; and**
- **they be used to test integrated ITS infrastructure.**

4

Issues and Opportunities for ITS in Australia

4.1 In the course of this inquiry, the committee noted that a narrowly focused examination of the application of ITS technologies to specified stretches of highway, while important as case studies, would not address the broader issue of ITS in Australia. It also became apparent that the potential of specific ITS technologies to be applied to specific stretches of highway infrastructure depended upon broader policy considerations and the potential case studies needed to be seen in the context of an overall ITS policy setting. In this chapter the broader policy context of ITS in Australia is examined.

ITS policy in Australia

4.2 A national strategy, *e-transport: A national strategy for intelligent transport systems*, was adopted by the Australian Transport Council of Ministers (ATC) on 12 November 1999. *E-transport* was launched by the Hon John Anderson MP, Deputy Prime Minister and Minister for Transport and Regional Services, on 16 December 1999. The strategy was commissioned by Austroads and developed by ITS-Australia. Implementation of the plan falls to different stakeholders depending on the specific action required. The key responsibilities for implementing *e-transport* fall to ITS-Australia, Austroads, and the transport ministers in each Australian jurisdiction.

4.3 *E-transport* outlines the future of ITS in Australia. It includes the

- development of a national systems architecture (the blueprint for developing the ITS), that includes consistent national technological standards;

- development of a national institutional framework, including government endorsed institutions, to facilitate the implementation of a nationally consistent policy approach to ITS;
- R&D, leading to an internationally competitive ITS industry; and,
- development of export markets.

4.4 Of particular importance is the role of government. The national strategy recognised that 'governments are responsible for developing the policy framework' and also that:

> … numerous organisations, public and private, need to work together if a multi-modal National Strategy is to deliver its objectives - a national institutional framework will facilitate cooperation.[1]

4.5 For this reason, *e-transport* specifically targeted action by ministers for transport in all Australian jurisdictions to lead the process by implementing the national strategy:

> Transport Ministers at Commonwealth, State and Territory levels inform other Ministers (including communications, planning, industry, science, environment and trade) and enlist their support in implementing the Strategy, including consideration of appropriate institutional mechanisms.
>
> Ministers, through direct contact, and all ATC modal groups, encourage the participation of relevant transport industry, user and other appropriate organisations, private and public, in implementing the Strategy, including through ITS Australia.[2]

4.6 The committee was advised that the progress of *e-transport* will be reviewed at the end of 2002.[3] ITS-Australia advised the committee that the actions identified in *e-transport* have been grouped into 24 projects.[4] ITS-Australia told the committee that:

> At this point [in] time, two years into the three-year program, the progress with these actions is:
>
> - 10 projects have been completed;
> - 5 projects have been completed and require ongoing activity; and,

1 *E-transport*, p. 5.

2 *E-transport*, Paras 4.2.2 and 4.2.3.

3 Mr Colin Jensen, Briefing, Brisbane, 13 September, 2002.

4 These projects are listed in Appendix B.

- all remaining projects are forecast to be completed within the three-year program to budget.[5]

Auslink and ITS

4.7 The Government has recently announced AusLink, a rolling 5-10 year transport infrastructure development plan. Auslink aims to deliver more strategic spending of Commonwealth transport funding, and greater opportunities for private sector involvement. The plan will be developed on a national participatory basis.

4.8 On the basis of the national plan, the Government will seek project bids that advance the plan's strategic priorities. The Government will issue invitations to the states and territories, local government, regional development bodies and the private sector to put forward their most attractive bids. Private sector proposals will be given equal treatment with all other bids.

4.9 Importantly, for ITS, non-engineering transport solutions, such as new technology and traffic management, will be eligible for funding. This will ensure that such solutions are implemented in a nationally consistent and strategic manner.

4.10 The government has stated that AusLink will not involve a reduction in the Commonwealth's transport expenditure. It will not affect any of the current projects funded by the Federal Government, or any projects the Government had previously made a firm undertaking to fund, and it will not affect the existing Black Spot Program and the Roads to Recovery Program. Funding in regional Australia will be quarantined.[6]

4.11 Transport industry organisations, such as the National Roads and Motorists Association, the Australian Logistics Council, and the National Farmers Federation, as well as Mr Martin Svikis of Specialised Container Transport, and Mr Chris Corrigan of the Patrick Corporation, expressed support for Auslink following the release of the Green Paper on 7 November, 2002, which detailed the government's proposal and sought public comment.[7]

5 E-mail communication with secretariat, 1 October, 2002.

6 http://www.dotars.gov.au/transinfra/auslink.htm; accessed 1 October, 2002.

7 NRMA Member Services, *Media Release*, 7 November, 2002; Philip Hopkins, 'Auslink to revamp freight transport', *The Age*, 8 November, 2002; Jason Koutsoukis, 'Nod for Transport overhaul', *The Financial Review*, 8 November, 2002.

4.12 The Warren Centre advised the committee that while the recognition of ITS in Auslink was an important step forward, the plan may not suit state transport plans.[8]

Recent developments

4.13 On 8 August the Australian Transport Council (ATC) approved the National Transport Secretariat project, *National Strategic Planning for Transport*. This project will lead to a green paper, *National Transport Futures*, to be published in 2003 by the ATC. The aim of *National Transport Futures* will be to describe national strategic directions and objectives, as well as the strategies and policy frameworks required to deliver the national transport outcomes identified by the ATC. In particular, the focus will be on aspects of transport where there is a need for coordination between the Commonwealth and the states and territories and/or local government.[9]

4.14 The Deputy Prime Minister and Minister for Transport and Regional Services, the Hon John Anderson MP has already signalled that the existing ITS policy framework is not adequate, especially in the light of the Auslink proposal, and that a new framework must be developed. Minister Anderson said that:

> [a] component of our land transport reform task is to establish a policy framework to underpin the growth of intelligent transport systems and new transport technologies, including the use of satellite positioning systems. [The government's] AusLink plan envisages that we'll provide Government funding for the use of these technologies.[10]

4.15 The committee agrees with the Minister's proposal for a new policy framework and does see merit in the fact that ITS is now squarely part of Commonwealth funding considerations, through Auslink. In the absence of detail concerning the revised policy framework, the committee suggests that it is not enough to merely develop a new ITS policy framework.

4.16 As well, the committee notes that Auslink is a *strategic infrastructure* plan and there is insufficient detail available about the *National Transport Futures* strategic plan to determine the extent to which it will integrate ITS. The information available to the committee, by way of a short briefing

8 Briefings, Sydney, 15 August, 2002.

9 National Transport Secretariat, *National Strategic Planning for Transport: Report on Workshops in Melbourne and Sydney*, August/September, 2002.

10 Keynote address to the Tourism and Transport Industry Leaders' Summit, 26 September, 2002.

provided in Brisbane, would indicate that while ITS will be part of the plan, the significance of ITS may not be properly understood.[11]

4.17 Stakeholders who briefed the committee about the strategies required to implement ITS in Australia indicated that, apart from new policies and approaches, the Commonwealth needed to take the lead. The task of the Commonwealth would be to lead the reorganisation of the arrangements that underpin the development, deployment and commercialisation of ITS and act as the catalyst for change. This would involve the Commonwealth assuming a similar role to the role assumed by the US federal administration, the Japanese government and the European Union.

International developments

4.18 Most industrial economies are developing comprehensive national ITS strategies to accelerate the development of ITS and its integration into their respective transport systems. ITS-Australia advised the committee that, unlike Australia, 'Both the EU and USA have specific "nationally" funded ITS strategies aimed at encouraging active implementation of ITS.'[12]

4.19 Mr Andrew Garrett reported in 1998 that the European Road Transport Telematics Implementation Co-ordination Organisation (ERTICO), the body then coordinating ITS activities throughout Europe, predicted and was working toward, the following benefits from ITS applications by the year 2017:

- 15% increase in survival rates from crashes, due to in-vehicle emergency call systems;
- 50% reduction in road fatalities;
- 25% reduction in travel times;
- 40 hours per traveller saved each year by the use of automatic tolling systems;
- 50% reduction in delays by improvements in public transport priority;
- 25% reduction in freight costs by improved efficiency of freight movement and fleet operations; and,

11 Printout of a 'Powerpoint' presentation by National Transport Secretariat, Briefing, Brisbane, 12 September, 2002.

12 E-mail communication with secretariat, 1 October, 2002.

- 50% less pollution in city centres by using advanced traffic management systems.

