e-transport

The National Strategy for Intelligent Transport Systems
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for
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e-transport
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Foreword

Whether we live in regional and rural Australia or cities, access to safe, efficient and competitive transport is essential to our way of life and economic prosperity. We also recognise that a significant component of the transport cost is due to congestion, pollution and energy depletion.

Use of modern technology provides an essential tool to help meet these many challenges. Accordingly, Commonwealth, State and Territory Transport Ministers, meeting as the Australian Transport Council (ATC), requested Austroads to develop a National Strategy for Intelligent Transport Systems (ITS).

The ITS National Strategy - e-transport - was subsequently commissioned by Austroads, following the request from ATC, and developed by Intelligent Transport Systems Australia. It was endorsed by ATC at its meeting in November 1999.

e-transport provides the national framework to harness the enormous potential of these advanced satellite, electronic, information and sensing technologies. Its task is to improve Australia’s transport systems and through this, enhance our economic development, as well as reducing the social costs of transport.

It has been estimated that Australia could gain in excess of $1 billion pa from use of ITS, supported by a National Strategy.

e-transport contains strategies and actions to help save lives, reduce transport injuries, accidents, traffic delays and emissions - and make our transport systems more accessible, globally competitive, sustainable and user-friendly.

The National Strategy focuses on strengthening the long-term benefits of ITS which can be achieved through the interoperability of national standards and cooperation. It also contains measures to foster a competitive, high-value Australian ITS industry.

Partnerships between the private and public sectors will be the hallmark of successful development and use of ITS in Australia. I strongly urge users, industry, research institutions, public and private sectors to cooperate in implementing e-transport.

JOHN ANDERSON

Chairman, Australian Transport Council, Deputy Prime Minister and Commonwealth Minister for Transport and Regional Services.
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1 Background

Transport and the Role of Intelligent Transport Systems

Australia’s population centres and diverse regions face many transport challenges. We need to:

- improve road safety and security for all users
- combat rising congestion, which is increasing travel times and industry costs
- enhance the attractiveness of public transport
- reduce the environmental impacts of transport
- improve the competitiveness and performance of our freight/logistics systems, and
- ensure Australia’s population has access to safe and affordable transport.

In April 1998, the Australian Transport Council (ATC) asked Austroads to develop a National Strategy for Intelligent Transport Systems. The National Strategy, in common with most overseas ITS strategies, derives from a roads base; however it emphasises integration of all transport modes, especially land transport.

Development of the National Strategy has benefited from an extensive consultation process, involving workshops in seven capital cities, over 50 written submissions, as well as consultation on the draft National Reference Architecture.

Why a National Strategy for ITS is Important

- to facilitate the sensible and effective use of ITS, so Australians can gain the potentially substantial social, consumer and commercial benefits. These benefits are estimated to total, in net present value terms to 2012, at least A$14.5 billion, which is 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 ITS1.

Congestion costs Australia over $5 billion a year in wasted time, vehicle costs and urban pollution - ITS are helping combat these rising costs

Sensible use of emerging technologies is essential to help meet these challenges. Intelligent Transport Systems (ITS) are sophisticated multimodal ‘tools’, which integrate advanced technologies and apply them to transport to develop solutions that will improve the quality of life of all Australians. ITS are about saving lives, time and money and improving the environment. ITS are, in effect, ‘e-transport’.

BENEFITS TO AUSTRALIA FROM ITS
Net present value to 2012*

- Efficiency $7.2 billion
- Environment $6.5 million
- Safety $3.8 billion
- Congestion and Traffic $7.5 billion

* The estimate understates the environmental benefits of ITS, by not including the contribution made by motor vehicles to global warming, for example, through greenhouse gas emissions. Booz Allen & Hamilton, ibid: p44.

1 Intelligent Transport Solutions for Australia, Technical Report, Booz Allen & Hamilton, Sydney, 1998: pp50-51. This is the most recent and comprehensive study into the potential benefits of ITS. The study describes these estimated benefits as ‘highly conservative’ (p54).
to harness the potential of ITS to the task of making our transport systems more effective, or Australia’s global and regional competitiveness will decline

- transport does not stop at State and Territory borders, so neither can ITS. Australia cannot afford more ‘break of gauge’ problems

- international experience shows greater benefits are gained when ITS work together, termed ‘interoperability’, underpinned by agreed standards and architecture. This is facilitated by cooperation and partnerships between governments, industry and users; and

- to develop a stronger Australian-based high technology ITS industry, capable of expanding its export markets.

