A Review of Highway Agencies in the South Asia Region

68040

DFID Department for
International
Development

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The Transport Research Support program is a joint World Bank/ DFID initiative focusing on emerging issues in the transport sector. Its goal is to generate knowledge in high priority areas of the transport sector and to disseminate to practitioners and decision-makers in developing countries.

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ACKNOWLEDGEMENTS

"A Review of Highways Agencies in South Asia Region" has been prepared for the World Bank Transport Anchor Group (TWITR) in Washington, which administers and manages the Transport Research Support Program (TRSP), funded by DFID, the Department for International Development of the United Kingdom Government.

The Task Team would like to acknowledge the overall guidance and support from Mr. Michel Audigé, Sector Manager and Mr. Ben L. J. Eijbergen, Lead Transport Specialist, Transport, South Asia Region. The task team wishes to thank Mssrs. Justin Runji, Senior Transport Specialist, AFTTR and Simon David Ellis, Senior Transport Economist, for quality and peer-reviews.

The task team would like to thank ECORYS Nederland B.V. and ICRA Management Consulting Services Limited (IMaCS), who were engaged for carrying out data collection, analysis, case studies and developing a major part of this study report. The task team highly appreciates support from Mssrs. Ahmad Luqman Sarwar, Ahmed Faruque, Ajit Pawar, G.C. Tallur, Keshav Thapa, Prem C. Sharma, R. K. Jain, and S. Arunachalam as well as Ms. Pradeepa Jayaratne and for their support in collecting data in Bangladesh, India, Nepal, Pakistan and Sri Lanka. Ms. Ritu Sharma and Mr. Rajesh B. S. Dongol provided excellent administrative and logistical support.

The task team also wishes to thank colleagues from South Asia transport team Mssrs. Ashok Kumar, Jean-Noel Guillosoou, Zafar Iqbal Raja, Ishtiaque Ahmed, Surendra Govinda Joshi, Farhad Ahmed, Mohi Uz Zaman Quazi and Ms. Amali Rajapaksa for helping with the data collection and providing insights of agencies in their countries.

The task team would like to extend special thank to Ms. Jacqueline J. Dubow, Program Coordinator, TWITR, who helped immensely in advising the TRSP and trust fund requirements. The team is also grateful to the Indian Roads Congress for organizing the stakeholder workshop to seek feedback.

EXECUTIVE SUMMARY

PREAMBLE

Explosive growth in demand for passenger and freight transport in the South Asia region, driven by high economic growth, has put the spotlight squarely on ensuring enhanced delivery of infrastructure and services. Accordingly, many South Asian governments plan to increase investments manifold and have launched large infrastructure development programs. Apart from mobilizing financial resources, a major challenge they face is the capacity constraints of their implementing agencies in ensuring timely and cost effective implementation of these programs. The road sector is a priority for all South Asian governments and highways agencies also face similar capacity constraints. It is, therefore, imperative to assess capacity and performance of the highway agencies, so that policy reforms and large investment programs can accordingly be planned by the policy makers and development partners in the region. This assessment is also critical to identify the appetite of these agencies towards the reforms needed for the successful and sustainable implementation of the programs.

There is also a need to find innovative ways to reform these road agencies and perhaps revisit their institutional structure and functions in the longer run.

THE STUDY: OBJECTIVE, SCOPE AND METHODOLOGY

The objective of the study is to help governments and policy makers in identifying reforms that are required to modernize and strengthen the capacity and performance of their road agencies to deliver large investment programs through performance monitoring as a tool. A review of the highway agencies in the region has been undertaken to suggest: (i) indicators to assess their capacities and performance; and (ii) a roadmap to improve performance in key functional areas of the agencies.

The scope of study included a review of a sample of highway agencies from Bangladesh, India, Nepal, Pakistan and Sri Lanka. This sample included national and provincial level highway agencies as well as road corporations. In India, the focus was on the state-level highway agencies. This study also incorporates findings from earlier studies commissioned by the World Bank.

The methodology covered the following five steps:

Step 1: Literature Review

The literature review provided the framework for the analysis in this study; the World Road Association (PIARC) framework was used to this end. The framework incorporates two dimensions: the organizational type of the highway agency and the stage of development of the road network, that is, birth, growth, upgrading, and maturity covering separation of client and producer organizations and their corporatization.

Step 2: Data Collection

Data collection was focused on the information that could help to assess the current capacity and performance of highway agencies as well as to understand the operating environment and challenges faced by them. As part of this phase, in-depth face-to-face interviews were also conducted with some of the highway agencies to gain a better understanding of their functioning and performance.

Step 3: Review of International Good Practices

Highway agencies in South Africa, New Zealand, Sweden and Australia were reviewed. These countries have, in the course of their development, faced challenges similar to those being faced by the highway agencies in the South Asia region currently. These agencies have

also successfully developed and institutionalized performance monitoring and evaluation frameworks, significantly contributing towards the institutional reform process. The lessons drawn from these cases provided inputs for designing the proposed framework.

Step 4: Development of a Framework of Indicators

Based on the literature review, analysis of good practices and data collected, an indicator framework for assessing capacity and performance was prepared. The draft framework was discussed during two stakeholder workshops to seek feedback, and finalized subsequently.

Step 5: Developing the Road Map for Reforms

Using the indicator framework as a tool, the study has finally proposed a generic roadmap for highway agencies to undertake reforms in their specific contexts.

THE ROAD INFRASTRUCTURE SECTOR IN SOUTH ASIA: ISSUES AND CHALLENGES

In the South Asia region, India has the largest road network as well as the largest vehicle fleet, with Pakistan in the second place. India and Sri Lanka lead in terms of road density, while Nepal has a lead over Pakistan and Bangladesh.

The majority of the agencies in the region reported that they have road policies in place, but long-term investment plans and vision documents are less common. The primary focus of highway agencies is on the inter-urban (state/provincial) highways and their priorities are rehabilitation, maintenance, and construction, in decreasing order of importance. However, formal policies and priorities are not always put into practice. The plans are generally broad-based, and lack concrete output and outcome targets for which the implementing agencies can be held accountable. This makes it difficult to determine whether the goals, objectives and targets of the policy have been achieved.

The regulatory and institutional framework governing highway agencies include acts and rules for the establishment of the agency, board, authority and road funds. Regulation on road pricing (toll policy), private sector participation and road safety is also emerging, though in a limited manner. However, the presence of an act or rule does not indicate its quality nor the level of its implementation, which is still a challenge in the region. Most highway agencies operate in relatively close association with their parent ministries. Less than 10 percent indicated that they are public entities with a higher degree of autonomy. Independent national authorities and agencies have also been established, which are essentially entrusted with the implementation of large highway programs. Although the mandate of all organizations is usually defined, significant overlap in responsibilities between highway agencies in one state or province have been reported.

The structure of highway agencies in South Asia is based primarily on the functions carried out by them, but structures based on territorial/regional jurisdictions continue and sometimes coexist with functional arrangements in the headquarters. The creation of a separate, dedicated organization or department to deal with large projects is also not uncommon – particularly in those agencies that receive external multilateral funding for the development of highway networks.

In some countries, particularly India, some states have established road development corporations as corporate entities under the relevant companies/corporate act, governed by a board consisting of majority representation from the government and limited representation from road users/private sector. Most organizations have been created as an implementation arm of the Public Works Departments to promote Public Private Partnership (PPP) projects. They also enjoy more independence in decision making and, at times, are able to raise resources from the market. Although their overall mandate is limited in comparison with the regular road authorities, their corporate structure provides them the leverage of faster implementation and expeditious decision-making capability.

Shortage of staff, particularly in the lower and middle ranks, is also a critical constraint to the performance and service efficiencies of the agencies. The scope for developing road agency-specific policies on recruitment and human resource management is limited, as there are restrictions applicable to all public sector agencies. Highway agencies' core competencies lie in areas such as technical (engineering). However, in emerging areas such as financial engineering, structuring and management of public-private concessions, impact assessment and road safety management, lack of competency is increasingly becoming evident. There are no systems in place for rewarding employees for their good or exceptional performance and higher postings are short in tenure due to the relative age of the office holders. Scarce attention is paid to improving knowledge and skills within highway agencies and the training provider infrastructure is weak.

A few highways agencies have taken the initiative of monitoring their performance through establishing systems of result frameworks, linked to a number of output indicators, and put in place policy/regulatory frameworks to attract private financing in provision of infrastructure assets and services, thus moving away from the traditional 'public works' mindset of the infrastructure owner approach to a more service-oriented approach. The challenge is to upscale such initiatives across the highway agencies in the region so as to bring about a cultural change from a strong 'engineering' and 'input' focus to a more service-oriented, user-friendly, accountable, and custodian-of-public-assets focus with value for money principles.

Other Challenges

In addition, the agencies are facing the following performance challenges:

- Pressure to manage a quantum leap in highway investments, sequel to years of underinvestment and rapid increase in demand;
- Attracting private sector investments;
- New contracting modalities – long-term asset management contracts (performance based, PPPs, Design, Build, Maintain, Operate and Transfer (DBMOT), and so on) rather than traditional 'input based' contracts;
- Supply side construction industry constraints – capacity of private sector contractors and consultants;
- Attracting and retaining qualified personnel and their career development; and
- Improving governance and accountability.

GLOBAL GOOD PRACTICES

From the case studies of agencies in South Africa, Australia, New Zealand and Sweden, lessons and good practices for regional agencies to meet current challenges were identified.

Institutional Setting: It is found that, though they are public bodies, agencies in these countries enjoy a higher degree of autonomy from the government.

Policy Framework: The agencies in these countries have adopted the outcomes; articulated central government goals in their policy, strategy and planning documents; and translated these outcomes into coherent goals, and measurable/verifiable targets for their organizations. Based on this, most agencies have issued statements of intent or corporate/business plans, and forward-looking three-year plans updated annually. These set the agencies' budgets and priorities, and demonstrate how they intend to make progress on the policy priorities over the 10 years. The documents contain sets of indicators (output and outcomes) for activities that are linked to policy goals and objectives.

Increased User Orientation: Increasingly, these agencies are considering the needs of 'users' as central to their activities. This is the result of a shift from 'building highways' to 'moving goods and people'. Agencies have formalized structures for receiving user

feedback, including increasing representation of road users in the agency's advisory boards and committees.

Performance Monitoring Frameworks: These agencies have gradually developed robust performance monitoring frameworks through the introduction of Key Performance Indicators (KPIs). The frameworks have helped them to stay focused on the outcome-centric development agenda and achieve gradual improvement in their performance, accountability and public image, thereby resulting in overall organizational and sectoral efficiency. The level of detailed information on performance indicators for a wide range of activities shows that this is seen as an effective way to inform the public on the agencies' activities and performance.

For all agencies, performance audits are usually carried out and are required by law. These agencies have recently started international benchmarking initiatives which, it is hoped, will enable them to review their own performance, identify best practices and set targets.

The focus on process improvement and accountability in these agencies has led to continual improvement in their performance. It has helped to focus on the best long-term investment that is particularly important in providing and managing infrastructure assets.

Focus on Environment and Safety Issues: All these agencies have greenhouse gas emission reduction strategies in place as part of the performance measures focused on environmental concerns. Also transport safety strategies and traffic management plans are part of their performance framework.

Asset and Risk Management Systems: In order to measure accomplishments, track trends and become accountable, the agencies increasingly rely on a variety of management (information) systems as tools. The concept of risk management is rapidly becoming central and is applied in all stages of the project cycle.

Human Resource Management and Knowledge Acquisition: Agencies are becoming more professional in their approach to management. They are investing in developing leadership programs to guide adoption of more integrated and performance driven work processes. They also recognize the need to further develop and diversify the skills and capabilities of staff at all levels. Training needs are assessed on a regular basis, including periodic reviews by external experts in some agencies.

Road Sector Funding: Besides budget allocations, financing sources for road development include road-use charges, loans from capital markets and PPPs.

CAPACITY AND PERFORMANCE INDICATOR FRAMEWORK

Based on findings on the current situation of highway agencies in South Asia, challenges they currently face and are likely to face in the future, as well as the lessons from the international case studies, the framework for capacity and performance indicators appropriate for the agencies in the region has been developed.

Measuring Capacity and Performance: Rationale and Principles

By monitoring capacity and performance, highway agencies can reap several potential benefits:

- The agency is able to improve its performance as its performance and that of its network become verifiable. It becomes relatively easy to monitor and intervene if the indicators deviate from their target values;
- The agency's accountability improves since, by setting target values for these indicators,

it becomes easier to assign responsibilities to specific departments and managers. Such indicators explicitly clarify the responsibilities and deliverables of the highway agency, its departments and officials;

- It brings transparency to the agency's decision-making process. Measuring capacity and performance requires the highway agency and officials to make sound decisions on the reasons for allocating certain resources to realizing certain goals. As a result, both internal and external transparency increases;
- It supports the highway agency in improving its efficiency and effectiveness in delivering the highway infrastructure to the society. Since there is clarity on 'what' and 'how' it must deliver, the agency is better able to carry out its mandate and explain certain choices that it has made;
- It allows a highway agency to mobilize and allocate resources towards those activities that contribute most, and most efficiently, to achieving its goals; intervene on time if the realization of projects or the performance of the network or individual assets is lagging; increase stakeholder involvement in its operations by creating insight into its activities and performance; and reorient itself to the needs of road users; and
- Institutionalizing performance measurement within the organization also helps the road agencies to improve resource utilization and achievement of the objectives and goals set out in the various large-scale national road development programs which have specific output/outcome indicators linked to fund transfer/allocation from the central government.

INDICATORS FRAMEWORK

As agencies in South Asia are, in general, not yet completely ready to start monitoring their performance, they cannot adopt a completely outcome-based framework at this stage. The framework is, therefore, a mix of input and process (capacity indicators), output, results and a few outcome indicators (performance). The framework requires measurement and monitoring of proposed indicators for a three-year rolling period. Guidance notes on measuring indicators have also been provided, including a guide to arrive at the overall performance score for the highway agency.

The indicators framework has been divided into seven categories:

(i) Mandate, Policy and Legal Framework: The indicators under this category are intended to capture the vision/mission statement of the highways agency and to find out if a formal road policy, backed by a legal and regulatory framework, has been laid down covering development, asset management and safety.

(ii) Planning: Indicators in this category are expected to inform planning capabilities of the highway agency by assessing the existence of long- and short-term investment plans for both development and maintenance of their road network and asset management system.

(iii) Capacity: Under this category, indicators are intended to capture the highway agency's strength to deliver its mandate by knowing outputs of the budget, expenditure, projects delivery, skill development strategies, and human resource management.

(iv) Efficiency: The indicators under this category would capture the agency's ability to evolve cost effective strategies in developing the road programs and efficient contract administration to contain time and cost overruns during the implementation. Monitoring the 'asset value' of the network is one such indicator.

(v) Quality of Road Network: The indicators under this category are intended to assess the agency's ability to provide a safer, greener, reliable and more comfortable road network. The indicators suggest the shifting of focus from a traditional input- and process-based one to outcome- and user-oriented measures, for example, capturing the degree of congestion, network quality index, and accident hazards.

(vi) Private Sector Participation: The indicators under this category intend to assess the road agency's effort to attract and promote private sector financing of the road sector.

(vii) Governance: The indicators under this category are intended to capture initiatives such as right to/freedom of information, e-procurement, website, publishing of annual reports, road user satisfaction surveys, and grievance redressal mechanisms.

It is important to note that the proposed framework is generic and agencies are advised to review and customize this framework first, based on their specific mandate and vision. The weightages to arrive at the overall performance score for various indicators given in the guidance notes may also be reviewed in their own context.

ROADMAP FOR REFORM

Needless to say, an essential prerequisite for highway agency reform would be larger public sector reforms as highway agencies do not operate in a vacuum; they are a part of the wider public sector. The internal reform of a highway agency would therefore be the critical next step. The study proposes a four-phase reform roadmap that should gradually transform the highway agencies from traditional to world-class, modern organizations. However, before agencies can start implementing this reform process, some basic requirements for performance monitoring need to be fulfilled. These include the existence of a regular data/information collection strategy in the organization and systems to support collection of data and monitoring of performance. It is also advisable that these systems are fully integrated for seamless information transfer, efficient information management and overall sector management.

PHASE 1: PREPARING FOR PERFORMANCE MONITORING

Phase 1 is the period in which necessary changes to the institutional and legal framework should be proposed. Apart from issues related to external linkages, the internal organization should also be reviewed. Phase 1 is the appropriate time to reorganize the agency in a manner that enables the realization of a long-term strategy and supports performance monitoring. Some of the reforms needed in this phase include:

- A clear and comprehensive mandate;
- Separation of client and producer functions;
- Preparation of annual performance agreements;
- Review/development of a long-term road sector policy; and
- Guidelines for detailing a program of works/preparation of operation manual.

PHASE 2: MONITORING AND IMPROVING PERFORMANCE

Phase 1 should have resulted in the reforms mentioned above. Phase 2 should then focus on improving performance in accordance with the annual performance agreement and/or the long-term strategy of the agency. The input and intermediate outcome indicators, which are relatively easy to implement, should now be monitored, and the agency should take action to align the realized values with agreed targets, monitoring systems and procedures that have been put in place. Some of the reforms needed in this phase include:

- Negotiation of an annual performance agreement between the highway agency and its parent ministry;
- Availability of qualified staff with an appropriate mix of skill sets;
- Involvement of users and stakeholders;
- Human resource management;
- Establishment of ring-fenced budgets/road funds; and
- Assessment of the value of the road network.

PHASE 3: PERFORMANCE FOCUSED ON OUTPUT

Phase 3 is centered on the highway agency improving its performance monitoring with a stronger focus on outputs and final outcomes, rather than inputs or intermediate outcomes.

This phase also requires highway agencies to apply rigorous and comprehensive measures to analyze its data and information. In addition, the highway agencies need to gather additional data and information. Internal procedures for the recruitment of staff, decision-making, measurement of indicators, and collection of data and information might require revision to ensure they still meet the requirements of the increased scrutiny of performance. It is also likely that the targets for performance will become more demanding, requiring the agency to fine-tune them.

PHASE 4: PERFORMANCE MONITORING THROUGHOUT THE ORGANIZATION

In Phase 4, the highway agency employs performance monitoring in every aspect of decision-making and operation, fully extending its focus on outcome indicators. All decisions in this phase would essentially be made on the basis of achieved performance compared to targeted performance. In this phase, the transport infrastructure delivery/management attributes need to be fully intertwined with transport service quality attributes to have full control on the outcome indicators. This might require expanding the mandate of the road agencies to include both provision of transport infrastructure and service delivery or close collaboration with agencies responsible for provision of transport services. The most apparent demand that this phase imposes on the agency is increasingly encompassing and demanding procedures for collecting, processing and analyzing data and information pertaining to the performance of the highway network and its use. The agency will need to look at the environment in which it operates its strategic plan and actual performance against set targets.

CONCLUSION

The four consecutive phases are progressively more demanding and expect significant reforms from the highway agencies and the respective governments, in particular, in Phases 1 and 2. These changes occur in several areas and will need to be implemented in a coordinated manner. Performance monitoring without the proper institutional structure, mandate and appetite for reform will, most likely, not yield the desired result. The changes may appear overwhelming initially, but the phased approach proposed in this study should guide highway agencies and the respective governments in this process. Governments will thus be able to demand a highway network that offers value for money in terms of moving goods and people within, to and from their jurisdictions.

The task team intends to disseminate the study findings in two/three stakeholder workshops across the region to help the road agencies in setting up and managing performance monitoring systems through future World Bank-funded projects. In addition, the team recommends that the World Bank continue to facilitate international knowledge transfer and help in setting up and managing a performance evaluation system, and linking human resources and institutional reforms with performance evaluation systems. Finally, there is a need to undertake a follow-up study on developing agency capacity and performance evaluation systems linked to budget allocation/support from the finance department.

Authors' note: While every effort has been made to incorporate findings and feedback from all five countries included in this study into this report, it may be possible that there is preponderance of findings and data with reference to India as this country has the largest network and vehicle fleet as well as several central and provincial level road and highway agencies in the South Asia region.

1 INTRODUCTION

1.1 BACKGROUND

High economic growth experienced by the South Asia region (Figure 1.1) is driving the growing demand for passenger and freight transport in the region. Figure 1.2 shows the projected car ownership between 2002 and 2030. India shows the highest growth in car ownership (547 percent), in line with the country with the highest economic growth in the South Asia region. On the other hand, though Pakistan is projected to have the lowest growth in the region, car ownership is still expected to increase by 142 percent. Thus, it is evident that ever larger freight flows and rising motorization rates will pose a challenge across the region.

Figure 1.1: Expected GDP growth 2007-12 as Compounded Annual Growth Rate (CAGR) (%) across South Asia

Source: Joyce Dargay, Dermot Gately and Martin Sommer (2007).

Figure 1.2: Growth of car ownership (left) and ratio between growth of car ownership and per capita income (right)

Source: The World Bank (2010).

Enhanced delivery of transport infrastructure and services is crucial to sustain this high growth and demand, and is one of the priorities of governments in the South Asia region. However, the governments are facing several challenges including: the need to attract additional resources from the private sector; construction industry capacity constraints; rising construction unit costs; demand for more accountability, transparency and good governance; increased user interface; and pressures of expeditious delivery. While governments have formulated varied strategies to meet these challenges across the region, one common issue that has emerged is the capacity of their road agencies, which are largely traditional and inadequately equipped to face challenges associated with a high growth-high demand situation, to implement these strategies.

It is therefore essential for policy makers and development partners in the region to assess the capacity and performance of the implementation agencies, before policy reforms or large investment programs can be planned. Although considerable work has been undertaken worldwide in the past on institutional strengthening, only a few agencies in the region have embarked on reform processes to address these challenges. Furthermore, the degree of success achieved by these reforms and institutional capacity building endeavors remains largely unknown due to lack of data. Therefore, considering the rapidly expanding economies in the region, there is a need for a fresh look at the role, institutional structure and function of the region's road administrations/organizations.

