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**Austroads/PIARC Seminar —  
Road Management within an  
Integrated Transport System  
Proceedings**



**Internal Report**

**AUSTROADS/PIARC SEMINAR**

**ROAD MANAGEMENT WITHIN AN INTEGRATED  
TRANSPORT SYSTEM**

**Proceedings**

Coolum, Queensland, Australia  
1 November 2001

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Road Management within an Integrated Transport System — Proceedings**

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***Prepared by***

Bruce Dockrill

Published by Austroads Incorporated  
Level 9, Robell House  
287 Elizabeth Street  
Sydney NSW 2000 Australia  
Phone: +61 2 9264 7088  
Fax: +61 2 9264 1657  
Email: [austroads@austroads.com.au](mailto:austroads@austroads.com.au)  
[www.austroads.com.au](http://www.austroads.com.au)

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## **AUSTROADS PROFILE**

Austroads is the association of Australian and New Zealand road transport and traffic authorities whose purpose is to contribute to the achievement of improved Australian and New Zealand transport related outcomes by:

- ◆ developing and promoting best practice for the safe and effective management and use of the road system
- ◆ providing professional support and advice to member organisations and national and international bodies
- ◆ acting as a common vehicle for national and international action
- ◆ fulfilling the role of the Australian Transport Council's Road Modal Group
- ◆ undertaking performance assessment and development of Australian and New Zealand standards
- ◆ developing and managing the National Strategic Research Program for roads and their use.

Within this ambit, Austroads aims to provide strategic direction for the integrated development, management and operation of the Australian and New Zealand road system — through the promotion of national uniformity and harmony, elimination of unnecessary duplication, and the identification and application of world best practice.

## **AUSTROADS MEMBERSHIP**

Austroads membership comprises the six State and two Territory road transport and traffic authorities and the Commonwealth Department of Transport and Regional Services in Australia, the Australian Local Government Association and Transit New Zealand. It is governed by a council consisting of the chief executive officer (or an alternative senior executive officer) of each of its eleven member organisations:

- ◆ Roads and Traffic Authority New South Wales
- ◆ Roads Corporation Victoria
- ◆ Department of Main Roads Queensland
- ◆ Main Roads Western Australia
- ◆ Transport South Australia
- ◆ Department of Infrastructure, Energy and Resources Tasmania
- ◆ Department of Transport and Works Northern Territory
- ◆ Department of Urban Services Australian Capital Territory
- ◆ Commonwealth Department of Transport and Regional Services
- ◆ Australian Local Government Association
- ◆ Transit New Zealand

The success of Austroads is derived from the synergies of interest and participation of member organisations and others in the road industry.

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## **Executive Summary**

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This seminar was held after the four Technical Committees of PIARC Strategic Theme 4 *Management and Administration of the Road System* had met. The seminar had as an objective the identification of futures which are inevitable from those which can be shaped and to identify the sorts of interventions by road managers which are likely to lead to the most desirable long term outcomes.

In the first session, views of the future were provided by the keynote speakers from Europe, Africa and Australia. While the visions were influenced by the economic development of the region from which each of the speakers came, there was general agreement that transport will have to continue to improve in effectiveness and efficiency of delivery. Improved pricing methods will have a major role to play in this and there will continue to be attention paid to environmental impacts of transport. Triple bottom line reporting on the performance of transport authorities will become the norm. In Europe and Australia, increased attention will be given to the integration of the transport modes and to the development and application of ITS.

The following four sessions dealt with the activities of the four Technical Committees which report on the Strategic Theme, covering Road Management, Road Bridges and other Structures, Economic and Financial Evaluation and Performance of Road Administrations. In each case, a number of Working Groups has been established to examine specific aspects of the work of the Committee. As well as an overview of the work of the Committee, more detailed description of the work of some of the Groups was provided. While there is a wide range of activities being undertaken by the Working Groups, much of the work is directed at issues arising from the private sector's involvement in road management, improving the effectiveness of the investment of funds in transport infrastructure, assessing and benchmarking the performance of road administrations including reporting on a triple bottom line basis, the application and benefits of ITS, improving road and bridge management and having roads play an appropriate role in the overall transport network through pricing and other measures.

The final session involved seven speakers linking the current work of the Committees to the visions of the keynote speakers. There was a strong agreement that mobility would continue to increase as the result of economic growth and that this would require a more integrated transport network. There was agreement that ITS and greater emphasis on appropriate pricing would be important. Issues surrounding the funding of infrastructure, probably using new forms of financing involving the private sector, would be explored. Transport authorities would need to be more responsive to community concerns and there would continue to be emphasis on sustainable transport. Regulatory arrangements and the structure of road authorities will continue to evolve. In summarising, the final speaker suggested that the future desirable outcomes, which would be measured on a triple bottom line basis, modified to include considerations of health and safety, would be achieved through attention to ITS, resource allocation, institutional arrangements, Public Private Partnerships, improved road building and maintenance techniques, integrated land use planning, demand management, vehicle technology, road use behaviour and pricing.

Many of the presenter's presentations are available for download from  
[www.austroads.com.au/austroads/coolum2001report.html](http://www.austroads.com.au/austroads/coolum2001report.html)



## 1. Introduction

This document reports on the Austroads/PIARC seminar held at Coolum, Queensland, on 1 November 2001 with the theme “Road Management within an Integrated Transport System”. The seminar followed meetings of the four Technical Committees in PIARC Strategic Theme 4 *Management and Administration of the Road System*, which had been held over the previous four days.

The program for the seminar is at Appendix 1 and it identifies the speakers for the various sessions. The program provided the opportunity for the vision for road management to be provided from different perspectives to set the scene for the four ST4 committees to report on the current state of knowledge in their respective areas. The final session provided for linkages to be drawn from the current situation to the visions that had been outlined earlier.