Australia’s Use of ITS

Australia was a pioneer in developing ITS, such as the Sydney Coordinated Adaptive Traffic Control System (SCATS), which is now used widely overseas. In 1998/99, over $80 million was spent by all levels of government on ITS-related projects, mainly by States and Territories, due largely to their major role in provision of roads infrastructure, public transport and traffic management. States and Territories’ extensive policy and regulatory responsibilities for land transport have also led a number to develop their own ITS strategies. 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.

Important steps towards national cooperation have also been achieved, for example, the ATC’s decision in 1998 to adopt a single standard for future electronic toll collection road projects.

While governments are responsible for developing the policy framework for ITS and are major users, the private sector is playing a substantial role in ITS innovation, development and provision. A small number of academic and research bodies are also active in ITS development. Private sector use of ITS in Australia is currently focused largely on freight/logistics and fleet management, such as the taxi industry and motoring associations’ roadside assistance. While consumer use of ITS is still relatively small, this is expected to be a major growth area of the future, eg through safety and navigation applications in cars.
What Is Happening Overseas?

Many leading industrialised countries are developing comprehensive national strategies to accelerate and integrate use of ITS into the task of modernising their transport systems, to tackle major transport problems, and to build a strong private sector ITS industry. Two of the most advanced national strategies are those of Japan and the US. In terms of investment, a total of over A$2.1 billion was budgeted for the Japanese ITS Strategy over the three years, 1996-1998, of which some 13% was allocated to R & D. On a per capita basis, this level of overall investment is around 30% higher than Australia. In the US, the Federal Government has allocated a total of at least A$2.0 billion for ITS over the six years, 1998-2003, in addition to considerable State funding.

Comparisons between overseas and Australian estimates are not simple, as the Australian research is based on more conservative assumptions. An important lesson from overseas experience, however, is that the size and extent of the expected benefits and their overall value to society and the economy, are related to the level and targeting of investment, and improved national coordination and cooperation. Without a national strategic approach and commitment to ITS, not only would opportunities for major transport improvement be wasted, but problems might be made worse. Uncoordinated ITS standards, for example, could mean ITS impede, rather than assist, development of an integrated national transport system.

2 Vision

Recognising the importance of transport to the quality of life of every Australian, and that information can improve the effectiveness of transport, Intelligent Transport Systems will be applied in an integrated program to the transport task to deliver a significant net contribution to Australia’s economic, environmental, and social needs and objectives over the next decade.

Substantial benefits are anticipated. A range of Japanese, US and European estimates suggest ITS applications could reduce road accidents by 20-40% or more, and cut urban travel times by around the same amount, assisting travellers, industry and the environment. In the US, for example, freeway management systems are reported to have cut crashes by 24-50%, while handling 8-22% more traffic, at speeds 13-48% faster than pre-existing congested conditions. Estimates of US metropolitan benefits suggest accident and time savings could have aggregate values of around A$170 billion, respectively, for the 20 years, 1996-2015 (present value). Japanese estimates suggest investment in relevant systems could cut the road toll by 20% and expressway congestion by 70%.

2 Appropriations for ITS under the Transportation Equity Act for the 21st Century (TEA-21).
3 Strategic Goals and Guiding Principles

The National Strategy has ten Strategic Goals.

- Improved transport safety and security
- Improved transport efficiency, performance and quality, for the movement of people (by public and personal transport) and goods, by covering all transport modes and their linkages
- Reduced congestion and travel times, and improved travel demand management
- Improved effectiveness of use of transport infrastructure
- Improved transport environmental outcomes, including reduced environmental and energy (including greenhouse) impacts
- Improved contribution to Australia’s economic development, including regional, rural and remote area development
- Improved transport contribution to sustainable development
- Improved transport accessibility and equity
- Enhanced transport planning, policy-making and delivery
- Achievement of a growing share of the world’s ITS market for Australian-based business.

4 Key Strategies, Actions and Accountabilities

4.1 Ensure Interoperability and National Standards

Without interoperability, there is a limited future for ITS. Interoperability means ITS applications can work together, facilitate an intermodal transport system, build on each other, and contribute more over time. Interoperability depends on national standards, consistent with international standards. Broadly accepted standards also improve competition, reduce risks for users and systems developers and contain costs.

4.1.1 Support development of open architectural systems to encourage interoperability and competitive provision of, and access to, ITS services, eg electronic tolling and on-board diagnostic systems, and request ITS Australia to report on the implications by June 2000.