1.2 OBJECTIVE OF THE STUDY

The objective of the study is to help governments and policy makers in identifying reforms that are required to modernize and strengthen the capacity and performance of their road agencies to deliver large investment programs in the current market scenario through performance monitoring as a tool. The study carries out a review of the highway agencies

in the region to suggest: (i) indicators to assess their capacities and performance; and (ii) a roadmap to improve performance in key functional areas of the agencies.

This study also provides an opportunity to learn from global good practices in terms of institutional structures and functions required to manage current challenges and contribute to effective service delivery in the fast growing road transport sector in the region.

1.3 SCOPE OF THE STUDY

This review covers the highway agencies of Bangladesh, India, Nepal, Pakistan and Sri Lanka, though not in the same level of detail. While national highway agencies only are reviewed in four countries, in India, the focus is on the state-level highway agencies. The National Highways Authority of India (NHAI) and National Rural Roads Development Agency (NRRDA) have therefore not been incorporated into the study due to their specific mandates.

Table 1.1 provides a list of organizations studied. In some cases, two organizations in the same state were studied as these states have both a Public Works Department (PWD) and a Road Development Corporation (RDC) (or similar).

Table 1.1: Organizations covered in the study

Countries	States of India
Bangladesh (1 agency)	Assam (2 agencies)
India (17 agencies)	Bihar (1 agency)
Nepal (1 agency)	Gujarat (1 agency)
Pakistan (1 agency)	Haryana (1 agency)
Sri Lanka (3 agencies)	Himachal Pradesh (1 agency)
	Jharkhand (1 agency)
	Karnataka (2 agencies)
	Kerala (1 agency)
	Madhya Pradesh (2 agencies)
	Maharashtra (1 agency)
	Punjab (2 agencies)
	Rajasthan (1 agency)
	Uttar Pradesh (1 agency)

This study also incorporates findings from earlier studies commissioned by the World Bank.

1.4 APPROACH AND METHODOLOGY

Figure 1.3 illustrates the methodology of this study. The data collection, literature review, and international benchmarking provided inputs for the analysis of the performance of highway agencies. This analysis formed the basis for developing a framework for measuring the capacity and performance of a highway agency. The framework was validated in two workshops and used to develop a roadmap for reforms. Each step is explained in more detail in the following subsections.

Figure 1.3: Overview of the methodology for the study

1.4.1 LITERATURE REVIEW

The literature review provided the framework for the analysis; the World Road Association (PIARC) framework¹ was used to this end. The framework incorporates two dimensions: the organizational type of the highway agency, and the stage of maturity of the road network under the highway agency. Figure 1.4 describes this framework; it shows an increasing involvement of the private sector and a growing focus on organizational management. Table 1.2 shows the five stages of development of a highway agency that are linked with this evolution.

Each highway agency is unique; it operates in a specific environment and is responsible for a specific road network. The imposition of a 'one size fits all' framework upon organizations that operate in different milieus is unlikely to succeed, since specific indicators dependent on its individual case are required for each highway agency. Nevertheless, the framework proposes a consistent and complete set of indicators to be used and also provides the outline of an 'ideal highway agency.'

1.4.2 DATA COLLECTION

Data collection was focused on gathering information that could help in assessing the current capacity and performance of highway agencies, as well as to understand the operating environment and challenges faced by highway agencies.

Data were collected in two phases. In the first phase, individual consultants visited the

¹The Steering Committee of Programme Committee C15 developed a discussion paper on road network and road agency trends for a range of economic and social systems, entitled Framework for the C 15 Work Program 2000-2003 (August 2001).

Figure 1.4: Evolution of highway agencies as highway networks develop

Table 1.2: Phases of development of highway agencies

Phase Description of development phases

- 1 A traditional construction and maintenance organization.
- 2 Separation of client and producer functions. The client organization is responsible for governmental functions: administration, management and planning, contracting, and associated information collection and dissemination relating to roads. The producer organization is responsible for execution: design, construction, maintenance and operation of the road network using in-house resources. The separation is formalized by creating internal divisions within the organization.
- 3 Separation of client and producer organizations; introduction of a road board. The producer organization reports to a ministry of transport (or similar) or the central management of the road administration.
- 4 Corporatization or privatization of the producer organization and establishment of an autonomous (client) road administration and a road fund. A separate delivery company is established to provide maintenance or construction by road management agencies. This company usually has to compete with the private sector for any construction or maintenance work, in public tender procedures.
- 5 Corporatization of the (client) road administration. This is quite common in other infrastructure administrations, such as railroads, ports and airports.

agencies and collected data on the capacity and performance of highway agencies using a questionnaire; in the second phase, an additional questionnaire was developed for this study, and distributed by post to the participating highway agencies (Annex B). As part of this phase, additional in-depth face-to-face interviews were conducted with highway agencies in six states of India to gain a better understanding of the functioning and performance of these organizations.

The topics covered in the data collection included:

- Strategic aspects of the road administrator²;
- Legal framework;
- Financing strategy;
- Governance architecture: structure and processes;
- External reporting and use of performance indicators;
- Human resources;
- Incentives and disincentives;
- Institutional integrity;
- Satisfaction with governance architecture;
- Network and statistics;
- Investments in road infrastructure (including Public Private Partnerships (PPPs) and road funds);
- Autonomous road development corporations;
- Participation of road users, nongovernmental organizations (NGOs) and road transport associations; and
- Reforms undertaken.

1.4.3 REVIEW OF INTERNATIONAL GOOD PRACTICES

Highway agencies in South Asia can learn from good practices around the world to improve their responses to the current challenges they face. This study reviewed highway agencies in South Africa, New Zealand, Sweden and Australia for this purpose. These countries have, in the course of their development, faced similar challenges in the past. The lessons drawn from these case studies also provide inputs for designing the proposed framework for the South Asian highway agencies.

Since 'good practices' are not always equally replicable in all parts of the world due to differences in circumstances, cultures, objectives and priorities in each country, care has been exercised in applying lessons learned in the context of the highway agencies in the South Asia region.

1.4.4 Development of a Framework of Indicators

Based on the literature review, the analysis of good practices and data collected, a draft indicator framework was prepared and presented during two workshops, held at the offices of the Indian Roads Congress (IRC) and the World Bank. Participants included representatives of eight highway agencies from across India, who were generally in agreement with the proposed framework. The main recommendations made at the workshop were focused on making the framework agency-friendly and easy to interpret, taking into account the stages of evolution of agencies, and ensuring the local milieu was taken into consideration.

Capacity and performance indicators must reflect two distinct, but related, functions within highway agencies: the management of outcomes and the delivery of outputs. Figure 1.5 shows the relationship between outcome and output indicators.

Output indicators measure the efficiency of highway agencies in translating inputs into

² The term highway agencies used in the report refers to road agencies or departments or road administrations.

Figure 1.5: Conceptual relation between output and outcome indicators

products and services (outputs) in relation to policy objectives and priorities. Outcome indicators reflect the effectiveness of highway agencies in meeting the needs of road users and the community at large. The framework developed as a result of this study covers the entire range of activities and services provided by a highway agency.

1.4.5 DETERMINING THE REQUIRED REFORMS AND DEVELOPMENT OF A ROADMAP

Based on the framework, the next step was to analyze the institutional reforms, pertaining to highway agencies and within the respective governments required in the sector. The objective of these reforms is to support the highway agencies in building capacities, improving their performance, and facing the challenges at hand.

To identify the required reforms, the agencies in South Asia were benchmarked against agencies elsewhere in the world. The benchmarking helped to arrive at the ideal role, structure and processes for a highways agency to meet its goals and realize its aspirations. The highway agencies in South Asia were compared to this 'ideal road agency' to identify gaps, generic reforms and a road map that can be used and adapted by highway agencies in the region to their specific contexts and requirements.

1.5 STRUCTURE OF THIS REPORT

This report is structured as follows: Chapter 2 describes the road transport sector in South Asia to create an understanding of the current situation, ongoing developments in the sector, and challenges faced by highway agencies. The lessons from the review of international good practices are presented in Chapter 3. Together, these lead to the proposed framework of indicators which is presented in Chapter 4. Finally, Chapter 5 presents the roadmap for reform to ensure the challenges can be successfully addressed by the highway agencies.

Relevant additional information is presented in the Annexes. Annex A presents additional information and guidance notes on the proposed framework of indicators, and Annex B includes the Phase I and II questionnaires. Subsequently, Annex C presents further detailed information of the four individual international case studies

2 ROAD INFRASTRUCTURE SECTOR IN SOUTH ASIA

This chapter describes the road transport sector in South Asia with particular reference to the policies pursued by governments, regulatory frameworks for the highway sector, organization of the highway agencies, and human resource issues. This chapter also features some examples of reforms that have been initiated in recent years to deal with the challenges of development. The chapter concludes with presenting the current and future challenges facing highway agencies and governments in the region.

2.1 INTRODUCTION

To enable a better understanding of the road infrastructure sector in South Asia, this section first presents some basic facts and figures, in absolute terms, in Table 2.1. India has the largest network in the region as well as the largest vehicle fleet with Pakistan in the second place, although its national road network is about the same length as that of Sri Lanka. However, categorization of roads could play a role here, in particular in the context of 'other roads'. Nevertheless, the extent of Sri Lanka's network is outstanding.

Table 2.1: Length and management of road networks in South Asian countries

Country	Responsible Organization	Length ^{3,4} , (km)
Bangladesh		
National highways	Roads & Highways Department	3,538
Regional highways, zila roads	Roads & Highways Department	17,733
Upazila, union and others	Local Government Engineering Department and Local Governments	249,830
India		
National highways, expressways	National Highways Authority of India, State PWDs, Border Roads Organisation	66,754
State highways, major/other district roads ⁵	State PWDs (and subordinate agencies)	1,017,763
Panchayat, rural and urban roads	Local governments	2,881,723
Nepal		
National highways and feeder roads	Department of Roads	9,400
Rural roads	Municipalities, District Development Committees	9,428
Pakistan		
Motorways, national highways	National Highway Authority	11,485
Provincial roads	Communication & Works Departments	<79,000 ⁶
Classified rural roads		97,881
Sri Lanka		
National roads	Road Development Authority	11,716
Provincial roads	Provincial Road Development Authorities	15,532
Classified rural roads	Other entities (local/national)	64,659

³ Cross-country comparison of 'tertiary road network length' is not recommended as the definitions and availability of data differ.

⁴ Respective highway agencies and Ministry of Road Transport and Highways in India as well as the World Bank website.

⁵ When managed by the state PWD.

⁶ Consultant's estimate.

A relative comparison of road length in the region shows the leading position of India and Sri Lanka in terms of high road density (Figure 2.1). Nepal has a clear lead over Pakistan and Bangladesh, although this is more pronounced when expressed per 100,000 people. In fact, when considering the surface density, Sri Lanka and India have a much higher value.

Figure 2.1: Road infrastructure benchmark for South Asia

* Inclusive of national highways and expressways; the respective figures for India would be 105 kilometer (km) of road per 100,000 people and 33 km per 100 square km (km²). However, these roads are not necessarily managed at the state level.

Source: As in Table 2.1, population and area data used for calculations are the latest available with the United Nations.

Figure 2.2 shows the development of road transport, for both passengers and freight, in India over the past 60 years and the projected development in the 11th Five Year Plan (2007-12). The main growth has occurred in passenger transport, which is expected to show a stronger growth than freight transport. The growth during the 11th Five Year Plan, in particular, exceeds previous growth rates with a Compound Annual Growth Rate (CAGR) of close to 20 percent. The development of freight transport is more in line with historic development. As this growth is linked to economic development, the development for the other countries will be similar, though possibly less pronounced due to lower economic growth (Figure 1.1).

2.2 ROAD SECTOR POLICIES, KEY PRIORITIES AND PROGRAMS

South Asia in General

Of the highway agencies studied for this report, 60 percent have road policies in place, 40 percent prepare annual reports, and about 80 to 83 percent indicated that they had long-term strategic plans in place (Figure 2.3). The policy documents and plans reviewed have a strong focus on advocating PPP and contain targets for performance (primarily but not exclusively in outcome/output terms). Most highway agencies use these targets to guide their budgeting process. Investment plans and vision documents are less common in the road sector in South Asia. Only the annual report and road policy are regularly published.

Examples of targets in some of the plan documents for Sri Lanka and a few states in India include:

Figure 2.2: Historic and forecasted demand for road transport in India

Figure 2.3: Formal documents in place, and publication of documents and indicators by highway agencies

Note: RIS: Road Information System; RMMS: Road Maintenance Management System; HR: human resource

- Connect all villages by all weather roads (in Punjab and Gujarat);
- Widen all state highways to two-lane roads (Karnataka and Tamil Nadu);
- Reduce travel time and vehicle operating costs (Kerala and Sri Lanka);
- Reduce the share of core state and national highways networks in poor condition (Kerala and Sri Lanka); and
- Achieve a (20 percent) reduction in fatalities and injuries by 2013 vis-à-vis 2006 (Tamil Nadu).

The primary focus of highway agencies is on the inter-urban highways. The prime long-term priorities are rehabilitation, maintenance, and construction, in decreasing order of importance. This prioritization approach applies also to the rural areas. However, rural areas remain a secondary priority compared to the urban areas and inter-urban linkages.

These long-term priorities generally match the long-term drivers identified by the respondents. Economic development and social objectives are the primary drivers for highway agencies in South Asia. Safety is slowly gaining importance but environment, (network) integration and other issues remain less important (Figure 2.4).

However, formal policies and priorities are not always put into practice. This could be explained by some interference of elected representatives in decision-making processes, lack of adequate resources for implementation of the policy/plan, lack of understanding on implementation issues, poor quality of planning, absence of coordination among various stakeholders, and information asymmetry, among other factors. The plans are generally broad-based and subjective, and lack concrete targets for which the implementing agencies can be held accountable. This makes it difficult to determine whether the goals, objectives and targets of the policy have been achieved.

Figure 2.4: Ranking of main drivers and long-term priorities of a highway agency⁷

⁷ Each priority could be ranked 1-6, 1 being the highest. Rankings were subsequently converted to a score (in case a priority was ranked first, it received six points); the sum of the scores is taken as the importance of the priority. The graph shows this importance (that is, the sum of scores).

REFORMS

Long-term development plan

Performance targets

Bangladesh

Bangladesh has a National Land Transport Policy (NLTP, 2004) and Road Master Plan in place. The NLTP provides guidance for the development of the transport infrastructure network and services in the country. Some targets are quantitative and time-bound, whereas others remain qualitative. For the road sector in particular, several goals that are included are:

- Maintenance is considered a priority;
- Traffic is the key issue for road design decisions;
- Development of a long-term master plan for the infrastructure network;
- Introduction of performance targets for the road network in terms of journey times and reliability to be achieved by the highway agencies;
- Management of the road network in such a way that its monetary value is maintained;
- Involvement of NGOs in traffic management and improving safety;
- Promotion of the involvement of the private sector in financing infrastructure;
- Support (the involvement of) the road construction industry; and
- Alignment of the organization and skills of the Roads and Highways Department with its goals.

In a World Bank report⁸, a weak institutional framework is pinpointed as the main constraint for the actual implementation of the policy. The NLTP has not been translated into a similar document for the road sector. This vision document of 1999 still prevails as the primary reference point. This vision was developed as part of a development project under the guidance of the Department for International Development (DFID, UK Government). The vision has a strong focus on qualitative goals, without specific targets. From the NLTP, it can be concluded that realizing the vision has been a challenge and has not yet been fully achieved.

REFORM

Active use of Public Private Partnerships

India

India does not have a national transport/highway sector policy but the overall policy on the highway sector has been governed by the broad framework set in the consecutive Five Year Plans. A balanced approach towards enhanced mobility (national highway development) and accessibility (development of an all-weather rural network) has underpinned road sector planning. At the national level, the Government of India has launched large investment programs for national highways (National Highways Development Project - NHDP) and rural roads (Pradhan Mantri Gram Sadak Yojna - PMGSY). However, the missing link, the state highways and major district roads under the sole jurisdiction of states/provinces, has languished due to a lack of strategic focus and investments. Very few states have developed a vision for the road sector with business plans grounded in such a vision. As is elaborated in section 2.6, Gujarat is one of the few states that developed a Vision 2010 which includes an infrastructure master plan. However, a few Indian states have formal and publicly available priorities for road infrastructure development; maintenance is generally not considered a priority. The Government of India is actively promoting and using PPP as a means of realizing (road) infrastructure. The country is globally recognized as a leader in PPP. Several states have also set up Special Purpose Vehicles (SPVs) to facilitate the implementation of PPP projects.

REFORM

National sector output monitoring

At the national level, the Ministry of Road Transport and Highways in India monitors output performance of the ministry and other central institutions annually through the Results Framework Document. Linked to 11 objectives, there are a number of actions with associated success indicators. It also clearly lists the involvement of related ministries, such as Environment and Forests, Railways and the state governments. A sample of these objectives and indicators is shown in Table 2.2. Targets are not usually published; achievements are.

⁸ Bangladesh, Transport Policy Note, World Bank South Asia Region (April 2000).

Table 2.2: Sample of objectives, actions and indicators of the Ministry of Road Transport and Highways Results Framework Document

Objective	Action	Success Indicator
Development of national highways infrastructure	Awards of works under NHDP	Length awarded
Development of state roads	Release of funds under Central Road Fund	Funds released
Improvement of the road safety scenario in the country through various measures such as generating mass awareness through print	To provide refresher training to heavy motor vehicles drivers	Number of drivers trained
Computerization of state transport departments	To evolve standardized up-to-date information on registration and licenses	Percentage of computerization of regional transport offices
Creation of a National Road Safety and Traffic Management Board	To set up the Board	Setting up and functioning of the Board

Source: Ministry of Road Transport and Highways.

REFORM

Long-term development plan with measurable targets

Nepal

The Government of Nepal published a three-year (2007-10) plan for the development of the country as a whole, emphasizing poverty reduction to which improving (road) connectivity should contribute substantially. In 2001, the government announced a road transport policy accompanied by a 20-year master plan. More recently (2007), a 10-year Priority Investment Plan was published. The plan is based on measurable targets regarding accessibility. The objectives of the road sector policy include⁹:

- Develop a national transport system through overall development, expansion, promotion and protection of the entire network of surface transport infrastructure to contribute to the economic and social development of the country;
- Develop, expand and strengthen the road network in a sustainable manner to enhance the overall socioeconomic development and integration of the country through balanced regional development with due consideration for remote areas and deprived communities, and ultimately help in the alleviation of poverty;
- Develop roads to support other infrastructure development and to link areas of significant economic importance;
- Encourage private sector participation in the development, maintenance and management of roads; and
- Adopt a road maintenance system, including performance-based maintenance contracts, and strengthen institutional capacity to execute works.

It is unclear how these objectives translate into specific projects or programs. However, the fact that measurable accessibility goals underlie the policy allows for possible assessment of whether the targets have been achieved.

⁹ Ministry of Physical Planning and Works, <http://www.moppw.gov.np/goal.html>.

Box 2.1: Relevant Documents and Projects

India : Road Development Plan Vision: 2021

Vision 2021 describes the aspiration for an extensive road network that will enable all to travel efficiently, sufficiently, affordably and at any time, while being relatively clean and energy efficient. It not only focuses on increasing the scope of the network but also strengthening the existing network. It furthermore calls for the efficient use of public and private funds to realize these ambitions.

NHDP

The NHDP is aimed at upgrading, rehabilitating and widening major highways in India to a higher standard. In the first phase, the focus was on the national highway connecting the main cities of Delhi, Mumbai, Chennai and Kolkata. In subsequent phases, the scope of the NHDP was increased and the latest phases incorporate expressways (fully access controlled) and national highway road infrastructure in major cities.

Rural Roads Vision and PMGSY

This program is focused on the implementation of the Rural Roads Vision 2025 for India. The primary objective is to provide connectivity through all-weather roads to unconnected rural habitations exceeding a certain number of inhabitants. Moreover, the program also funds the upgradation of the existing roads, if all-weather connectivity to all villages has been achieved.

Pakistan

A business plan of the National Highways Authority was developed with the assistance of the Japan International Cooperation Agency (JICA). It is linked to the overall vision for the development of Pakistan. The plan includes the following policy objectives:

- Develop a national highway network including extensions to the 'corners' of Pakistan and servicing the main national transport corridor (north-south);
- Implement preventative maintenance to eliminate the need for rehabilitation;
- Institute measures to minimize the adverse impacts of road network management and traffic on the environment;
- Reduce the number of black spots and actual accidents;
- Provide up-to-date road user information and minimize delays;
- Implement transparent procedures, in part to stimulate private sector participation in the development and maintenance of the road network;
- Implement tolls (road pricing) to maintain and develop the national transport corridor;
- Make appropriate and objective decisions supported by an effective management information system; and
- Employ well-trained and highly motivated professionals who are appropriately rewarded.

The plan includes a multi-year budget outlay broken down into projects and sources of funds. Apart from those related to construction and maintenance of roads and funding, objectives have not been fully quantified. The focus is thus on input and output indicators but not specifically on outcome indicators.

Sri Lanka

Sri Lanka has had a National Road Policy in place since 2002, which contains the following general objectives. These, however, fail to address the specific priorities to be followed, such as connecting cities or improving rural connectivity:

- Promote the economic development of Sri Lanka, by taking into consideration the present and future socioeconomic development plans and policies, thereby improving the quality of life of people;
- Facilitate greater mobility, shorter travel time and provide easy accessibility with

- improved safety for the people;
- Adequately meet the demand for transport of passengers and freight while considering the current and expected demand; and
- Improve the quality of roads by using cost-effective and innovative techniques of design, construction, maintenance and rehabilitation.

