PIARC – C15

PERFORMANCE OF ROAD ADMINISTRATIONS

Thursday 23 October 2003 (1.30 – 5.00 p.m.)

SESSION AGENDA & INTRODUCTORY REPORT

22.15.E

SESSION AGENDA

Section 1: Summary of activities carried out during 2000-2003

1. Outline of the work of the C15 Committee

Ms. Miranda DOUGLAS-CRANE (Chairperson of C15/AUSTRALIA)

2. The technological forces shaping Road Administrations and Road Network Stages

Dr. John COX (Transport Economist)

Section 2: Outcomes of the work of the Committees

1. Positioning of Road Administrations

a) Results and trends world wide on the role and positioning of road administrations

Mr. Paul van der KROON (Leader of WG2, C15/THE NETHERLANDS)

b) An African perspective on the positioning of Road Administrations

Mr. Nazir ALLI (First Delegate for PIARC/SOUTH AFRICA)

2. Internal performance improvement

a) C15 framework on internal performance improvement of Road Administrations

Mr. Rick van BARNEVELD (C15 English-speaking Secretary/NEW ZEALAND)

b) A case study on Performance Improvement in a birth phase

Ms. Eredene OYUNCHIMEG (C15 member/MONGOLIA)

c) Two case studies on Procurement in developing countries

Mr. Ijaz KHAN (C15 member/PAKISTAN)
Mr. John CLEARY (Lamont Consulting Engineers/ZIMBABWE)

3.Performance of Road Administrations

a) C15 framework on performance indicator for the road network and Road Administrations

Mr. Laurent DONATO (C15 French-speaking Secretary/BELGIUM)
Dr. John COX (Transport Economist)

b) Case studies on use of performance information from countries in three of the four road network stages

- Growth stage

Mr. Fernando RODARTE(C15 member/MEXICO)

- Upgrading stage

Mr. Marc LEMLIN (First Delegate for PIARC/BELGIUM)

- Mature stage

Ms. Connie YEW (C15 member/USA)
Mr. Murray KIDNIE (Secretary of National Committee/AUSTRALIA)

4. Forum

Ms. Miranda DOUGLAS-CRANE (Chairperson of C15/AUSTRALIA)

Section 3: Future Directions - the next 5 to 10 years

Ms. Miranda DOUGLAS-CRANE (Chairperson of C15/AUSTRALIA)

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EXECUTIVE SUMMARY

The roles, responsibilities, strategic direction, structure and resourcing of Road Administrations (RA's) are shaped by a complex set of forces. The principle drivers though are economic, social and political, environmental and technological developments in each individual country.

National development generally progresses from an agricultural and industrial economy through a services based economy to a knowledge based economy. The economies produce different road transport characteristics that in turn shape the road management task in each country.

Technological change historically has affected the demand between transport modes and recent developments in communications and information technology are now having a major effect on transport systems and the internal management of Road Administrations.

Road Administrations must contribute to the outcomes that the community requires at each stage of their national development. The main focus in the early economic stages is generally on economic outcomes while a more demanding set of economic, social, health and environmental outcomes is required in the latter stages.

Road networks undergo different phases of development that are categorised in the paper as Birth, Growth, Upgrading and Mature phases. This S shaped growth curve also occurs in other transport and technological systems.

There is a correlation between economic/social development and road network development, with developing countries mainly involved in network growth and developed countries mainly concerned with network upgrading. Some countries are observing a slowing of increases in car ownership and road travel demand as they move into a maturer phase.

Road Administrations have responded to these external economic, social, environmental, political and technological pressures as their road networks have developed.

Institutional reform has occurred to provide greater value for money and to bring clearer lines of accountability in the necessary policy, regulation, funding, procurement and delivery functions. Further reform is occurring to take account of the greater involvement of both the community and the private sector in the planning, funding and delivery of road transport improvements and government efforts to facilitate intermodality outcomes.

Road Administrations have also needed to develop different capabilities as road networks develop and the road system management task changes.

This conceptual model of Road Administrations managing the various phases of road network development in the midst of economic, social and technological changes is not deterministic. It could, however, be useful in proactively managing changes if analysis indicates that a different set of economic and social characteristics are likely to arise in the near future and impact on the road administration.

Political, economic, social and technological forces pose very significant performance challenges for Road Administrations. C15's work and the case studies of best practice, which have been assembled show, however, that performance improvement opportunities can be developed very effectively from inside existing Road Administrations. Unlocking this potential gain in value for governments, road users and communities is a very important responsibility for road managers.

The key areas of opportunity identified by the Committee:

- good governance
- strengthened strategic and business planning
- clearly focused organisational structures with transparent accountabilities
- appropriately trained and managed human resources
- management systems supporting outputs and performance measures of key Performance indicators (KPI's).

The Committee has found that international collaboration on improving procurement of goods, works and services by Road Administrations has the potential to improve both effectiveness and efficiency.

The Committee has achieved some groundbreaking results by establishing a framework and performance indicators for measuring the performance of road networks and Road Administrations, which is relevant to all PIARC countries. This has been challenging because of the:

- wide differences in economic and social conditions in these countries
- differences in the level of motorization and the extent of road network development
- differences in the type and structure of management organisations.

Performance indicators have been proposed in three overall categories as follows:

- those that provide a quantitative measure for the performance of the overall road transport sector in a country, e.g. road fatalities/100,000 population
- those that are used by Road Administrations to measure the outcomes of their own internal management
- those that measure other internal road management performance such as output measures or the delivery efficiency of translating inputs to outputs, e.g. construction or maintenance costs/km.

The Committee considers that PIARC could do further very useful work in the area of performance of Road Administrations.

SECTION 1 – INTRODUCTION AND C15 FRAMEWORK

1.1 Preamble

The World Road Association (PIARC) has established a Technical Committee, C15 Performance of Road Administrations to undertake activities in accordance with the PIARC Strategic Plan 2000-2003.

C15's goal is to improve the performance of Road Administrations in the provision, operation and management of road infrastructure and its use in accordance with best practice.

The Terms of Reference of C15 Committee are to identify and disseminate information relating to:

- new management and organisation modes of Road Administrations
- public/private and public/public management and risk sharing
- new public road authority competencies
- internationally comparable measures of Performance Indicators of the Road System and Road Administrations
- effective performance management systems and processes and tools to evaluate performance.
- tools for improving optimal resource allocation
- procurement methods for works.

Three working groups have undertaken the work of the Committee. These are listed below along with their main topic areas of work:

- Trends for Road Administrations
  - trends in organisational modes
  - trends impacting the Road Administrations
  - interactions with central Government and other network providers.

- Internal Performance
  - management framework for Road Administrations
  - case studies on Procurement, Quality/Benchmarking and building capability to meet future needs
  - developing country seminar on Institutional Strengthening.