4.20 These estimates, although prepared by ITS proponents, were claimed to be conservative. [13]

4.21 In 2001, the European Union released a white paper, *European Transport Policy for 2010: time to decide*. The 119-page white paper identifies the reduction of fatalities, the alleviation of congestion and of transport bottlenecks as top priorities for the 10 years to come and promotes the use of ITS to solve these critical issues.[14] The white paper also sets out plans for inter-modal linkages, including inter-modal, integrated ticketing and baggage handling. In addition, the EU white paper also states that the EU 'must be more assertive on the world stage'.[15]

4.22 As part of the white paper's plan to reduce fatalities, the European Commission issued a call for a program for standardisation in ITS. It is part of a comprehensive 'eSafety Action Plan' developed and currently being implemented by the EU.[16] This initiative focused on such ITS issues as the standardisation of vehicle control and telematics technologies.

4.23 Mr Colin Jensen advised the committee that overall the EU is actively setting an ITS agenda for the EU and setting minimum deployment targets for ITS, including specifying targets for the installation of ITS applications in motor vehicles.[17]

4.24 More recently, ITS-Australia, advised the committee that the EU is considering mandating the inclusion of ITS technology in vehicles to achieve safety, security and emission reduction targets.[18] The targets set are ambitious, given the geography and many diverse jurisdictions involved. However, an immediate EU target is a single EU-wide telephone number that will provide all people on the move throughout Europe with full access everywhere to multi-lingual support, call localisation and fully organised provision of emergency services.

4.25 Initiatives to be introduced by the end of 2002 include:

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13 'Intelligent Transport Systems: Potential benefits and immediate issues', Facing the Main Roads Lecture Series, Main Roads Western Australia, www.mrwa.wa.gov.au/projects/strategies/future/its_paper04.pdf; accessed: 26 September, 2002.

14 http://europa.eu.int/comm/transport/themes/network/english/its/html/vision_policy.html; accessed 28 September, 2002.

15 *European Transport Policy for 2010: time to decide*, p. 92.

16 European Commission, *Research on integrated safety systems for improving road safety in Europe*, September, 2002.

17 Briefing, Brisbane 13 September, 2002.

18 ITS-Australia, submission no. 3.

- All new cars sold in Europe will be equipped with more efficient active safety-enhancing and driver assistance systems;
- Value-added personalised traffic and travel planning information services so as to cover 50% of medium and large European cities;
- All main trans-European networks will be covered by systems offering traffic incident/congestion information and management;[19] and,
- 50% of major European motorways to be equipped with congestion and incident management systems.[20]

4.26 The 2017 ERTICO goals have been brought forward so that by the end of 2010, the EU aims to have:

- Reduced road accidents by 50%;
- Reduced travel time by 20%;
- Used ITS to increase effective road capacity by 50%;
- Achieved a significant reduction in CO^2 emissions; and,
- Increased in-vehicle ITS use by 20%.[21]

4.27 To implement ITS in a national and orderly fashion, Japan has established the Advanced Information and Telecommunications Society Headquarters under the Prime Minister to coordinate ITS at a national level. Thirty year goals for ITS in Japan include:

- halving the number of fatal traffic accidents;
- eliminating traffic congestion; and,
- reducing vehicle fuel consumption and carbon dioxide emissions by 15% and nitrous oxide by 30%.[22]

4.28 There are a number of ITS initiatives in Japan. These include:

- The Vehicle Information and Communication System (VICS), which was introduced in April 1996, is rapidly coming into widespread use. The number of vehicles equipped with a VICS-compatible car navigation equipment reached 3.17 million in June 2001.

19 *e-Europe: An Information Society For All*, Communication on a Commission Initiative for the Special European Council of Lisbon, 23 and 24 March 2000.

20 http://www.netpark.or.jp/ahs/demo2000/eng/demo_e/ahs_e7/aki/aki.html; assessed 1 October, 2002.

21 Submission no. 3. Mr Colin Jensen also made the same points; Briefing, Brisbane, 13 September, 2002.

22 'Intelligent Transport Systems: Potential benefits and immediate issues', Facing the Main Roads Lecture Series, Main Roads Western Australia, www.mrwa.wa.gov.au/projects/strategies/future/its_paper04.pdf; accessed: 26 September, 2002.

- As of the end of September 2001, the VICS service was available in Tokyo, Hokkaido, and 30 prefectures. At present, about 84% of retained motor vehicles and about 86% of driver's license holders in Japan receive services from VICS.
- Environmental road pricing is a differential tolling method. It aims to encourage the use of roads which avoid residential areas and thereby improve the environment of residential areas. In this scheme, the tolls for roads located in areas such as coasts are set lower than those for roads running through residential areas. Environmental road pricing will be tested between 2001 and 2002 on several expressways.
- In November 1999, the five governmental bodies concerned with ITS released 'System Architecture for ITS in Japan'. [23]

4.29 The United States Department of Transport established the Intelligent Transportation Systems Joint Program Office (ITS JPO) in May 1994. The role of the ITS JPO is to serve as the 'principal architect and executor of ITS leadership'. The objectives of the ITS JPO are to:

- provide strategic leadership for ITS research, development, testing, and deployment;
- guide policy coordination; and,
- ensure resource accountability.[24]

4.30 The United States administration also sets standards and national architecture requirements and allocates funds to programs that comply.[25] This approach of setting national standards and a national architecture is designed to accelerate the deployment of ITS technology.

4.31 The Federal ITS program in the United States, is funded under the Transportation Equity Act for the 21st Century (TEA-21). This Act provides $USD 1.3 billion over six years, 1998 – 2004. TEA-21 provides a comprehensive framework for deploying ITS in the US in that period. ITS is referred to throughout TEA-21.

4.32 Clear policy intent of TEA-21 is to make ITS a part of the US primary surface transportation mission, rather than a special program, and to provide a legislative basis for setting standards and attaining architecture and standards consistency.[26]

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23 http://www.its.go.jp/ITS/2001HBook/topics/index.html; accessed 1 October, 2002.

24 http://www.its.dot.gov/jpostaff/backgrd.htm; accessed 1 October, 2002.

25 http://www.its.dot.gov/aconform/Policy.htm

26 http://www.its.dot.gov/tea21/japana/index.htm; accessed: 1 October, 2002.

4.33 TEA-21 also required the development of a 10-year national ITS program plan. This 146-page plan, developed in collaboration with the Intelligent Transportation Society of America sets out specific goals, which include:

- Reducing fatalities by between 5,000 –7,000 per annum by 2011;
- Reducing congestion to save one billion gallons of petrol per annum and associated emissions;
- 13% reduction in travel time through better road conditions and 8% - 10% reduction in transit travel time and a 13% reduction in fuel consumption through better signal coordination;
- 20% – 40% reduction in accident response time;
- 10% – 15% reduction in truck operating costs;
- 85% reduction in delays at toll booths, through the use of e-tags; and
- 15% – 40% reduction in accidents in motorway ramps due to ramp metering.[27]

4.34 The plan also provides for cross-modal integration, collection of data for planning purposes, financing options, and adoption of ITS technologies by the public sector in order to hasten the adoption of ITS in other sectors of the community.

Issues, opportunities and remedies

4.35 In this section the major issues facing the further development of ITS in Australia are examined.

A national ITS policy framework

4.36 The adoption of ITS in Australia has followed a cooperative, non-legislative approach. The Commonwealth has provided funding for the development of policy blueprints, and some funding for R&D, scoping studies, and deployment of ITS. However, most ITS development and deployment has been driven by the state and territory governments because it is these governments who have been the major source of funds. This has led a number of the states to develop their own ITS strategies.[28] The national policy approach to ITS appears to be fragmented and the strategy embodied in *e-transport* only partly implemented.