A review financed by the World Bank¹⁰ finds that:

Specific application of these policies in project formulation or in investment planning cannot be observed at present. The budgetary process also does not include assessment of objectives or outcomes of proposed projects in order to determine the degree of subscription of a project for which funding is sought, to these policies.

A comparison between achievement and objectives is not possible. The success of the policy and supporting plans cannot be assessed, since this performance is also not published. Only one of the two provincial highway agencies has a road policy in place; and in this case too it is not possible to compare achievement and objectives.

2.3 REGULATORY AND INSTITUTIONAL FRAMEWORK

South Asia in General

Typical elements of the regulatory and institutional framework governing highway agencies are acts and rules for the regulation of road pricing (tolling, in 70 percent of cases), private sector participation (30 percent of cases), and the establishment of road funds, agencies, boards or authorities. Regulation on road safety has also started to emerge as a significant element, though in a limited manner. However, it should be kept in mind that the presence of an act or rule does not indicate its quality, or the level of its implementation.

In South Asia, most highway agencies operate in relatively close association with the parent ministry; 92 percent of the agencies indicated their department was a government department directly accountable to the minister. Only 8 percent indicated that their organization was a public entity with a higher degree of autonomy. Only a few highway agencies actually operate with some degree of independence from the parent ministry. The parent ministry provides guidance for their activities through a policy outline. In about 50 percent of the cases studied in India, independent RDCs have been established in the states. Independent national authorities and agencies have also been established in India and Pakistan, which are essentially entrusted with the implementation of large highway programs.

Issues such as budget allocation and appointment of senior officials are controlled by the oversight ministry, despite some internal delegation of responsibilities and powers. This is clearly shown in Figure 2.5, where the legislature and the governor are authorized to decide on the position of the executive management. The decision to upgrade a road from one category to the next is, in all but one case, made by considering the traffic density of that road. In case of the one exception, the reason for upgrading a road to a higher category is 'government discretion.'

Although the mandate of all organizations is usually defined, there is ample room for further clarification. Respondents indicated significant overlap in responsibilities between highway agencies in one state; this however is not the case for national agencies. Table 2.3 shows the overlap in responsibilities of organizations responsible for a given road network. However, implementation, in some cases, is the responsibility of RDCs and daily management of certain individual road sections that of the private concessionaire, where applicable.

¹⁰ Capacity and Functional Review of Highway Agencies in Sri Lanka, Pradeepa Jayaratne (2009).

Figure 2.5: Division of responsibilities within highway agencies

Table 2.3: Share of network managed by respective highway agencies in India¹¹ - example

	Madhya Pradesh			Karnataka	Punjab, Haryana
	RDC	PWD	Rural Road Development Agency	Public Works, Ports and Inland Water Transport Department	PWD
State highways	100%			100%	100%
Major district roads	< 20%	> 80%		100%	100%
Other district roads		> 80%		100%	100%
Village/lower roads		> 20% +/- 80%		some	100%

REFORM

Potentially powerful institutional framework

Bangladesh

The regulatory framework in Bangladesh is all encompassing. It consists of the Ministry for Communications, the Roads and Highways Department (RHD), the Bangladesh Road Transport Authority (BRTA), and the Bangladesh Road Transport Corporation (BRTC) (Figure 2.6). The ministry is responsible for the overall national land transport policy; RHD for the implementation of this plan for the highways sector, including some ferries (Table 2.4) ; and BRTA for the regulation of the road transport sector with a specific focus on safety. BRTC provides transport services in Bangladesh. There is no dedicated entity for highways only.

¹¹ The focus of this report is on highways; other roads are included for reference.

Figure 2.6: Institutional set up of the highway sector in Bangladesh at the national level

Table 2.4: Description of Bangladesh Roads and Highways Department

Roads and Highways Department (RHD)	
Funding by	<ul style="list-style-type: none"> • DFID, UK • Government of Bangladesh • Prospect for the future: higher levels of private funding and introduction of a Bangladesh Road Fund
Level of autonomy	RHD has no independence in determining its spending, or in appointing senior officials, and projects are suggested by the Ministry. The level of autonomy is therefore low
Level of responsibility	Due to the fact that RHD is responsible for the development and maintenance of all national and regional highways as well as feeder roads classified as type 'A', the level of responsibility can be defined as medium
Level of accountability	Information on the level of accountability is limited; however the Southwest Road Network Development Project (2007) is particularly aimed at introducing higher transparency and accountability at the RHD. However, as it currently is, the level of accountability is low
Responsible Ministry	Ministry of Communications
Legal status	Corporatized
Phase of highway agency reform	Separation of client and producer functions
Road ownership	Road network is owned by the Government

However, the framework is classified as 'weak' in a World Bank review¹². It states:

In particular, achieving a balanced and coordinated transport system has not been possible as the Government does not have a system for coordinating development plans and budgets in a fragmented institutional framework, whereby three ministries and several agencies oversee transport sector policy and development.

The act on the freedom of (access to) information has been passed in parliament, but its impact thus far is limited.

India

REFORM Transparency through Right to Information Act

All state governments in India have PWDs which take care of the provision of road infrastructure (100 percent of cases) and buildings (60 percent). PWD is the parent organization of the Road Development Boards/Corporations, although there are also Infrastructure Finance Boards/Corporations of which the Department of Finance is the parent organization (Figure 2.7). PWDs and RDCs are described in detail in Table 2.5.

The Right to Information (RTI) Act is applicable to all public service organizations, including the highway agencies. The impact of this act on improving the overall transparency and

Figure 2.7: Institutional set up of the highway sector in India at state level*

¹² Bangladesh, Transport Policy Note, World Bank South Asia Region (April 2000).

Table 2.5: Description of state PWDs and RDCs in India

State PWDs and RDCs	
Funding by	<ul style="list-style-type: none"> Central government funding from the Central Road Fund, PMGSY, National Bank for Agriculture and Rural Development (NABARD) and so on State budgets, both plan and non-plan In cases there is international funding from, for example, the Asian Development Bank (ADB) and the World Bank PPP
Level of autonomy	<p>PWDs (or similar) are government departments, with all senior officials being appointed by the Public Service Commissions. PWDs implement the strategy, if any, or plans of the state government. They have a low level of autonomy. RDCs (or similar) has higher levels of autonomy but have strong links with the government and usually implement state development plans under international conditions. Their level of autonomy is therefore medium</p>
Level of responsibility	<p>PWDs have a low level of responsibility, since they are usually only responsible for the execution of works of state highways and some national highways, although exceptions exist such as in Madhya Pradesh. For other roads, a limited share falls under the responsibility of PWDs. Planning, if it takes place, is sometimes taken care of by RDC, which reports to Secretary, PWD. Their level of responsibility is low/medium</p>
Level of accountability	<p>The level of accountability is low. Both PWDs and RDCs provide a very limited set of information and often lack targets. Their books and projects, however, are usually audited by the Auditor General. Surveys and subsequent actions are never undertaken</p>
Responsible Ministry	<p>PWDs are often the highway agencies as well. RDCs can also be linked to the Department of Finance as its parent organization; Infrastructure Finance Boards are always linked to the Department of Finance</p>
Legal status	<p>PWDs are government departments, whereas RDCs are corporatized</p>
Phase of highway agency reform	<p>PWDs: traditional construction and maintenance organizations</p> <p>RDCs: separation of client and producer functions</p>
Road ownership	<p>The road network is owned by the state government</p>

accountability of the highway agencies is quite evident. Compliance with RTI is generally good and only one of the six Indian highway agencies in the study sample indicated that it was yet to fully comply with the requirements of this Act.

Nepal

The Ministry of Physical Planning and Works is responsible for all land transport at national and regional levels and provides the policy framework for the sector. It also sets the accessibility targets. The Department of Roads (DOR) is monitored by the Roads Board Nepal (RBN), which manages the funding of the road sector, takes care of planning and coordinates research and development (R&D) (Figure 2.8). It is, however, recognized that the functioning of RBN needs improvement. The implementation of plans and projects is in the hands of DOR (Table 2.6), which subsequently outsources part of the work to consultants. At the local level, the two main entities are the Ministry of Local Development and the Department of Local Infrastructure Development and Agricultural Roads (DOLIDAR), responsible for implementation of projects. Municipalities also have a role in the management of local roads.

Figure 2.8: Institutional set up of the highway sector in Nepal at national level

Table 2.6: Description of the Department of Roads in Nepal

Department of Roads	
Funding by	<ul style="list-style-type: none"> Government of Nepal International donors, for example, ADB (partially) fund projects
Level of autonomy	Low, in its overall strategy, the Government of Nepal has already laid out which projects are to be implemented as per the new political priorities and objectives for the country
Level of responsibility	DOR is charged with the execution of the vision of the Government of Nepal for the road sector in Nepal as a whole, but only for the implementation of projects. Its level of responsibility is therefore medium
Level of accountability	DOR only reports internally and to the Ministry, it publishes limited information to assess its performance – apart from output. It is however monitored by RBN, which publishes information. Accountability is thus medium.
Responsible Ministry	Ministry of Physical Planning and Works
Legal status	Government body
Phase of highway agency reform	Separation of client and producer functions
Road ownership	Government of Nepal

REFORM

Dedicated Highway Police closely linked to highway agency

Pakistan

The Ministry of Communications is responsible for all land transport in Pakistan. The minister chairs the National Highway Council, which oversees and guides the National Highways Authority (NHA) (Table 2.7). Other representatives include ministries at the federal level and two external experts: one financial and one road construction. The National Highways Authority Act (2001) lays down the responsibilities of the NHA, whose scope includes national and strategic roads. The NHA is charged with the management and extension of this road network. While the extent of the network is defined by law, additional roads can be taken up by the NHA if it so desires. Figure 2.9 provides details on the institutional set up for the highway sector in Pakistan.

Table 2.7: Description of the National Highways Authority in Pakistan

National Highways Authority	
Funding by	<ul style="list-style-type: none"> Government of Pakistan International donors, such as JICA, the World Bank and ADB
Level of autonomy	NHA is closely linked to the Government of Pakistan; federal politicians and senior government officials participate in the National Highway Council, which bears the ultimate responsibility. As such, the level of autonomy is classified as low
Level of responsibility	NHA is responsible for the implementation of projects and programs sanctioned by the Council, which it only partly designates itself. Therefore, the level of responsibility is low
Level of accountability	Accountability is low; information is limited. Objectives have rarely been quantified and performance is therefore difficult to assess
Responsible Ministry	Ministry of Communications
Legal status	Corporatized, as per National Highways Authority Act 2001
Phase of highway agency reform	Separation of client and producer organizations
Road ownership	National highways are owned by NHA

Sri Lanka

REFORM

Relatively independent authority

Road transport is a shared responsibility between the national and provincial governments. 'National transport' falls within the scope of the national government. While provinces have their own organizations for the road sector, the Road Development Authority (RDA) (Table 2.8) is responsible for national road transport infrastructure and operates under the Ministry of Highways. The ministry is responsible for drafting policies and strategy for the sector, which are then implemented by the Authority (Figure 2.10).

2.4 FUNCTIONS AND STRUCTURE OF HIGHWAY AGENCIES

South Asia in General

Highway agencies' core competencies lie in areas such as technical (engineering), project development, maintenance and some aspects of project management (Figure 2.11). Even though many highway agencies retain the required skills for engineering design, detailed (design) work is frequently outsourced to consultants to achieve better quality and expediency. In emerging areas including financial engineering, structuring and management of public-private concessions, impact assessment and road safety management, lack of competency is increasingly becoming evident.

Figure 2.9: Institutional set up of the highway sector in Pakistan at the national level

Table 2.8: Description of the Road Development Authority in Sri Lanka

Road Development Authority	
Funding by	<ul style="list-style-type: none"> Government ADB (Road Sector Development Project) and the World Bank
Level of autonomy	All members as well as the Chairman of RDA are appointed by the Minister, which restricts the authority's level of autonomy, classified as low
Level of responsibility	RDA is only responsible for national roads (class A and class B) that make up 11,700 km out of a total road network of 108,000 km. The Council proposes which projects are to be undertaken by RDA; therefore classified as low
Level of accountability	As a separate Authority, the level of accountability should be medium, as a clear responsibility and targets could be assigned
Responsible Ministry	RDA falls under the responsibility of the Ministry of Highways and Roads Development
Legal status	Corporatized
Phase of highway agency reform	Separation of client and producer functions with the introduction of a Road Board
Road ownership	Class A and Class B roads are owned by the national government Class C, Class D and Class E roads are owned by the provincial governments

Figure 2.10: Institutional set up of the highway sector in Sri Lanka at the national level

Figure 2.11: Competencies represented in highway agencies

Some nontechnical (and nontraditional) competencies could be located in the national road agencies in the region and in the Road Development Corporation/Boards established in India. However, the quality of skills needs to be enhanced; for example, only 30 percent of the highway agencies are able to provide safety statistics for the road network because safety is not a core competence of the agencies, nor is it considered their responsibility or concern. In addition, only 40 percent of the highway agencies have a safety council or committee in place, evidence of the fact that safety is not on the list of priorities for most highway agencies.

The structure of highway agencies in South Asia is based on the functions carried out by them. Some highway agencies have restructured themselves along functional lines, but structures based on territorial/regional jurisdictions still continue in many cases and sometimes coexist with functional arrangements in the headquarters. Some highway agencies have also set up regional branches for the execution of construction works. The creation of a separate, dedicated organization or department to deal with large projects is also not uncommon – particularly in those agencies that receive external multilateral funding for the development of highway networks. Most highway agencies have now established quality management/control units and a few have set up specialist cells for planning and asset management, road safety management, social and environment aspects, and so on. However, the terms of reference of these specialist cells are usually not very well defined and they fail to attract staff with relevant skills. Among the national road agencies, Bangladesh provides an exception in the region, where the road agency structure includes a Planning and Development cell, headed by an economist, responsible for the prioritization of road projects according to economic need.

The RDCs have a slightly different management structure. They are formed as corporate entities under the relevant companies/corporate act and governed by a board consisting of majority representation from the government and limited representation from road users/private sector. Most organizations have been created as an implementation arm of the PWD to promote PPP contracts. They also enjoy more independence in decision making and, at times, are able to raise resources from the market. Although their overall mandate is limited in comparison with the regular road authorities, their corporate structure provides them the leverage of faster implementation and expeditious decision-making capability.

In all cases, powers are delegated from the most senior official to subordinate officials. The extent of delegation varies across organizations. Delegation of powers is categorized by nature (approval of proposals, time extensions, cost overruns, and so on) and size, for example, minor cost or time overruns can be approved by junior officials. For instance, in the case of Pakistan, powers are (officially) not delegated to a level lower than the head of department.

Bangladesh

The Bangladesh RHD has a clearly defined structure (Figure 2.12): Five Additional Chief Engineers head the different departments of the RHD and report to a Chief Engineer, who is the highest-ranking official of the RHD. In addition, there are nine Additional Chief Engineers; one in each zone and four or five Additional Chief Engineers who work as Project Directors of Development Projects. The Chief Engineer is appointed by the ministry, to which he also reports. The departments of RHD are aligned to functions, for example, planning and development, and bridges as well as geographic zones. There are no departments catering specifically to projects funded by international financial institutions (IFIs) or donor agencies.

India

In India, many states have PWDs headed by a (Principal) Secretary, a bureaucrat from the administrative services and/or an Engineer-in-Chief from the department itself, rising through the ranks. There are instances where the technical head, that is, the Engineer-

REFORM

Economist explicitly involved in planning and development

Figure 2.12: Simplified organizational structure of Bangladesh Roads and Highways Department

REFORM

Road Development Corporations to support private participation

in-Chief, also acts as the administrative head of the road agency. In the case of RDCs, the administrative head of the organization is often an Indian Administrative Services (IAS) official while the technical head is one of the Chief Engineers drawn from mainstream PWD. There are also cases where the Secretary, PWD, doubles up as the administrative head of the RDC. Planning and other functions have not been centralized, nor is this the case for support functions as represented by a senior official (Figures 2.13 and 2.14).

Figure 2.13: Common and simplified organizational structure of state PWDs in India (alternative 1)

Figure 2.14: Common and simplified organizational structure of state PWDs in India (alternative 2)

Nepal

The structure of DOR in Nepal is built along functional lines, with primary and secondary functions at par with each other, for example, planning and design, on the one hand, and administration, on the other (Figure 2.15). In addition, there is one senior official who is ultimately responsible for the organization: the Director General. Explicitly separated departments are those dealing with foreign cooperation and ADB projects to cater to the specific requirements of these activities.

Pakistan

The structure of NHA is straightforward, based on its functions (Figure 2.16). In the case of operations and construction, there are regional offices. Each department is headed by a Chief Engineer (or similar). There is no specific department for projects funded by IFIs or donor agencies.

Sri Lanka

In Sri Lanka, the RDA is structured along functional lines, with one official holding ultimate responsibility (Figure 2.17). The departments are also organized broadly according to function, and a positive exception for South Asia is the explicitly mentioned Coordinator for Road Safety.

REFORM
Highway agency has 'full-fledged' Planning Department

REFORM
Road safety finds explicit mention in structure

Figure 2.15: Simplified organizational structure of Nepal Department of Roads

Figure 2.16: Simplified organizational structure of Pakistan National Highways Authority

Figure 2.17: Simplified organizational structure of Sri Lanka Road Development Authority

2.5 STAFFING AND HUMAN RESOURCE MANAGEMENT

The survey shows that most highway agencies primarily employ engineers, and technical and administrative support staff. However, a few respondents were able to state the precise composition of their staff. When considering future recruitment, the focus is on hiring engineers and Information Technology (IT) professionals, with only a few exceptions (Bangladesh and the Indian state of Karnataka). These highway agencies recognize the need to improve the skill mix and hire non-engineering staff including transport planners, economists and financial specialists.

South Asia in General

The scope for developing road agency-specific policies on recruitment and human resource management is limited, as there are restrictions applicable to all public sector agencies. Recruitment of gazetted officials¹³ is done by the Public Service Commissions; for non-gazetted officials, direct recruitment from a pool of pre-selected candidates is allowed. The details differ from country to country in South Asia. Less than half of the respondents expressed a desire to be granted more freedom in this respect.

REFORM

Sri Lanka's RDA has its own Human Resource policy

Shortage of staff is an issue, although no data are publicly available. However, Karnataka PWD in India has provided information (Table 2.9). In the lower ranks, a significant shortage of around 20 percent exists. The staffing situation in road development authorities is a little better. For example, the Sri Lanka RDA, which operates as an independent authority with its own human resource policy, has all positions filled up.

There are no systems in place for rewarding employees for their good or exceptional performance, yet (disciplinary) actions are taken when circumstances so demand. Such actions are only taken, however, when there is a case of serious default on responsibilities or tasks. The combination of a lack of promotional opportunities and possibilities to ensure good performance of all staff contributes to a lack of incentives for staff to excel. Compounding this problem is the fact that career progression schemes are based on seniority rather than merit. For example, there is one case where the career progression

¹³ Terminology may differ between countries in South Asia.

Table 2.9: Composition of staff in Karnataka Public Works, Ports & Inland Water Transport Department (example)				
Post	Sanctioned	Filled up	Vacant	Vacant as Share of Sanctioned
Engineer in Chief	1	1	0	0%
Chief Engineer	3	3	0	0%
Superintending Engineers	21	21	0	0%
Executive Engineers	64	61	3	5%
Assistant Executive Engineers	344	341	3	1%
Assistant Engineers	1,119	857	262	23%
Junior Engineers	863	703	160	19%
Total	2,415	1,987	428	18%

Source: Karnataka Public Works, Ports & Inland Water Transport Department.

scheme is described merely as the entitlement of an employee to wage increases as (s)he grows older.

Most senior postings, the responsibility of the parent ministry, are promotional posts for officials from within the highway agency. These posts tend to be filled by older officers nearing their superannuation. The tenure in senior position, therefore, is generally short, between one and three years. The higher echelons are thus relatively old in age, a potential barrier for a fresh approach to the management of highway agencies.

Scarce attention is paid to improving knowledge and skills within highway agencies. Membership of the respective national institutes of engineers is limited to half of the responding organizations and the concept of professional registration is unknown. Participating in committees of such or similar institutes is observed in 40 percent of cases. Despite the importance attached to training in the available policy and vision statements, training does not receive much attention. In 60 percent of the highway agencies, junior and assistant engineers do not undergo any training. Training is limited only to senior officials and, that too, is often not targeted; in 20 percent of the highway agencies training is only given to engineers at the level of Executive Engineer and above. Highly skilled staff is an exception: 30 percent of the agencies employ Ph.Ds and 20 percent employ postgraduates.

2.6 REFORMS UNDERTAKEN AND SUCCESS ACHIEVED

Governments and highway agencies have realized that their approaches would not yield the desired outcomes in view of the economic and social development that is taking place in the region. Therefore, a variety of reforms have already been implemented across South Asia. Some of these have been highlighted in the previous sections of this chapter.

In addition, Figure 2.18 shows other reforms that have been implemented across the region. Most common is the digitization of information and processes. Limited procurement and financial management reforms have also been undertaken. In 70 percent of the cases covered in the study, rudimentary management information systems have been put in place, and in 40 percent of the cases budget tracking studies were undertaken. In India, RTI is complied with by all but one agency covered in the study. However, grievance redressal procedures are only implemented in 30 percent of cases. There are also efforts to increase transparency and accountability and, to this end, standard bid documents and transparent bidding procedures are in place in 70 percent of the cases.

Figure 2.18: Reforms implemented by highway agencies in past five years

Successful reforms across the region are often replicated. For example, in Pakistan and Sri Lanka, there are now highway authorities in charge of extending and maintaining the network. In the Indian states, RDCs (or Boards) have been established with a similar objective, as well as to attract private financing. The explosion of the use of PPP, particularly in India, is clearly a success. Some examples of successful reforms are cited in Boxes 2.2-2.7.