- Performance Management
  - matching requirements to road user and stakeholder needs
  - performance indicators for developing and developed countries
  - private/public partnerships.

C15 MEMBERS

Comité technique de la Performance des Administrations routières
Technical Committee on Performance of Road Administrations
Liste des membres - Membershiplist

NOM/NAME	PRENOM/FIRST NAME	PAYS	COUNTRY	WG
DOUGLAS-CRANE	*MIRANDA (Chair)*	*AUSTRALIE*	*AUSTRALIA*	*1*
DONATO	*LAURENT (French Speaking Sec)*	*BELGIQUE*	*BELGIUM*	*1*
VAN BARNEVELD	*J.H. (RICK) (English Speaking Sec)*	*NOUVELLE-ZELANDE*	*NEW-ZEALAND*	*3*
ROBINSON	**John**	**ROYAUME-UNI**	**UNITED KINGDOM**	**1**
DONATO	Laurent	BELGIQUE	BELGIUM	1
DOUGLAS-CRANE	Miranda	AUSTRALIE	AUSTRALIA	1
HESSLE	Manfred	AUTRICHE	AUSTRIA	1
MAATTA	Tapani	FINLANDE	FINLAND	1
MANTEIGAS	Rui	PORTUGAL	PORTUGAL	1
RASOAVANINY	Justine	MADAGASCAR	MADAGASCAR	1
RODARTE	Fernando	MEXIQUE	MEXICO	1
VODZINSKA	Ludmila	SLOVAQUIE	SLOVAKIA	1
YEW	Connie	ETATS-UNIS D'AMERIQ	UNITED STATES OF AMERI	1
van der KROON	**Paul**	**PAYS-BAS**	**NETHERLANDS**	**2**
BERGFALK	Lars	SUEDE	SWEDEN	2
BOUCHER	Maurice	CANADA-QUEBEC	CANADA-QUEBEC	2
DIETERLE	Rudolf	SUISSE	SWITZERLAND	2
HAALAND	Kjell	NORVEGE	NORWAY	2
LAMER	Mladen	CROATIE	CROATIA	2
LECHANTEUR	Pascal	FRANCE	FRANCE	2
PYCH	Jerzy	POLOGNE	POLAND	2
RUBIO	Jesús	ESPAGNE	SPAIN	2
VERBAKEL	Yvan	BELGIQUE	BELGIUM	2
NIELSEN	**Niels Christian Skov**	**DANEMARK**	**DENMARK**	**3**
BOURREL	Albert	FRANCE	FRANCE	3
CERCIELLO	Maria Pia	ITALIE	ITALIA	3
GHILAIN	Eric	BELGIQUE	BELGIUM	3
KHAN	Ijaz	PAKISTAN	PAKISTAN	3
LEE	Steve	ROYAUME-UNI	UNITED KINGDOM	3
OYUNCHIMEG	Erdene	MONGOLIE	MONGOLIA	3
RODRIGUEZ COMES	Omar	CUBA	CUBA	3
SVARC	Jan	REPUBLIQUE TCHEQUE	CZECH REPUBLIC	3
VAN BARNEVELD	Rick	NOUVELLE-ZELANDE	NEW-ZEALAND	3

1.2 Overview

In considering the approach to take in relation to its work, the Committee tried to determine how it could best provide focus to the Committee's work program and make the work relevant and useful to all PIARC member countries. Since Road Administrations cannot operate in isolation, the Committee decided it needed a framework on which to test its ideas and research and map the Committee's experience. The literature was reviewed and a transport economist engaged to do some work on Road Network Development.

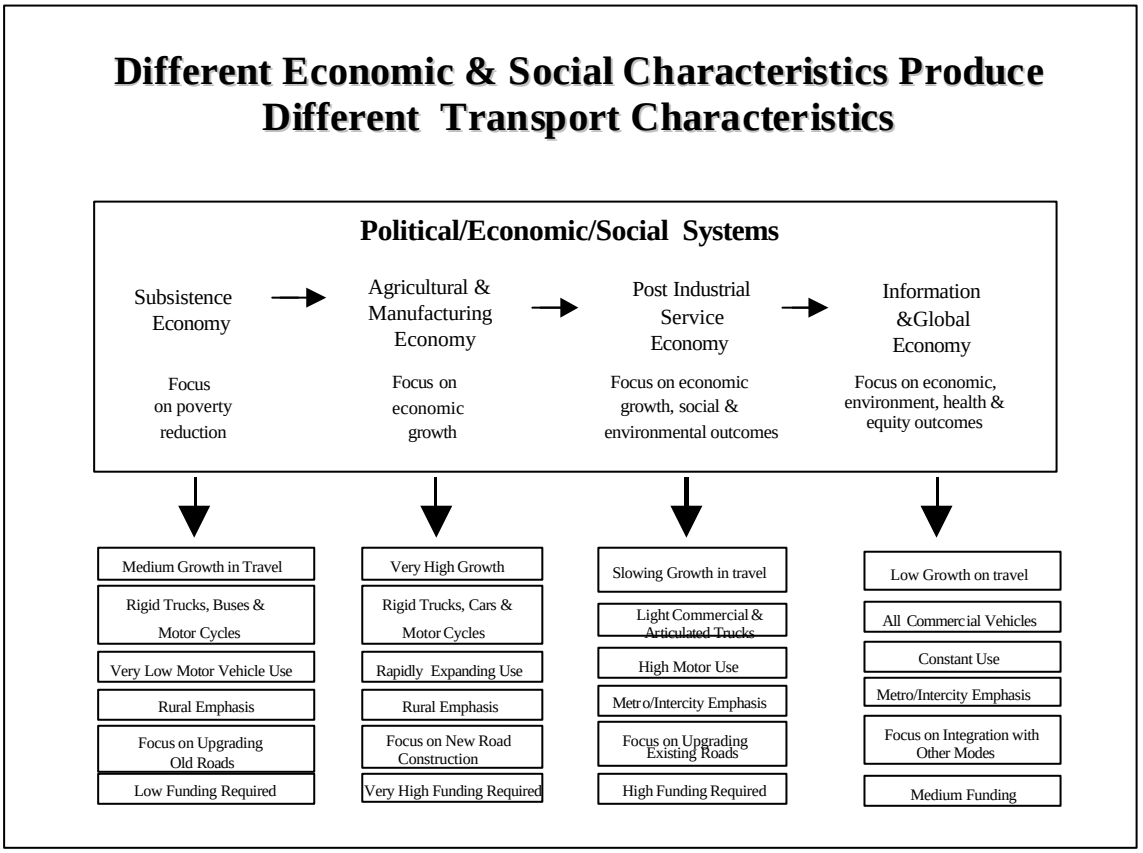
Following considerable discussion, the Committee developed a paper titled 'The Economic, Social and Technological Forces Shaping Road Administrations'. The purpose of the paper was to set out the key forces shaping the overall context within which Road Administrations operate and to outline the range of responses that are taking place to meet the pressures. This set the framework on which the rest of the Committee's work was to be tested and developed.