27 Intelligent Transportation Society of America, *Delivering the future of transportation: the national intelligent transport systems program plan: A ten-year vision*, January, 2002.

28 *E-transport*, p. 2.

4.37 According to stakeholders providing briefings to the committee, this has had a number of counter-productive consequences, most particularly, the failure to develop targeted policies. For example, ITS-Australia claimed that ITS had not been widely integrated into policies to save lives. ITS-Australia said that:

> So far there has been no push by Government to direct policy toward saving lives, instead State Governments have adopted an approach which some argue is a 'bandaid' approach of using speed enforcement policies instead of looking at more active safety systems such as speed limiting devices, adaptive cruise control and lane keeping guidance systems. ITSA believes that we are significantly behind the policy developments and policy statements of many countries in this area where targets are being set and plans developed to achieve these targets. The EU e-safety and ITS America 10 year plan [are] two such examples.[29]

4.38 ITS-Australia advised the committee that there 'urgently needs to be a funded National Transport Strategy Plan' of which ITS would be an integral element.[30]

4.39 Mr Colin Jensen, advised the committee that a revised strategy for ITS was required[31] while the Warren Centre stated in its submission that:

> … in ITS the Commonwealth government should ensure that Australia adopts the most cost effective and appropriate national standards for e-commerce, for electronic tolling systems, for transport smart cards, for road management systems and the like. We already have the makings of a 21st century interstate rail gauge problem in different tolling systems use in Sydney, Melbourne and Brisbane.[32]

4.40 The dangers of failing to develop and implement a national policy framework were put to the committee repeatedly. ITS-Australia summed up the issue this way:

> Australia's transport history of different rail gauges and road regulations demonstrate the costs of fragmented standards and regulatory frameworks.[33]

4.41 Submissions and stakeholders providing briefings to the committee made it clear that in their view, it was the responsibility of the Commonwealth

29 ITS-Australia, submission no. 3.

30 Submission no. 3.

31 Briefing, Brisbane, 13 September, 2002.

32 The Warren Centre, submission no. 1.

33 ITS-Australia, Submission no. 7.

to develop a national framework – and see to its implementation. The Warren Centre advised the committee:

> The Commonwealth Government must take the lead in identifying with the States the relative contribution that each ITS measure can make to transport in Australia and thereby establish a priority list for attention to each. This is occurring in other countries.[34]

4.42 The Commonwealth's role was more than merely identifying priorities, in the view of the Warren Centre; the Commonwealth's role was one of national leadership:

> The *Sustainable Transport in Sustainable Cities* project highlighted the need for the Commonwealth Government to take leadership in numerous aspects of transport, not the least of which in Intelligent Transport Systems (ITS), to give a National economic and consistency perspective in the transport area.[35]

4.43 The role of the Commonwealth is recognised in the national strategy:

> The Commonwealth also has a sizeable ITS role, notably through road funding, mainstream industry development schemes, and responsibility for communications, which is an important ITS-enabling technology.[36]

4.44 The committee notes that a national strategy was considered essential to attaining the benefit of ITS, and the need for one was indicated prior to the release of *e-transport* in 1999:

> A national strategy which accelerates the deployment and integration of ITS is expected to generate additional community and economic benefits of at least $3.8 billion per annum by 2012, excluding export income.[37]

4.45 *E-transport* was intended to provide a national strategy. It was implemented through agreement, negotiations and consensus by a non-government organisation, ITS-Australia. *E-transport* lacks legislative muscle and a central agency to ensure co-ordination and compliance. Now, three years after *e-transport*, 'rail gauge' problems still persist. National institutions have not been established, and we do not have a clear, national framework that can guide the implementation of ITS.

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34 The Warren Centre, submission no. 1.

35 The Warren Centre, submission no. 1.

36 *E-transport*, p. 2.

37 Booz Allen & Hamilton, *Intelligent Transport Solutions for Australia*, summary report, Sydney: 1998, p. 13.

4.46 The current situation in Australia is unlike that in the EU and the United States. In those jurisdictions, a national or trans-national framework, embedded in law and administered by public institutions, drives the development and deployment of ITS.

4.47 The committee concludes that Australia needs to develop a national framework. The committee supports the announcement by the Deputy Prime Minister, the Hon John Anderson MP, providing for better recognition for ITS in Australia's transport policy.[38] However, it is the committee's opinion that ITS policy must go a stage further. Based on the actions of governments in developed economies, national security issues and ITS in Australia's future economic prosperity, it is the committee's conclusion that ITS must not merely be on an equal footing with other transport programs, but be brought into prominence in transport policy and planning.

Recommendation 4

4.48 **The Committee recommends that the current policy framework for ITS be reviewed and that a new, comprehensive policy framework be developed that:**

- **identifies strategic directions and national priorities;**
- **identifies funding options; and,**
- **recommends appropriate institutional and legal arrangements to give effect to national ITS policy and programs.**

A national ITS coordination administration

4.49 ITS policy development and implementation involves drawing together different parts of the Commonwealth administration, working with state administrations, non-government organisations and stakeholder groups, to produce a nationally, consistent approach for ITS.

4.50 Within the Commonwealth administration alone, close cooperation will be required between many different, and sometimes competing, agencies. For example, there will need to be cooperation between agencies that regulate the radio spectrum and agencies that develop policy for and which regulate road, rail and other transport modes. As well, agencies involved in tourism and trade, along with other agencies, such as the National

38 See para. 4.14 above.

Office of the Information Economy, that are concerned with utilising developments in information and computing technologies, will need to participate closely in the development of ITS.

4.51 The necessity for a national, strategy for intelligent transport, was noted in *e-transport*, released in 1999:

> Numerous organisations, public and private, need to work together if a multimodal National Strategy is to deliver its objectives - a national institutional framework will facilitate cooperation.[39]

4.52 However, according to the CSIRO the national ITS effort is fragmented:

> Despite the abundance of creative ITS developments in Australia, there is a distinct lack of coordinated effort, interoperability between systems, and standardisation of products and services.[40]

4.53 The committee saw at first hand the good work in ITS occurring in Queensland and New South Wales. The committee received a submission from VicRoads highlighting the innovative work being done in Melbourne. The committee also had briefings from stakeholders who complained of incompatible e-tag standards, which made it impossible to use e-tags from Melbourne in Sydney and that this had been a problem for some time.

4.54 To meet the challenges of increased traffic flow, increase economic activity and meet the need for greater efficiencies in production we must implement a state of the art ITS. The committee noted, however, that there was not the level of coordination between jurisdictions that is required in order to develop the multi-modal, seamless ITS that should be developed.

4.55 The solution to this problem, according to submissions and stakeholders providing briefings, was for the Commonwealth to take a leadership role. In this vein, the Warren Centre advised the committee that government should provide leadership in resolving inter-state differences and move towards the adoption of a national standard.[41] ITS-Australia offered a similar sentiment to the committee:

> It is the Federal Government that must take the lead in a firm but consultative approach with the industry and the community to provide a plan to the future that will take into account the national interests of Australia.[42]

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39 *E-transport: The national strategy for intelligent transport systems*, p. 5.

40 http://www.dbce.csiro.au/innovation/2000-10/its_connect.htm; accessed 26 September, 2002.

41 The Warren Centre, Briefing the Warren Centre provided, Sydney, 15 August, 2002.

42 ITS-Australia, submission no. 3.

4.56 It is not sufficient that the Commonwealth merely establish an administrative unit to develop policy and administer policy. In this area, community engagement is crucial. ITS-Australia indicted that a forum to facilitate the engagement of stakeholders was necessary. ITS-Australia advised the committee that:

> To better understand and commercialise services which support these information needs in delivering the mobility and integrated freight transport, ITSA proposes to develop the Australian Centre for ITS Competency and Commercialisation. This innovation centre would draw together freight operators, car manufacturers, public transport systems developers, toll and tag manufacturers, government, road agencies and ITS specialists in a cooperative environment to develop solutions that are not only transportable across modes, but also across jurisdictions that are national. All of these sector participants operate nationally as opposed to jurisdictions which operate on a state or portfolio basis.[43]

4.57 Although the committee encourages such initiatives, at the end of the day, the effectiveness of any decision must rely upon the authority of government. This is why the EU and the United States, while maintaining and fostering close links with stakeholder organisations, also provide a national institution (or more) as a legislated backstop, to ensure that consistent national standards and a national architecture are implemented.