Box 2.2: Road User Involvement in Karnataka

Karnataka has undertaken promising steps in involving users in its decision-making process. Although the initiatives have been implemented, the outcomes and results are not known. As such, it can be stated that there has been a start, but significant room for improvement exists.

- The Government of Karnataka constituted the Karnataka Road Users' Board in 2002. The Board consists of representatives of the public and private sectors and meets under the chairmanship of the Minister for Public Works. The Board will contribute to policy-making. Further outcomes of the Board have not been reported;
- Karnataka's PWD commenced organizing the Annual Road Users' Stakeholders Forum to bring together the various stakeholders in the road sector. Three such well-attended forums have been held between 2003 and 2007. Detailed proceedings of these forums have not been reported, and the results and outcomes are therefore not known; and
- In the Project Agreement between the Karnataka State Highways Improvement Project and the World Bank, it is agreed that the Government of Karnataka shall conduct at least three road user surveys to assess road user satisfaction with the PWD's performance in maintaining and operating the road network and compare the results of subsequent surveys. Apart from these three surveys, no additional surveys have been conducted independently of the World Bank.

Box 2.3: Gujarat State Road Development Corporation Ltd.

To implement the plans laid down in Gujarat Infrastructure Agenda – Vision 2010, the Government of Gujarat incorporated the Gujarat State Road Development Corporation Ltd. (GSRDC) on May 12, 1999 as a limited company under the Companies Act, 1956. Roads account for nearly 17 percent of the total planned investments amounting to some INR 200,000 million. GSRDC aims to:

- Raise financial resources from banks, institutions and mutual funds, amongst others;
- Support the development of bridges and roads;
- Commercially develop and exploit land near the roads/bridges; and
- Plan projects and prepare feasibility studies for those projects.

Vision 2010 is developed by another 'new' institute, the Gujarat Infrastructure Development Board (GIDB). Its mission is to support the implementation of PPP towards the realization of Vision 2010. Supporting GIDB is a law governing Build Own and Transfer (BOT) transactions and other such arrangements along with private participation in infrastructure projects, among the first of its kind in India. Since then many states have followed suit. The tasks of GIDB include:

- Develop and maintain Model Concession Agreements for, for example, road projects;
- Conduct techno-economic feasibility studies, prepare the Terms of Reference for projects, as well as bid documents; and
- Conduct standardized internal evaluation of projects.

The Government of Gujarat has recently updated this document to a new Vision 2020, which envisages about US\$270 billion of investment in 17 sectors, including road infrastructure.

Box 2.4: Road Sector Policy in Bangladesh

As part of the Institutional Development Component of DFID support to the Government of Bangladesh in the transport sector, a vision for the road sector was published in 1999. This vision clearly expressed that roads should be seen as a business and be approached as such. The road network, including bridges, ferries, buildings, and so on, are therefore valued and considered in an asset management approach. The Vision calls for sound decision-making based on clear criteria and priorities, and whole-life cost considerations of an asset. The Vision then provides details of factors/aspects necessary to arrive at a situation and environment in which it is possible to achieve these goals. The organization of the Roads and Highways Department has been aligned accordingly. As it turns out, however, the implementation of the Vision has suffered from barriers to its realization and has not been implemented to its full extent. However, the plans and potential have been identified and were, in principle, politically supported. As such, it carries some value as an example for the region.

Box 2.5: Road User Satisfaction in Nepal

The RBN regularly conducts a road user satisfaction survey in its efforts to monitor the performance of the road agencies in Nepal. It covers a profiling of road users as well as research into vehicle operating costs. Interestingly, user perception is also an important topic. Users are not only considered to be those using motorized vehicles, but also residents, pedestrians and those using other slow modes. The survey deals with intangible issues as well, such as irritation factors when using a road, road reliability and pollution. The objectives of this research are to:

- Elicit views on public perceptions of current sector outcomes, performance and policies of the Government of Nepal's road agencies;
- Document the views in a summary format suitable for comparison over time; and
- Improve policy decisions of the Government of Nepal.

The survey is also used to monitor the performance of road agencies in the country.

Box 2.6: e-Procurement

Several highway agencies in South Asia have implemented e-procurement for a variety of tenders issued by them, including consultancy services and maintenance activities. Highway agencies that have implemented e-procurement include those in the states of Madhya Pradesh, Kerala and Karnataka in India and Nepal. The use of online procurement systems increases the transparency of interaction between the public and private sectors. A well-designed system will also contribute to the efficiency of procurement.

Box 2.7: Nepal Roads Board – Managing a Second-Generation Road Fund

As a first in South Asia, Nepal established an autonomous RBN in 2002. The Nepalese fund is a so-called second-generation road fund, sourced from user fees and controlled by an independent board comprised of mostly private sector representatives. Some characteristics of the Nepalese fund are:

- Established by the Roads Board Act of 2058 (2002 in the Western calendar);
- The Nepalese fund is sourced from:
 - A fuel levy on diesel and petrol for vehicles, received through the Ministry of Finance,
 - Road user taxes (toll charges), received directly,
 - A vehicle registration fee, received through the Ministry of Finance;
- Resources are firstly allocated to routine, recurrent, periodic and emergency repair and maintenance of roads. Secondly, funds can be allocated to rehabilitation, reconstruction and upgrading of roads; and
- In 2009-10, about US\$5.5 million of funds were disbursed, about 60 percent of the budget allocation to RBN.

The Board publishes its financial statements annually. However, it has not yet delivered on the promise it was set up to fulfill. Two main causes are acknowledged. On the one hand, there are barriers to generating adequate resources. On the other hand, RBN suffers from inefficiencies in its operations. Nonetheless, the Nepal example shows it is possible to establish a user-charge road fund with an independent board in a region where most road funds are still first generation funds.

2.7 IN CONCLUSION: CURRENT PERFORMANCE

South Asia in General

That developments in the road sector are still driven by ad hoc decision-making and lack of long-term plans and/or a vision is highly apparent. Organizational priorities are often implicit and not laid down in formal policies or business plans. Additionally, even if a formal policy has been formulated, it is not necessarily applied in practice. Existing priorities for highway agencies are, in the first place, aimed at improving and maintaining connectivity between main urban centers and cities, and secondly at improving or maintaining connectivity in/to rural areas.

Moving away from Sole Implementation Focus

In terms of focusing on service provision, there are considerable differences between national and regional highway agencies. The former, in particular, have taken more steps to move away from the traditional 'public works' mindset of the infrastructure owner approach to a more service-oriented approach. The core strength of traditional highway agencies has been technical/engineering aspects of road construction and maintenance. Other considerations, for example, improved service provision, traffic and asset management, safety, and so on, are secondary. Associated issues which are economic in nature, however, are not a part of the mindset of the traditional highway agencies. The establishment of road development authorities has been helping to change this traditional mindset to some extent.

Structural Collection of Data is Still Limited

Only 50 percent of the highway agencies indicated that they regularly collect and maintain a repository of traffic data. Given this lack of data, it is not possible to assess the performance of individual highways or network as a whole. Often, this information is only collected when a road is proposed to be upgraded, especially in the case of RDCs and authorities.

For projects undertaken with assistance from multilateral or bilateral financing agencies, motivation and arrangements to improve performance are stronger. Such programs often contain specific conditions and resources for, for example, institutional strengthening and user involvement. In a few cases, special units or organizations have been set up to implement projects financed by IFIs.

Better Performance through Monitoring is Far Away

South Asian highway agencies are not yet completely ready to monitor their capacity and performance due to lack of available information and data.

2.8 CHALLENGES FACING HIGHWAY AGENCIES

Almost all the highway agencies that participated in the study indicated that an important development was the increasing involvement of private contractors in the construction and maintenance of roads, for example, through PPPs (Figure 2.19). In addition, 62 percent of the respondents indicated that there was increasing consolidation of roles and responsibilities into a single road (highway) agency structure instead of fragmented institutional arrangements for the management and development of the road network. Approximately 250 respondents also indicated that the public demand for improved services would increasingly exert pressure on the road agencies to enhance overall accountability and discharge their responsibilities more efficiently and effectively.

Figure 2.19: Perceived current transitions for highway agency

2.8.1 DEMAND FOR ROAD INFRASTRUCTURE CAPACITY

Quantum Leap in Highway Infrastructure Investments

Highway investments are lagging behind growth in demand. As a result of years of underinvestment and rapid increase in demand, there is a huge backlog of investments that are urgently needed to upgrade highway infrastructure in the South Asia region. The World Bank states¹⁴:

“South Asia’s rebound since March 2009 has been strong. South Asia is poised to grow by about 7 percent in 2010 and nearly 8 percent in 2011, thanks to the strong recovery in India, good performance in Bangladesh, post-conflict bounce in Sri Lanka, recovery in Pakistan, and turnarounds in other countries, including Afghanistan, Bhutan, and Maldives.”

Elsewhere:

“The results (...) suggest that a 7.5 percent GDP growth in South Asia would result in increased demand for infrastructure services that in turn would require investment amounting to about 5 percent of GDP plus a further 2 percent of GDP capital replacement.” This growth of infrastructure investments includes road infrastructure but also sanitation and power, amongst others. Transport infrastructure accounts for about half.

In section 1.1 it was stated that car ownership in India is forecast to increase by nearly 550 percent between 2002 and 2030. For Pakistan, even though expected economic growth rates are less than half of those forecasted for India, car ownership is predicted to increase by almost 140 percent. Such huge increases in motorization rates in the region imply that the demand for highway infrastructure will increase significantly.

Attracting Necessary Investments

The volume of investments needed to upgrade the highway infrastructure means that highway agencies will need to attract significant sums of money from the private sector. PPPs are recognized as a good vehicle for attracting private sector financing for transport infrastructure; Figure 2.19 shows this transition. Although India has been particularly successful in developing a coherent PPP policy and implementing a large number of projects, highway agencies need to attract still higher levels of investment. Apart from the sheer volume of investments that are required, there are few other associated issues:

- An imbalance in risk allocation between the public and private sectors leading to failure to attract private investment or ‘unfair’ distribution of profits to the private sector;
- A lack of information about the value of assets leading to inability to determine possibilities for leverages in financing; and
- A fragmented approach to the network such that individual roads take preference over networks leading to suboptimal decisions.

There are also other issues to consider in this respect. Firstly, although considerable funds are available for the primary network and rural roads, the secondary network is suffering from a lack of funds. Secondly, maintenance funding and contracting arrangements are generally acknowledged to be inadequate and inefficient to maintain the quality of the roads and provide quality service to the road users. In India, for example, the poor condition of the secondary network is estimated to cause an annual loss of INR 200,000 million.

Managing Larger Road Networks

The extent and quality of highway networks have improved as a response to the enhanced demand for accessibility and improved transport quality as well as efforts to support economic development by improving connectivity. The networks have thus increased in

¹⁴ South Asia Economic Update 2010. Looking East. World Bank (2010).

length and gained complexity. Larger networks call for a different approach in planning, operation and management. If the quantum leap in highway infrastructure investment is realized, these networks will further increase in size and complexity, and thus managing these networks will require new approaches that are very different from those that are in use today in most highway agencies in South Asia.

2.8.2 CAPACITY TO SUPPLY INFRASTRUCTURE

Supply Side Capacity to Meet Demand

If extensive construction and maintenance plans are to become a reality, the industry needs to be able to deliver the scope of work associated with such plans. In an earlier study, the World Bank¹⁵ identified a number of constraints in the industry that need to be addressed. Although this study focused on India, the other countries in South Asia face similar challenges. These constraints include a fragmented industry where small firms (small relative to the size of firms outside India) dominate. These small companies lack the scale to handle large projects which increases the transaction costs associated with managing contracts. Moreover, the industry is relatively labor intensive; to increase capacity and quality, higher levels of mechanization or capital investment are required. Highway agencies need to take such constraints into account as they limit their capacity to realize ambitious expansion plans.

Developing Technological Capability

The World Bank in 2008 stated that:

Construction industries have improved in recent years, adopting more modern technologies and better equipment, but their scale is still small in relation to the proposed programs. The South Asian construction sector may not have the capacity to meet the rapidly rising demand, and it will take time for the capacity to develop.

Across South Asia, gang labor is the common standard. In addition, training facilities for semi-skilled workers are inadequate. To construct and manage a modern and high-quality network, the industry needs to improve its technological capability, and invest in knowledge development along with investment in infrastructure.

Support for Private Sector Development

There is a rising trend to outsource tasks that were traditionally performed in-house by highway agencies. This outsourcing, however, poses a new challenge: the private sector must have the capacity to absorb this work and execute it well. The approach of blindly outsourcing work to the private sector, without the requisite support and attention to developing its capacity, may be counterproductive. Thus, highway agencies face the challenge of developing the capabilities and capacity of the private sector in a manner that will enable the private sector to face future challenges and support the highway agencies in achieving their goals.

Attracting and Retaining Qualified Personnel

Highway agencies face significant challenges in their human resource management. The survey and interviews indicated that the majority of staff was made up of engineers and there was a significant number of vacancies. The limited promotion opportunities act as a deterrent for talented professionals to join the highway agencies. In view of the need to improve performance, highway agencies will need to increasingly attract qualified staff.

The desired qualifications and competencies of highway agencies' staff will also have to change as the agencies increasingly manage private contractors instead of actually executing the works: managerial and financial skills will be needed in addition to

¹⁵ Indian Road Construction Industry Study, World Bank (2008).

engineering skills to do so effectively. However, to be able to manage private contractors, highway agencies will need to retain a repository of technical knowledge. A number of respondents recognized the need for a broader set of competencies within the highway agencies by mentioning the requirement for IT professionals as well as managers. However, the majority is focusing on maintaining and improving certain engineering capabilities.

Career Development of Personnel

Maintaining good organizational memory, essentially for streamlined functioning of an organization, requires retention of staff over time. Staff retention is going to become increasingly difficult for highway agencies as their staff has new employment opportunities that previously did not exist in the private sector. Also competition for new staff is going to become increasingly fierce, as highway agencies compete with the private sector for the same set of skills and people. Highways agencies must enhance their attractiveness as employers to successfully retain current staff and attract talented new professionals. One example of this is the potential for talented individuals to develop their careers, skills and competencies within the highway agencies. Thus, highway agencies will need to seriously rethink their current human resource management policies, including training of their staff, which is currently based on seniority and tenure rather than merit.

The in-depth interviews for this study suggest that, besides civil engineering skills, the highway agencies will require the following additional competencies in the next five years:

- Asset managers;
- Road safety experts;
- Geographic information system (GIS) /remote sensing and other IT experts;
- Planners;
- Finance specialists; and
- Project management specialists.

2.8.3 PERFORMANCE CHALLENGES

Improving Governance and Transparency

With large spending on the road network and an increasing demand for taxpayers' value for money, the need to improve governance and transparency will become stronger. Transparency will facilitate achievement of better results by highway agencies and enable them to keep the public informed on the use of taxpayers' money. It will also enable an outsider, be it a user, consultant or service provider, to understand the functioning of the agency, its use of public funds or support required by the agency to achieve its objectives.

The need to improve governance also addresses the same issue. There is a need to better control the agency, the network it manages and the inputs it uses, as the public and specific stakeholders become more demanding.

Meeting Increasing Expectation of Road Users

With growing incomes and awareness, road users are becoming more demanding: they demand quality services and infrastructure, and expect to easily and clearly understand how their tax money is being spent. Thus, roads will need to comply with higher quality standards, congestion will need to be reduced, and road safety concerns will become more apparent. Highway agencies, carrying the responsibility for the operation and management of the road network, will need to face these demands.

Various policy documents recognize the need to commit sufficient resources to maintenance so as to deliver quality infrastructure. Examples are the Perspective Plan 2010-21 of the Bangladesh Planning Commission and the Approach Paper for the 12th Five Year Plan of the Planning Commission of India.

Cultural Change Required

Currently, as explained before, highway agencies have a strong 'engineering' and 'input' focus. They need to pay additional attention to the concerns of users, transparency, value for money and the quality of output and outcome. Highway agencies need to shift their focus from an engineering provision of asset-only to a more service oriented, user-friendly, accountable, and custodian-of-public-assets focus.

3 INTERNATIONAL CASE STUDIES

This chapter describes global good practices related to institutional structure and functions to manage transition challenges and contribute to effective service delivery in the fast growing road transport sector in the region. This chapter also highlights the performance monitoring frameworks that some other road agencies have developed. Key findings of the four case studies are presented; the complete case studies are included in Annex C. The countries covered by these four case studies are: South Africa; Australia; New Zealand; and Sweden.

3.1 INTRODUCTION

This section briefly describes the scope of road infrastructure in the international cases considered.

Table 3.1: Length and management of road networks in the case study countries

Country	Responsible organization	Length (km)
South Africa		
• National roads	South African National Roads Agency	16,175
• Provincial roads – paved	Provincial governments	47,157
• Provincial roads – gravel	Provincial governments	176,716
• Provincial roads – access	Provincial governments	124,238
• Unproclaimed rural roads		221,092
• Metro, municipal and other roads	Municipalities or municipal road authorities	168,058
Australia (New South Wales only)		
• National roads (on behalf of national government)	NSW Road Transport Authority	4,269
• State roads	NSW Road Transport Authority	13,459
• Unincorporated regional and local roads	NSW Road Transport Authority	2,946
New Zealand		
• State highways	New Zealand Transport Agency	10,906
• Local roads	City and district councils	83,000
Sweden		
• State roads	Swedish Transport Administration	98,400
• Municipal roads	Municipalities	41,000
• Private roads	Private entities	284,000

3.2 INSTITUTIONAL SETTING - AUTONOMY FROM THE MINISTRY

All highway agencies are public bodies – government departments, agencies or state enterprises acting as independent highway agencies to implement the road sector policy on behalf of the Ministry of Transport (or the Ministry of Enterprise, Energy and Communications in the case of Sweden).

All have a considerable role and responsibility for long-term planning of the road transport system. The authorities are responsible for the construction (network development), operation and maintenance of national/state roads as well as part of the provincial/regional roads. They are usually involved in drafting the technical standards for the network, but operate within policy objectives with reference to network quality (congestion, speed, safety, and so on) set by a policy department.

In addition, the agencies in New Zealand and Sweden have adopted an integrated approach towards the implementation of transport policies, giving respective agencies the mandate to manage implementation of policies for the entire land transport sector in a holistic manner.

All agencies enjoy a certain degree of autonomy from the government, which reduces political involvement in the day-to-day business of providing road infrastructure to the public. Although the agencies are predominantly executive agencies, without a formal policy development task, they all have substantial influence on the policy objectives regarding the road network.

In all cases, the road networks are owned by the state.

3.3 POLICY FRAMEWORK - CLEAR STRATEGIC GUIDANCE FOCUSED ON OUTCOMES

Framework for Performance Management

The four agencies have similar policy frameworks that are considered examples of good practice, and that provide strategic guidance. Based on a general vision statement from the concerned ministry, the agency develops its own vision and supporting plans. Different plans often exist and have different time horizons.

The national governments have expressed the broad goals and outcomes desired from the transportation agencies. This is often a statutory process that results in the formulation of a long-term policy or vision document with a 20- to 30-year horizon. These can be supported by a rolling policy document (two to four year updates) with a 10-year horizon of which the first four to six years are substantially detailed out. These plans form the basis for the mid-term and annual budgeting in conjunction with budget requests made by the agencies.

The agencies have clearly adopted the outcomes-articulated central government goals in their policy, strategy and planning documents and translated these outcomes into coherent goals, measures, and targets for their organizations. They have also adopted a 10-year policy or vision in line with the national policy. Based on this, most agencies have issued a statement of intent or corporate/business plan; a forward-looking three-year plan updated annually that spells out how the agency will link its efforts with the state's policy aspirations. It sets the agency's budgets and priorities, and demonstrates how it intends to make progress on the policy priorities over the 10 years.

The three-year plans are rolling plans that are updated annually and are the basis of funding allocations/budget requests, listing projects to be executed in the coming year and projects planned in the next two years.

The documents contain sets of indicators (outputs and outcomes) for activities that are linked to policy outcomes as well as for the outcomes themselves. In this way, they form the core of a robust performance management system that cascades national transportation performance goals throughout the agency and down to local governments.

Increased User Involvement

Increasingly, highway agencies are considering the needs of users as central to their activities. This is the result of a shift from building highways to moving goods and people. In order to move people, it is not only necessary to provide infrastructure but also the right infrastructure at an acceptable cost to the user. All agencies have formalized structures for receiving user feedback, including the representation of road users in the agency's internal advisory boards and committees.

Box 3.1 Involving Small and Medium-sized Enterprises in South Africa

South African National Roads Agency Limited's (SANRAL's) procurement policy is aimed at stimulating growth of small and medium enterprises (SMEs), promoting Black Economic Empowerment and training for historically disadvantaged South Africans. In particular, for routine road maintenance, SANRAL revisited its model contract resulting in a situation where:

- The main contractor operates as a management contractor with 80 percent or more of the work being carried out by small contractors; the main contractor is responsible for training and mentoring the sub-contractors;
- Consulting engineers are hired for design and supervision in addition to a SANRAL road manager;
- Low entry barriers for small contractors are maintained; and
- There is no exploitation of small contractors.

3.4 MAIN ACTIVITIES - FROM BUILDING HIGHWAYS TOWARD MOVING PEOPLE AND GOODS

The scope of the core tasks of the agencies reviewed differs to some extent between countries (Table 3.2). As also already noted, there are some differences in the extent to which the agencies are responsible for road sector policy development; although they all have, at the very least, a strong advisory role. Differences are also noted in terms of traffic and incident management services, and licensing and registration services.