4.1.2 Recognise the development of the draft National Reference Architecture. This draft will be the subject of further review, through consultation, in order to allow Austroads to recommend its endorsement by mid-2000.

A National Systems Architecture

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.

It aims to:

- promote national and international compatibility of systems
- promote interoperability between system components
- identify where standards are needed and what items those standards need to specify
- accelerate the generation of benefits of ITS by reducing the uncertainties surrounding systems development and deployment
- provide a means of presenting an overview of ITS to consumers, service providers, systems developers and investors.

ITS will contribute, along with many other factors, to achieving the Strategic Goals.

The National Strategy is flexible in the face of the dynamic technological change associated with ITS, and provides the community and industry with as much certainty as possible about the future direction and values of the Strategy. Twelve Guiding Principles have been developed to help guide the Strategy’s evolution and implementation. These are included in Attachment 1.
4.1.3 A broad-based mechanism to further develop the National Systems Architecture to be established by ITS Australia.

4.1.4 Participation in relevant national policy and standards-setting processes to support requirements of a national, multimodal approach to ITS, eg transport and spatial data, communications, spectrum, Global Navigation Satellite System, electronics fora, to be undertaken by ITS Australia.

4.2 Create a National Institutional Framework

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.

4.2.1 Austroads, in consultation with other modal groups, implement the National Strategy on behalf of ATC and report progress annually.

4.2.2 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.

4.2.3 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.

4.2.4 Regulatory and other impediments to ITS development and use be the subject of reports by ITS Australia.

4.3 Improve Public and Industry Awareness

Poor levels of awareness are impeding the development and use of ITS to improve transport effectiveness. This is not only the case with the public, but industry also often lacks awareness and understanding of how ITS can improve its competitiveness and performance. Demonstration projects (Section 4.6) will also contribute to raising awareness.

4.3.1 A program to provide ITS information in existing transport-related web sites, including links to other relevant sites, national and international, be developed by ITS Australia by June 2000.

Privacy

Some ITS applications have the potential to identify information about individuals, such as travel movements. ITS Australia has therefore developed ten Privacy Principles as a guide to be used when ITS could affect privacy.

The Principles cover issues such as: fair collection of personal information, security of data, access by individuals to their personal information, accuracy of information, and limits on use of personal information and disclosure to third parties.

Standards Australia is in the process of adopting draft standards on a Personal Privacy Code of Practice for Electronic Tolling, based on the Privacy Principles.

Electronic toll collection (ETC) saves time. Australia’s Transport Ministers have agreed to a single standard for future ETC projects to avoid inefficiencies for motorists.
4.3.2 A targeted communications and marketing strategy and program for raising relevant community and industry awareness of ITS, be developed by ITS Australia for ATC’s consideration.

4.3.3 An ITS skills awareness program for industry be developed by ITS Australia for dissemination in all States and Territories by the end of 2000. The program should assist with developing productive public/private relationships.

4.3.4 Promote Australia’s interests at the 8th ITS World Congress, in Sydney, in 2001, and its lead-up.

4.4.5 Each ATC modal group should commit at least 10% of its R & D budget to ITS R & D over the next three years.

4.4.6 Encourage the establishment of an ITS Cooperative Research Centre (CRC) in Australia.

**Better information for travellers on travel times means less stress**

![Navigation systems in vehicles are becoming more widespread. They depend on accurate databases and digital maps](image)

### 4.4 Foster a Competitive Australian-based ITS Industry

The ITS industry has many advantages - it is information-based, high technology, high value-adding and a rapidly growing sector of the global economy. The competitiveness of the Australian ITS industry can be improved by coordinating access to relevant national resources and R & D programs.

4.4.1 Encourage appropriate access by ITS service providers to publicly-held data sources, in order to foster development and use of value-adding ITS. Principles to facilitate such access be developed by Austroads.

4.4.2 Encourage the development of Australian-based ITS equipment and software.

4.4.3 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.

4.4.4 Develop, by June 2000, and thereafter maintain a data base of current academic and R & D work on ITS.

### 4.5 Promote International Cooperation

Considerable work is under way overseas on ITS and there is substantial international technical, developmental and policy cooperation. Australia can learn much from, and contribute through participating in international efforts on ITS. In addition to the actions listed below, there is substantial international cooperation involved in activities to develop standards (Section 4.1) and expand exports of ITS products and services (Section 4.4).

4.5.1 International ITS developments which could be of benefit to Australian use of ITS be monitored and communicated by ITS Australia.