A shortened version of the paper titled 'The Economic, Social and Technological Forces Shaping Road Administrations' was published in the July 2001 edition of the PIARC Routes/Roads magazine and in Transportation Research Record 1812 of the US Transportation Research Board in 2002.

A summary of the main thesis follows.

1.3 National Development and Transport Characteristics

National development generally passes through several social and economic phases, which focus on different national outcomes. There is a clear relation between these economic development phases and road transport characteristics, such as vehicle types, traffic growth and road network development. These characteristics are summarised in the figure below.



A rapid growth in population and GDP from agricultural and industrial development generates significant traffic of rigid trucks for freight movements and buses, and light vans for passenger travel. Larger articulated trucks replace rigid trucks in the service economy because of cost efficiencies.

The dominance of commercial vehicles in the birth and growth phases reduces as the road network grows and car travel for private purposes becomes central. The use of cars expands during later economic phases but car ownership rates start flattening off in the information and global economic phase, when the highest transport growth rates are for international passenger and freight movements rather than within the country.

1.4 Economic Phases and Road Network Development

The different economic phases not only affect the overall transport characteristics but also affect road network development, with the more developed economies having more extensive road networks.

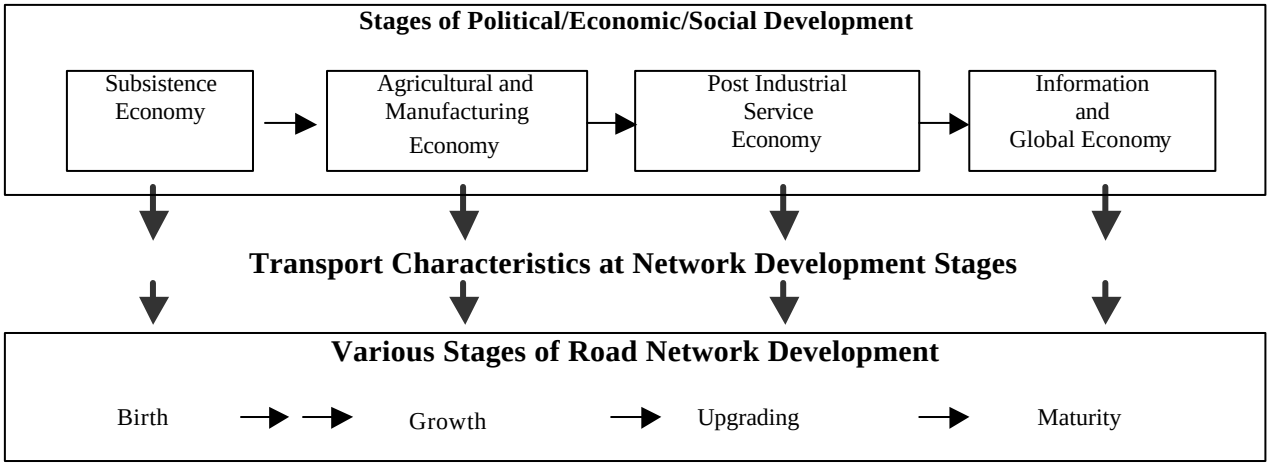
Road network development has been shown to go through the normal S or logistic curve growth pattern of new technological innovations. The different phases of road network development on this S curve are categorised as Birth, Growth, Upgrading and Mature phases, and are associated with different stages of political, economic and social development, as seen in the figure below. A general description is given below.

Birth phase - associated with subsistence economy and limited motorization and road network development.

Growth phase – associated with an agricultural and manufacturing economy and a rapid expansion of the vehicle fleet. The paved road network needs to increase to satisfy this increased vehicle demand.

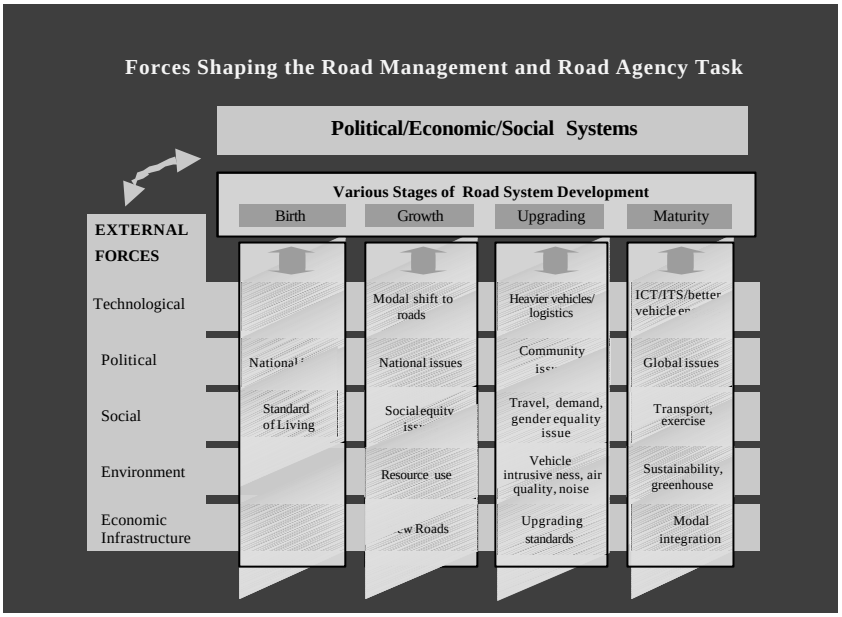
Upgrading phase – associated with a service economy and a focus on the upgrading of road standards. The existing road network needs to be upgraded to higher geometric and pavement standards to safely carry the greater amount of articulated trucks. The need for 'just in time deliveries' to retail and manufacturing establishments, together with a trend to 'just in time living', also applies pressure for improvements in road capacity.

Mature phase – associated with a globalised, information based economy where road transport is a less important economic actor and traffic growth slows. Private car travel, in particular, slows due to the saturation of new drivers taking up the motorcar.



1.5 Trends impacting Road Administrations

The forces acting on Road Administrations will differ significantly during the various stages of national and road network development. Some of these external pressures are summarised in the figure below as technological, political, environmental, social and those related to the development of new infrastructure.



Technological: Technological developments have a dominating influence on the share of transport demand between modes, the structure of road transport itself and on internal processes within Road Administrations.

Rapid advances in computer and communications technology are also having a significant effect on road transport operations through Intelligent Transport Systems, which involve intelligent vehicles, smart roads and better transport information systems. Advances in engine technology are already having a major effect on air pollution from road transport.

As in other economic sectors, information and communication technologies are having a major effect on internal road administration processes that should reduce communication costs and assist in better decision-making.