Some one hundred and seventy participants attended the seminar including a number of members of the PIARC Executive and member of Austroads Council. Representatives from Europe, Japan, Singapore, Pakistan, South Africa, the UK, Canada and the US made up over half the delegates, the remainder coming from Australia and New Zealand. There was a good mix of delegates from the public and private sectors.

## **2. Session 1— Road Management within an Integrated Transport System-Towards 2020**

### ***2.1. A European Vision***

In presenting a European vision for road management, Mr Jean-François Coste, PIARC Secretary General, cautioned that approaches to transport integration may not be transferable between countries or regions.

In opening, Mr Coste noted that the current size of the European Union is fifteen members and that over the next ten to twenty years the twelve countries that have applied for admission are likely to be part of the Union. Establishment of the single European market led to a great boost to the growth of transport, especially to cross border movements. In 1996, guidelines were adopted for the development of the Trans European Network-Transport (TEN-T), which comprises roads, railways, waterways, ports, airports, navigation aids, intermodal freight terminals and product pipelines, and the services necessary to operate these infrastructures. As the existing composition of the Union is largely focussed on Western Europe, many of the key linkages are north south. If the Union spreads to include countries from Central and Eastern Europe, greater attention will need to be given to east-west linkages.

An EU White Paper on transport policy was released in September 2001. It found that little progress had been made on the harmonious development of transport policy. This has led to an imbalance between modes, congestion on main road and rail links and harmful effects on the environment, public health and the high road toll. Mr Coste noted that the perceived imbalance between modes was indicated by the greater increase in road traffic relative to economic growth although there is no single criterion because of the range of different circumstances, such as large urban areas, rural areas and the like.

For the future, the EU will have to:

- accommodate greater needs for mobility arising from economic growth;
- handle increased transport demand arising from the enlargement of the EU; and
- make significant investments in infrastructure to relieve current congestion and to upgrade facilities in new member countries.

Mr Coste said that the European Union has resolved to break the link between the demand for transport and economic growth, to take modal shares to 1998 levels. This would be pursued through constraining the growth in road freight and traffic and better integration between the modes. A major package of measures has been identified and is to be implemented by 2010 to achieve these objectives. The principal measures are as follows;

- Upgrading of the Trans European Road Network (TERN) and the development of improved techniques for upgrading and maintenance so that lane capacity restrictions are avoided during the works.
- The harmonisation of technical standards including mass limits and traffic signing.
- The deployment of Intelligent Traffic Systems (ITS), with particular attention to traffic management, information services, electronic fee collection and data acquisition. The interoperability of the services across the network will be a major objective.

- Vehicle technology development including cleaner vehicles and improved on-board systems.
- Pricing measures which internalise to vehicle operators the external costs of their operations. In this regard, the Swiss Heavy Vehicle Fee is an innovative approach and encourages the transfer of goods from road to rail.
- New approaches to road financing such as Public Private Partnership (PPP) structures, the sharing of risk between the public and private sectors and the pooling of funds between motorway concessionaires to provide an efficient interconnected system. The EU approach is oriented in support of rail in line with the Swiss model.

There is no intention to restrain mobility and it is envisaged that there will be growth in personal mobility with the individual having freedom of choice between the modes. This means that the modes have to be considered as an integrated network rather than individual systems. It also means that it will be important for an individual (and goods) to be able to switch easily between modes and for information and payment systems to be integrated. The EU sees mobility as the outcome of an integrated transport system combining the internalisation of external costs, intermodality and interoperability. Such integration will favour personal mobility.

The management of roads has to be seen as part of the management of the whole transport system and road managers have to take account of mobility in their work.

## ***2.2. An African Vision***

Mr Nazir Alli, Chief Executive of the South African National Roads Agency Limited, presented an African vision for road management.

Mr Alli pointed out that Africa has a colonial legacy where trade strongly influenced the development of external transport links and security considerations shaped the structure of internal transport arrangements. These factors, linked to restricted access, led to underdevelopment. Today, however, Africa's transport system is needed to support the equitable development of the people and to provide an opportunity for individuals to pursue a full life. To achieve these social goals, it is essential that the potential of individuals be realised, but there are a variety of economic and social needs of individuals to be addressed. In the case of the rural poor, accessibility to markets and services is important and the ability to participate in the economy requires the provision of extensive labour-based programs. In the cities which are the engines of growth, the needs of the community are different and transport has a different role in the context of the systems of the cities.

While institutional transformation is occurring, as evidenced by the establishment of the South African National Roads Agency, the Government has, and will continue to have, a major role in the transport system. It will also be the dominant economic player in the provision of transport services; its current involvement in the airline industry is an example of this role. Nevertheless, PPP is showing real promise and the private sector has demonstrated an ability to respond to social needs.

The relative size of the Government sector means that it is also a dominant economic factor through its demand for goods and services, its investment in infrastructure and facilities, and the role it plays in the development and implementation of policies. Unlike Governments in many developed countries, Governments in Africa provide an important social safety net through their operations, as there is no welfare support for individuals if the Government reduces its size or range of activities.

While the Government sector in Africa has a major role in the provision of transport services and the development of policy, it is important that this part is played in an effective and efficient manner, recognising that there are many social considerations to the provision of transport services. The elimination of inappropriate pricing of services and inefficiencies in the delivery of services can deliver major gains relative to the amount of investment required. Provision of infrastructure has to be responsive to the needs of users and be capable of adjusting to changes in trade patterns or other social or economic developments. As the African community becomes increasingly motorised, the infrastructure needs to be able to accommodate such a development. It must also support improvements in the standard and quality of living.

Managers of the transport system must recognise that operations in the future must be environmentally sustainable. Consideration will need to be given to the effects of congestion and pollution in its various forms as well as the impact of transport on the health of the community and economic growth.