Table 3.2: Division of responsibilities in studied highway agencies

Main area	Task	Responsibility			
		New Zealand	NSW	South Africa	Sweden
Network	Policy development	MoT	MoT	MoT	MoT/STA
	Strategic planning	NZTA	RTA	SANRAL	STA
	Network implementation	NZTA	RTA	SANRAL	STA
Maintenance Management	Regular maintenance	NZTA	RTA	SANRAL	STA
	Traffic management network wide		RTA		
	Traffic management (local)	NZTA, Traffic Mgmt NZ		SANRAL	STA
	Incident management ¹⁶	NZTA, police	RTA	various	Police
	Licensing and Registration	NZTA	RTA	RTMC	STA
	Overload control	NZTA	RTA	SANRAL	STA

Note; MoT (Ministry of Transport) is the ministry responsible for transport policy. It may have a different name or be part of a larger ministry; NZTA is New Zealand Transport Agency; SANRAL is South African National Road Agency Limited, RTA is Road Transport Authority in New South Wales, Australia; RTMC is Road Traffic Management Corporation; STA is Swedish Transport Agency

¹⁶ In case of no injuries.

Whereas the Road Transport Authority (RTA) in New South Wales, Australia, covers almost the entire network with traffic management instruments, the scope of traffic management is more restricted in other countries. In South Africa and Sweden (prior to 2010), the agencies were not involved in licensing and registration services. These tasks lay with a separate agency under the ministry.

The trend in the scope of tasks in the four cases shows a shift from building highways towards moving people and goods. Client and delivery functions have been separated. The agencies focus on planning of activities, defining standards and guidelines for the execution of work and services, and monitoring of their execution. The delivery organizations are corporatized or privatized. All four agencies use private sector contractors to execute maintenance services and, in some cases like South Africa, to execute traffic management services. Also South Africa provides a good example of how SMEs can be involved in the execution of routine maintenance activities and increasing overall sector capacity for executing maintenance activities.

The shift in focus towards planning, control and management of activities increasingly requires the need for accurate information on delivery processes and outcomes, use of planning tools and risk management systems, and different skills from agency staff.

3.5 INCREASED AND CONTINUOUS CONCERN FOR ENVIRONMENT AND SAFETY ISSUES

Closely related to the integrated transportation planning and delivery approach is the trend that agencies focus on environmental and safety issues. All agencies have greenhouse gas emission reduction strategies in place as part of the performance measures focused on environmental concerns. Also transport safety strategies and management plans are part of their performance framework.

Sweden has probably the most well developed environmental management and safety plans incorporated into its performance framework and has inspired many other countries worldwide. The Swedish Transport Agency (STA) example illustrates the success of a transport agency in reaching beyond its normal stakeholders to create alliances in other sectors to address cross-cutting issues such as vehicular safety and emission reduction. It cooperates with transport companies (public transport and trucking) to improve fuel efficiency, and with the automobile industry to enhance safer vehicle design.

3.6 PERFORMANCE AND ACCOUNTABILITY - INCREASED NEED TO DEMONSTRATE RESULTS

These agencies clearly feel the need to monitor their performance and publish this information. In short, they are aware of the fact that the government and public hold them accountable for the results achieved with the means provided to them by the taxpayer. This results in close monitoring of financial flows as well as approaches to evaluate investment and expenditure options.

Availability of Wide Range of Performance Documents

All agencies have a wide range of publicly available, professionally produced reports and documents containing performance information, evidence of their commitment to open communication. The level of detailed information on performance indicators for a wide range of activities shows that this is seen as an effective way to inform the public on the agencies' activities and to create awareness on the importance of the agencies' activities to public interests (improving access, safety, environment, efficiency and reliability of the network).

The concern for user interest is also expressed in the monitoring and performance framework. Apart from the fact that all agencies have adopted a similar framework for monitoring public views, they have also included key performance indicators related to a customers' rating service in their monitoring framework, and carry out surveys to obtain information on user satisfaction.

Clearly Established Audit and Review Procedures

From the abundance of documentation and indicators on the agencies' performance across a wide range of activities, it is evident that sufficient information is available to evaluate their performance.

For all agencies, performance audits are usually carried out and are required by law. Treasury officials or (private) auditors are responsible for carrying out performance audits. The auditors publish reports and recommendations which are incorporated into the management priorities for subsequent years.

Also, internal and external reviews of the agencies' performance are widespread. These reviews are often required by statutes or regulation. For example, the RTA in New South Wales (NSW), Australia, and New Zealand Transport Agency (NZTA) in New Zealand prepare regular progress reports to central officials on the implementation of their results and service plans and the statements of intent, respectively. This can help to promote mutual trust and a common understanding of the issues at hand between the ministry and the agency.

Benefits of Benchmarking

The four agencies have recently started international benchmarking initiatives which, it is hoped, will enable them to review their own performance, identify best practices and set targets. NTZA and RTA and seven other state transportation agencies participate in Austroads, the association of Australian and New Zealand road transport and traffic authorities, aimed at promoting improved road transport outcomes, whilst STA in Sweden started a benchmarking initiative with Poland, Lithuania, Latvia, and the Nordic Association.

Cooperative Target Setting with a Long-term Focus

There are no mandated performance targets or penalties if agencies fail to realize their targets; the agencies have negotiated their targets or service agreements with the ministry.

The long-term focus on process improvement, performance reporting, and accountability in all the agencies has led to continual improvement in performance¹⁷. It has helped to focus on the best long-term investment that is particularly important to managing infrastructure assets over their entire life as well as to minimize nonrational behavior led by short-term targets that are suspect because data are often unreliable.

3.7 INCREASING NEED FOR ASSET AND RISK MANAGEMENT SYSTEMS

In order to measure accomplishments, track trends, and become accountable, agencies increasingly rely on a variety of management (information) systems as tools to satisfy the need for information.

Asset Management

Maintaining the existing network is an important activity of the agencies. A well-maintained network is generally a cost-effective way of keeping the performance of the network at a desired level. Roads have to be maintained throughout their design life to ensure that they deliver the performance envisaged, and the timing of maintenance is crucial. For example, SANRAL has calculated that repairing a road with a five-year maintenance backlog will be 18

¹⁷ FHWA (2010). Linking Transportation Performance and Accountability.

times more expensive compared to proper and timely maintenance of that road. Also, road performance depends on what, when, and how maintenance is performed.

To manage road assets in a sustainable manner, all four agencies have adopted an elaborate asset management system. It is driven by policy goals and objectives, and relies on systematic assessments of asset performance and costs, when making decisions on future actions. As a result, asset management impacts virtually every aspect of the agencies' business, including planning, engineering, finance, programming, construction, maintenance and information systems.

Risk Management

The concept of risk is rapidly becoming central in the work of the four agencies. It is applied in all stages of the project cycle.

The NSW's Total Asset Management Manual describes risk management as a systematic process to identify risks that may impact the organization's objectives, analyze their consequences, and develop ongoing measures to treat them. For example, the concept of risk management informs NSW RTA's decisions in virtually every area of the organization.

SANRAL has completed the process of enterprise-wide risk assessment. Management and employees are given the opportunity to voice their concerns regarding the strategic and operational risks faced by SANRAL. It has developed a risk register that is the product of a continuous assessment of current risks and identification of new risks. All employees are encouraged to be alert to risk exposures in their area. The risks are analyzed by a special unit that analyzes each risk and initiates appropriate mitigating action and treatment. All risks are documented and communicated to the Board and employees. The internal audit coverage plan is risk-based, and risk management is a standing item on all Board and committee meetings.

3.8 HUMAN RESOURCE MANAGEMENT AND KNOWLEDGE – KNOWLEDGE-DRIVEN ORGANIZATIONS

Agencies are becoming more professional in their approach to management as well as the adoption of an increasingly integrated approach toward mobility management instead of road management. This has had a number of consequences for agencies' corporate resource (staff) management. One example is the diverse composition of staff, including engineers as well as economists, business administrators, and so on.

All the agencies are investing in developing leadership programs to guide further adoption of more integrated and performance driven work processes. They also recognize the need to further develop the skills and capabilities of staff at all levels. Training needs are assessed on a regular basis, including periodic reviews by external experts in some agencies.

Notably, road agencies are all recognized and appreciated as 'good employers' in national 'employer/human resource management' type benchmarks.

To further develop knowledge, all agencies fund and cooperate in research on subjects such as pavement strengths/durability, pavement management and road safety measures. Research partners are mainly universities and specialized public and private research institutes.

3.9 ROAD SECTOR FUNDING - INCREASING USE OF OFF-BUDGET FINANCING

Table 3.3 summarizes the sources of finance for the agencies. Financing other than from budget allocations is used in all four countries in this study. In particular, NSW in Australia and South Africa use off-budget sources to finance (part of) the network tasks. Both are using toll and toll concession to finance, design, construct, operate and maintain the

Table 3.3: Overview of funding sources of studied highway agencies

	Investments: Network Development	Operational Expenses (Maintenance, Traffic/Incident Management)
Budget allocations	New Zealand, New South Wales, Sweden	New Zealand, New South Wales, South Africa, Sweden
Road-users charges (tolls, congestion charging, taxes, duties)	New Zealand, Sweden, New South Wales, South Africa	New Zealand, Sweden, South Africa
Loans on capital market ¹⁸	New Zealand, New South Wales, South Africa	New South Wales, South Africa
Private sector (pre-financing, PPP, toll concessions)	New South Wales, South Africa	New South Wales, South Africa

infrastructure. On publicly operated toll roads, toll is used to cover the debt services from loans on the capital market.

New Zealand only had toll bridges since 2009 when Northern Gateway Toll Road (NGTR) opened on State Highway 1, north of Auckland. To bring forward construction, NZTA borrowed against future revenue through toll collection.

Also, in Sweden, private sector involvement, either in terms of toll concessions or private pre-financing, is still limited to a couple of bridges. It has been using the Design-Build Operate (DBFO) possibility for some future projects. Congestion tax is charged for Swedish-registered vehicles that are driven into and out of central Stockholm

3.10 PERFORMANCE MONITORING FRAMEWORK

The agencies covered in the case study have gradually developed robust performance monitoring frameworks through the introduction of Key Performance Indicators (KPIs). The frameworks have helped the road agencies tremendously to stay focused on the outcome-centric development agenda and achieve gradual improvement in their performance, accountability and public image, thereby resulting in overall organizational and sectoral efficiency. An example of a performance monitoring framework used by SANRAL, South Africa, is presented in Table 3.4.

Table 3.4: SANRAL's performance monitoring framework

Activities and Services	Outcome	Performance Indicators	Output	Target Indicators
Road maintenance & operation	General User satisfaction	General The User Satisfaction Index (USI) is a measure of road users' satisfaction with the national road network. The index is based on road users' ratings (roadside surveys) of a number of attributes related to the national road network.		Under development
	Surface/pavements (per class) Roughness	Surface/pavements (per class) The Smooth Travel Exposure (STE) indicator represents the proportion of travel undertaken each year on roads with surface roughness less than the defined level.		Surface/pavements (per class) 95% of travel on less than 4.2 m/km roughness.

¹⁸This relates only to loans directly made by the Road Administration. Governments may conclude loans in the capital market to finance the budget allocations.

Table 3.4: SANRAL's performance monitoring framework (continued)

Activities and Services	Outcome	Performance Indicators	Output	Target Indicators
	Rut depth	The Low Rut Exposure (LRE) indicator represents the proportion of travel undertaken each year on roads with rut depth less than the defined level.	Surface/ pavements (per class)	95% of travel on less than 20 mm rut depth
	Macro texture	The High Texture Exposure (HTE) indicator represents the proportion of travel undertaken each year on roads with macro-texture higher than the defined level.		95% of travel on higher than 0.4 mm texture
	<i>Bridges</i> Travel over/under bridges	<i>Bridges</i> The Bridge Condition Exposure (BCE) indicator represents the proportion of vehicles that travel over or under bridges with Overall Condition Index (OCI) higher than the specified level.	<i>Bridges</i>	<i>Bridges</i> 90% of travel over or under bridges with OCI higher than 80%
Construction	<i>Roads, surface/ pavements (per road class)</i> Road maintenance effectiveness	<i>Roads, surface/ pavements (per road class)</i> The Road Maintenance Effectiveness (RME) indicator represents the cost per km to maintain the roads in smooth condition, less than defined roughness level.	<i>Roads, surface/ pavements (per road class)</i>	<i>Roads, surface/ pavements (per road class)</i> Under development
	Asset Preservation Index	The Asset Preservation Index (API) is the ratio between construction expenditure and the increase in the asset value of the pavement layer portion of the pavement.		Under development
Upgrading / rehabilitation/ improvements	<i>General roads, surface/ pavements (per road class)</i> National road Development Index	<i>General roads, surface/ pavements (per road class)</i> The National Road Development Index (NRDI) is the ratio between the total vehicle km travelled on national roads and all vehicle travel	<i>Roads, surface/ pavements (per road class)</i>	<i>Roads, surface/ pavements (per road class)</i> No target
Management of funding allocation	<i>General</i> Internal Rate of Return	<i>General</i> The Return on Construction Expenditure (RCE) indicator is based on weighted Internal Rate of Return (IRR) estimates of capital projects undertaken by the road agency. IRR is calculated as the discount rate for which community life-cycle benefits equal the road agency life-cycle costs.		Internal Rate of Return > 15%
	Expenditure efficiency	The Expenditure Efficiency Index (EEI) is the annual percentage spent on overheads by the agency compared to the total expenditure of the agency.		5%
	Private sector investment	The Private Sector Investment Index (PSII) is the ratio between expenditure funded by the private sector and expenditure funded by the fiscus.		0.85

4 CAPACITY AND PERFORMANCE INDICATOR FRAMEWORK

Moving forward from the findings about the present situation of highway agencies in South Asia, the current and future challenges they face as well as the lessons from the international case studies, this chapter presents the framework for capacity and performance indicators considered appropriate for the agencies in the South Asia region. The following issues are presented and discussed in this chapter: the ideal structure and functions of a highway agency, rationale behind measuring capacity and performance, and actual indicators. Working from this ideal agency, which should be adapted to the local circumstances, will enable the road sector to generate best practices and strive to achieve this level. In effect, the framework presented in this report is a tool to reform the agencies.

4.1 THE 'IDEAL' HIGHWAY AGENCY: FUNCTIONS AND STRUCTURE

Agencies can be used to bring about a more independent and professional approach to road asset management. Agencies operate within the framework of government rules but their position insulates the implementation of their responsibilities from fluctuating government budgets. This section outlines the functions and structure of such an agency.

Performance agreements between the agency and the parent ministry ensure the alignment of the objectives of the agency with those of the government. The agreement should be based on a multi-year business plan and spell out the highway agency's obligations, strategies for achieving them, performance targets, and procedures for monitoring and evaluation. Such arrangements assign managerial responsibility in a transparent manner.

4.1.1 FUNCTIONS

The ideal highway agency has a clearly-defined set of functions, related only to the development, operation, maintenance and extension of the highway network. It is generally acknowledged that the private sector is better equipped to handle certain functions, and these functions could be outsourced by the highway agency to private players. The responsibility for these functions, however, still lies with the agency. The responsibilities of the agency should be laid down in a legal mandate. The performance associated with the responsibilities should be formalized in a performance contract with the parent ministry.

The ideal highway agency should be responsible for the following functions:

- Planning and development of the road network;
- Management and allocation of funding to achieve its goals;
- Network extension and road construction;
- Road operation and maintenance; and
- Highway patrolling.

To successfully perform its functions, a highway agency should ideally also be responsible for:

- Human resource management;
- Risk management of its activities and assets;
- Involving users in planning and development; and
- Regulation and licensing of road users (drivers) and vehicles¹⁹.

There are also functions for which it carries a shared responsibility:

- Road safety, together with the police for enforcement, and trauma centers for post accident emergency medical care;
- Traffic management; and
- An advisory role in the development of a road sector policy by the concerned ministry.

¹⁹ Regulation and licensing of road users and vehicles, in Bangladesh, is the responsibility of a separate organization: the Bangladesh Road Transport Authority. In India, this task is undertaken by the state and regional transport authorities. In other cases, for example, South Africa and New Zealand, the highway agency carries out the responsibility.

4.1.2 STRUCTURE

The ideal national or state highway agency benefits from some degree of independence from the government. This allows the government to focus on the strategic policy issues associated with the highway sector while enabling the highway agencies to focus on delivering and operating a quality highway infrastructure. The distance between the agency and the government also provides the former the freedom to deliver the best possible results – within constraints placed upon it by the government. However, such freedom comes with responsibilities. The indicator framework assists in managing and explaining these responsibilities.

As structure follows function, the internal structure of the ideal highway agency would represent a pyramid, with one official ultimately representing the agency. Reporting to him/her are a number of functional departments each of which serves a different purpose within the agency. Table 4.1 describes the elements of the structure of an ideal highway agency; Figure 4.1 provides a graphical representation of this structure. As argued in section 4.1.1, the highway agency bears responsibility for the network and for certain functions; however, it does not necessarily need to perform all the associated tasks. It can, and should, outsource activities to the private sector, as and when appropriate.

Table 4.1: Description of highway agency 'departments'

Element	Description
Highway Agency Board	<p>The board includes representatives from both the public and private sectors, including road users and the business community. Transport related ministries include Ministry of Transport, Ministry of Public Works, Ministry of Railways, Ministry of Shipping, amongst others. This wide composition of the board is aimed at achieving integration between modes and incorporating users into strategic decisions regarding the highway network. The board is jointly responsible for the highway agency at a strategic level, as laid down in the agency's long-term strategy which is a different document from the ministry's road sector policy (although the two are linked).</p> <p>The board is chaired by a representative of the ministry responsible for road transport and infrastructure. All members of the board have an equal standing but in case the board is unable to reach consensus, the chair holds a decisive vote.</p>
Chief Executive	<p>The mandate of the Chief Executive is dual. Firstly, s/he is charged with the management of the highway agency. Secondly, s/he cooperates in the highway agency board on strategic issues with other board members.</p> <p>S/he should translate the long-term strategy of the agency into concrete development and maintenance programs.</p>
Chief Executive's Staff	<p>The Chief Executive's staff will support the Chief Executive on issues not placed in the 'line of the organization;' examples could be risk management or internal audits.</p>
Engineering Services	<p>The Engineering Services department provides specific services related to those technical aspects of maintenance and extension of the network that are not outsourced to the private sector. In addition, it provides contract management and quality control and assurance for outsourced works. The department should also be responsible for overseeing preparation of detailed project reports, technical sanctioning of projects and procurement processes.</p>
Corporate Services	<p>This department supports other departments of the highway agency to enable them to carry out their activities, such as human resource management, IT support, administrative support or legal services. This department is thus crucial in enhancing the skills of the staff and ensuring that career opportunities exist within the agency.</p>
Financial Services	<p>This department manages the financial aspects associated with the highway network and individual projects.</p>
Planning and Development	<p>This department is responsible for the planning and development of the highway network and individual projects.</p>

Figure 4.1: Schematic structure of an ideal highway agency²⁰

Coordination

Additionally, a mechanism needs to be established to ensure coordination between the highway agency and other relevant organizations. Coordination is required with various agencies at appropriate levels for pre-construction activities, land acquisition, rehabilitation and resettlement, trees, environment safeguards, utilities, railway over/under bridges and canal crossings. In addition, the highway agency's planning department should also coordinate with medical, education and police departments to ensure traffic law enforcement and issues such as protection of the right of way.

4.2 RATIONALE OF AND PRINCIPLES FOR MEASURING CAPACITY AND PERFORMANCE

4.2.1 BENEFITS FOR A HIGHWAY AGENCY

By implementing capacity and performance monitoring, highway agencies can reap four potential benefits:

- The agency is able to improve its performance and pride itself in doing so as its performance and that of its network become verifiable. It becomes relatively easy to intervene if the indicators deviate from their target values as systems and procedures to measure and monitor have been established;
- The agency's accountability improves since, by setting target values for these indicators, it becomes easier to assign responsibilities to specific departments and managers. Such indicators explicitly clarify the roles, responsibilities and deliverables of the highway agency, its department and officials;
- It brings transparency to the agency's decision-making process. Measuring capacity and performance requires the highway agency and officials to make sound decisions on the reasons for allocating certain resources to realizing certain goals. As a result, both internal and external transparency increases; and
- It supports highway agencies in improving its efficiency and effectiveness in delivering the highway infrastructure to the society. Since there is clarity on 'what' and 'how' it must deliver, the agency is better able to carry out its mandate and explain certain choices that it has made.

²⁰The link between the Highway Police and the Ministry of Home Affairs is based on common practice. Actual allocation should be as per the laws and practices of each country. Important is the direct link between the agency and the police.

Measuring capacity and performance also allows a highway agency to:

- Mobilize and allocate resources towards those activities contributing most, and most efficiently, to achieving its goals;
- Intervene on time if the realization of projects or the performance of the network or individual assets is lagging;
- Increase stakeholder involvement in its operations by creating insights into its activities and performance; and
- Reorient itself to the needs and concerns of road users.

4.2.2 PRINCIPLES FOR MEASURING CAPACITY AND PERFORMANCE

Principle 1: Performance Indicators Need to be Outcome Focused

Across the world, and based on lessons learned from case studies, governments are focusing on achieving outcomes that people desire. Outcomes are usually grouped into four main areas:

- Economic;
- Social;
- Security, safety and health; and
- Environmental.

The importance attached to each of these outcomes depends on the local circumstances, for example, the level of economic and network development, and cultural issues. In South Asia, economic and social outcomes will have relatively more importance than in, say, Europe.

Principle 2: Outcomes are the Result of Actions of the Highway Agency and the Government as a Whole

Highway agencies do not operate in a vacuum. Their mandate and responsibilities are determined by the government and formed by other constraints, for example, political, institutional and financial. As a result, governments should facilitate the good performance of highway agencies by introducing appropriate legislation or executive orders describing their tasks, functions, powers and responsibilities, apart from ensuring appropriate funding.