Political: As most Road Administrations are still government departments controlled by Ministers, they are subject to a variety of political pressures at the various stages of road network development. In early network stages national development issues predominate, whereas regional and community concerns emerge when greater vehicle use and upgrading of networks in metropolitan areas is needed. This leads to a greater dialogue between Road Administrations and the community in relation to regional and community issues, which in turn empower the community and enables them to impact road transport decisions. In mature networks globalisation issues impact on Road Administrations with fast growing international passenger and freight traffic affecting road capacity to airports and sea ports.

Social: In birth countries, the biggest imperative is reduction of poverty. Social equity pressures arise during the road network growth phase when decisions on whether to improve feeder roads to the developing arterial highway network are being made, as these roads generally have a lower benefit-cost ratio than arterial roads. The question of limiting travel demand instead of the upgrading of roads arises in urban areas in the service economy phase. Gender equity issues arise because most of the increase in car travel in this period is coming from female drivers. In a knowledge based society where life span itself becomes the only scarce commodity, there undoubtedly will be greater attention to "transport exercise", in order to increase health outcomes. This trend will involve Road Administrations in providing smaller scale facilities for walking and cycling along their right of ways, as well as limiting vehicle movements in residential areas to allow such exercise.

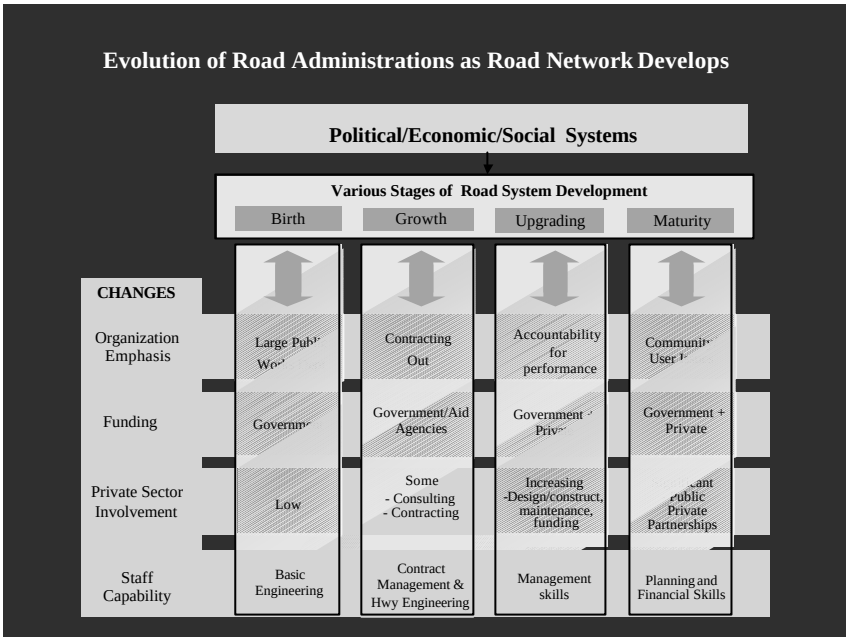
Environmental: There are not too many environmental issues shaping Road Administrations in the birth and growth phase where the emphasis is on economic outcomes. Greater vehicle intrusiveness (VKT/ha) in European cities in the service economy phase causes environmental disquiet because higher noise and air pollution levels lead to a greater disruption to the quality of urban living than in North America and Australia. This then leads to greater pressures in Europe for a reduction in motor vehicle demand, often via higher fuel prices, more public transport use, stricter vehicle emission standards, less road expenditures and more sustainable transport policies.

Economic: Road Administrations are required to provide suitable economic infrastructure for each stage of network development. This progresses through new road construction, upgrading existing infrastructure and finally integration of road transport with other transport modes.

1.6 Internal Responses of Road Administrations to External Forces

Organisational Emphasis: Road Administrations change their organisational form and focus as road networks develop. Roads are generally managed as part of other engineering public works in the birth and early phases of network development. There is a greater management emphasis on the contracting of road works in the road network growth stage, while Road Administrations need to become more accountable to the community when upgrading of existing roads begins.

The provision of economic infrastructure is largely dominated by the public sector in early road network development phases, but there is an increased use of private sector management practices and private funds as networks expand.



Staff Capability Renewal: There is a continual need to upgrade the management and technical skills of personnel in Road Administrations as road networks develop. Technical skills within Road Administrations need to increase in the road network growth phase to meet an order of magnitude change in the volume of road works being designed, constructed and maintained.

In the upgrading phase there is generally a greater emphasis on internal management matters in order to get better use of the existing road system. This is done by separating out the various financial, technical, regulation, planning and delivery functions to different bodies which are then held accountable through performance and benchmarking indicators for both road networks and internal management processes. In the final mature road network stage, even greater management skills are required to integrate road transport into a seamless transport system within an expanding information technology context and greater use of private sector funds and management practices.

SECTION 2 - STRATEGIC POSITIONING OF ROAD ADMINISTRATIONS

There is an enormous variation in the role, positions, and functions of the Road Administrations of member countries due to the history of the country its national economy, its social and political makeup and the associated forces for change as outlined in the first section of this report.

In order to get a better insight into the issues related to the trends described in the framework paper, C15 drafted a questionnaire on various aspects of the role and positioning of Road Administrations. All C15 member countries, an additional number of developed countries and various developing countries, amounting to 35 countries in total, completed this questionnaire.

Results from the questionnaire confirm most of the trends described in Section 1 of this report, in particular those relating to the relationship between economic development and road network development. They also substantiate the external drivers and the more commercial approach that Road Administrations are taking, as well as the increasing role of the private sector in the road management task, particularly in developed countries.

The results also suggest that some external drivers (economic growth, politics) are more important in shaping the road management organisation, while others have an impact on the task and activities of the RA (i.e. social factors, environmental and safety concerns, technological developments). The impact of the drivers is thus diverse.

The following trends in relation to the road management task have been identified:

2.1 Relationship between Government and Road Administrations (Road Administrations)

- The Committee has found that as economies face increased competition and Governments aim to reduce outlays, Road Administrations are under increasing pressure to demonstrate effectiveness and efficiency. In all network stages there is pressure for “more value for money” with value being associated with optimum economic outcomes in the birth and growth network phases and with a more balanced set of economic, social health and environmental outcomes in the latter phases of road network phases.

- Institutional reform has also been prompted by government concerns to ensure value for money.

- Other drivers of institutional change include the need for increased responsiveness to road users and transparency in road management operations. Another driver has been the requirements set down by aid agencies and banks providing road network development loans. These institutions usually require governments to introduce progressive institutional arrangements as a condition of funding and as a means of ensuring value for money.