The demands for funding in future will need to be examined from a number of points of view. While proposals for funding will continue to be analysed from an economic perspective, which can lead to a simple “yes/no” outcome, proposals will also need to be assessed against social factors. Considerations arising from demographics and urbanisation factors will have be taken into account, along with trends in income distribution. The Government will also have to consider the national priorities in various areas. In the social areas, it will need to consider the requirements of health, education and welfare. In the area of infrastructure, it will have to balance the needs of sectors such as municipal services, roads and other transport modes, and telecommunications. Such considerations will need to recognise that some areas, such as squatter settlements, are drastically underserviced in every sector.

The outcome of investment decisions may be assessed in terms of economic and financial factors, environmental and sustainability factors and social and distributional factors. Mr Alli noted that it would be useful to consider also the impacts of investments on health and safety and observed that these factors could be included with the examination of environmental impacts.

In closing his remarks on the future challenges for transport in Africa, Mr Alli referred to:

- the size of Africa, the distances involved and the relatively low GDP;
- the complexity of African society and the inequalities within it; and
- the imaginary borders.

### **2.3. An Australian Vision**

Dr Max Lay, President of the Automobile Association of Australia and Independent Reviewer Representative for the Melbourne City Link Program, provided an Australian vision of road management to 2020.

Dr Lay observed that in terms of road management, 2020 is not particularly far into the future and that the nature of transport assets change slowly. Given that the Australian vehicle fleet has a median age of around 10 years, the impact of vehicle changes will be relatively minor by 2020.

The Australian road network is now at the mature stage and largely satisfies the needs of users. It is likely that demand for expansion of the road infrastructure will plateau as car usage stabilises. A breakthrough in engine technology to produce cleaner emissions is not anticipated and, even if one were to occur, the slow rate of changeover of the fleet would lead to it having a relatively minor impact by 2020. Nevertheless, gradual improvements in engine design will lead to a reduction in pollution over the period. “Sustainability” will remain an issue but people will continue to travel and he endorsed the view put by Mr Coste that Governments cannot restrict mobility.

Dr Lay expects that public transport and carriage of freight by rail will continue to be promoted by various groups. However, inadequacies of these solutions will become apparent, probably in overseas operations, and these are likely to temper the enthusiasm for the wider application of these solutions.

ITS technology is expected to have an increasing impact on road management by 2020 and inappropriate driver behaviour will be monitored. Improvements in road pricing will be achieved and will be used to manage the demand for infrastructure.

On the other hand, Dr Lay foresees that road investment in Australia will continue to be undertaken on an ad hoc basis and that political considerations will influence the investment in road assets. In his view, the Australian road network needs to be planned on an integrated national basis, possibly on the model of the US Interstate System. To develop such a network, a roads agency should be established on a national basis to make road transport policy, provide criteria for the investment in roads and to impose constraints on those projects which could lead to environmental degradation and sustainability and social disruption. It would also be important to have mechanisms to integrate land use planning and public transport operations.

### **2.4. Summary**

The three keynote speakers envisage that the future will see continuing improvements in the effectiveness and efficiency of the development of the road system, its operation and the agencies involved in the administration of the system. Greater involvement by the private sector, particularly in Europe and Australia is anticipated. Further work will be undertaken to improve pricing arrangements and continuing attention will be given to environmental sustainability and health impacts of transport. Continuing attention will be given to reducing the pollution arising from transport although no technological breakthroughs in engine technology are foreseen.

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All speakers agree that investment decisions will take account of triple bottom line outcomes, although there is likely to be a different emphasis in Africa given to the factors where transport has a key role in achieving equity in economic development.

The emphasis given to the integration of the various modes will be less in Africa than Europe or Australia, largely because of the state of development of the system and the stage of economic development. Europe will be working to develop a transport network involving all modes, with adjustments to modal splits. There is a consensus between the European and Australian views about the continuing growth in mobility into the future and the need to have improved integration of networks.

ITS is seen as having a real role to play in Europe and Australia in the improved efficiency of the transport network.

### 3. Session 2A — Road Management

#### 3.1. Overview of PIARC C6 work program

This session was chaired by Dr Michael Gorski, Chair of PIARC Technical Committee 6 (C6) *Road Management*, who gave an overview of the work program of the four Working Groups which report to the Committee.

Working Group 1 (WG1) is to develop a comprehensive decision making framework for the management of assets and to determine the data requirements for the decision-making. Matters that it is considering are:

- valuation of assets;
- benchmarking performance;
- utilisation of information and its communication within an organisation and between organisations; and
- skills development/training of staff in the use of the information.

WG2 addresses performance management from the point of view of users. Matters that this working group is considering are:

- safety;
- comfort;
- services;
- travel time; and
- environment.

WG3 deals with economic prediction models using benefit/cost analysis techniques. The models are developed at the network or project level and the group will be comparing the application of benefit/cost analysis and utility analysis. The group is examining the types of costs which may be used, taking into consideration the knowledge which is available on the various costs being considered, and the steps which are to be followed in applying the techniques.

WG4 is addressing maintenance programming and budgeting. The group is analysing the available methods which might be used when options are being presented to decision-makers. It will identify the advantages and disadvantages of the various methods and to distinguish between the different characteristics of various countries. The group will also seek to identify the specificities of various types of decision-makers.

### **3.2. PIARC C6 WG1 activities**

Mr David Baker, Chair of WG1, said that the overall objective of the work is to develop indicators which will assist with investment decisions.

The valuation of assets is related to accounting and financial systems. The group is examining the appropriate basis for valuations, and is considering approaches such as the original construction cost, the current replacement cost and the community value. Other considerations include whether to include the cost of land, equipment and offices/depots and whether different methods of valuation should be used for different parts of the network. The willingness of users to pay for the asset as a measure of its value and the treatment of assets with considerable heritage value, such as certain bridges, have not been considered as yet. In the latter case, there is a significant element of social value of the asset to be considered.