4.5.2 Promote Australia overseas as a developer of high technology ITS products, services and achievements.

4.5.3 Encourage Australian involvement and participation, public and private, with the global ITS community, especially through established mechanisms, including ISO, OECD, PIARC, PIANC, ICAO, IMO, APEC, ITS Asia Pacific, and other national and regional ITS associations.

4.5.4 Ministerial and Parliamentary participation in relevant study tours and international conferences, be supported by ITS Australia, by providing information packages on current ITS developments.
4.6 Establish and Monitor Demonstration Projects

Programs of demonstration projects have been used extensively in overseas ITS strategies to provide lessons to improve larger-scale investments. They provide on-the-ground experience and assessment of ITS applications, allowing lessons to be learned more quickly, improve consumer confidence and accelerate use of high value ITS.

4.6.1 Note a number of trials and projects are already under way, and monitor their development, including:

- F3 (Sydney Newcastle Freeway) Electronic Driver Aid Project - (Commonwealth)
- Sydney Coordinated Adaptive Traffic Control System (SCATS 7) - (NSW)
- Transitways - (NSW)
- Transport Management Centre - (NSW)
- Sustainable Transport in Sustainable Cities Project - (Warren Centre, NSW)
- Pacific Motorway Traffic Management System - (Qld)
- Brisbane Bus Priority and Passenger Information System - (Qld)
- Brisbane Port Overmass Container Authorisation System - (Qld)
- Rural/Remote Area Traveller Information - (Qld)
- Adelaide Southern Expressway - (SA)
- Intelligent Access Project - (Tasmania)
- Smart Bus Project - (Victoria)
- Vehicle Safety Initiative - (Transport Accident Commission, Victoria)
- Traveller Information System on Internet - (WA).

4.6.2 An inventory of existing demonstration projects be developed by ITS Australia and reported on a six monthly basis, and proposals coordinated for additional demonstration projects.

4.6.3 Support ITS trials with potential to improve rural road safety and safety for higher risk travel, such as fatigue management, driving in unfamiliar conditions, collision avoidance, road/rail crossing warnings, mayday systems.

4.6.4 Undertake an assessment of the greenhouse benefits of existing ITS, by end 2000.

4.6.5 Support a feasibility study for the development of a National Multimodal Traveller Information System.

4.6.6 Enforcement regimes which have been implemented for private electronic toll systems be the subject of a report by Austroads by end 2000, with actions recommended to meet public expectations of uniform enforcement.

4.6.7 CSIRO be encouraged to develop a major ITS research project in the field of freight distribution in urban areas.

4.6.8 Support a feasibility study for integrated use of ITS, real-time cargo monitoring and e-commerce to facilitate freight logistics for perishable cargoes, and request Austroads to work with relevant groups, such as those involved in the ‘Supermarket to Asia’ program, and report by end 2000.
4.6.9 Consistent criteria for evaluating ITS projects be developed by end 2000.

6 Conclusions

Many leading industrialised countries have embarked on major national ITS strategies to ensure they integrate ITS successfully into modernising their transport systems. Capturing the potential of ITS to facilitate social, safety, economic, environmental and commercial objectives is involving these countries in higher levels of cooperation, R & D and investment, across both the public and private sectors.

This Strategy will harness ITS to meet Australia’s transport challenges. Estimates suggest an overall reduction in the total costs of road accidents, congestion and vehicle emissions by at least 12% by 2012 from using ITS, is achievable, and indeed should be a minimum expectation of the total gains from using ITS.

5 Funding

Indicative funding for the implementation costs of this strategy is about $950,000, with recurrent costs for three years of the strategy estimated at $0.5M annually.

The National Strategy for ITS establishes the direction, policies and framework to achieve these gains. Implementing the Strategy will yield valuable experience from demonstration projects and from the other initiatives, and should enable proposals for high benefit national ITS projects to be developed. These should focus on the major areas of benefit from use of ITS in Australia - safety, improving urban living, and improving transport for regional and rural Australia.

The key to successful implementation of the National Strategy will be cooperation.
Attachment 1

Guiding Principles for Development and Implementation of National Strategy

1) **Broad and Equitable Distribution of Benefits and Costs.** All Australians, wherever they live and whatever their transport and accessibility needs, must be able to benefit from some use of ITS. The costs of deploying ITS should also be distributed equitably.

2) **Inclusive and Consultative.** All groups with a significant interest in the direction of ITS in Australia, should have the opportunity to participate in the continuing development of the National Strategy to ensure broad ownership of, and commitment to, the Strategy.