4.58 The first step in developing a coordinated system is cooperation and coordination between agencies of the Commonwealth administration.

4.59 At the public hearing on 25 September, 2002, the committee asked the Department of Transport and Regional Services (DoTaRS) about inter-agency co-operation. DoTaRS testified that at a Commonwealth level:

> [DoTaRS] relationship with agencies in the Commonwealth, such as Invest Australia, is pretty good. We recently met with them to talk about Australian participation in the Chicago ITS congress. Another agency that has some involvement is NOIE… We do not work very closely with that agency, but we do work cooperatively as necessary.[44]

4.60 The committee is aware that NOIE has embarked on work in the transport sector to investigate the use of electronic commerce and to try to remove some of the potential barriers to the further use of e-commerce in the

43 E-mail communication with secretariat, 1 October, 2002.

44 *Transcript of Evidence*, p. 12.

sector.[45] It would be reasonable to expect that there should be close cooperation between DoTaRS and NOIE.

4.61 DoTaRS did indicate that there is a vehicle ticketing and tolling committee that operates under the Australian Transport Council's Standing Committee on Transport. DoTaRS suggested that this tolling committee was one forum that the Commonwealth could use to participate with the states in the development of ITS.[46] DoTaRS also indicated that it is trying to be more active in the tolling group in order to exert greater influence on the compatibility between the tolling systems of the states.

4.62 However, ITS-Australia advised the committee that there is a National Tolling and Ticketing Working Group (NTTWG) operating under the aegis of ITS-Australia. The committee was advised by ITS-Australia that there are no Commonwealth representatives on that committee.[47] An examination of the membership list, published on the ITS-Australia internet site, indicated that not one of the members had a Commonwealth government e-mail address, although other members had e-mail addresses from the major ITS states in Australia, industry stakeholders and research centres. This was also the case with the National Reference Architecture Working Group (NRAWG), another committee operating under the aegis of ITS-Australia. The NTTWG and NRAWG bring together government, industry, and researchers. These working groups would appear to provide substantial opportunities for the Commonwealth to influence the development of ITS in Australia. The committee considers that DoTaRS' apparent lack of engagement with two of the more significant national ITS fora very puzzling.

4.63 DoTaRS was asked about its commitment to ITS. DoTaRS assured the committee that the 'The Department of Transport and Regional Services has as its main objective trying to achieve a better transport system for Australia' and that DoTaRS regards 'as an important part of achieving that objective the fostering and support of intelligent transport systems'. DoTaRS also testified that it 'does take ITS very seriously'.[48] Nevertheless DoTaRS also testified that:

- there is no national forum in which to discuss ITS issues;
- DoTaRS had no over-arching powers to ensure that ITS are implemented in road upgrades;

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45 http://www.noie.gov.au/projects/ecommerce/Sector/Transport/; accessed 26 September, 2002.

46 *Transcript of Evidence*, pp. 3, 12.

47 ITS-Australia, submission no. 7.

48 *Transcript of Evidence*, pp. 1 and 7.

- there was not, to DoTaRS knowledge, any mechanism for insisting on specific infrastructure requirements and DoTaRS had to rely upon negotiation;
- DoTaRS has a 'technology team' of seven people of which one person is devoted full-time to ITS; and,
- DoTaRS had no regular meetings with the states or territories in which DoTaRS could try to exert influence or represent the national interest.[49]

4.64 It would appear that involvement of officers from the Commonwealth administration in the implementation of e-transport, via one of the lead agencies (ITS-Australia) is minimal and the capacity of the Commonwealth to influence matters is limited. Moreover, one officer, working full time would indicate that DoTaRS considered the Commonwealth interest in ITS as relatively unimportant. As noted earlier in this report, the national significance of ITS would suggest that a more intense interest on the part of DoTaRS is indicated. There appears to be a case for the government examining the performance of stakeholder departments in the Commonwealth administration as to their engagement with state governments and private sector organisations, in respect of ITS.

4.65 Moreover, it would appear that there is a plethora of organisations, committees, associations, and working groups, producing a seemingly endless round of reports. However, in all this activity an over-arching and coordinating structure that meets regularly to attain outcomes, has not been developed. At best, it would appear that there is patchy inter-agency and inter-jurisdictional cooperation and coordination.

4.66 This is in contrast to the European Union, the United States and Japan, where the central governments provide leadership, set priorities, agendas architectures and standards.

4.67 Given the importance of implementing ITS to the Australian community and the prosperity of the nation, the committee believes that a more pro-active and comprehensive approach be adopted, and in particular, that the Commonwealth take the lead role. The committee also notes the enthusiasm and support for ITS, its further development and deployment by Minister Anderson. The committee believes that the current situation is unacceptable and that a nationally coordinated approach must be developed.

49 *Transcript of Evidence*, pp. 3, 4, 9.

Recommendation 5

4.68 **The committee recommends that the government establish an ITS implementation bureau as an executive agency directly responsible and accountable to the Minister for Transport and Regional Services.**

Recommendation 6

4.69 **The committee recommends that the specific responsibilities of this bureau must be to:**

- **act as a national forum for resolving differences in standards, and approaches;**
- **coordinate Commonwealth government activity in the area of ITS;**
- **develop and implement national ITS policy, including identifying national goals;**
- **set standards for inter-operability and national architecture;**
- **coordinate R&D; and,**
- **provide assistance to other Commonwealth agencies to facilitate the export of ITS technology.**

Technical standards, national reference architecture and inter-operability

4.70 Intelligent transport systems are national and, ultimately, global systems. In order for the elements of the system to work seamlessly, compatible standards for data collection, storage and transmission must be developed. This is usually referred to as 'inter-operability', which means the ability of ITS applications to work together, facilitate an inter-modal transport system, and build on each other.[50]

4.71 Inter-operability is one element of a larger planning activity: a national systems architecture. *E-transport* defines a national systems architecture as:

> A national systems architecture for ITS is the blueprint for development of the array of systems which need to relate to each other in order to maximise the benefits of ITS.

50 *E-transport: The national strategy for intelligent transport systems*, p. 4.

4.72 A national systems architecture aims amongst other things to:

- promote national and international compatibility of systems;
- promote inter-operability between system components; and,
- identify where standards are needed and what items those standards need to specify[51]

4.73 Inter-operability and a national systems architecture each depend on national standards. However, standards development, and the consequent implementation of a national systems architecture in Australia has not been as effective as it could be. The Australian Transport Council (ATC) would appear to be aware of this. The communique issued by the ATC after its 3 August 2002 meeting in Auckland, announced that transport ministers had made the commitment to giving priority to developing national standards:

> Ministers renewed their commitment to national inter-operable standards for ticketing and electronic tolling, and pledged to give priority to current work directed towards this public transport objective.
>
> The Council acknowledged the broader significance of smartcard technology, and noted the need to ensure its use in the transport sector is compatible with use in other sectors, such as tourism and local government.[52]

4.74 These are long-standing issues. Writing in 1998, Mr Andrew Garrett said:

> The development of standards is a complex and time-consuming process. In the ITS area it is even more difficult because of the global competition and the probability that Australia will be a follower rather than a leader. For ITS to be deployed effectively it is critical that Australia adopt national standards to protect the community and that it influences international standards to suit Australia's needs. Standards should also seek to ensure the compatibility, interoperability and ease of upgrade of systems, avoid conflicting communication protocols/transmission media and, above all, ensure safe usage.[53]

4.75 ITS-Australia, in its submission, stated that the lack of standards and spectrum allocation for wireless technologies was limiting the implementation of theft reduction and safety technologies. ITS-Australia said:

51 *E-transport*, p. 4.