Related to the valuation of assets are the use of an appropriate depreciation method and the rates of depreciation. The traditional straight line and non-linear methods as well as condition-based depreciation are being assessed. The group is also to advise on the frequency at which the depreciation of assets should be updated and on the way in which maintenance and renewal should be recognised in the determination of depreciation. The impact of policies relating to routine maintenance on depreciation is also to be considered.

At this stage, no conclusions have been reached on linking the engineering and accounting valuation of assets and the treatment of depreciation. It is clear, however, that economic benefits are very important.

In addressing the benchmarking of performance in asset management, it is proposed to use high-level indicators to enable comparisons to be made between and within nations and regions. Examples of possible indicators provided by Mr Baker were the value of assets compared with GNP, the relationship between gross value and net value and the comparison of maintenance spend to asset value.

The group will be advising on the utilisation of information and its communication within an organisation. It will identify the sources of data, the manner in which it is provided, how the output is used and by whom. The way in which the information is disseminated within an organisation will be examined and the importance of the information to others will be assessed. The group will also examine how feedback on the information can be provided to those who prepare it.

In relation to skills and training, the group will investigate the extent of training carried out by road managers in the use of information on asset management. Where training is being conducted, the group will determine the levels at which it is aimed (decision-makers, engineers, workmen, the public, etc) and the topics that are covered.

### ***3.3. An Australian/New Zealand perspective***

Ms Susan Allen, General Manager, Road System Management, VicRoads, is a member of C6 and of its WG1.

Ms Allen identified the benefits that an Australian member of WG1 obtains from participating in the activities of the group. The benefits fall within four main areas:

- access to information on a range of approaches and techniques for use in the management of roads;
- encouragement to adopt a broader perspective on road management problems and issues;
- opportunities to work with senior experts from overseas authorities; and
- establishment of a large network and many contacts who are able to provide advice and assistance on a wide range of issues and matters beyond the work of the group and C6.

She was keen to explore ways to improve the flow of information between C6 and Australia and to explore the opportunity for joint research projects. She also saw it important that there is increasing participation from developing countries.

### ***3.4. Summary***

The approaches being considered to valuation of assets, benchmarking of performance, and dissemination of information throughout and between organisations are of great importance to all road administrations.

## 4. Session 2B — Road Bridges and other Structures

### 4.1. Overview of PIARC C11 work program

The overview was provided by the Chair of C11, Mme Brigitte Mahut.

C11 has three working groups examining topics on the management of road bridges and other structures. In undertaking its work, the Committee is seeking to meet the needs of:

- decision makers, owners and others who are in charge of the management of the network as an asset;
- authorities who are in charge of the management of bridges and are concerned with performance management; and
- engineers who are responsible for the technical assessment of the condition of bridges.

In relation to asset management, Mme Mahut said that Working Group 1 (WG1) is considering management of the asset from a global viewpoint. It will seek to develop a procedure for benchmarking bridge management activities.

The group (WG2) examining the second topic, performance management, is concentrating on whole of life costing. While this approach has been used in respect of other types of assets, it has not been used widely in respect of bridges. The group is addressing problems with the approach relating to the lifespan of bridges and the level of use of bridges during their lifetime. The group is also examining the difficulties associated with determining the true cost of bridge construction and the way to take into account the deterioration of bridges and the risks associated with their operation.

The third topic relates to condition assessment of bridges. The Working Group (WG3) will be establishing criteria for assessing bridge performance in terms of safety, serviceability, adequacy, etc and will also be seeking to develop indicators for setting priorities for bridge maintenance. Effective bridge rehabilitation and maintenance actions are to be developed although they will be confined to concrete bridges. The group will be convening workshops in Thailand (June 2002) and Madagascar (February 2003) on the assessment of bridge condition to assist developing and transition countries.

### 4.2. PIARC C11 WG1 activities

Mr John Bjerrum, Chair of WG1, and Mr John Thomas Collins, a member of WG1, expanded on the work of the group.

Mr Bjerrum noted that the definition of an asset has been taken from the finance sector and that there has been little engineering or technical input. As a result, asset management has been traditionally compartmentalised, with attention being given to particular groups of assets, such as bridges, pavements, lights and guard rails. He also noted that there are a range of stakeholders who have an interest in asset management such as users, owners, neighbours and various organisations. No accepted definition of asset management exists although it is defined in the OECD report "Asset Management for the Roads Sector" as:

“A systemic process of maintaining, upgrading and operating assets, combining engineering principles with sound business practice and economic rationale, and providing the tools to facilitate a more organised and flexible approach to making decisions necessary to achieve the public’s expectations.”

Mr Collins outlined the way in which successive British Governments have introduced the private sector into highway procurement and maintenance activities. The initial approach in 1991 was the use of Design Build Finance and Operate (DBFO) arrangements under which the infrastructure was provided by the private sector and financed by tolls paid by users. This was subsequently extended to the Private Finance Initiative (PFI) where “shadow tolls” funded from general taxation financed the privately provided asset. In the last few years, the PFI has been further developed to the Public Private Partnership (PPP) which is intended to introduce private sector management expertise into transport services while maintaining public ownership. All of the trunk road network in England and much of it in Scotland is now managed and maintained under contract.

Mr Collins addressed the implications of private operation and management of bridges for bridge management systems. Such systems need to be used by:

- the client to obtain funds, and to understand the impact of the bridge maintenance requirements on the remainder of the network. The system should demonstrate the consequences of failure to provide the necessary funding, such as increased whole of life cost and traffic restrictions. It should also provide information on the residual life of the structure and the associated upgrading or replacement costs for those who plan improvement schemes.
- the client and the maintaining agent to determine and agreed maintenance strategy. The system should permit the agent to formulate programs of remedial work with reference to the residual life of the bridge and the client to assess the programs.
- the maintaining agent to measure and appraise the extent of deterioration of the structural capacity, to determine programs for inspections and data collection, to plan work and to assess maintenance program to coordinate with road maintenance authorities to minimise disruption.