- The C15 survey found that the organisational form of Road Administrations did not appear to be related to the linear institutional development model of the World Bank (Talvitie) nor the economic development or road network stage of the country as suggested in the C15 framework paper “The Economic, Social and Technological forces shaping Road Administrations”. The types of reform introduced within Road Administrations vary substantially. After a long period of stability there has been significant restructuring of Road Administrations in the last 4 years in Finland, Norway, Denmark, Italy, Netherlands, Austria, Switzerland, Belgium Flanders and several states of Australia and the U.S. The Committee considers this trend will continue in Asia, and the USA.

- Central Agencies, Ministries and Transport Departments are more clearly specifying their goals and targets and more Road Administrations are delivering services in accordance with outcome or output focused service level agreements with higher levels of government. There has also been a trend for Departments to call for more transparency in road management, i.e. more sharply define the framework within which the RA operates, including the relationship between the government ministry of transport and the Road Administration. In the Netherlands for example, there has been a distinction made lately within the Ministry between a policy formulating entity and an executive body being the Road Administration. In the last two or so years a further split of the responsibility has been made by creating an inspection body in addition to the policy and executive functions.

- A number of countries have devolved responsibility for management of their national road networks as a means of ensuring relevance to, and involvement of, lower levels of government. Again, this is most visible in the upgrading and maturity phases. In several countries, proposals for investments in the road network need to be based on integrated regional transport plans (e.g. New Zealand; Switzerland at the urban level), and Portugal have plans to introduce similar arrangements in 2004. In such plans, interests of the users, general public and regions are to be balanced. In 2004 Finland will trial the distribution of Federal budgetary allocations, including road allocations to regional governments as a means of delivering services, which are relevant to local communities.

2.2 Private sector involvement

- There has been an increasing use of the private sector, irrespective of the level of the development of the network. Aid agencies and banks require recipient developing countries to contract out management and construction of works. Very high funding requirements and pressures on overloaded networks in the network growth and upgrading stages are forcing other countries to deliver results more quickly at lower costs by contracting construction and maintenance works. Other activities, such as design, network management and corporate functions are being packaged up in larger parcels and outsourced. Design, Build, Finance Operate (DBFO) projects have delivered considerable savings to some governments.

- In some developed countries the increasing private sector involvement in road management has triggered discussion as to the possible boundaries with respect to the role of the private sector. The discussions focuses on ways in which the government can realise its policy objectives even when the Road management task has been (partly) privatised. One way or another Governments want the achievement of such objectives to be safeguarded. Governments need to provide a transport system for its citizens, which maximises the desired quality of the system, (e.g. mobility), whilst minimising any adverse impacts on the personal lives of citizens. Governments are accountable for delivering on a range of social health and environment outcomes and they now see the benefit of having more control of the functions and processes that relate to the delivery of these.

2.3 Relationship with road users

- A number of Road Administrations, particularly in developed countries, must now see themselves as service providers to increasingly articulate and vocal community based interest groups, which are very aware of the real and potential impacts of road construction and congestion on their lives. Not only do Road Administrations need to be more cognisant of the impact of the network on those communities neighbouring the roads, but also enter into dialogue with them when changes are being planned. There is also a requirement to focus on the more effective utilisation of the existing network and Road Administrations are using capabilities associated with ITC and traffic demand management to do so. Such concerns are less apparent in countries, which are still building their networks' (birth and growth phases) since their citizens have more economic based imperatives.

2.4 Integrated transport (intermodality)

The C15 questionnaire found that dialogue between Road Administrations and other transport modes is, generally speaking, confined to the planning stage of road network developments. Nevertheless, there are clear signs of a significant sea change in relation to intermodality. Several governments have introduced legislation to ensure an integrated approach to infrastructure development and transport issues.

- The European Union (EU) has released a White Paper on Common Transport Policy, which articulates a commitment to integrated transport. The EU has introduced several initiatives to foster a more competitive rail sector and has introduced new regulations to foster more equitable road user charges.

- A number of Australian Road Administrations have now been incorporated into a broader, more integrated transport or infrastructure based departmental structure. The Australian government has also released (in November 2002) a green paper proposing reform to Australia's land transport system which aims at producing an integrated network of land transport links of strategic importance, as well as intermodal connections to ports and airports. Auslink, as it is known, is intended to form the basis of a new inter-governmental agreement between Commonwealth, State, Territory and local governments to underpin new planning and funding arrangements.

- Belgium has a federal based organisation of the railway management and a regional based organisation for roads, ports, public transport and regional airports management. This creates interesting integration possibilities on multimodality in the regions of Wallonia, Flanders and Brussels. Furthermore Flanders will change next year its department of environment and infrastructure into a department of mobility with several agencies, i.e. road agency, public transport agency, waterway agency, etc. There will be a one to one relation between the minister and its department and the agencies, and it will be a clear signal to the transport sector.

- In Finland there are plans to establish new organisational arrangements with all transport-related administrations into one. There is considerable activity at the regional level to foster greater bus travel. The recent organisational changes in Austria are designed in part to foster a greater focus on intermodality in that country.

2.5 Road management development financing

- Pressure on, and competition for, scarce government funds is providing the impetus for a range of non-budget financing arrangements that in some cases involve the private sector. New links and rehabilitation are being funded by a mix of public/private sector arrangements through a variety of mechanisms, including trust funds or dedicated road funds, (US, Japan, Germany), road tolls (most countries) and commercial loans and even capital market financing (South Africa). Funding of roads from developers with interests outside the transport sector (e.g. commercial and residential developments) is a developing trend

2.6 Technological changes

- Technological development has progressed quickly in recent years and has enabled road users to access real time information about the performance of the network and to make decisions about their travel plans. Road Administrations are establishing mechanisms to exploit e-technology for the benefit of road users. Seventy percent of the hits on the Portugal home page are to view the real time traffic information available to users. The more pervasive use of the Internet has enabled a faster and closer interaction between road users and the road administration and faster provision of services by the RA. This trend has enabled the development of e-government initiatives in Sweden, Norway and the Netherlands.

- Technological developments are definitely one of the more important factors that can impact the scope of the road management task, particularly in developed countries. In the financing process, many developed countries are exploring the increased role of Electronic Fee Collection. Technological development has lowered the threshold, both to change road user charges from fixed (like taxes linked to car ownership) to variable (linked to car use), as well as to diversify to time (rush hours) and place (more urbanised areas). The role of the RA can vary in the future, from heavy to non-involvement (third parties collecting such fees).

SECTION 3 - INTERNAL PERFORMANCE IMPROVEMENT

3.1 Best Practice Performance Management Frameworks

The forces shaping Road Administrations and road networks described in Section 1 of this report, pose very significant challenges in relation to improving the performance of Road Administrations. The key areas of opportunity summarised in the Committee's article published in the April 2003 issue of Routes/Roads are as follows:

- good governance
- strengthened strategic and business planning
- clearly focused organisational structures with transparent accountabilities
- appropriately trained and managed human resources
- ,management systems supporting outputs and performance measures of key Performance indicators (KPI's).