4.3 INDICATORS FRAMEWORK

As indicated in section 2.7, agencies in South Asia are, in general, not yet completely ready to start monitoring their performance due to the absence of regular data/information collection systems. Therefore, they cannot adopt a completely outcome-based framework at this stage. The proposed indicators (presented in the following pages) are, therefore, a mix of input and process (capacity indicators) and output, results and outcome indicators (performance).

The proposed categories of indicators are broadly similar to case studies representing various functions of the agency. However, the key difference is that for the South Asian agencies, the study suggests more output and process indicators rather than place emphasis on outcomes. However, it is expected that the framework should gradually mature towards 'outcome' indicators, as the agencies regularly start monitoring their performance.

The proposed framework requires measurement and monitoring of proposed indicators for a three-year rolling period. The monitoring of this framework shall also provide the senior management of the agencies with clear indications regarding the required reforms within the organizations. A guidance note on measuring indicators is provided in Annex A, including a guide to arriving at the overall performance score for an agency.

The indicators framework has been divided into seven categories:

(i) Mandate, Policy and Legal Framework: The indicators under this category are intended to capture the vision/mission statement of the highways agency and to find out if a formal road policy, backed by a legal and regulatory framework, has been laid down covering development, asset management and safety.

(ii) Planning: Indicators in this category are expected to inform planning capabilities of the highway agency by assessing the existence of long- and short-term investment plans for both development and maintenance of their road network and asset management system.

(iii) Capacity: Under this category, indicators are intended to capture the highway agency's strength to deliver its mandate by knowing outputs of the budget, expenditure, projects delivery, skill development strategies, and human resource management.

(iv) Efficiency: The indicators under this category would capture the agency's ability to evolve cost effective strategies in developing the road programs and efficient contract administration to contain time and cost overruns during the implementation. Monitoring the 'asset value' of the network is one such indicator.

(v) Quality of Road Network: The indicators under this category are intended to assess the agency's ability to provide a safer, greener, reliable and more comfortable road network. The indicators suggest the shifting of focus from a traditional input- and process-based one to outcome- and user-oriented measures, for example, capturing the degree of congestion, network quality index, and accident hazards.

(vi) Private Sector Participation: The indicators under this category intend to assess the road agency's effort to attract and promote private sector financing of the road sector.

(vii) Governance: The indicators under this category are intended to capture initiatives such as right to/freedom of information, e-procurement, website, publishing of annual reports, road user satisfaction surveys, and grievance redressal mechanisms.

It is important to note that the proposed framework is generic and agencies are advised to review and customize this framework first, based on their specific mandate and vision. For example, for a state road corporation which may be responsible for the development of only selected state highways, indicators related to state level policy and regulations might not be very relevant. Similarly if the agency is responsible for delivering any specific scheme/ program, the framework and indicators should be closely linked to the performance of those programs.

Table 4.2: Framework of capacity and performance indicators

A. Basic Information

1. Total Road Network Owned by the Agency km

Category of Road	Length (km)							
	(less than 2 lane)		(2 lane with or without paved shoulder)		(4 lane or more)		Total	
	Previous FY	Current FY	Previous FY	Current FY	Previous FY	Current FY	Previous FY	Current FY
National highways/ national strategic/trunk corridors								
State/provincial highways								
Major district/feeder roads								
Others								
Total								

2. Total Length of Core Road Network (CRN), if defined km

Category of Road	Length (km)							
	(less than 2 lane)		(2 lane with or without paved shoulder)		(4 lane or more)		Total	
	Previous FY	Current FY	Previous FY	Current FY	Previous FY	Current FY	Previous FY	Current FY
National highways/ national strategic/trunk corridors								
State/provincial highways								
Major district/feeder roads								
Others								
Total								

- Note:
- Figures for the Financial Year (FY) should be from the beginning of the FY.
 - The category of roads needs to be determined by the agency as per the road classification system of the country.
 - It is assumed that a majority of roads in these categories would be paved (bituminous or concrete). However, if an agency owns/manages large sections of non-paved roads, the categories should be appropriately expanded.

B. Indicators									
Category	Performance Measure/ Objective/ Outcome/ Output	S. No	Indicator	Unit	Previous FY		Current FY	Next FY	
					Target	Achievement	Target	Target	
Mandate, Policy and Legal Framework	A clear mandate/scope and sound legal and regulatory framework exists	1	A clear vision/mission statement exists	(Yes / No)					
		1a	If Yes, please provide the statement below						
		2	Existence of Various Acts/Policy						
		2a	Road sector policy/strategy in place	(Yes / No)					
		2b	Highway Act	(Yes / No)					
		2c	PPP/toll policy	(Yes / No)					
		2d	Safety, Health and Environment (SHE) policy	(Yes / No)					
		2e	Road fund Act	(Yes / No)					
		2f	Control of land and traffic Act	(Yes / No)					
		2g	Infrastructure development Act	(Yes / No)					
		2h	Urban planning Act	(Yes / No)					
		2i	Road safety policy and strategy exist	(Yes / No)					
Planning	Agency has sound planning processes in place	3	Preparation of Investment Plans						
		3a	A long- term master plan (10 to 15 years) exists	(Yes / No)					
		3b	Three/five-year road sector investment plan has been prepared	(Yes / No)					
		3c	Annual plans/programs are prepared	(Yes / No)					
		4	Asset Management						
		4a	Road inventory for the entire road network is available and updated regularly	(Yes / No)					
		4b	Road information system/maintenance management system established and data updated regularly.	(Yes / No)					
		4c	Traffic census are conducted regularly	(Yes / No)					
		5	Ratio of Allocated budget vs Required						
		5a	Plan (development/capital works/new construction)	Percent					
5b	Non-Plan (operation and maintenance)	Percent							
Capacity	Strength to deliver the mandate	6	Resource Use						
		6a	Budget (plan/ capital works)	Million ₹					
		6b	Expenditure (plan/capital works)	Million ₹					

Efficiency	To provide value for money in delivery of infrastructure	6c	Budget (non-plan/operation and maintenance)	Million ₹						
		6d	Expenditure (non-plan/operation and maintenance)	Million ₹						
		7	Resource, Training, R&D							
		7a	Human resource policy exists and in use	(Yes/No)						
		7b	Total number of engineering staff per 1,000 km of total road network owned by the agency	Number						
		7c	Total number of administrative staff including accounts per 1,000 km of total road network owned by the agency	Number						
		7d	Total number of temporary staff per 1,000 km of total road network owned by the agency	Number						
		7e	Total number of specialized staff (planners, traffic engineers, legal, environment, social, finance, contract specialist, pavement, bridge/structure designers)	Number						
		7f	Training need assessment done and updated regularly	Yes/No						
		7g	Training plan/strategy exists and updated regularly	Yes/No						
		7h	Expenditure on training and skill enhancement	Million ₹						
		7i	% of engineering staff (below Superintending Engineer) sent on training	Percent						
		7j	Percentage of engineering staff with qualifications equal to M.Tech. or above	Percent						
		7k	Expenditure on R&D, technology and innovation	Million ₹						
		8	Delivery of Road Infrastructure							
	8a	Projects completed (amount)	Million ₹							
	8b	Projects in progress (amount)	Million ₹							
	8c	Projects ready for bidding (amount)	Million ₹							
	9	Cost Performance Index (CPI) of major projects	Absolute number							
	10	Schedule Performance Index (SPI) of major projects	Absolute number							
11	Average Cost of Construction									
11a	Widening to 2-lane without paved shoulders	Million ₹/km								
11b	Widening to - 2 lane with paved shoulders	Million ₹/km								

B. Indicators										
Category	Performance Measure/ Objective/ Outcome/ Output	S. No	Indicator	Unit	Previous FY		Current FY	Next FY		
					Target	Achievement				
		11c	Widening 2-lane to 4-lane	Million ₹/km						
		11d	Widening 4-lane to 6-lane	Million ₹/km						
		11e	New construction: 2 lane	Million ₹/km						
		11f	New construction: 4 lane	Million ₹/km						
		11g	New construction: 6 lane	Million ₹/km						
		11h	Periodic maintenance (strengthening + overlay) (2 lane)	Million ₹/km						
		11i	Routine maintenance (2 lane)	Million ₹/km						
		12	Staff and Administrative Cost	Million ₹						
		13	Asset Value (Replacement Cost) of the CRN	Billion ₹						
		14	Road Safety Audit Conducted	Km or number of projects						
		15	Social and Environmental Impact Assessment Carried Out	Projects - Number						
		16	Entity-wide ISO or equivalent certification received	(Yes/No)						
		17	Standard Bid Documents Developed	(Yes/No)						
		18	Computerization/Enterprise Resource Planning in Place	(Yes/No)						
		19	Amount of Claims under Dispute	Million ₹						
		Quality of Road Network	To provide a safer, greener, reliable and comfortable road network	20	Network Congestion Indices					
				20a	Congestion-free CRN	%				
				20b	Congested CRN	%				
				20c	Over-congested CRN	%				
21	Network Quality Index(NQI)			Absolute number						

		22a	Fatalities per 100 km of network	Number					
		22b	Accidents per 100 km of network	Number					
		23	% of Projects where Environment Management Plan was Implemented	Percent					
		24	% of CRN Managed Through Long-term Maintenance Contracts	Percent					
Private Sector Participation	Promote private sector investments	25	% of CRN Developed on any of the PPP Mode	Percent					
		26	% of total Private Sector Investment to the Total Investment	Percent					
Governance	To operate with increased user interface, transparency and greater accountability	27	Department Website Exists and Updated Regularly	(Yes/No)					
		28	Adequate Representation (at least 25%) of Road Users in the Road Fund Board	(Yes/No)					
		29	Users/stakeholder Forum Established and Convened at least Half Yearly	(Yes/No)					
		30a	RTI Compliance Ratio	Percent					
		30b	Appeals Received by the State Information Commission against the Department	Number					
		31	Annual Report Published	(Yes/No)					
		32a	Vigilance cases registered	Numbers					
		32b	Vigilance cases decided as ratio of cases registered	Percent					
		33	Grievance Redressal Mechanism Exists	(Yes/No)					
		34	Road User Satisfaction Index	Absolute number					

Note: 1. The currency unit of indicators need to be appropriately customized.

2. The outcome indicators are 20, 21, 22 and 34

5 ROADMAP FOR REFORM

One of the key objectives of this study is to provide a roadmap for reform of the highway agencies in South Asia, using the performance monitoring and evaluation framework as a tool. Needless to say, an essential prerequisite for highway agency reform would be larger public sector reforms as highway agencies do not operate in a vacuum; they are a part of the wider public sector. The internal reform of a highway agency would be the critical next step. The roadmap, presented in this chapter, proposes a four-phase reform that should gradually transform the highway agencies from traditional to modern world-class organizations.

This chapter is organized according to phases, indicating steps that need to be undertaken in each phase and the outcomes they should result in. Subsequently, the issue of financing is addressed separately. First, however, a short introduction on 'general' issues is provided.

5.1 INTRODUCTION

5.1.1 APPROPRIATE PROCEDURES

Performance monitoring is an essential ingredient of the decision-making process. This implies that the performance indicators should be consistently and continuously applied when decisions are to be made regarding the allocation of funding, preparation of network and recruitment plans, and so on. Consistent and continuous use of the indicators contributes to a higher standard of accountability and transparency of the agency's decisions.

In addition, data collection required for performance monitoring must be guided by appropriate procedures that ensure that data for each indicator are collected in a consistent manner and at regular intervals. The framework is not intended as a once-a-year static exercise. Rather, the agency should measure performance continuously and strive to make improvements in a dynamic manner. If actual performance is not aligned with the targeted performance, necessary and timely action should be taken. This contributes to a higher standard of accountability and transparency. It also increases the likelihood of the agency achieving targeted performance levels.

The performance management framework should also be supported by concomitant initiatives on:

- Human resource management, particularly continuous training and skill upgradation of staff; and
- User orientation and stakeholder involvement in decision making.

To ensure reliability and consistency of the performance indicators, it is also essential that relevant and sufficient data are collected and properly analyzed. Without an accurate and relevant database, it is virtually impossible for the agencies to monitor performance and take corrective actions to achieve targets.

5.1.2 SUPPORTING SYSTEMS

The highway agency will need to develop and manage systems to support the collection of data and monitoring of performance. The data requirements for performance monitoring are significant, but realistic. The requirements increase with the evolution of highway agencies. As is evident from the international case studies, modern highway agencies use a number of systems for performance monitoring. These agencies constantly enhance their systems to match the requirements of targets, circumstances, and improved understanding.

Agencies in South Asia could and should similarly use systems that address the needs of the moment and near future.

The proposed indicator framework clearly alludes to the development and management of at least three basic systems, namely:

- A financial management system;
- An integrated road information and asset management system; and
- A project management system.

It is also advisable that these systems are fully integrated for seamless information transfer, efficient information management, and overall sector management.

Financial Management System

A financial management system is required to maintain the accounts of the agency and support the reporting of information related to financial performance. Such a system should be capable of incorporating the value of assets, expenditures for capital and maintenance projects as well as the expenditures associated with running the organization, for example, salaries, and accounts payable/receivable. Such systems are widely available commercially.

Integrated Road Information System and Asset Management System

An integrated asset management system supports the agency in maintaining all relevant information and data with respect to the state and value of its assets. It is, therefore, indispensable for the indicators related to the network. Capabilities of an asset management system extend beyond maintaining this information. Such a system also enables the highway agency to develop annual capital improvement and maintenance plans, and forecast budget requirements. It supports clarity in decision-making on which assets to maintain at what point in time. The tools and software to monitor the network quality should feed directly into this system. Asset management systems are widely available off-the-shelf, but need to be customized to suit the needs of a particular highway agency.

Project Management System

The performance of the highway agency depends, to a considerable extent, on the effective and efficient implementation of projects, whether executed by an external party or the agency itself. To monitor these projects, the agency will need to set up an integrated system linking progress monitoring, risk management and resource deployment/usage. This will enable the agency to manage risks related to the projects under implementation, ensure delivery on time and within cost, and provide quality assurance. For each project, large or small, the agency will need to continuously update data on physical and financial progress as well as agreements between the agency and its contractors. Such a system is widely available commercially, but needs to be fine-tuned to the needs of a particular highway agency.

Risk Management

Risk management comprises risks related to assets but also the financial performance of the agency and the projects implemented by or on behalf of the agency. As such, risk management uses all three systems discussed above.

5.2 PHASE 1: PREPARING FOR PERFORMANCE MONITORING

Initiating the process for setting up a performance monitoring system, the agency should undertake an overall evaluation of the current status and accuracy of the available information and data. This would help the agency to identify the gaps in the available data and information as well as associated issues/problems. The evaluation results in an action plan for the collection of essential data and information. Part of this action plan should lead to the development of systems that enable the agency to gather information in a manner

that is conducive to monitoring progress and implementing action as and when necessary.

The present milieu in which most South Asian highway agencies operate may not promote the improved performance described earlier. Therefore, Phase 1 is the period in which necessary changes to the institutional and legal framework should be proposed. Apart from issues related to external linkages, the internal organization should also be reviewed. Phase 1 is the appropriate time to reorganize the agency in a manner that enables the realization of a long-term strategy and supports performance monitoring.

5.2.1 GOVERNMENT-HIGHWAY AGENCY INTERACTION

The wider institutional setting, including legal and regulatory aspects, as it exists today, limits the capabilities for highway agencies to implement certain reforms. As such, the reforms proposed in this roadmap should be preceded by changes in this setting. In this regard, the government could also play a significant role by incentivizing or setting up a fund/grant transfer mechanism linked to setting up and maintaining a performance monitoring and evaluation system in highway agencies.

Clear and Comprehensive Mandate

For the functional independence of a highway agency, a clearly defined mandate is required. This includes a coherent set of responsibilities that should not overlap with the responsibilities of other organizations. The lack of a well-defined mandate may result in interference from other organizations, the government, or elected representatives in resolving conflicting responsibilities. The independence of a highway agency could be adversely affected as a result.

The mandate should also be comprehensive, that is, extend beyond the construction and maintenance of highways only. Separation of functions such as planning, construction, maintenance, management and operation across a multitude of organizations brings about inefficiencies, for example, substantial transaction costs of coordination between organizations. Nevertheless, separation of some functions, for example, enforcement of traffic rules or at least levying penalties on those violating the rules, will occur. In effect, the mandate should be comprehensive but exclude responsibilities not related to highways, such as buildings²¹.

Separation of Functions

Highway agencies are responsible for the operation of the highway network, on the one hand, and for the construction/development of highways, on the other. Inefficiencies or even problems may arise from combining these functions within one organization or from lack of understanding about the differences between these responsibilities. Separating the functions associated with these responsibilities is a starting point for further improvements in the highway sector. In other words, actual construction/development should not be in the hands of the agency.

Annual Performance Agreements

An annual performance agreement is a contract negotiated between the highway agency and the responsible minister on the deliverables of the highway agency. The agreement also describes the obligations of the minister such as support the minister is expected to provide to the highway agency to achieve the desired results. The following issues could, or even should, be covered in such an agreement:

- Financial targets;
- Targets for highway construction;

²¹ In Karnataka, there is the Public Works, Ports & Inland Water Transportation department which is also involved in highway infrastructure. As such, it is responsible for 'all' transport infrastructure. However, it is also responsible for buildings. Having a single body for all transport, as is the case in New Zealand, might not yet be feasible in most of South Asia. However, separating functions such as buildings from transport infrastructure should be implemented.

- Reliability of infrastructure, for example, through maintenance, operation and management;
- Road safety targets; and
- Obligations of the responsible ministry.

As demonstrated in the international case studies, the performance agreement between the Ministry of Transport and SANRAL in South Africa is a good example. Thus, the issues covered in the agreement are linked to the framework of capacity and performance indicators. The targets for some or all of these indicators are part of the agreement between the highway agency and the responsible ministry. The negotiations take place between the highway agency, represented by the Chief Executive Officer (CEO), and the responsible ministry. The ministry should consult with other ministries relevant to road infrastructure, for example, the Ministry of Finance, as well as other stakeholders such as road users. In this context, the Government of India's recent initiative to set up a Result Framework Document (RFD) for about 84 central departments and ministries, including the roads and highways transport ministry, is a step in the right direction. Further details of this initiative can be obtained from <http://performance.gov.in/>. It is expected that this will set up a good practice example to be emulated across the states in India and also across the region. Generally, the indicators for such RFDs would also require the agency to graduate from process- and output-based to outcome indicators.

In line with the international case studies, the annual performance agreement could be a derivative of a multi-year statement of intent but should, in any case, be based on a strategic development plan for the state or country.

This phase is also the right time to initiate the process of developing a long-term transport and road sector policy that will serve as the basis of the agency's strategy and annual performance agreement. Such a policy should make a choice between priorities comparable to:

- Extension of the highways to and between major cities/centers;
- Extension of the highways connecting rural areas;
- Maintenance of the highways between major cities/centers;
- Maintenance of the highways connecting rural areas;
- Rehabilitation of the highways connecting major cities/centers; and
- Rehabilitation of the highways connecting rural areas.

5.2.2 REFORMS INTERNAL TO THE HIGHWAY AGENCY

Guidelines for Detailing a Program of Works

To ensure the projects are objectively selected, highway agencies need to formalize the project selection procedure (maintenance and construction). In practice, this means that the highway agency needs to develop guidelines for detailing a program of works. There should be a clear link between the criteria, long-term strategy and annual performance agreement of the highway agency. As a result, the agency will ensure that it is able to achieve its targets.

Internal Separation of Functions

Internally, there should also be a separation of functions. Performance monitoring should be separated from those whose activities are being monitored. To cite an example, the quality of the highways should be assessed by staff members other than those responsible for the management of the highway. To ensure objectivity and impartiality in the monitoring process, outsourcing of some of the critical data collection should also be explored by the

agencies. In the end, the achieved values of the indicators should be reported to managers within the agency so as to monitor performance and take action accordingly.

5.3 PHASE 2: MONITORING AND IMPROVING PERFORMANCE

Phase 1 should have resulted in the reforms mentioned above, including the collection of basic data and information. The subsequent phase should aim at improving performance in accordance with the annual performance agreement and the long-term strategy of the agency. The input and intermediate outcome indicators, which are relatively easy to implement, should now be monitored, and the agency should take action to align the realized values with agreed targets, monitoring systems and procedures that have been put in place.

Phase 2 should ideally start with the negotiation of an annual performance agreement between the highway agency and its parent ministry. For successful and fruitful negotiations, both organizations will need to build a knowledge base to ensure both 'know what they are talking about'. In this way, the negotiations can focus on reaching an agreement that is both acceptable and feasible in terms of the targets of the highway agency as well as the obligations of the parent organization.

5.3.1 REFORMS INTERNAL TO THE HIGHWAY AGENCY

Availability of Appropriately Qualified Staff

Reform in the highway sector requires highway agencies to change the way they conduct their business. Such a shift demands that the agencies improve the skill mix within the organizations. The focus should shift from engineering skills to managerial and financial skills that are needed to manage an agency centered on delivering a technically, socioeconomically and financially sound network. The agency's staff will need to design financial structures, as well as understand the financial and socioeconomic implications of technical decisions. They will also need to manage contractors and concessionaires to ensure the organization's targets are achieved and contracts adhered to. In short, this implies that highway agencies should, besides recruiting engineers only, expand the skill mix to include economists, planners, finance specialists, sociologists and environmentalists as well.

Required Reforms

It should be understood that now that the highway agency is bound to a long-term strategy and performance targets, it will need a different approach to planning. Planning can no longer be narrowly focused on the detailed design of a particular project but on the identification, prioritization and sequencing of capital and maintenance projects.