#### ***4.3. An Australian/New Zealand perspective***

Dr John Fenwick, Executive Director, Structures, Department of Main Roads, Queensland, described the application by his organisation of a Bridge Asset Management System (BAMS) to the variety of bridges in Queensland.

Dr Fenwick drew attention to the variety of vehicles which use the road network. Over the last few years, B-Double vehicles have been allowed to use many parts of the network, while in the more remote parts of the State, road trains with up to four and sometimes more trailers are used. While there are clear economic advantages from the use of such vehicles, overloading can be a problem on occasions.

Some of bridges on the Queensland network were constructed up to 130 years ago and 25% of the bridges are wooden. Many of the network’s bridges were designed and constructed for horse drawn vehicles or modest loads carried by early motor vehicles.

Dr Fenwick noted that the demands for increasingly heavy items of equipment to be carried by road are continuing and ways must be found to accommodate these requests without causing undue damage to the road system. He foresees the demands to handle increasingly heavy loads continuing because of the economies that larger items of plant offer to industry. He cited the power industry as an example of an industry sector where increasingly large items of plant are being used.

The objective of an asset management system is to ensure that the network is able to handle the needs of the economy and industry as their demands continue to increase.

#### ***4.4. Summary***

Systems to assist the management of bridges need to take into consideration special considerations relating to the valuation of bridges, the determination of their residual structural life and the impact that their maintenance or upgrading or replacement can have on other elements of the network. The involvement of the private sector requires a management system which is able to provide a range of information to the various parties involved.

In the Australian context, there are special demands on bridge maintenance and related management systems in view of the number of wooden bridges that are used coupled with the increasing loads that have to be accommodated to meet the needs of the economy and industry.

## 5. Session 3A — Economic and Financial Evaluation

### 5.1. Overview of PIARC C9 work program

Ms Sherri Alston, Chair of PIARC C9, outlined the topics being examined by the three working groups of the Committee in pursuit of the Committee's objective to "improve the economics and finance of road administrations".

Working Group 1 (WG1) deals with the economics of road assets and is focussing on methods of evaluation. It is examining the economic benefits of the use of ITS and IT in the road system, the valuation of road assets and the economic evaluation of road maintenance.

WG2 addresses pricing and costing and is currently examining costing and pricing principles, transport costs and pricing instruments and regulations.

The third Working Group (WG3) considers financing and public private partnerships. It is examining best practice in funding and financing and benchmarking PPP. It will prepare an update report on road system financing.

Ms Alston said that the outputs of the Committee would be analytical and technical tools for use by road administrations, articles in Routes/Roads by the three working groups on their work, seminars in developing countries and reports on the work of the Committee and its working groups.

### 5.2. PIARC C9 WG3 activities

Ms Caroline Visser of the Directorate General of Public Works and Water Management, the Netherlands, described the activities of WG3 on behalf of the Chair of the Group, Mr Peter Struick.

Ms Visser said that the group expected to:

- identify various forms of financing or funding;
- identify best practices, some of which at least could be developed into case studies;
- develop indicators for benchmarking of forms of financing and funding; and
- redefine PPP.

The group intended to determine the state of the art in relation to PPP by the end of 2001. For this purpose, the group has sought information from road administrations on matters such as the use of PPP, financing arrangements, contracts with the private sector and the management of these contracts, and the evaluation of the performance of the private sector.

The group also intended to investigate issues such as the tension which can arise between selection procedures and transaction costs and between the term of the contract and the need for both parties to exercise discretion and for the contract to accommodate changing circumstances.

Ms Visser commented on the need to examine integrated land use and transport planning and the use of PPP. As an example of a successful involvement of the private sector with integrated planning she described a residential development in The Hague.

### ***5.3. An Australian/New Zealand perspective***

This perspective was presented by Mr John Pauley, a member of C9 and it's WG3.

Mr Pauley identified the following issues which are being examined by the group, and others in C9, as being of particular interest to Australia:

- the development of a framework for pricing and the role of PPP;
- the development and application of a road pricing framework, especially for marginal cost pricing;
- innovations in PPP;
- the impact of alternative valuation techniques as road agencies adopt an increased commercial and business focus (the work of C6 is also relevant to this issue);
- the identification of economic benefits of ITS; and
- the development of frameworks for risk sharing and risk analysis.

### ***5.4. Summary***

The range of issues being addressed by C9 is of relevance to all road administrations. The increasing role being played by the private sector and the need to manage the road network more effectively and efficiently means that issues such as the evaluation of investment in infrastructure and pricing for its use are being brought to the fore. Included in this is the need to understand the economic benefits that can be obtained from the introduction of ITS. The relationships between the road administrations and the private partners need to be better understood and developed so that the arrangements better meet the needs of road users and the community.

## 6. Session 3B — Performance of Road Administrations

### 6.1. Overview of PIARC C15

Ms Miranda Douglas-Crane, Chair of C15, provided an overview of the work of C15.

C15 is to examine the management and organisation of road administrations. This will cover the management of the interfaces between the public and private sectors and the related sharing of risks, competence and the performance indicators for the road authorities, quality systems, resource allocation, and procurement methods for works.

She indicated that, in developing a framework for assessing the performance of road administrations, it is necessary to recognise the variation in political, economic and social systems in which the administrations operate and that the focus of government depends on the country's stage of economic development. It also needs to be recognised that the types of transport vehicles change as a country moves from one stage of development to another. Variations will also occur in the issues which are given emphasis by organisations, in funding arrangements and in the level to which the private sector is involved.

Ms Douglas-Crane noted that research has identified five phases through which a road agency may pass from an initial establishment wholly as a government department to a fully corporatised entity in the private sector.