Many Road Administrations are looking to address performance management improvement through big picture reforms. Changes in legislation and the requirements imposed by lending institutions are often significant external factors in relation to performance improvement. C15's work and the case studies of best practice, which have been assembled show, however, that performance improvement opportunities can be developed very effectively from inside existing Road Administrations. Unlocking this potential gain in value for governments, road users and communities is a very important responsibility for road managers. A proactive approach presents one of the most significant current challenges to the managers of Road Administrations.

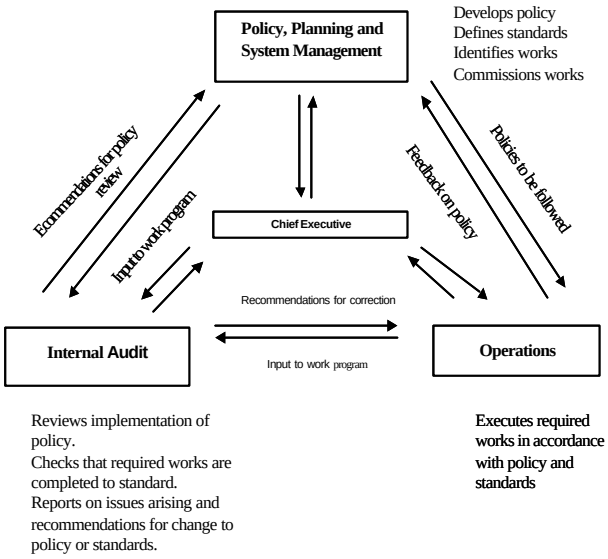
The most valuable performance improvement initiative identified by the Committee on each of the five areas listed above is as follows:

Clarification of roles and accountabilities: Essentially this is about distinguishing policy and management roles from delivery and production. The latter includes professional (engineering) services, maintenance work and projects (capital works). It is important to have clarity about at least the following principle functions:

Policy and Management	-	regulation
	-	funding
	-	road policy and planning
	-	road system management and control
Delivery and Productions	-	asset and maintenance management
	-	project planning and engineering
	-	other professional services
	-	maintenance works
	-	construction works
	-	provision of plant and machinery

More Transparent public budgeting and reporting: The public increasingly expects full information on road sector budgets and programmes, together with easily understood information on performance in quality, and timeliness terms. Common examples of documentation to complement published road programmes include a charter, contractual performance agreements with government, benchmarking studies, annual statements of intent and service performance, independent system, programme and project audits.

Flattening the organisational structure: The best practice structural relationships between policy and management, operations and internal audit respectively, are shown below:



Market-based approach to staffing: It is often difficult to apply a best practice market approach to the human resources function in a Road Administration while it is part of a government department. A number of important principles should, nevertheless, be targeted for progressive implementation as the development and retention of competent trained staff is an essential prerequisite to sustainable performance management.

The key principles for attention are:

- personnel selection on merit
- performance appraisal related to position requirements and tied to remuneration
- private sector relativity
- outsourcing specialist requirements.

Planned approach to improved management systems: The commitment a Road Administration makes to developing and maintaining its core management systems is very important to the effectiveness and efficiency of its activities.

The Committee has found the importance of making changes to the road management function is often overshadowed by the split focus of the large government departments of which they are traditionally part. On the other hand, where improvements to performance management are made along the lines of those described, benefits are reported from around the world in both developing and developed countries, generally in the following areas:

- clearer accountability for achievement of high level government outcomes;
- improved efficiency in the allocation of resources
- improved efficiency in utilisation of resources
- increased community involvement and stakeholder satisfaction
- greater assurance in quality of outputs
- better opportunities to demonstrate social and environmental credibility and very importantly
- sustainable staff resources with full private sector compatibility.

The performance management framework summarised here, along with a compendium of directly related case studies, has been published by Committee C15. The case studies illustrate key features of the performance management framework but by definition they will be rapidly overturned by new developments. Making new case studies in these important areas readily available on PIARC's website is an important possibility for consideration.

3.2 Procurement Improvement Opportunities

International collaboration on improving procurement of goods, works and services by Road Administrations has the potential to improve both efficiency and effectiveness. It is increasingly the expectation of governments that the best use of limited funds must be demonstrated and this includes the need for benchmarking against private sector practices. The proposals for stronger accountabilities and separation of operational functions from management and policy described in Section 3.1, allow adoption of a number of valuable procurement improvement initiatives.

While the Committee has prepared a comprehensive report describing a framework for improving procurement practices a number of key issues have emerged.

In-house business unit structures: Semi-formal contracts between in-house units offer a valuable opportunity for road administration staff to gain experience with the preparation and management of business like arrangements, which can be benchmarked against the private sector to identify improvement plans. This approach has the secondary benefits of allowing an in-house workforce to be well prepared for any prospective competitive tendering/bidding initiatives in the future. This is particularly significant in relation to maintenance activities, which are still widely delivered in a very traditional way.

Pricing systems: Agreements on standardised pricing for inputs of time, plant and materials are a generally accepted prerequisite to making systematic efficiency gains. The transition from road costs driven by inputs to an outputs focus is the next critical step forward in changing from a traditional government approach to a more businesslike model for the management of roads.

Packaging in terms of scope and extent: These factors need analysis for country specific situations and no single solution is appropriate. The scope and extent and also term of agreements and/or contracts for road maintenance, whether in-house or contracted out, need to take account of at least:

- integration of services for users
- small package inefficiencies for suppliers
- large packages reducing current competition
- long-term arrangements reducing future competition
- the influence of the range of activities in a package of work on the viability of the supply unit.

Form of contract: Many important procedures and processes have been identified and reported by the Committee in relation to both input and output driven contracts. The interesting new development in more innovative and mature procurement strategies, is a move toward outcome driven performance specified and alliance contracts.

Substantial savings and superior performance characteristics have been reported from both long-term performance specified maintenance contracts and alliance contracting, respectively. Very importantly, neither of these outcome-contracting approaches is well suited to the early transition from in-house operation, as good performance data is required and sound contracting competencies are required to secure success.

SECTION 4 - INSTITUTIONAL STRENGTHENING IN DEVELOPING COUNTRIES

Some 20 delegates from low or middle-income countries, participated in a seminar on Institutional Strengthening and Procurement Improvement, facilitated by Committee C15 in Cuba in September 2002.

The Committee's hypothesis regarding the forces that shape Road Administrations and their impact in relation to the stage of road system development was strongly endorsed by participants. The performance management issues identified by participants in workshop sessions were strongly aligned with the transport characteristics shown on Figure 1. This means that Road Administration managers can use Figure 1 to confirm that they have improvement strategies in place for all the dominant transport issues which may be relevant to their current political, economic and social situation. Perhaps even more importantly, it is possible to foreshadow the likely future change of emphasis and put strategies in place to strengthen performance management systems accordingly.