To acquire such skills, two basic reforms need to be implemented by the highway agencies in South Asia. Firstly, a revision of recruitment rules, so that the agencies are able to hire new staff independently through the market-based competitive process instead of depending on centralized hiring, bound by the government's stringent recruitment program. This will demand that the agency develop well-defined rules for staff recruitment. These rules need to be flexible to the extent that the agency is able to respond on time to the requirements of maintaining or improving its performance. Flexibility also implies that the agency should be able to terminate employment of staff in case of lack of performance.

Secondly, the highway agency will need to offer its staff a roadmap for career development. To encourage staff members to contribute to the achievement of the agency's targets, staff members will need to be motivated. A well defined career growth path is one way to motivate staff; a prime example is merit-based promotions. Another is protection

from politically motivated appointments and transfers. These aspects become even more critical if the agency is to attract and retain staff with specialized skills such as business administration, financial expertise and others.

Involvement of Users and Stakeholders

A valuable lesson from the international case studies is the importance of the involvement of stakeholders, including users, in decision-making. By involving stakeholders, the highway agency is able to develop a long-term strategy for the network and thus the organization – a strategy that is supported by the stakeholders. It is obvious that trade-offs between the demands of different stakeholders are unavoidable. However, the collaborative process creates support for the highway agency's strategy.

The formal agreement of strategy, and its translation into the annual performance agreement, results in explicit targets the agency promises to achieve. By looking at the agency's regularly published reports on performance, stakeholders can hold the agency accountable for not meeting targets. Conversely, a good performance will strengthen stakeholder support for the agency. Stakeholder involvement thus contributes to the accountability of the agency.

Stakeholder involvement extends beyond being part of the process of developing the agency's strategy. At the project level, users and stakeholders can be involved to ensure that projects are implemented smoothly and not subjected to adverse actions by, for example, landowners²². Regular interaction with stakeholders will provide the agency with valuable information on the performance of the network, individual assets and itself, in general. Based on their feedback, the agency can take necessary action, when required, to ensure performance levels are maintained.

Human Resource Management

The highway agency will need to attract the right employees and expertise to monitor performance, and develop and implement plans accordingly. As previously discussed, this calls for an organization that has the appropriate in-house skills for the evaluation of the indicator and underlying information, management of projects and financial expertise. Phase 2 is thus the phase in which changes in recruitment of officials and related human resource management issues should be implemented. These reforms need to be implemented before the negotiations with the parent organization can start, to ensure that negotiations produce the required results.

5.3.2 FINANCIAL SECURITY

Highway agencies face two challenges with respect to financial security. These are a quantum leap in highway infrastructure investment and attracting necessary investments. Apart from internal changes, following the introduction of a system for monitoring of capacity and performance, highway agencies need to be enabled by implementing:

- A ring-fenced budget for highways construction and maintenance;
- Adequate financing; and
- Valuation of the network.

Ring-fenced Budgets

Setting aside budgets dedicated to highway construction and maintenance better enables the highway agency to independently decide on the funding of projects through a fund. This reduces the possibilities of external interference in the distribution of funds. Moreover, if set

²² This is not to say landowners or other stakeholders cannot object to proposals or, for example, demand higher compensation. However, cooperative involvement of stakeholders tends to contribute to the efficiency of implementing proposals.

up properly, the fund will eliminate the necessity of including construction and maintenance expenditures in the government's budgetary process. Over the course of years, the World Bank and other financial institutions have built an extensive body of knowledge on designing and managing such funds.

Recommendations with respect to the fund are:

- An access fee (yearly vehicle license fee) and a user fee (for example, fuel cess) should be the two sources of funding;
- There should be clear procedures for allocating the funds;
- Funding of one agency could be managed internally; otherwise it is recommended that an external and independent board manage the fund;
- Create a customer-supplier relationship through the involvement of users and the government in the board of the fund;
- The fund should be an independent body and preferably be established by a legislative act; and
- The revenues of the fund should be linked directly to the use of highways and expected/desired development of the network.

The fund should be set up as a joint highway construction and maintenance fund to enable the highway agency to optimize the lifecycle cost of the network and individual assets. The introduction of the performance indicator 'value of network' will enable the highway agency to balance development and maintenance. In addition, it could encourage the highway agency to carefully plan maintenance as timely maintenance is often less expensive in comparison to cost involved in rehabilitation resulting from deferred maintenance.

Adequate Funding

To achieve the targets negotiated between the highway agency and its parent organization (the Board), the agency should receive adequate funding, aligned with the targets agreed upon. Therefore, the highway agency and its parent organization, in their negotiations, should balance targets against available funding. Once funding and targets have been agreed upon, it is the responsibility of the highway agency to achieve the targets with the allocated funding. After committing the funding, the parent organization should not interfere in the spending of the funds during the timeframe of the agreement.

An implicit consequence of this arrangement is that the highway agency needs to be able to demonstrate the impact of any increase or decrease in funding when negotiating with its parent organization. The agency needs to clearly establish the manner and extent of impact of reduced funding on its network or organizational performance. It needs to demonstrate that lower levels of funding will reduce its ability to achieve original targets, which might require revision.

Value of Network

An optimal indicator for financing and private sector participation, the value of networks, is proposed. Using the indicator will enable the highway agency to capitalize this value. It would be provided with an appropriate legal structure, be able to leverage this value against bonds in the capital market to finance extension of the network. However, this may only be possible to a limited extent, as public assets are not always considered good collateral by banks, in particular since the government would retain ownership; nevertheless this may differ from case to case. In addition, assessing the value of the network will also explicitly establish the impact of deferring maintenance and, as a result, demonstrate that regular maintenance pays off by reducing costs of rehabilitation, as in the example shown in the case study from South Africa.

5.3.3 REQUIREMENTS

The transition to Phase 2 should be targeted in a publicly available letter of intent by the parent ministry and highway agency. The letter should indicate a date when the agency will be ready to monitor its performance. The agency, in turn, should reassess the capabilities of the systems and procedures in place, and improve them in case they are found wanting.

5.4 PHASE 3: PERFORMANCE FOCUSED ON OUTPUT

Phase 3 is centered on the highway agency improving its performance monitoring with a stronger focus on outputs and intermediate/final outcomes, rather than inputs or intermediate outcomes. For example, with reference to Table 4.2, Chapter 4, the agencies should fully monitor the performance indicators 9 and 10 besides the several output indicators as presented in the table, in this stage.

This phase requires highway agencies to apply rigorous and comprehensive measures to analyze their data and information. In addition, the highway agencies need to gather additional data and information. Systems, as a result, might need to become more robust or enhanced to handle this additional data and information.

Internal procedures for the recruitment of staff, decision-making, measurement of indicators, and collection of data and information might require revision to ensure they still meet the requirements of the increased scrutiny of performance. It is also likely that the targets for performance will become more demanding, requiring the agency to fine-tune them.

Some states in India have mooted the concept of output-based budgeting. This initiative would indeed provide a fillip to the output-focused-performance-framework. Moreover, many of the centrally funded schemes/road programs the agencies are mandated to deliver, usually place significant focus on the outputs and intermediate outcomes. The agencies need to slowly align the performance framework with such schemes to derive the dual benefit of improved monitoring of the schemes as well as overall organizational capacity and performance enhancement.

5.4.1 REQUIREMENTS

The transition to Phase 3 should also be targeted in a publicly available letter of intent by the parent ministry and highway agency, in the manner described in section 5.3.3. As amply demonstrated by other international agencies, enhanced focus and orientation to users and embracing a culture of service provision facilitates transition to this phase.

5.5 PHASE 4: PERFORMANCE MONITORING THROUGHOUT THE ORGANIZATION

In Phase 4, the highway agency employs performance monitoring in every aspect of decision-making and operation, fully expanding its focus to outcome indicators. For example, with reference to Table 4.2, Chapter 4, the agencies should monitor the performance indicators 20 (a through c), 21, 22 and 34 and integrate these indicators fully in the decision-making process. All decisions in this phase would essentially be made on the basis of achieved performance compared to targeted performance.

The most apparent demand this phase imposes on the agency is increasingly encompassing and demanding procedures for collecting, processing and analyzing data and information pertaining to the performance of the highway network and its use. The agency will need to carefully look at the environment in which it operates, its strategic plan and actual performance against set targets. The agencies which are responsible for only provision of transport infrastructure but not services might also face an enhanced challenge to fully monitor and control the achievement of the outcome indicators.

Human Resource Management

The performance of a highway agency will eventually be assessed by the extent to which it has achieved its targets. The CEO of the highway agency is ultimately responsible for the performance of his organization. To ensure the agency's employees contribute to achieving the targeted performance, the CEO should be equipped with the means to motivate them to perform in accordance with the organization's needs. The performance of departments, managers and staff members, therefore, needs to be monitored and action (reward or penalty) taken when needed.

5.5.1 REQUIREMENTS

The transition to Phase 4 should be targeted in a publicly available letter of intent by the parent ministry and highway agency. The letter should indicate a date when the agency will be ready to move to the next phase of capacity and performance monitoring. As experienced elsewhere, for example, in Sweden or Australia, the transport agencies' institutional transformation to manage both transport infrastructure and services has actually facilitated transition to this phase. In the South Asian context, such a possibility should also be explored.

5.6 CONCLUSION

The four consecutive phases are progressively more demanding and require significant changes from the highway agency and the respective governments, in particular, Phases 1 and 2. These changes occur in several areas and will need to be implemented in a coordinated manner. Performance monitoring without the proper institutional structure and mandate will, most likely, not yield the desired result and may not be sustainable. Moreover, the capacity and performance indicators and their progressive monitoring need to be closely aligned with the various centrally sponsored/mandated road improvement programs the agencies are supposed to deliver. The changes may appear overwhelming at the first instance, but a phased approach should guide highway agencies and the respective governments in this process. Altogether performance monitoring and proposed reforms should lead to the evolution of world-class highway agencies in South Asia. On the one hand, these agencies will be able to effectively and efficiently contribute to the development of societies across the region. Governments, on the other hand, will be able to demand a highway network that offers value for money in terms of moving goods and people within, to and from their jurisdictions.

5.6.1 WAY FORWARD

The proposed next steps are:

- Dissemination of the study findings in two/three stakeholder workshops across the region in the next six to nine months;
- Helping the road agencies in setting up and managing performance monitoring systems through future World Bank-funded projects in the next two to three years;
- Facilitating international knowledge transfer and help – especially in setting up and managing a performance evaluation system and linking human resources and institutional reforms with performance evaluation systems – through overseas knowledge sharing visits; and
- Undertaking follow-up studies on developing agency capacity and performance evaluation systems linked to budget allocation/support from the finance department.

ANNEX A: GUIDANCE NOTES ON THE PROPOSED FRAMEWORK

A1 GUIDANCE NOTE ON DETAILS AND METHODOLOGY PROPOSED FOR CALCULATING THE VALUE OF INDICATORS

A1.1 INTRODUCTION

The proposed framework has two sections. Section A covers basic information, related to the extent of the road network owned by the concerned highway agency while Section B covers indicators essentially of three types:

- Some indicators are closed questions, requiring the agency to respond in either 'yes' or 'no' depending upon the response/status about the indicator at the time of preparation;
- In some indicators, the agency has to provide either data in absolute number/amount, or in terms of percentage; and
- There are some indicators for which the agency has to work out the value based on analysis of certain input data to be collected by/available with it.

A1.2 EXPLANATORY NOTES FOR PROVIDING DATA IN SECTION A RELATING TO BASIC INFORMATION

A1.2.1 TOTAL ROAD NETWORK OWNED BY THE AGENCY

- (i) The agency may be a state/provincial PWD or RDC or road authority with a specific mandate and jurisdiction over a certain part of the total road network in the country/state. The data for this block shall be limited to only those categories of roads which are within the jurisdiction of the concerned highway agency.
- (ii) The category "Others" may include, for example, other district roads, village roads and roads in urban areas, if owned by the agency.

A1.2.2 TOTAL LENGTH OF CRN, IF DEFINED

- (i) Some highway agencies define the strategic network or CRN out of the total road network owned by them, taking into account factors such as prioritization in terms of traffic and high level of mobility, connectivity to economic growth centers, such as district headquarters, tourist attractions, industrial centers, ports, and so on. In case the highway agency has defined the CRN, the break-up of road length may be provided in this block.

A1.3 EXPLANATORY NOTES ON PROVIDING INFORMATION/DATA IN SECTION B

A1.3.1 INDICATORS 1, 2 (A, B, C, D, E, F, G, H, I), 3 (A, B, C), 4 (A, B, C), 7 (A, F, G), 16, 17, 18, 27, 28, 29, 31, 33, REQUIRE THE AGENCY TO INDICATE ONLY YES/NO STATUS

Detailed explanation is provided below on a few indicators for additional clarity:

- Indicator 2 (d): This indicator is intended to ascertain whether agencies that are sensitized to safety and health of construction workers at project sites have prepared and issued policy/rules/office orders in this regard;
- Indicator 2 (e): This indicator is intended to ascertain whether the concerned local/state government has a policy to ring-fence funds required for road sector development and maintenance;
- Indicator 4 (c): This indicator is intended to ascertain whether there is a regular

arrangement for conducting classified traffic volume counts (for example, in India, IRC requires a seven-day count twice a year); and whether, in addition to such traffic census, the agency has instituted special features such as permanent traffic counts (365 days a year) through automatic traffic counters;

- Indicator 7(a): This indicator is intended to ascertain whether the agency has a policy in place for skill enhancement, talent retention, career progression and performance awards, and so on, for employees – technical and secretarial -- at all levels; and
- Indicator 29: This indicator is intended to ascertain whether the agency has established a formal arrangement to consult user stakeholders such as industry associations, truck owners associations, automobile associations, tourist associations, and so on, and, if established, whether regular meetings are held. It is noted that several states in India and governments in the South Asia region are increasingly reorienting their highway agencies to cater to the felt needs of such forums in formulating their road infrastructure development programs.

A1.3.2 INDICATORS 5 (A, B), 6 (A, B, C, D), 7 (B, C, D, E, H, I, J, K), 8 (A, B, C), 11 (A, B, C, D, E, F, G, H, I), 12, 13, 14, 15, 19, 22 (A, B), 23, 24, 25, 26, 30 (A, B), 32 (A, B), REQUIRE THE AGENCY TO PROVIDE DATA EITHER IN ABSOLUTE NUMBER OR AMOUNT OR IN TERMS OF PERCENTAGE

- For indicators 6 (a, b, c, d), 7 (h, i, k), 8 (a, c), 12, 13, 14, 15, 24, 25 and 26, information may also be provided for targets laid down for the current FY and next FY.
- An illustration is provided to calculate indicator 13 in Table A1.

Table A1: Calculations for indicator 13				
Basic data: Assumed as under:				
CRN as on January 1, 2011 defined as under: length		(Figures in km)		
Category of Road	Less than 2 lane	2 lane	4 lane or more	Total
NHs	800	1800	400	3000
SHs	3300	1600	100	5000
MDRs	7400	600	Nil	8000
Others	20000	Nil	Nil	20000
Total	31500	4000	500	36000

- a. Condition of CRN: Assumed as under:
- National Highways (NHs): Of roads with less than 2 lane carriageways, 20 percent are in poor condition, 30 percent in fair condition and the balance network is in good condition.
 - State Highways (SHs): Of roads with less than 2 lane carriageways, 40 percent are in poor condition, 40 percent in fair condition and the balance network is in good condition
 - Major District Roads (MDRs): Of roads with less than 2 lane carriageways, 60 percent are in poor condition, 20 percent are in fair condition, and the balance network is in good condition.
 - Others: Of roads with less than 2 lane carriageways, 60 percent are in poor condition, 20 percent in fair condition, and the balance network is in good condition.

- b. Average cost of construction (to be extracted from the information filled for indicator 11) except for other roads. For other roads, average unit costs as applicable to village roads may be adopted.

- Cost per km, say, as on January 1, 2011

o Cost for new construction (2 lane)	=	₹20 million per km
o Cost for new construction (4 lane)	=	₹70 million per km
o Cost for new construction (less than 2 lane)	=	Assume it to be 50 percent of 2 lane new construction
		₹10 million per km
o Cost for new construction of rural roads	=	₹2 million per km

- These cost figures may be assumed as replacement value of the network in good condition. For roads in fair condition, the cost figures may be reduced by 20 percent of the values given above. For roads in poor condition, the cost figures may be reduced by 40 per cent.

- c. Replacement value computations

National Highways

• Less than 2 lane: 800 km		
20 percent, i.e., 160 km in poor condition, replacement value @ ₹6 million per km	=	₹960 million
30 percent, i.e., 240 km in fair condition, replacement value @ ₹8 million per km	=	₹1,920 million
50 percent, i.e., 400 km in good condition, its replacement value @ ₹10 million per km	=	₹4,000 million
• 2 lane: 1,800 km @ ₹20 million per km	=	₹36,000 million
• 4 lane or more: 400 km @ ₹70 million per km	=	₹28,000 million
<i>Subtotal for NHs</i>	=	₹70,880 million

State Highways

• Less than 2 lane: 3,300 km		
40 percent, i.e., 1,320 km in poor condition, replacement value @ ₹6 million per km	=	₹7,920 million
40 percent, i.e., 1,320 km in fair condition, replacement value @ ₹8 million per km	=	₹10,560 million
20 percent, i.e., 660 km in good condition, its replacement value @ ₹10 million per km	=	₹6,600 million
• 2 lane: 1,600 km @ ₹20 million per km	=	₹32,000 million
• 4 lane or more: 100 km @ ₹70 million per km	=	₹7,000 million
<i>Subtotal for SHs</i>	=	₹64,080 million

Major District Roads

• Less than 2 lane: 7,400 km		
60 percent, i.e., 4,440 km in poor condition, replacement value @ ₹6 million per km	=	₹26,640 million
20 percent, i.e., 1,480 km in fair condition, replacement value @ ₹8 million per km	=	₹11,840 million
20 percent, i.e., 1,480 km in good condition, its replacement value @ ₹10 million per km	=	₹14,800 million
• 2 lane: 600 km @ ₹20 million per km	=	₹12,000 million
<i>Subtotal for MDRs</i>	=	₹65,280 million

Other Roads

• All less than 2 lane: 20,000 km		
60 percent, i.e., 12,000 km in poor condition,		
replacement value @ ₹1.2 million per km	=	₹14,400 million
20 percent, i.e., 4,000 km in fair condition,		
replacement value @ ₹1.6 million per km	=	₹6,400 million
20 percent, i.e., 4,000 km in good condition,		
its replacement value @ ₹2 million per km	=	₹8,000 million
<i>Subtotal for Other Roads</i>	=	<i>₹28,800 million</i>
Total	=	₹229,040 million

Total Asset value for CRN as on January 1, 2011 is ₹229 billion.

Detailed explanation is provided below on a few other indicators for additional clarity:

- Indicator 5 (a, b): Here the intention is to ascertain the gap between the funds requested by the agency on the basis of its felt/assessed needs and those allocated by the government (as a percentage of budget allocated to budget requested) for plan (capital works) and non-plan (operation and maintenance) works.
- Indicator 7 (d): Temporary staff should include those employees who are not on the regular payrolls and not entitled to pension benefits but employed on contract basis for the short term. The gang labor engaged by the agency, even on temporary/casual basis, should also be included.
- Indicator 7 (i): The percentage of engineering staff below the Superintending Engineer (SE) level sent for training: The percentage of staff should be calculated in terms of the number of technical officers from the level of Junior Engineers (JEs) up to and including SEs sent for training to the total number of technical officers from the JE to SE level. For the sake of clarity, the number of Chief Engineers and above will not be counted while calculating the value of this indicator.
- Indicator 7 (j): The percentage of engineering staff with qualifications equal to M. Tech. or above should be calculated with respect to the total number of staff with B. Tech. qualifications or above (exclude the number of staff with diploma qualifications from the total).
- Indicator 23: To determine the percentage for this indicator, projects above a particular estimated cost, say, Rs. 200 million or above, may be considered.
- Indicator 24: The percentage of CRN managed through Long Term Maintenance Contracts (LTMCs) should be calculated in terms of the length for which LTMCs of more than five years are managed and the total length of the CRN.
- Indicator 26: The percentage of the total private investment to total investment should be calculated in terms of the amount of PPP investment to total investment. For total investment, information provided against indicator 6 (b) may be used as a common reference denominator.
- Indicator 30 (a): The RTI compliance ratio should be calculated in terms of the total number of RTI complaints disposed of to the total number of complaints received during the previous FY, expressed as a percentage.
- Indicator 32 (b): The ratio of vigilance cases decided to the total number of vigilance cases registered during the previous FY, expressed as a percentage.

A1.3.3 INDICATORS IN WHICH THE AGENCY IS REQUIRED TO CALCULATE THE VALUE OF THE INDICATOR BASED ON ANALYSIS OF CERTAIN DISAGGREGATED DATA

Such indicators include indicators 9, 10, 20, 21 and 34. The methodology proposed for each of these indicators is explained below.

Indicator 9: Cost Performance Index (CPI) for Major Projects

This indicator is concerned with contract/project management and cost efficiencies being achieved by the highway agency. Projects funded by the government and those undertaken through PPP should be analyzed separately. The following steps can be used to arrive at the CPI.

Step 1: The analysis should include all such projects which were in progress at the beginning of the previous FY and were completed at the end of the previous FY but exclude such projects whose original contract cost was less than Rs. 500 million.

Step 2: All such projects (from Step 1) should be divided into two categories:
(a) Projects whose original contract cost is more than Rs. 500 million and less than Rs. 1,000 million
(b) Project whose original contract cost is more than Rs. 1,000 million

Step 3: These two categories would be further divided into three:
(a) Projects which were completed with a cost overrun of 30 percent or less.
(b) Project which were completed with a cost overrun of more than 30 percent but less than 50 percent
(c) Projects which were completed with a cost overrun of more than 50 percent

An illustrated example is then presented in Table A2 to calculate the CPI.