The Committee has established three working groups to examine particular aspects of the Committee's responsibilities. Working Group 1 (WG1) is examining the positioning of road administrations, WG2 is examining the internal performance of the road administrations and WG3 is looking at performance management and the development of appropriate performance indicators.

### 6.2. PIARC C15 WG1 activities

The activities of the group, which is examining the positioning of road administrations, were discussed by Mr Paul van der Kroon, Chair of WG1.

Mr van der Kroon said that the group is to identify:

- the trends which are impacting on road administrations;
- the trends in organisational modes; and
- the interactions between central governments and other road providers.

To obtain data on the situation within road administrations, the group has prepared a questionnaire which has been sent to the 35 countries participating in C15 activities. The questionnaire is seeking information on:

- elements of public interest such as safety, mobility and the environment;
- the relationship between the road administration and the Ministry;
- arrangements for funding the network;
- the role of the private sector;

- dynamic traffic management; and
- relationships with other network providers.

Preliminary findings suggest that:

- road administrations are shaped by social, economic and technological forces;
- road administrations are acting in a more business-like manner;
- the five phases of organisational development can be seen as elements which are used to meet Government and user expectations; and
- some difficulties or variances may arise when organisations are in the later phases of development.

### **6.3. PIARC C15 WG2 activities**

The activities of WG2, which is examining the internal performance of road administrations, were described by Mr Niels Nielsen, Chair of WG2.

Mr Nielsen said that the group is aiming to promote improvements in internal performance of road administrations by the identification and application of best practice. It is planned to develop a quality “tool kit” of best practice in management and procurement methods.

The group will also develop and conduct seminars in developing countries to assist with institutional strengthening in the road administrations.

It is intended that the group develop case studies on best practice in improving internal performance. These case studies will draw on the model developed by Dr John Cox of the four stages of the life of a transport network (birth, growth, upgrade and maturity) integrated with Talvitie's five stages of an organisation's development (establishment as a public works authority, identification of client and producer, separation of client and producer, corporatisation of the producer and corporatisation of the client.) While initial work will be based on these models, they could be altered as work progresses if that appears appropriate.

Case studies will also be developed on best practice in procurement.

### **6.4. An Australian/New Zealand perspective**

Mr Rick van Barneveld, National State Highways Manager, Transit New Zealand, provided the Australian/New Zealand perspective.

Mr van Barneveld anticipates that road administrations will need to be more responsive to the views of communities in future. Rather than being satisfied with consultation on issues as in the past, he sees communities demanding an involvement in the making of decisions. At least in New Zealand, community issues are going to align closely with global issues. Issues relating to heavy vehicles and logistics will move on to developing more intelligent and friendly transport. Issues arising from vehicle intrusion will move on to sustainability matters and pricing.

Social, economic and environmental factors will become key shaping forces, and will lead to emphasis on triple bottom line reporting. Indicators will need to change as maturity of the system approaches. Attention will be paid to the outcomes of a road administration's activities and the time, cost and quality of producing them.

In relation to PPP, New Zealand has moved from having a road administration in the form of a public works authority to the privatisation of the delivery of road assets. However, there has been no borrowing to finance the system, the DFBO approach has not been adopted and only limited use has been made of tolls to finance infrastructure.

Resource allocation in the past has been based on influence based decisions and cost/benefit analysis. In future, it is likely that resources will be allocated to outcomes. Reliability and the best use of assets will be key performance areas. It is possible that the era of upgrading the New Zealand network will conclude.

### **6.5. Summary**

Road administrations, particularly in the countries which are moving into the post industrial or the global economy stages of development, are facing challenges in meeting the changing demands of society and the needs of the road network. Society will be expecting greater accountability by the administrations in terms of triple bottom line reporting and in demonstrating that they have delivered their outcomes efficiently.

The organisational structure of the administrations is also likely to develop and the demands to upgrade the network may diminish as the network reaches a mature state.

## 7. Session 4 — Road Management in a Integrated Transport System-linking the present to the future

### 7.1. Roads to the Future-Role of Road Administration in a Multimodal Transport System

Dr Gerold Estermann, PIARC ST4 Coordinator, addressed the seminar on this topic. The Terms of Reference for ST4 is to “improve the performance of road administrations and the provision and administration of road infrastructure and its use in accordance with world’s best practice.”

Dr Estermann noted that road transport is reaching its environmental and financial limits and, in Europe, it will be important to obtain some shifts in the modal choice. Work remains to be done on road safety, particularly on the development of an integrated approach to roads, vehicles and drivers. In addition, it is important for Europe that further work be undertaken on tunnel safety, particularly in the light of recent serious incidents.

In terms of national and regional development, the funding and financing of roads is emerging as an important issue, particularly in Europe. There is a need for greater equity in user charges. The application of tolls has been varied and they have usually been applied to new roads. Dr Estermann expressed some reservations about the practicality of internalising all external costs. Europe accepts that mobility will not be restrained and that users should have a free choice of mode. However, this choice may be influenced by prices and the levels of service. In relation to regional development, Europe will need to address the possible need for further east-west links.

Environmental, economic and social sustainability issues arising from road transport need to be addressed. In this context, it is important to consider planning matters and the greater integration of land use planning and transport planning.

Comparing the situation in Europe with that in Australia, Dr Estermann noted that the clearing of bottlenecks and more effective pricing required attention in Europe. He also noted that the achievement of a modal shift towards rail seems less important in Australia than in Europe. He also noted that the key outcomes identified in the Austroads Strategic Plan closely matched the key issues identified by PIARC.

### 7.2. The Queensland approach to road management in the future

The Queensland Minister for Transport and Main Roads, the Hon Steve Bredhauer MP, outlined the approach that will be taken by the Queensland Government to the management of roads in the future.