In relation to performance management, the most significant observations from a developing country perspective are:

- Making accountability clearer must be a good place to start as even for developed countries it gives improvements.

- Increasing the separation of the client or manager from the supplier of work is helpful for motivation of teams and a simple way to emphasise simple lines of accountability.

- Businesslike practices make better results for everyone. Early initiatives should include introduction of reporting real costs and work completed in preparation for introducing accrual accounting.

- Users can help make a funding case and define better performance objectives so involve them in at least an advisory role. Try to give them real responsibilities.

- Involvement of the private sector in delivery can make them advocates for the administration.

- Savings from outsourcing must be balanced against quality and to do this, outsourcing should follow a planned approach to establishing competency in the market. Time is critical.

- With a focus on reform, must not forget the asset and the skills needed by the Road Administration to manage its ownership interest.

- Reform can help a Road Administration focus on its core business, which is the condition of the roads, and not the business of how to do the work efficiently - this is the role of the maintenance and construction enterprises. This is a very real opportunity.

Business like procurement arrangements were widely agreed by the developing countries represented at the Committee's workshop in Cuba to present a very significant opportunity for performance improvement. Their key observations were:

- Procurement improvements do not need outsourcing. Better in-house arrangements can achieve a large proportion of the benefits outsourcing.
- Good briefs avoid big problems between clients and suppliers.
- Take time to get the estimate right and avoid misalignment and expectations with suppliers.
- Capable contractors are a key to outsourcing, so need transition to build a market.
- Good evaluation skills by the client's representatives are very important.
- Do not accept very low bids without being ready for the consequential tension between client and supplier.
- Performance monitoring should influence future evaluations of bids by respective suppliers.
- Savings from innovative procurement arrangements can equal initial competition savings.

SECTION 5 – PERFORMANCE INDICATORS FOR THE ROAD SYSTEM AND ROAD ADMINISTRATIONS

5.1 The Task

PIARC and OECD have done considerable work on how to measure the outputs from Road Administrations and their effective management. Nevertheless, at the World Congress in Kuala Lumpur, member countries stated that they *"were having difficulties identifying indicators that were meaningful and measurable".*

During its current term C15 has developed a Conceptual Framework that allocates responsibility for the performance of the road transport sector to three main actors namely:

- the Whole-of-Government (not just Road Administrations and agencies),
- the Road Administration as a manager of the network, and
- the Road Administration as deliverer of road projects.

The Framework has focused on two strategic themes (part of PIARC Strategic Plan Theme 4) namely, to *"identify internationally comparable measures of performance of the road system and Road Administrations"* and to *"identify and disseminate effective performance management and tools to evaluate performance with these frameworks"*. Additional complexity results from the involvement of the private sector and the contribution from Public Private Partnerships has been considered and included.

5.2 The Challenges

The task sets many challenges for the identification of suitable Performance Indicators:

- governments generally specify that they require multiple outcomes from the road transport sector
- these road related outcomes are influenced by a variety of outputs that are provided by other actors besides the road administration
- many traditional financial performance indicators in the private sector and government business enterprises cannot be used because there is no market mechanism whereby road users are charged for a service
- a performance management system is extremely data hungry.

These challenges are exacerbated when trying to develop an effective performance management framework which is relevant to all PIARC C15 countries because of the:

- wide differences in economic and social conditions in these countries
- differences in the level of motorization and the extent of road network development
- differences in the type and structure of management organisations.

Despite these challenges a wide range of performance indicators have been proposed for the management of road transport in various countries around the world and these can be classified into three overall categories as follows:

- Those that provide a quantitative measure for the performance of the overall road transport sector in a country, e.g. road fatalities/100,000 population.
- Those that are used by Road Administrations to measure the outcomes of their own internal management efforts on the performance of the road transport sector, e.g. the benefit cost ratio of capital projects.
- Those that measure other internal road management performance such as output measures or the delivery efficiency of translating inputs to outputs, e.g. construction or maintenance costs/km.

5.3 The Stages of Road Network Development

Section 1 of this report develops the thinking about the forces shaping Road Administrations and defines the development of the road network from Birth, through Growth and Upgrading to Maturity. The various correlations between the factors influencing the road network development stage achieved and the management role of the Road Administration have formed the basis of a simplified approach to the presentation of performance indicators.

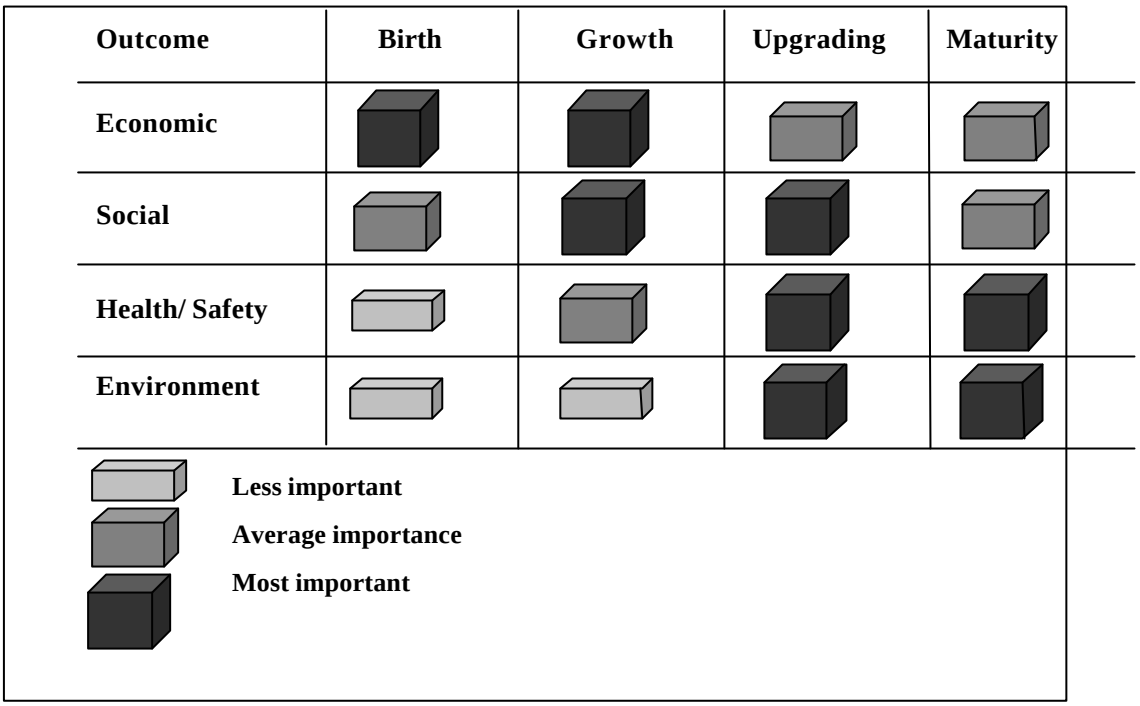
5.4 The Principles

To respond to the challenges, the Framework proposes three principles for a robust performance management framework:

5.4.1 Performance indicators need to be outcome focussed

The Framework report develops performance measures for economic, social, health/safety and environmental outcome areas and shows that the importance of each outcome area depends on the stage at which the road network development has reached.