52 http://www.dotars.gov.au/atc/atc13.htm; accessed 3 October, 2002.

53 'Intelligent Transport Systems: Potential benefits and immediate issues', Facing the Main Roads Lecture Series, Main Roads Western Australia, www.mrwa.wa.gov.au/projects/strategies/future/its_paper04.pdf; accessed: 26 September, 2002.

> …that it is virtually impossible for designers to know what spectrum and bandwidth will be available three years from now and if existing services are used, [whether] these will be available for the warranty (3 years) and maintenance and parts availability obligation period (7 years).[54]

4.76 In a supplementary submission, ITS-Australia indicated to the committee the problems around failing to agree on standards for smartcards:

> Due to our small population size, unlike the many other smartcard operations being deployed globally, local applications (if not interoperable or integrated) will be unable to enjoy economies of scale sufficient to ensure viable large scale smart card infrastructure deployment.[55]

4.77 ITS-Australia set out the disincentives different standards have for vehicle builders:

> … a car company will not develop an emergency system for each state, nor would they embed tolling tags in vehicles if there [were] no common standard. Whilst this is being resolved with policy specifying interoperability, we are trying to catch up with a sector that is still accelerating away from us.[56]

4.78 The committee was advised that ITS standards are set, via negotiation between interested players.[57] One example of this process is the National Ticketing and Tolling Working Group that is developing an Australian Transport Information Protocol. As noted already, industry players advised the committee that the Commonwealth in not closely involved in this process and that the Commonwealth (through DoTaRS or Commonwealth tourism or communication related agencies) is not represented on the working group.[58] Yet, NOIE, in a scoping study on the road transport industry, in 1999 recommended that:

> The Commonwealth Government needs to continue its work in developing electronic commerce enabling infrastructure and assisting the development of standards.[59]

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54 ITS-Australia, submission no. 3; ITS-Australia, reiterated this view its submission to the Standing Committee on Communications, Information Technology and the Arts, Wireless Broadband Technologies Inquiry, submission no. 24.

55 ITS-Australia, submission no. 7.

56 E-mail communication with secretariat, 1 October, 2002.

57 *Transcript of Evidence*, p. 4.

58 ITS-Australia, submission no. 7.

59 NOIE, *Trucks Online: National Road Transport Scoping Study*, 1999, Commonwealth of Australia, 1999.

4.79 Submissions complained of a 21st century version of the rail gauge problem, and this point was put repeatedly to the committee in briefings and submissions:

> … in ITS the Commonwealth government should ensure that Australia adopts the most cost effective and appropriate National standards for e-commerce systems, for electronic tolling systems, for transport smart cards, for road management systems and the like. We already have the makings of a 21st century interstate rail gauge problem in different tolling systems used in Sydney, Melbourne and Brisbane.[60]

4.80 ITS-Australia advised the committee that inter-operability in respect of electronic tolling was anticipated to occur by June 2003.

4.81 This is a long-standing problem. The potential for rail gauge-type incompatibility was known to be a problem in 1996.[61] It was noted in 1998, as was the need for a number of standards. As well, the incompatibility between e-tag standards was then – four years ago – just about to be solved:

> A current example is electronic toll collection systems. In Sydney alone there are now three incompatible electronic toll systems in use. There are different systems in use in Brisbane and proposed in Melbourne - the prospect of a 'rail gauge' fiasco was very real. Fortunately standards are now being developed and industry is in the process of agreeing to migrate to these over time to minimise disruption and costs. There are many more standards required.[62]

4.82 That a rail gauge problem was emerging in 1999 was alluded to in the national strategy:

> States and Territories' extensive policy and regulatory responsibilities for land transport have also led a number to develop their own ITS strategies.[63]

4.83 The committee was treated to different explanations concerning the impasse concerning the incompatibility between different e-tag systems. Some stakeholders suggested that differing technical standards were the cause of the incompatibility. Other stakeholders suggested that the operators of a tolling system in one state were holding out on agreeing to shared standards until agreement had been reached as to the fees that

60 The Warren Centre, submission no. 1.

61 ITS-Australia, submission no. 7.

62 Andrew Garrett, 'Intelligent Transport Systems: Potential benefits and immediate issues'.

63 *E-transport*, p. 2.

would be charged for the collection of tolls on behalf of interstate operators. In effect, an ITS version of bank interchange fees.[64]

4.84 The Commonwealth does not appear to have been closely involved in resolving this impasse. The committee is concerned that something as crucial to the success and adoption of ITS – setting an electronic standard for the inter-operability of tolling systems – should take seven years without agreement.

4.85 Differing technical standards are not only impeding the development of nationally compatible tolling systems. DoTaRS reports that most current freight transport and logistics (FTL) systems are proprietary. As a result, DoTaRS reports,

> E-commerce developments have not been as effective in promoting a seamless flow of freight as they might have been if they were developed as open/adaptable systems. The development of Internet based E-commerce in the FTL industry is beginning to address this problem by being more accessible to new entrants.

4.86 ITS-Australia highlighted the problem that proprietary systems may produce:

> The alternative to cooperation to achieve interoperability is a proprietary approach to architecture and standards, where competition and differentiation of basic standards and protocols prevails. This approach carries enormous risks of fragmentation and long-term discontinuity, that will be costly to remedy. Australia's transport history of different rail gauges and road regulations demonstrates the costs of fragmented standards and regulatory frameworks.[65]

4.87 This is in contrast to the United States where there is close involvement of the Federal Department of Transport in the creation and adoption of standards. For example, the US DOT ITS Standards Program is working toward the widespread use of standards to encourage the inter-operability of ITS systems.

- the Federal Highway Administration (FHWA), has an ITS Standards Program. The manager of this program has primary responsibility for standards development, testing, outreach and education, technical assistance, and policy support activities within the program.

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64 Automobile Association of Australia, the Warren Centre, ITS-Australia, Briefings, Sydney, 14-15 August, 2002; Professor Phil Charles, Mr Colin Jensen, Briefings, Brisbane, 13 September, 2002.

65 Submission no. 7.

- the Technical Director of the US DOT Joint Program Office (JPO) is involved in ITS technical programs, including architecture, standards, telecommunications, and research and development efforts.
- the Federal Transit Administration (FTA), coordinates ITS standards activities relating to transit.
- the Federal Railroad Administration (FRA), coordinates ITS standards activities relating to the highway-rail intersection.[66]

4.88 TEA-21 provides the legislative basis by which metropolitan areas and the states of the United States will confirm with the national systems architecture. The rule was announced in January, 2001 and compliance is expected to occur within four years. Funding is made dependent upon compliance. This approach was taken because it was recognised that is was 'highly unlikely that the entire National ITS Architecture would be fully implemented by any single metropolitan area or state'. The rule issued under the TEA-21 requires that the National ITS Architecture be used to develop a local implementation of the National ITS Architecture.[67] In addition, TEA-21 requires the Secretary of Transportation to identify ITS standards considered critical to achieving national inter-operability and to require those standards be complied with in ITS projects.[68]

4.89 Another issue that the committee had brought to its attention in briefings and inspections is the ability of people and freight to move across modes of transport. So called cross-modal efficiency is central to achievement of more seamless logistics practices in the FTL industry. However, inter-modal linkages have tended to be developed in a piecemeal fashion.[69]

4.90 Commonsense, borne of the experience of Federation, would suggest that the Commonwealth should have a central facilitating role in the development and deployment of ITS. This does not appear to be the case.

4.91 The committee does not consider that a failure to agree on technical standards or pure self-interested business concern should undermine national development and the broader public interest.

66 See http://www.its-standards.net/; accessed 25 September, 2002.

67 *Federal Register,* 8 January, 2001 (Volume 66, Number 5).

68 *Federal Register*, 23 April, 2001 (Volume 66, Number 78).

69 *Transport Infrastructure Policy*, http://www.dotrs.gov.au/transinfra/aftliaa/linking_ahead.htm' accessed: 25 September, 2002.