Mr Bredhauer noted that the Department of Main Roads has evolved from being a road builder to being a road system manager. The Department is now focussing on development of the total road system in conjunction with local government, Queensland Transport and other departments, industry and the community. The Departments of Transport and Main Roads are now responsible for the development and management of transport solutions to the community’s needs within broad Government objectives.

The future planning of transport in Queensland is based on a document prepared by the two departments within the Transport portfolio in 2000. Titled *4Seeable Futures*, the document seeks to use a scenario planning approach to explore answers to the question “how will we be connecting people, goods and services in 25 years and what will that mean for transport?” The transport portfolio scenarios are SuperCity, Coastal Bloom, Carbon Crunch and Global Bust.

The structure of the portfolio allows the planning, operation and management of roads to be considered in the context of a totally integrated transport system and with input from land use planning. A number of integrated regional transport plans covering major areas of the State have been prepared which take into account land use planning, and consider the needs of education, health etc, as well as transport.

A key challenge of the transport portfolio in the future will be to manage the expectations of the various stakeholders.

### **7.3. Panel discussion**

A panel consisting of four eminent transport practitioners provided their views on the way in which road management might evolve over the next few years.

The discussion was commenced by Professor David Hensher, of the University of Sydney, who focussed on urban public transport and the Transport and Environment Strategy Impact Simulator (TRESIS) decision support system. TRESIS is designed to assist planners to understand and predict the impact of mixtures of transport strategies. Professor Hensher showed how TRESIS is able to predict the effects of the implementation of various public transport policies on a variety of output indicators. The model is able to address the effects of policies on bus fares, levels of service and accessibility on greenhouse gas emissions, modal share, operator revenue, total car passenger vehicle kilometres, an accessibility indicator and total end-user costs. Based on the results from TRESIS, significant changes in policy are needed to bring about significant alterations in the use of public transport. He also argued that the increased use of information technology can increase the demand for local area freight in urban areas which can be significant contributors to global emissions.

Dr Hiroshi Mitani, PIARC Immediate Past President and President of the Tokyo Metropolitan Expressway Public Corporation, pointed out that Tokyo has had an integrated transport system for many years and now relies heavily on rail for commuter transport. By 2020, it is planned to improve mobility to support the vitality of the economy and societies, to create an environmentally friendly transport system and to realise a safe and secure life and transport. In relation to roads, further construction of ring roads will be undertaken and attention will be given to improved road management, the increased use of ITS, the implementation of demand management through road pricing and the promotion of a multi-modal policy. In an effort to pursue these objectives, institutional reform was initiated earlier this year to strengthen linkages between the various transport modes through the amalgamation of ministries to form the new Ministry of Land, Infrastructure and Transport.

Dr John Cox, a Transport Consultant, argued that all modes follow the four stages of development (birth, growth, upgrading and maturity) which may be represented by an "S" curve. Some countries have flat growth in transport, indicating that their economy is moving into a service and global economy phase, although mode shifts may occur such as from road to air for intercity travel. The increasing use of electronics is able to increase the efficiency of transport and communications may take the place of some transport. Integration of the modes indicates a maturing of the transport network and other earlier phases of economic development have different requirements of the transport network.

Dr Robin Dunlop, the Chairman of Austroads and the Chief Executive of Transit New Zealand, noted that New Zealand has tried to work on a competitively neutral basis with reliance on economic analysis. For the future, he sees funding and pricing issues and the regulatory framework being important. New pricing arrangements will need to be developed to replace fuel taxes which have been found to be not effective. Ease of interchanging between modes will become increasingly important. Administrations will have to take more account of user feedback. Dr Dunlop foresees continuous change with users demanding more mobility and greater access to transport.

Mr Steve Golding, the Chair of the session and Director General of the Department of Main Roads, Queensland, observed that there would be a need to formulate views about the level of mobility which would be provided to users. He also anticipates that congestion and other external impacts will need to be addressed and that there will be funding and pricing implications to be addressed.

#### **7.4. Summary and conclusion**

The summary and concluding remarks were provided by Professor Ken Ogden, Group Manager, Public Policy, Royal Automobile Club of Victoria.

He saw the objective of the seminar as being to distinguish between those future events which will be inevitable and those future events which can be shaped. From this, it would be possible to identify those interventions which can lead to desirable outcomes. These would be reflected through triple bottom line reporting, covering economic, social and environmental outcomes, amended to include outcomes on health and safety.

Professor Ogden identified ten factors through which the desirable outcomes could be achieved:

1. ITS — This will involve major technological developments. It will be important to have interoperability and the harmonisation of standards will be key to achieving this. Improvements in safety could have equity benefits. However, there may be political problems to overcome to achieve the gains that ITS offers.
2. Resource allocation — Improved pricing of roads will lead to greater investment in the other modes and to an improved integrated transport network. However, it will be important to recognise social objectives in taking decisions on investment in transport infrastructure, such as for communities in remote areas, as such investments could provide benefits to other sectors like education and health.