3) **Outcomes-driven.** There needs to be a firm focus on effectively and efficiently meeting real transport and transport-related needs, driven by the consumer and public policy.

4) **Prioritised.** The Strategy must focus on areas of greatest potential benefit and ensure a balance between the short and longer terms. The Strategy must give stakeholders and others a clear view of goals, priorities and direction, to enable the most effective development and use of ITS.

5) **Integrated and Coordinated.** The Strategy needs to be cohesive and integrated at all levels, covering all transport modes and their linkages (multimodal approach), all levels of government, and all stakeholders. It should also foster integration and compatibility, and aim to integrate ITS effectively into the tasks of achieving and adding value to relevant transport, economic, environmental and social policies, strategies and programs.

6) **Cooperative and Collaborative.** Enhanced cooperation and new or improved relationships, within and between the public and private sectors, consumers and the community, need to be fostered to ensure maximum benefits are achieved. Collaboration and cooperation will help secure involvement and integration, minimise the need for new bodies to carry the Strategy forward, and create an environment for value-adding competition.

7) **Pro-competitive.** The Strategy needs to foster an open, competitive environment and be consistent with Competition Policy. It should be based on open basic systems and infrastructures, that encourage maximum competition, involvement and development of value-adding ITS applications applicable to the wide range of potential ITS beneficiaries. The deployment of ITS must enhance Australia’s economic and industrial competitiveness and development. The Strategy should also provide the basis for assisting with the process of sustainable growth in Australia’s ITS exports, through improved competitiveness.

8) **Maximum National and International Consistency and Compatibility.** The Strategy needs to develop nationally applicable positions, policies, frameworks, architectures and infrastructures in areas of fundamental importance to effective and beneficial ITS development across Australia. International consistency should also be actively sought, where this is relevant, eg standards. Consistent and compatible national approaches will help ensure a framework is established that allows maximum competition, interoperability and certainty, and minimises risks and costs.

9) **Enabling, Facilitating and Leadership Role for Government.** The role of government in the Strategy should be to facilitate achievement of the Vision and Strategic Goals, in whatever forms are appropriate, without imposing unnecessary restrictions or limiting the flexibility of industry to develop, deploy and use ITS consistent with the Strategy. This is appropriate to a rapidly-changing and dynamic industry, and a Strategy which involves numerous stakeholders. It will involve government ensuring the fundamental frameworks, policies, infrastructures and programs are put in place so all Australians can benefit from effective use of ITS, and an understanding being forged between industry, consumer and community groups and levels of government, on respective roles. There must also be clear leadership from government, to champion ITS development to ensure all Australians benefit.

10) **Encourage Innovation.** The Strategy will be developed and managed in such a way as to encourage the private and public sectors to actively seek out ITS opportunities and to develop innovative ITS solutions.

11) **Transparent, Rigorous and Accountable.** The Strategy will be developed, managed and monitored in an open way, with clear goals and accountability for their achievement, and promotion of rigorous assessment of prospective directions and ITS projects.

12) **Consistent with Broad Societal Policies.** Adherence to broad societal policies, such as access and equity, sustainable development and protection of privacy, consumer rights and intellectual property, need full reflection in the Strategy.
Glossary

Asia Pacific Economic Cooperation (APEC)
APEC is the primary mechanism for promoting open trade and practical economic cooperation among the economies of the Asia Pacific region.

Australian Transport Council (ATC)
The group of Commonwealth, State and Territory Transport Ministers. Local Government has observer status on ATC.

Austroads
The Australasian association of road transport and traffic authorities.

International Civil Aviation Organisation (ICAO)
The United Nations’ agency responsible for maintaining the framework for the safe and orderly development of civil aviation.

International Maritime Organisation (IMO)
The United Nations’ agency responsible for improving maritime safety and preventing pollution from ships.

International Organisation for Standardisation (ISO)
The worldwide, non-governmental federation of national standards bodies. ISO’s work results in international agreements which are published as International Standards.

ITS Asia Pacific
Seeks to facilitate ITS cooperation between the countries of the Asia Pacific region.

Organisation for Economic Cooperation and Development (OECD)
A grouping of some 30 industrialised countries which provides member governments with a mechanism to discuss, develop and improve economic and social policy.

Permanent International Association of Road Congresses (PIARC)
The World Road Association which facilitates international co-operation and progress with road engineering, road policy and management of road networks.
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