Recommendation 7

4.92 **The Committee recommends that the government:**

- **resolve, if need by legislation, the current disputes and inconsistencies between technical and other ITS inter-operability standards; and**
- **establish as soon as possible, but no later than 31 December, 2003, a system, administered by the Commonwealth ITS bureau, to develop national standards for ITS, inter-operability, systems architecture, and, if necessary, establish such standards by legislation and or regulation.**

Transport information and tourism

4.93 Tourism contributes significantly to the Australian economy. In 2000-01, the tourism industry employed 551,000 people. Tourism accounted for $26.3 billion (4.3 per cent) of total industry gross value added in 2000-01. Tourism gross value added exceeded that of Government administration and defence, agriculture, and forestry and fishing.

4.94 In 2000-01 international visitors consumed $17.1 billion worth of goods and services produced by the Australian economy and overall consumption associated with the tourism sector increased from $58.2 billion to $71.2 billion between 1997-98 and 2000-01. The $17.1 billion worth of goods and services consumed by international visitors represented 11.2 per cent of total exports of goods and services. The export of tourism products is higher than coal, iron, steel and non-ferrous metals, but lower than food and live animals.

4.95 Tourism accounted for $31.8 billion of total GDP in 2000-01, up from $25.2 billion in 1997-98. International visitors contributed $7.6 billion or 1.1 per cent of GDP in 2000-01, while domestic tourists generated $24.2 billion or 3.6 per cent of GDP in 2000-01.[70] The Australian Bureau of Statistics reported that for 1997 -1998 if direct tourism demand and indirect tourism

70 The share of GDP contributed by tourism is the total market value of Australian produced goods and services consumed by tourists, after deducting the cost of goods and services used up in the process of production. See Australian Bureau of Statistics, Tourism Satellite Account, Australian National Accounts 2000-01 (Cat no. 5249.0), released on 9 April 2002, cited: http://atc.australia.com/research.asp?art=2221; accessed 27 September, 2002.

demand are aggregated, tourism accounted for 8.5 per cent of national GDP.[71] The tourism industry share of GDP was 4.7 per cent in 2000-01.

4.96 Long distance passenger transportation represented the largest proportion of tourism consumption by international visitors at 29 per cent, followed by shopping, including gifts and souvenirs (14 per cent) and accommodation services (13 per cent).[72]

4.97 ITS-Australia reports that there are over 36 different phone numbers across Australia that the travelling public, tourists and commercial vehicle operators use to obtain public transport, traffic and incident information or to report accidents.[73] One of the major impediments in Australia is incompatible data sources, and sometimes, unco-operative data managers.

4.98 In contrast, in the EU and the US, each has an easy to remember number that can be used to obtain traffic information.

4.99 ITS-Australia also raised the issue of allocating specific radio frequencies to transport information, as occurs in the US and EU, in much the same way that radio stations aimed at tourists have been established in some parts of Australia. ITS-Australia suggested that specific incident, travel time, and traveller specific weather alerts could be delivered to vehicle operators.[74]

4.100 The committee was also told that Australia did not have a single, national rail ticketing system, unlike Europe.[75] The result is that tourists, whether international or domestic, have to purchase rail tickets in each jurisdiction and that this could be a complex task to people unfamiliar with the specific requirements of a particular system. Given the trend to using multi-modal transport, the committee was told, there was a need for a national transport ticketing system that covered all modes of transport and which was available throughout Australia and at Australian presences abroad.[76]

4.101 ITS-Australia advised the committee that:

> The National Ticketing and Tolling Working Group seeks to develop a nationally consistent standard for public transport ticketing smart cards in Australia. These cards could be issued by public transport operators, banks, Telstra, [or] any one with an e-

71 See Australian Bureau of Statistics, Tourism Indicators – March Quarter 2002 (Cat no. 8634.0), released on 9 August 2002, p. 25.

72 http://atc.australia.com/research.asp?art=2221; accessed 27 September, 2002.

73 ITS-Australia, submission no. 3.

74 ITS-Australia, submission no. 3.

75 Briefings, ITS-Australia, AAA, Warren Centre, Sydney, 14 - 15 August, 2002; submission no. 7.

76 Briefings, ITS-Australia, AAA, Warren Centre, Sydney, 14 - 15 August, 2002.

> purse function on a smart card. They would be interoperable with all transport in Australia and would greatly enhance … tourism.[77]

4.102 The committee considers that these issues could be dealt with easily and quickly and is puzzled that the Commonwealth does not appear to have addressed them. For example, as noted already, the Commonwealth does not appear to have a close involvement with the National Ticketing and Tolling Working Group. This is surprising given that the Commonwealth allocates radio spectrum, has constitutional powers to make laws in respect of trade and commerce between the states, and corporations, amongst others.

4.103 Australia is considered as a high quality, friendly and safe tourist destination. However, we must develop and maintain a tourist-friendly infrastructure that facilitates not only domestic but international tourism.

Recommendation 8

4.104 **The Committee recommends that the Commonwealth enter into negotiations with the states and stakeholders, and establish, no later than 31 December 2004:**

- **a single national traveller information number;**
- **a national tourist and transport information radio network along major tourist routes; and**
- **a system of national ticketing to enable tourists to purchase a single, electronic rail, road, toll and public transport ticket.**

ITS Market and export potential

4.105 The market for ITS technology is already large and it is expected to grow significantly, in line with the introduction of ITS technology in Europe and the US and the development of transport infrastructure in Asia.

4.106 In 2000, the annual market for transport technologies was estimated at A$800 million for Europe and A$2 billion in the US. The US market for ITS alone, is estimated to grow from about $5 billion to $35 billion by 2010. Moreover, it is expected that over $700 billion will be spent on transport infrastructure in the Asia-Pacific region, leading to an increasing demand

77 ITS-Australia, submission no. 7.

for ITS technology.[78] In Japan alone, the annual market size has been estimated at A$7 billion by the year 2010. The cumulative ITS market potential to 2010 for five ASEAN countries (Singapore, Malaysia, Thailand, Indonesia and Philippines) and China including Hong Kong has been estimated at over A$6.5 billion.[79]

4.107 The Australian ITS industry has demonstrated its potential for developing cutting edge technology and is recognised as a pioneer in developing advanced transport technologies such as the Sydney Coordinated Adaptive Traffic Control System (SCATS) which is now operating in over 80 cities worldwide. In addition, Australia is already part of the global ITS market, with 270 companies involved in ITS technology and exports.[80]

4.108 The global market opportunities facing Australia are well understood by key industry players. For example, Raytheon advised the committee that:

> An advanced highway traffic management system that is developed in Australia will have huge export potential as most regions and countries currently suffer from serious traffic congestion. Worldwide traffic numbers will, as predicted for Australia, continue to increase and this, in turn, will require advanced management of all road systems to reduce congestion and improve safety. Australia has the opportunity to become a world market leader for advanced traffic management systems and [so] will benefit from the export potential.[81]

4.109 ITS-Australia also highlighted the export potential of ITS:

> There is an enormous potential for export of ITS technologies. This was clearly demonstrated when ITS Australia hosted the 8th World Congress on ITS in Sydney in 2001. Over 2800 delegates from 55 countries attended the congress and significant business conducted by Australian companies including SMEs [small-medium enterprises] following the congress as a direct result of participation.[82]

78 Booz Allen & Hamilton, *Intelligent Transport Solutions for Australia*, summary report, Sydney: 1998.

79 Dr Hussein Dia, *Proposal to establish the Intelligent Transportation and Vehicle Systems Research Laboratory*, The University of Queensland, 2000; http://www.uq.edu.au/dia/its-lab.pdf

80 Booz Allen & Hamilton, *Intelligent Transport Solutions for Australia*, summary report, Sydney: 1998.

81 Raytheon, submission no. 4.

82 E—mail communication with secretariat, 1 October, 2002.

4.110 It has been recognised for some time, and reaffirmed in this inquiry[83], that 'Australia's opportunities for ITS will increase rapidly, but … capturing a share of this opportunity will require coordinated government efforts'.[84] This is reflected in the national strategy, *e-transport*:

> Commonwealth Government advice be sought, by June 2000, on the inventory of development assistance programs available to the ITS industry from all levels of government, recognising the development and export potential of the industry.[85]

4.111 Yet, there appears to be considerable reluctance on the part of policy makers to actively pursue the market possibilities for ITS. In 2001 Australia hosted the 8th World Congress of Intelligent Transport Systems. The committee was advised in August and September that the 9th ITS World Congress is going to be held in Chicago, 14th – 17th October, 2002. However, the committee was also advised at its Sydney and Brisbane briefings that apart from a display coordinated by ITS-Australia and paid for by the industry itself, there was no concerted sales effort by agencies of the Commonwealth government. Moreover, at the time of the Sydney and Brisbane briefings, the committee was advised by those providing the briefings that there was no indication of the Commonwealth's involvement despite repeated attempts from ITS - Australia to seek involvement from the Commonwealth administration.