3. Institutional arrangements — While it seems certain that institutional arrangements will change in the future, the direction of the change is not clear and the federal form of government in some countries will lead to special problems. A major issue will be whether roads are privatised.
4. Public Private Partnership — PPP will lead to more innovative funding sources for roads (and the transport network) but there is a need to find a proper balance between commercial and community objectives. Judgements will be necessary to determine when private involvement is appropriate and to what level, and how PPP may be used to obtain social outcomes. The downside of private sector participation will need to be carefully managed and care will have to be taken to ensure that privacy requirements are not compromised.
5. Improved road building and maintenance techniques — Further work on these techniques will be necessary and there may be changes to decision making process and practices. Technology transfer will be important to ensure that developments are used effectively. Consideration will have to be given to the level of social standards, sometimes known as Community Service Obligations.
6. Land use planning — Cities will continue to grow because of their importance to economic growth although the definition of a city is becoming blurred. Transport systems will have to accommodate this continued growth but there may be some non-transport solutions to transport problems.
7. Travel Demand Management — Mobility will continue to grow although there may be a plateau in cities in the number of trips/capita. At present, congestion is the only TDM mechanism but pricing will be used in the future. This plateau effect could lead to the demand for travel being met through measures such as pricing and the use of ITS.
8. Vehicle technology — Major changes in vehicles can be expected but their impact will not take effect for a long time. There will be continuing pressure on manufacturers to produce cleaner vehicles.
9. Road use behaviour — There will be greater intervention on behaviour by systems. It is important to gain a greater understanding of the reasons for driver behaviour and the behaviour of older drivers will have been better understood.
10. Prices/charges/taxes — The community will demand greater transparency in the charges applied to roads. External costs will be internalised to a greater extent. So that the charges can be determined better, it will be necessary to identify the costs better. It will also be necessary to have Governments less dependent on road taxes. The economic benefits of ITS will need to be analysed.

## Appendix 1 — Seminar Program

Time	Topic and Presenter
08.30am	Registration
<b>Session 1</b>	<b>Road Management within an Integrated Transport System – Towards 2020</b>
09.00am	Chair: Mr Colin Jordan, PIARC Vice President and Australian First Delegate, Chief Executive and Managing Director, Royal Automobile Club of Victoria
09.10am	Keynote addresses: Mr Jean-Francois Coste, PIARC Secretary General <i>A European vision</i> Mr Nazir Alli South African First Delegate and Chief Executive Officer The South African National Roads Agency Limited <i>An African vision</i> Dr Max Lay Independent Reviewer Representative for Melbourne City Link Program Office of the Independent Reviewer <i>An Australian vision</i>
10.10am	Discussion
10.30am	Morning tea/coffee
<b>Session 2A</b>	<b>Road Management</b>
11.00am	Chair: Dr Michel Gorski, Chair PIARC C6 Overview of PIARC C6 work program, Dr Michel Gorski PIARC C6 WG1 activities, Mr David Baker (UK), Chair WG1 <i>Asset Management</i>
11.10am	An Australian/New Zealand perspective, Ms Susan Allen, General Manager, Road System Management, VicRoads
11.20am	Discussion
<b>Session 2B</b>	<b>Road Bridges and other Structures</b>
11.45am	Chair: Mme Brigitte Mahut, Chair PIARC C11 Overview of PIARC C11 work program, Mme Brigitte Mahut
11.55am	PIARC C11 WG1 activities, Mr J.Bjerrum (Denmark), Chair WG1 <i>Asset Management</i> Mr John Thomas Collins, Welsh member of WG1 An Australian/New Zealand perspective, Dr John Fenwick, Executive Director (Structures) Department of Main Roads Queensland
12.15pm	Discussion
12.30pm	Lunch

<b>Session 3A</b>		<b>Economic and Financial Evaluation</b>
1.30pm		Chair: Ms Sherri Alston, Chair PIARC C9  Overview of PIARC C9 work program, Ms Sherri Alston
1.40pm		PIARC C9 WG3 activities, Ms Caroline Visser (Netherlands), <i>WG3 Finance, Public Private Partnerships</i>
1.50pm		An Australian/New Zealand perspective, Mr John Pauley, Acting General Manager, Strategic Policy and Planning Department of Infrastructure, Energy and Resources, Tasmania
2.00pm		Discussion
<b>Session 3B</b>		<b>Performance of Road Administrations</b>
2.15pm		Chair: Ms Miranda Douglas-Crane, Chair PIARC C15  PIARC C15 WG1 activities, Mr Paul W.A.M. van der Kroon, Chair WG1 <i>Positioning of Road Administration</i>
2.25pm		PIARC C15 WG2 activities, Mr Niels Christian Skov Nielsen, Chair WG2 <i>Improving Internal Performance</i>
2.35pm		An Australian/New Zealand perspective, Mr Rick Van Barneveld, National State Highways Manager, Transit New Zealand
2.45pm		Discussion
3.00pm		Afternoon tea/coffee
<b>Session 4</b>		<b>Road Management in an Integrated Transport System – linking the present to the future</b>
3.30pm		Chair: Mr Stephen Golding, Director General, Department of Main Roads, Queensland  <b>Roads to the Future — Role of Road Administration in a Multimodal Transport System</b> , Dr Gerold Estermann, PIARC ST4 Coordinator, Ministry of Transport, Innovation and Technology, Austria
3.45pm		<b>Welcome to delegates and Queensland approach to road management in the future</b> — Hon Steve Bredhauer, Queensland Minister for Transport and Roads
4.00pm		<b>Panel discussion:</b>  Panel Members: Prof David Hensher Professor of Transport Management University of Sydney Dr Hiroshi Mitani PIARC Immediate Past President Senior Adviser, Tokyo Metropolitan Expressway Public Corporation Mr John Cox Transport Consultant Dr Robin Dunlop, PIARC New Zealand First Delegate, Chief Executive, Transit New Zealand, Chairman Austroads
4.45pm		<b>Summary and conclusion:</b> Prof Ken Ogden, Group Manager – Public Policy Royal Automobile Club of Victoria
5.00pm		Close

## INFORMATION RETRIEVAL

Austroads (2001), **Austroads/PIARC Seminar — Road Management within an Integrated Transport System — Proceedings**, Sydney, A4, 34pp, IR-23/01

### **KEYWORDS:**

Austroads, (PIARC) World Road Association, Australian, New Zealand, roads, transport, system.

### **ABSTRACT:**

This document reports on the Austroads/PIARC seminar held at Coolum, Queensland, on 1 November 2001 with the theme “Road Management within an Integrated Transport System”. The seminar followed meetings of the four Technical Committees in PIARC Strategic Theme 4 *Management and Administration of the Road System*, which had been held over the previous four days.

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