The emphases are shown in the following figure. The reasoning and background behind the emphases is explained in the full report.



5.4.2 Performance indicators provide for road transport outcomes that are influenced by both whole-of-government and road administration actions

Road Administrations are not the only parts of government to contribute to particular transport outcomes, e.g. police enforcement. This principle recognises the wider role and the report provides performance indicators for use by Road Administrations as well as for this wider role that is termed 'whole of government'. The tables contained in the report reflect this split.

5.4.3 Performance indicators must provide an accountable measure of both whole-of-government and road administration management actions

The report identifies performance indicators that are known to be measurable and for which data can be provided. They are clearly aligned with defined responsibilities. Those for Road Administrations cover their accountability for delivery of government outcomes and specific outputs.

5.5 The Performance Indicators

A range of performance indicators has been produced from which Road Administrations can select those for which they can collect data and are needed for managing their road network. It follows the simplified approach to the grouping of indicators according to outcomes and the development stage reached on the road network (Birth, Growth, Upgrading and Maturity).

In addition, the report recognises the need for effective delivery of outputs within the road administration and proposes a range of indicators specifically aimed at the management process.

These are summarised below:

Economic Indicators

Whole-of-Government	*RA Management Responsibility*
Paved roads (km/million pop.)	Capital works BCR (average)
Growth in paved road network (%)	Road assets (net or annual increase)
Paved lane-km/million pop.	Travel speeds (km/h)
Motorway km/million pop.	Travel speeds (variability)
Motorway km/billion veh-km	Congested roads (%)
Motorised vehicles/thousand pop.	Rough roads (% length)
Growth in motorised fleet (%)	Economic budget (% of total)
Rigid trucks/thousand pop	
Growth in rigid truck fleet (%)	
Articulated trucks/thousand pop.	
Freight (tonne-km/million pop.	
Congestion costs (% of GDP)	

Social Indicators

Whole-of-government	*RA Management Responsibility*
Total road (km/million pop)	Bus/bicycle lanes (km/thousand pop)
Growth in total road network (%)	Satisfaction with road transport (%)
Buses/thousand pop	Social budget (% of total)
Cars/thousand pop.	
Car vehicle-km/capita	
Female/male driver licenses (%)	
Regional development (% of total budget)	
Urban vehicle-km/ha	

Health Indicators

Whole-of-government	*RA Management Responsibility*
Fatalities/100,000 pop	Safety works BCR (average)
Fatalities/100,000 vehicles	Bicycle lanes (km/urban ha)
Fatalities/100 million vehicle-km	Health budget (% of total)
Road crash costs (% of GDP)	
Trips by cycle and walking (%)	

Environmental Indicators

Whole-of-government	*RA Management Responsibility*
Air pollution cost (% of GDP)	Rural roads (% acceptable)
Greenhouse gas emissions (GG & g/km)	Urban roads (% acceptable)
Particulate emissions (t/urban ha)	Environmental budget (% of total)

Delivery Indicators

Total factor productivity
Road construction costs/sq.m
Road maintenance costs/sq.m
License transaction costs/unit
Vehicle registration transaction cost/unit
Works achievement ratio (%)
Delivery achievement ratio (%)
Delivery overhead (% of works budget)

It is strongly recommended that all indicators be used within a performance based management system at all levels with the need for decision makers to make positive responses to the signals that the indictors produce.

SECTION 6 – CONCLUSIONS

The Committee has found that Road Administrations are under increasing pressure to demonstrate effectiveness and efficiency and provide value for money with optimum value being associated with economic outcomes in the Birth and Growth network phases, and with a more balanced set of economic, social, health and environmental outcomes in the latter stages of road network phases.

This conceptual model of Road Administrations managing the various phases of road network development in the midst of economic, social and technological changes is not deterministic. It could, however, be useful in proactively managing changes if analysis indicates that a different set of economic and social characteristics are likely to arise in the near future and impact on the road administration.

Road Administrations have responded to these external pressures as their road network has developed. Institutional reform has occurred to bring clearer lines of accountability in the necessary policy, regulation, funding, procurement and delivery functions. Further reform is occurring to take account of the greater involvement of both the community and the private sector in the planning, funding and delivery of road transport improvements and government efforts to facilitate intermodality outcomes.

The private sector is becoming more involved in the road network management task and the role of Road Administrations is evolving into one of procurer/manager rather than deliverer and from a focus on maintenance and construction to active management of the service on the network for users. Road Administrations now need to manage the process of interaction with a much wider range of stakeholders/parties. This closer relationship with the community and other stakeholders in turn helps to strengthen the position of the Road Administration with respect to the government, as long as the Road Administration is helping to achieve the broader government policy goals.

In the changing and competitive world in which Road Administrations operate, performance based systems provide stability and help Road Administrations in their relationships with those who govern them, and the citizens they serve. These help Road Administrations demonstrate good governance and transparency in their operations. Enhanced performance management systems provide governments with assurance that the activities of the Road Administrations are aligned with policy directions/objectives and desired outcomes.

The Committee has found that Road Administrations need to develop different capabilities as road networks develop. There needs to be a shift in capabilities, predominantly from engineering skills during road network growth to management when upgrading road networks. In the mature phase even greater management skills are needed to integrate road transport with other transport modes, partner the private sector and incorporate new information and communication technologies. The capability of Road Administrations must continue to change and be adaptive if they are to continue to be relevant.

The Committee considers that PIARC could do further very useful work in the area of performance of Road Administrations. Firstly PIARC could continue the work of the current C15 Committee by identifying Best Practice in the following areas:

- new management approaches and trends in organisational modes
- Road Administration structures which help to achieve the broader objectives of the government's transport policy
- Road Administration structures which reflect increased accountability with respect to
- commercialisation
- customer focus
- traffic management
- interactions with other transport network providers such as the public transport agencies and private sector operators
- matching service provision to road user and stakeholder needs.

The C15 Committee has produced a range of indicators for the road network and Road Administrations, which relate to economic, social, health/safety and environmental outcomes. The framework highlights those indicators, which are likely to be most relevant to member countries based on their stage of road network development. The Committee could test the application and practicality for benchmarking purposes of the indicators. It could also facilitate the use of the C15 performance indicators through a program of benchmarking between countries at similar stages of development.