4.112 This matter was raised with DoTaRS at a public hearing on 25 September, 2002. DoTaRS testified that the department was going to be represented in Chicago World Congress by one officer, the head of the transport programs division, and DoTaRS also understood that the Australian consul would be in attendance along with two officers from Invest Australia.[86]

4.113 It is a matter of concern to the committee that DoTaRS and other elements in the Commonwealth administration did not take a more enthusiastic and pro-active approach. The committee considers that the Commonwealth involvement in the Chicago Congress is unacceptably timid. This concern is heightened when the potential export market and actual markets so far developed, are considered.

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83 ITS-Australia, submission no. 3; the Warren Centre, Briefing, Sydney, 15 August, 2002 and submission no. 1.

84 Booz, Allen & Hamilton, *Intelligent Transport Systems for Australia, Technical Report*, p. 59; cited by Stuart Hicks, Chairman, NRTC, 'An Intelligent Transport System for Australia', 4th International Conference, Adelaide, 1999. Mr Hicks said in his speech (in 1999) that he was not sure he had yet seen a definitive argument made for government support.

85 *E-transport*, para. 4.43.

86 *Transcript of Evidence*, pp. 10 & 12.

4.114 The relaxed approach apparently taken by DoTaRS is in contrast to that taken by other nations. For example, the transport administrations of other ITS-exporting nations have ITS dedicated internet sites containing a wealth of information.[87] DoTaRS has a link to ITS-Australia, with the result that the ITS activities of government and business are difficult to find and evaluate as elements of a developing national system.

4.115 The uncoordinated way in which Australia's ITS industry is taken to world markets is in contrast to the approach adopted by other countries. For example, participation by French ITS stakeholders at the Chicago Congress took the form of a French pavilion housing thirteen separate companies or organisations. It included included companies developing video detection equipment for highways, software engineering for navigation and mobility applications, multiplexing equipment, text to speech technologies, video tele-surveillance firms, and engineering consultants specialising in ITS applications. Business development agencies, representatives of ITS France, a professional organisation which is a contact point for coordinating ITS strategies in France and in French speaking countries, the RATP, the Paris Transit Authority, and representatives of the French Ministry of Transit Equipment were on hand at the French pavilion. The French Ministere De L'Equipement Des Transport et du Lodgement had its own exhibition within the French pavillion. [88]

4.116 Some countries do not wait for international congresses. Canada continues to search for export opportunities in growing international markets. In 2000, Transport Canada's *Annual Report* stated:

> Canadian missions went to Japan, Germany, China, Brazil and Italy, among other countries, to position Canada's ITS industry and develop export opportunities for Canadian ITS firms. Canada continues to work on the international front through participation in the ITS World Congress, and attended the most recent congress held in Torino, Italy, in November 2000.[89]

4.117 The committee is concerned that the cutting-edge ITS technology that we are developing in this country will either be commercialised by others (who will accrue the benefits) or will not be developed at all. The main reason for this is likely to be that we do not have a coordinated and

87 For example see www.its.dot.gov.– the US Department of Transport Intelligent Transport Systems site or http://www.its.go.jp/ITS/index/indexHBook.html - Road Bureau, the Ministry of Land, Infrastructure and Transport, Japan.

88 http://www.itsa.org/ITSNEWS.NSF/4e0650bef6193b3e852562350056a3a7/6a6e3837b56a4f3485256c33003fd002?OpenDocument; accessed: 25 September, 2002.

89 Transportation Canada, *2000 Annual Report*; http://www.tc.gc.ca/pol/en/anre2000/tc0010ce.htm; accessed 28 September, 2002.

enthusiastic exporting policy, and more fundamentally, we do not possess the institutional infrastructure and linkages necessary to develop and implement such policies.

4.118 The committee was advised that ITS-Australia through Austroads has requested the assistance of the Commonwealth to engage the Bureau of Transport and Resource Economics to conduct analysis of the size and scope of the industry.[90] The committee believes that such a study is an important element in developing a national export oriented industry.

Recommendation 9

4.119 **The Committee recommends that the government commission the Bureau of Transport and Regional Economics to:**

- **survey the export potential of ITS;**
- **review Australian ITS industry and export policy;**
- **develop an Australian ITS industry marketing plan; and,**
- **make other such recommendations as may be appropriate.**

Recommendation 10

4.120 **The Committee recommends that the Minister for Transport and Regional Services, the Minister for Communications and Information Technology, jointly develop in co-operation with other associated agencies and related agencies a plan for the representation of Australian ITS companies at appropriate future ITS forums.**

ITS research and development

4.121 There are R&D programs operated by the CSIRO, and a number of Australian Universities, private companies and government departments are undertaking research not only into the more theoretical aspects of ITS but also the practical, hardware-oriented aspects. However, funding levels are not known but it would appear that we do not spend a great deal on ITS R&D, compared to other nations.

90 E-mail communication with secretariat, 1 October, 2002.

4.122 For example, between 1996-1998 Japan budgeted some $AUD270 million for R & D in ITS out of a total ITS budget of $AUD2.1 billion.[91] In the United States in FY 2000 over US217 million was allocated for ITS research and development by the Federal Administration.[92] This does not include the R&D contributions made by state administrations. Overall, the United States government has allocated over $AUD2 billion for ITS over six years, 1998 – 2003. This is in addition to considerable state funding.

4.123 Each year in the European Union, research programs contribute approximately €100 million to fund projects to develop and demonstrate information and communication technologies across all modes of transport.[93] This does not include the R&D contributions made by member-state administrations.

4.124 *E-transport* reported that in 1998 –1999 over $80 million was spent by all levels of government on ITS-related projects. The States and Territories were the main source of this expenditure largely because they have the major role in provision of roads infrastructure, public transport and traffic management. This $80 million also included R&D. *E-transport* reports that per capita the R&D budget of Japan in respect of ITS is about 30% higher than the R&D budget available in Australia.

4.125 If the Commonwealth Parliament were to appropriate proportionally similar ITS targeted funds, the sum in the order of $AUD30 – 50 million would be required. This would be part of a total national expenditure of $110 – $130 million.

4.126 The committee is aware of the fiscal pressures under which the Commonwealth operates. However, a proportion of the ITS R&D expenditure could be for projects that might have a safety focus. In particular, certain road 'black spots' may be addressed by ITS applications, rather than engineering or passive signs.

4.127 The committee notes that the Commonwealth allocated $48.85 million to black spot funding in 2001-2002.[94] The committee believes that there is a strong case to create a fifth, ITS specific, category of road fundings, as recommended already in paragraph 3.41 and reallocate a portion of Commonwealth road funding to ITS applications to this category.

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91 *E-transport: The national strategy for intelligent transport systems*, p. 3.

92 http://www.iot.gov.tw/apec_tptwg/TPT/tpt-main/Steering-Committees/Safe/Intelligent-Transport/tpt-wg-17-final-papers/its-funding.htm; accessed 28 September, 2002.

93 http://europa.eu.int/comm/transport/themes/network/english/its/html/vision_policy.html; accessed 28 September, 2002.

94 Department of the Parliamentary Library, *Research Note No. 2*, 2001-2002, p. 2.

4.128 It is not merely a matter of money. It is, importantly, a matter of administrative acumen on the part of policy advisers. They should be alert to the deficiencies in the current R&D arrangements and propose appropriate policies.

4.129 In this respect, Australia has not acted strongly at a national, institutional level for fundamental decisions and clear goals to be identified and pursued. Large nations, such as the United States, have seized the opportunity and devised targeted programs that will reap great rewards. Smaller nations, comparable to Australia, adopt energetic policies. For example, in partnership with the private and public sectors, and academia, Transport Canada is preparing a five-year R&D Plan to support private sector innovation and technology development and to ensure that ITS technologies lead to safer and more efficient, accessible, and sustainable transportation systems. The draft plan will be released in 2002.[95]

4.130 The CSIRO advised the committee that there appeared to be some duplication of research effort and that better co-ordination and targeting of research was needed.[96] When briefing the committee, ITS-Australia also called for better targeted and more research funds, a sentiment that was also reflected in the briefings provided by other industry stakeholders. It would appear that Australia does not possess even basic coordination at a national level for R&D.

4.131 The committee notes that R&D, including the creation of the ITS Cooperative Research Centre and the establishment of demonstration projects, are central proposals of *e-transport: The national strategy for intelligent transport systems*. However, the committee also notes that apart from the ARC funded ITS laboratory at the University of Queensland, a CRC has not been established and there does not appear to be a national ITS R&D committee reporting to the Australian Transport Council.

4.132 The estimates of the global market potential noted already indicate that the ITS industry is rapidly growing as a major sector of the global economy. However, the opportunities presented to Australia will be enjoyed only if ITS research and development is increased by coordinating access to relevant national resources, R&D programs and by developing an Australian ITS industry. Therefore, an active research and development program is necessary if Australians are to meet our own ITS needs and, importantly, develop appropriate products for a large and expanding export market. This was recognised in *e-transport: The national strategy for intelligent transport systems*, released in 1999. However, unlike other

95 http://www.its-sti.gc.ca/en/research_and_development.htm; accessed 28 September, 2002.

96 Briefing, Sydney 15 August, 2002.

countries, we do not appear to have developed a national research agenda that is capable.

4.133 This committee is acutely aware that research funds are scarce and need to be precisely targeted. The committee was unable to determine the extent to which the *e-transport* R&D strategy has been introduced. It would appear from the comments made by stakeholders providing briefings that the strategy has only partially been implemented.

Recommendation 11

4.134 **The Committee recommends that the government review the national ITS R&D strategy as soon as possible and that the government:**

- **establish an ITS R&D forum that brings together industry, academia and government, the task of which is to facilitate the exchange of information and identify national R&D priorities;**
- **establish a targeted ITS R&D fund to be administered by the previously recommended Commonwealth ITS Bureau;**
- **allocate a portion of the Commonwealth road allocations as seed funding for an ITS R&D fund; and**
- **establish a cooperative research centre for ITS.**

Paul Neville MP

Committee Chair

2 December 2002

A

Appendix A - Evidence

Submissions

Number	Organisation
1	The Warren Centre
2	VicRoads
3	Intelligent Transport Systems Australia (ITS)
4	Raytheon Australia
5	Department of Transport and Regional Services (DOTARS)
6	Saab ITS Pty Ltd
7	Intelligent Transport Systems Australia (ITS) [Supplementary submission to no 3]

Exhibit

1	Letter tabled by Mr McIntosh, dated 13 August to the Chief Scientist, Department of Education, Science and Training at a briefing in Sydney, 14 August 2002.

Public hearing

Wednesday, 25 September 2002 – Canberra

Department of Transport and Regional Services

Mr Joe Motha
Director
Safety Research and Education
Australian Transport Safety Bureau

Mr John Goldsworthy
Project Manager
Safety Research and Education
Australian Transport Safety Bureau

Mr Tony Griffiths
Director
Technology Team

Mr Graham Evans
Assistant Director
Technology Team

Ms Danielle Aeuckens
Assistant Director
Technology Team

Inspections and Briefings

Sydney - Wednesday, 14 August 2002

Inspections

The committee conducted an inspection of the facilities of the Roads and Transport Authority Traffic Management Centre and held discussions with Authority staff.

Briefings

Mr Brent Stafford
Executive Director
Intelligent Transport Systems Australia

Mr Peter Bentley
Board Member
Intelligent Transport Systems Australia

Mr Lauchlan McIntosh
Past President
Intelligent Transport Systems Australia, and
Executive Director
Automobile Association of Australia

Sydney – Thursday, 15 August 2002

Briefings

Dr Nariida Smith
CSIRO Transport Futures

Mr Robert Mitchell
General Manager
Warren Centre

Mr Ken Dobinson
Project Director
Warren Centre

Mr James Lawson
Jigsaw Property Group
Warren Centre

Mr Bert Prinsloo
PPK Environment and Infrastructure
Warren Centre

Mr Alan Finlay
NRMA Ltd
Warren Centre

Mr Keith Pettigrew
Sinclair Knight Merz
Warren Centre

Mr Neil Matthews
Strategic Design and Development
Warren Centre

Mr Peter Makeham
National Roads Transport Commission

Mr Chris Koniditsiotis
Ausroads

Brisbane – Friday, 13 September 2002

Briefings

Professor Phil Charles
University of Queensland: ITS Laboratory

Dr Hussein Dia
University of Queensland: ITS Laboratory
Mr David Panter
SAAB – ITS Australia

Mr Gary Linton
SAAB – ITS Australia

Mr Colin Jensen
Queensland Department of Main Roads.

Inspections

The committee travelled to the Woolloongabba Busway control centre and conducted inspections and held discussions.

The committee travelled to Eight Mile Plains and conducted inspections and held discussions on traveller information systems.

The committee travelled to the Gateway Bridge and conducted inspections and held discussions on the electronic toll collection system.

B

Appendix B - Status report of ITS Projects under e-transport: the national strategy for intelligent transport systems[1]

Project	Status
Establish ITSA Web Site	Completed
Marketing & Communications Strategy	Completed
Industry Skills Awareness Program	Ongoing
Sydney ITS Congress	Completed
Database of Academic and R&D Work on ITS	Completed
Inventory of Existing Projects	Completed
Support ITS Trials to Improve Rural and High Risk Travel	Active
Greenhouse Benefits of ITS	Completed
Strategy for National Multimodal Traveller Information System	Active
Support for CSIRO Project	Completed
Feasability Study for Integrated Use of ITS for Perishable Cargo	Active
Criteria for Evaluating Projects	Completed
Ministerial Releases	Ongoing

1 From the the Austroads internet site (http://www.austroads.com.au/program_its.html), 14 November, 2002. Status of projects confirmed with Austroads via telephone communication with secretariat, 14 November, 2002.

Project	Status
Regulatory Reporting by ITSA	Ongoing
ITSA Communication	Completed
Participation and Sponsorship in Journals and Conferences	Ongoing
Ministerial Study Tours	Ongoing
Open Architectural Systems	Active
National Reference Architecture	Active
National Systems Architecture - Information Seminars	Completed
National Systems Architecture - Coordination Over 3 Years	Active
National Policy & Standards - Settings Process	Active
Participation and Sponsorship in Journals and Conferences	Active
Ministerial Study Tours	Active
The Way Forward for e-transport	Active
Open Architectural Systems	Active
National Reference Architecture	Active
National Systems Architecture - Information Seminars	Completed
National Systems Architecture - Coordination Over 3 Years	Active
National Policy & Standards - Settings Process	Active
The Way Forward for e-transport[2]	Active

2 As per para. 4.6, the committee was advised that this project was added to the original 24 in late October 2002 by the Austroads Council. The purpose of the project is to 'consult with all modal groups on the future direction of e-transport, the national strategy for intelligent transport systems and develop a detailed issues and options paper addressing the way forward for e-transport, for consideration at the Austroads council meeting in March 2003 and the meeting of SCOT (Standing Committee on Transport) in April, 2003'. Austroads telephone communication with secretariat, 14 November, 2002.