Table A2: Computation of CPI

Category of Projects	Projects (>₹500 m < 1000 m)	Weighted Score	Projects (>₹1000 m)	Weighted Score
	(%)		(%)	
Projects completed with cost overrun of 30% or less	x_1	1.0	y_1	1.0
Projects completed with cost overrun of more than 30% but less than 50%	x_2	0.6	y_2	0.5
Projects with cost overrun more than 50%	x_3	0.1	y_3	0.1
Total	(100%)		(100%)	

$$CPI = \frac{(x_1 \times 1.0 + y_1 \times 1.0) + (x_2 \times 0.6 + y_2 \times 0.5) + (x_3 \times 0.1 + y_3 \times 0.1)}{2}$$

CPI value ranges from a maximum of 100 to a minimum of 10.

Indicator 10: Schedule Performance Index (SPI) of Major Projects

This indicator is an indicator of timely delivery of projects by the highway agency. Projects funded by the government and those undertaken through PPP should be analyzed separately. The following steps can be adopted to arrive at the SPI.

Step 1: The analysis should include all such projects which were in progress at the beginning of the previous FY and were completed at the end of the previous FY but exclude such projects whose original contract cost was less than ₹500 million.

Step 2: All such projects (from Step 1) should be divided into two categories:

- (a) Projects whose original contract cost is more than ₹500 million and less than ₹1,000 million
- b) Project whose original contract cost is more than ₹1,000 million

Step 3: These two categories would be further divided into three:

- (a) Projects which were completed with a time overrun of 30 percent or less
- (b) Project which were completed with a time overrun of more than 30 percent but less than 50 percent
- (c) Projects which were completed with a time overrun of more than 50 percent

An illustrated example is presented in Table A3 to calculate the SPI.

Table A3: Computation of SPI				
Category of Projects	Projects (>₹500 m < 1000 m)	Weighted Score	Projects (>₹1000 m)	Weighted Score
	(%)		(%)	
Projects completed with time overrun of 30% or less	x_1	1.0	y_1	1.0
Projects completed with time overrun of more than 30% but less than 50%	x_2	0.6	y_2	0.5
Projects with cost overrun more than 50%	x_3	0.1	y_3	0.1
Total	(100%)		(100%)	

$$SPI = \frac{(x_1 \times 1.0 + y_1 \times 1.0) + (x_2 \times 0.6 + y_2 \times 0.5) + (x_3 \times 0.1 + y_3 \times 0.1)}{2}$$

The SPI value ranges from a maximum of 100 to a minimum of 10.

Indicator 20: Network Congestion Indices

The highway agency is expected to carry out regular traffic volume counts on the CRN twice a year and seven days at a time. Besides such counts, the agency may also establish a few permanent traffic count stations for round-the-clock automatic traffic counts. The Network Congestion Index indicator is intended to capture the level of congestion in terms of volume divided by capacity (v/c) ratio.

The level of service (LOS) concept from the Highway Capacity Manual (HCM) of the USA is adopted/adapted in several countries including South Asia. LOS reflects operating conditions in terms of traffic performance relating to speed, travel time, freedom to manoeuvre, traffic interruptions, comfort and convenience. Six levels of service are usually followed. Traffic performance for each LOS is:

LOS A = Free Flow

LOS B = Reasonably Free Flow

LOS C = Stable Flow
 LOS D = Approaching Unstable Flow
 LOS E = Unstable Flow (Maximum Capacity)
 LOS F = Forced or Breakdown Flow

In India, for example, a similar concept is followed and LOS 'B' is prescribed for design capacity of major arterial routes and LOS 'C' for other roads. China follows a system of levels 1 to 4. For Class I highways, level 2 is adopted and this corresponds closely to LOS 'C' of USA's HCM. Of late, PPP projects for four-laning in India follow a design based on LOS 'B'; however, a holding service volume corresponding to LOS 'C' is permissible for further augmentation to six lanes.

At service level 'B', the volume of traffic is nearly 0.5 times the maximum capacity, and at 'C' nearly 0.7 times the maximum capacity. The HCM does not indicate much difference between the average speeds of LOS 'B' and LOS 'C' but there is an approximate 40 percent increase in the volume of traffic handled at LOS 'C' and the traffic remains in stable flow condition. The benchmarks proposed for computing Network Congestion Indices are indicated in Table A4:

Table A4: Benchmarks for computing Network Congestion Indices	
Traffic Performance	Volume/Capacity Ratio
Congestion free	Up to 0.70
Congested	Between 0.70 and 1.00
Over-congested	Above 1.00

The following steps can be adopted to compute the congestion indices of the CRN:

Step 1: Based on analysis of traffic volume and capacity of the road (this will depend upon the number of traffic lanes and presence of paved shoulders), the volume/capacity ratios will be established at the beginning of each year for the entire CRN. This information would be available for different categories of roads, that is, NHs, SHs, MDRs and Other Roads comprising the CRN and also for various carriageway configurations, for example, less than two lane, two lane and four lane or more.

Step 2: Tabulate the results and compute the congestion indices considering the extent of volume/capacity ratios on the length of the CRN as indicated in Table A5.

Table A5: Computation of congestion indices		
Volume/capacity Ratio	Percent Length of CRN	Level of Congestion
Up to 0.70	x_1	Congestion free
Between 0.70 and 1.00	x_2	Congested
Above 1.00	x_3	Over congested

The higher the percentage of congestion free network, that is, the value of x_1 , the better the performance of the road sector and the agency. The percentage of over-congested network, that is, the value of x_3 would serve as an indicator to the highway agency to plan capacity augmentation investments to meet the traffic demand on such road networks.

Indicator 21: Network Quality Index (NQI)

This indicator is intended to capture the quality of the network. To start with, the NQI may be determined based on the parameter of riding quality in terms of roughness expressed

in millimeter (mm) per km of road. The following steps can be used to compute the NQI of the network.

Step 1: The roughness levels may be measured all along the CRN once a year; divide the network into the following categories:

- (a) Length where roughness is up to 3,000 mm/km
- (b) Length where roughness is between 3,000 and 4,000 mm/km
- (c) Length where roughness is more than 4,000 mm/km

Step 2: Tabulate the results and compute the NQI considering the extent of roughness on the network as indicated in Table A6.

Table A6: Computation of NQI			
Roughness Level	Percent Length of CRN	Relative Score	Weighted Score
Up to 3,000 mm/km	x_1	100	$x_1 = WS_1$
Between 3,000 and 4,000 mm/km	x_2	80	$0.80 x_2 = WS_2$
More than 4,000 mm/km	x_3	50	$0.50 x_3 = WS_3$
Network Quality Index			$WS_1 + WS_2 + WS_3$

Higher the value of NQI, better the performance of the highway agency.
An example to illustrate the computation of NQI follows.

- (i) Let us assume that, as a result of the analysis carried out in Step 1, the following picture emerges (Table A7):

Table A7: Result of analysis in Step 1		
Roughness	Length	Percent Length
Length where roughness is up to 3,000 mm/km	4,000 km	(33.33%)
Length where roughness is between 3,000 and 4,000 mm/km	6,000 km	(50.00%)
Length where roughness is more than 4,000 mm/km	2,000 km	(16.67%)
Total	12,000 km	100.00

(ii) Computation of NQI

Table A8: Computation of NQI			
Roughness Level	Percent Length of CRN	Relative Score	Weighted Score
Length where roughness is up to 3,000 mm/km	33.33	100	33.33
Length where roughness is between 3,000 and 4,000 mm/km	50.00	80	$0.80 \times 50.00 = 40.00$
Length where roughness is more than 4,000 mm/km	16.67	50	$0.50 \times 16.67 = 8.33$
Network Quality Index			81.66, say 82

Indicator 34: Road User Satisfaction Index (RUSI)

The highway agency is expected to carry out user satisfaction surveys on its CRN once a year on sampling basis, using statistical techniques. Such surveys should record opinions of the users on certain parameters such as riding comfort, accident hazards, response to emergency situations, wayside amenities, time delays at toll plazas, check posts and railway crossings, facilities for vulnerable road users, road signs and traffic arrangements in work zones. The results of each of these surveys may be recorded on a rating scale of 3 for each parameter, 1 being poor, 2 being fair and 3 being good.

The following steps can be used in computing the overall RUSI.

Step 1: First, tabulate the results and compute the RUSI for each sample survey as indicated in Table A9. Higher the index, higher the level of user satisfaction and better the perception of the road user about the performance of the highway agency.

Table A9: Computation of RUSI for each sample survey (Illustrative example of one sample survey)				
Parameter	Net Average ¹ Opinion from the Sample on Rating Scale of 3	Relative Score ²	Weightage for the Parameter ³	Weighted Score
Riding comfort	3	100	0.20	20
Accident hazards	2	60	0.20	12
Response to emergency situations including medical trauma care facilities.	1	30	0.20	6
Wayside amenities	2	60	0.10	6
Time delays at toll plazas/ check posts, railway level crossings	1	30	0.10	3
Facilities for vulnerable road users	1	30	0.10	3
Road signs and travel information	2	60	0.05	3
Traffic arrangements in work zones	2	60	0.05	3
Overall RUSI				56

1. Number denotes level of satisfaction 1 low (poor), 2 medium (fair) and 3 high (good).

2. Allocate 100 points to scale 3, 60 points to scale 2 and 30 to scale 1.

3. Weightage proposed for the parameter.

Step 2: Compute the average RUSI by summing up the overall RUSI for each of the sample surveys and dividing the sum by the number of sample surveys.

$$\text{Overall RUSI for the network} = \frac{1}{n} \sum_{i=1}^n \text{RUSI}_i \text{ (arithmetic average)}$$

Higher the index value, better the road user satisfaction.

A2 GUIDANCE NOTE FOR DETERMINATION OF OVERALL PERFORMANCE SCORE BY THE HIGHWAY AGENCIES

A2.1 WHILE THE HIGHWAY AGENCY MAY FEEL FREE TO DECIDE THE WEIGHTAGES TO BE APPLIED TO EACH OF THE INDICATOR CATEGORIES, IT MAY LIKE TO USE THE FOLLOWING OPTIONS GIVEN IN TABLE A10.

Table A10: Proposed weightages for categories of indicators		
Category	Option 1 Maximum Marks (A national highway or provincial road or rural road agency/authority)	Option 2 Maximum Marks (A national/provincial road corporation)
Mandate, policy and legal framework	5-10	5
Planning	5-10	10
Capacity	15-20	15
Efficiency	20-25	20
Quality of road network	20-25	20
Private sector participation	5-15	15
Governance	15-20	15
Total	100	100

Note: Under Option 1, while a range is indicated in respect of national highway or provincial road or rural road agency, the weightage adopted for a particular category should be such that the sum of weightages for all categories put together should be 100.

A2.2 THE DISTRIBUTION OF MAXIMUM MARKS WITHIN EACH CATEGORY MAY AGAIN BE DECIDED BY THE HIGHWAY AGENCY. AN INDICATIVE DISTRIBUTION FOR EACH INDICATOR WITHIN THE SEVEN CATEGORIES IS PROVIDED IN TABLE A11. THE METHOD PROPOSED FOR DETERMINING THE SCORE AGAINST EACH INDICATOR IS ALSO PROVIDED SUBSEQUENTLY.

Table A11: Indicative distribution of marks for each indicator							
Category	Performance Measure/ Objective / Outcome/ Output	S. No	Indicator	Unit	National/Provincial or Rural Road Agency		National/ Provincial Road Corporation
					Lower Range	Upper Range	
Mandate, Policy and Legal Framework	A clear mandate/scope and sound Legal and Regulatory Framework Exists	1	A clear vision/mission statement exists	(Yes / No)	0.5	1.0	0.5
		1a	If Yes, please provide the statement below				
		2	Existence of Various Acts / Policy				
		2a	Road Sector Policy / Strategy in Place	(Yes / No)	0.5	1.0	0.5
		2b	Highway Act	(Yes / No)	0.5	1.0	0.5
		2c	PPP/Toll Policy	(Yes / No)	0.5	1.0	0.5
		2d	SHE Policy	(Yes / No)	0.5	1.0	0.5
		2e	Road Fund Act	(Yes / No)	0.5	1.0	0.5
		2f	Control of Land and Traffic Act	(Yes / No)	0.5	1.0	0.5
		2g	Infrastructure Development Act	(Yes / No)	0.5	1.0	0.5
		2h	Urban Planning Act	(Yes / No)	0.5	1.0	0.5
		2i	Road Safety Policy and Strategy Exist	(Yes / No)	0.5	1.0	0.5
			Sub total for Mandate, Policy and Legal Framework		5.0	10.0	5.0
Planning	Agency has sound planning processes in place	3	Preparation of Investment Plans				
		3a	A long-term master plan (10 to 15 years) exists	(Yes / No)	0.5	1.0	1.0
		3b	Three/five year road sector investment plan has been prepared	(Yes / No)	0.5	1.0	1.0
		3c	Annual plans/programs are prepared	(Yes / No)	0.5	1.0	1.0
		4	Asset Management				
		4a	Road inventory for the entire road network is available and updated regularly	(Yes / No)	0.5	1.0	1.0
		4b	Road information system / maintenance management system established and data updated regularly.	(Yes / No)	1.0	2.0	2.0
		4c	Traffic census are conducted regularly	(Yes / No)	1.0	2.0	2.0
		5	Ratio of Allocated budget vs. Required				
		5a	Plan (development/capital works/new construction)	Percent	0.5	1.0	1.0

Table A11: Indicative distribution of marks for each indicator

Category	Performance Measure/ Objective / Outcome/ Output	S. No	Indicator	Unit	National/Provincial or Rural Road Agency		National/ Provincial Road Corporation
					Lower Range	Upper Range	
Capacity	Strength to deliver the mandate	5b	Non-plan (operation and maintenance)	Percent	0.5	1.0	1.0
			Sub Total for Planning		5.0	10.0	10.0
		6	Resource Use				
		6a	Budget (plan/ capital works)	Million ₹	1.0	1.0	1.0
		6b	Expenditure (plan / capital works)	Million ₹	1.0	1.0	1.0
		6c	Budget (non-plan / operational and maintenance)	Million ₹	1.0	1.0	1.0
		6d	Expenditure (non-plan / operational and maintenance)	Million ₹	1.0	1.0	1.0
		7	Human Resource, Training, R&D				
		7a	Human resource policy exists and in use	(Yes / No)	0.5	0.5	0.5
		7b	Total number of engineering staff per 1,000 km of total road network owned by the agency	Number	0.5	0.5	0.5
		7c	Total number of administrative staff including per 1,000 km of total road network owned by the agency	Number	0.5	0.5	0.5
		7d	Total number of temporary staff per 1000 km of total road network owned by the agency	Number	0.5	0.5	0.5
		7e	Total number of specialized staff (planners, traffic engineers, legal, environment, social, finance, contract specialist, pavement, bridge/structure designers)	Number	1.0	2.0	1.0
		7f	Training need assessment done and updated regularly	Yes / No	0.5	0.5	0.5
		7g	Training plan/strategy exists and updated regularly	Yes / No	1.0	2.0	1.0
		7h	Expenditure on training and skill enhancement	Million ₹	1.0	2.0	1.0
		7i	% of engineering staff (below SE) sent on training	Percent	0.5	0.5	0.5
		7j	Percentage of engineering staff with qualifications equal to M.Tech or above	Percent	0.5	0.5	0.5
		7k	Expenditure on R&D, technology and innovation	Million ₹	0.5	0.5	0.5
		8	Delivery of Road Infrastructure				
		8a	Projects completed (amount)	Million ₹	1.0	2.0	1.0

		8b	Projects in progress (amount)	Million ₹	1.0	2.0	1.0
		8c	Projects ready for bidding (amount)	Million ₹	2.0	2.0	2.0
			Sub Total for Capacity		15.0	20.0	15.0
Efficiency	To Provide Value for Money in Delivery of Infrastructure	9	CPI of Major Projects	Absolute number	3.0	4.0	3.0
		10	SPI of Major Projects	Absolute number	3.0	4.0	3.0
		11	Average Cost of Construction				
		11a	Widening to 2-lane without paved shoulders	Million ₹/km	0.5	0.5	0.5
		11b	Widening to 2-lane with paved shoulders	Million ₹/km	0.5	0.5	0.5
		11c	Widening 2-lane to 4-lane	Million ₹/km	0.5	0.5	0.5
		11d	Widening 4-lane to 6-lane	Million ₹/km	0.5	0.5	0.5
		11e	New construction: 2 lane	Million ₹/km	0.5	0.5	0.5
		11f	New construction: 4 lane	Million ₹/km	0.5	0.5	0.5
		11g	New construction: 6 lane	Million ₹/km	0.5	0.5	0.5
		11h	Periodic maintenance (strengthening + overlay) (2 lane)	Million ₹/km	0.5	0.5	0.5
		11i	Routine maintenance (2 lane)	Million ₹/km	0.5	0.5	0.5
		12	Staff and Administrative Cost	Million ₹	0.5	0.5	0.5
		13	Asset Value (Replacement Cost) of CRN	Billion ₹	3.0	4.0	3.0
		14	Road Safety Audit Conducted	Km or number of projects	1.0	2.0	1.0
		15	Social and Environmental Impact Assessment Carried Out	Projects Number	1.0	2.0	1.0
		16	Entity wide ISO or equivalent certification received	(Yes / No)	1.0	1.0	1.0
		17	Standard Bid Documents Developed	(Yes / No)	1.0	1.0	1.0
		18	Computerization / Enterprise Resource Planning in Place	(Yes / No)	1.0	1.0	1.0
		19	Amount of Claims under Dispute	Million ₹	1.0	1.0	1.0
			Sub Total for Efficiency		20.0	25.0	20.0
Quality of Road Network	To Provide a Safer, Greener, Reliable and Comfortable Road Network	20	Network Congestion Indices				
		20a	Congestion free CRN	%	5.0	6.0	5.0
		20b	Congested CRN	%	1.0	1.0	1.0
		20c	Over-congested CRN	%	0.0	0.0	0.0

Category	Performance Measure/ Objective / Outcome/ Output	S. No	Indicator	Unit	National/Provincial or Rural Road Agency		National/ Provincial Road Corporation
					Lower Range	Upper Range	
		21	Network Quality Index	Absolute number	6.0	7.0	6.0
		22a	Fatalities per 100 km of network	Number	2.0	2.0	2.0
		22b	Accidents per 100 km of network	Number	2.0	2.0	2.0
		23	% of Projects where Environment Management Plan was Implemented.	Percent	2.0	3.0	2.0
		24	% of CRN managed through Long Term Maintenance Contracts	Percent	2.0	4.0	2.0
			Sub Total for Quality of Road Network		20.0	25.0	20.0
Private Sector Participation	Promote Private Sector Investments	25	% of CRN Developed on any of the PPP Mode	Percent	2.0	6.0	6.0
		26	% of Total Private Sector Investment to the Total Investment	Percent	3.0	9.0	9.0
			Sub Total for Private Sector Participation		5.0	15.0	15.0
Governance	To operate with increased user interface, transparency and greater accountability	27	Department Website Exists and Updated Regularly	(Yes / No)	1.0	2.0	1.0
		28	Adequate Representation (at least 25%) of Road Users in the Road Fund Board	(Yes / No)	1.0	2.0	1.0
		29	Users / Stakeholder Forum Established and Convened at least Half Yearly	(Yes / No)	1.0	2.0	1.0
		30a	RTI Compliance Ratio	Percent	1.0	2.0	1.0
		30b	Appeals received by the State Information Commission against the Department	Number	1.0	2.0	1.0
		31	Annual Report Published	(Yes / No)	2.0	2.0	2.0
		32a	Vigilance cases registered	Numbers	2.0	2.0	2.0
		32b	Vigilance cases decided as ratio of cases registered	Percent	2.0	2.0	2.0
		33	Grievance redressal mechanism exists	(Yes / No)	2.0	2.0	2.0
		34	Road User Satisfaction Index	Absolute Number	2.0	2.0	2.0
			Sub Total for Governance		15.0	20.0	15.0

Note: 1. The currency unit of indicators need to be appropriately customized.

2. As an overall total of 100 maximum is required for a road agency, the combination of the lower and upper ranges would need to be selected by the road agency.

A3: GUIDANCE NOTE ON THE METHOD FOR DETERMINING THE SCORE AGAINST A PARTICULAR INDICATOR

A3.1 IT MAY BE NOTED THAT SOME INDIVIDUAL INDICATORS ARE GIVEN A COMPARATIVELY HIGHER WEIGHTAGE. THE CONSIDERATION BEHIND SUCH A SUGGESTION IS BASICALLY TO SIGNIFY THE INDICATOR'S RELATIVELY HIGHER IMPORTANCE FROM THE POINT OF VIEW OF:

- Good database for planning;
- Efficient delivery of programs;
- Proper operation and management of the road network;
- Good level of service and safety for users of improved road; and
- Enhanced transparency and governance.

A3.2 THE PROPOSED METHOD FOR DETERMINING THE SCORE AGAINST EACH INDICATOR IS AS FOLLOWS:

(a) For all (Yes/No) indicators, the score should be maximum, i.e., full marks for 'Yes' and zero for 'No'.

(b) For other indicators, the highway agency would need to establish its own benchmarks for determining the score against each indicator. A simple approach could be to set the benchmarks at three levels, that is, Good, Fair, and Poor. The suggested range of scores may be:

- (i) Benchmark 'Good' – 80 to 100 percent
- (ii) Benchmark 'Fair' – 40 to 60 percent
- (iii) Benchmark 'Poor' – 20 to 40 percent

ANNEX B

B1 QUESTIONNAIRE PHASE 1

CAPACITY AND FUNCTIONAL REVIEW OF HIGHWAY AGENCIES (INDIA)*

	Highway Agency (States)	Measurable/Identifiable Parameters/Indicators																								
1.	Provides Road Infrastructure that provides transport services – movement of goods and men																									
	1.1 Road policy, investment plan / road master plan, vision document, annual reports – in place 1.2 Are they published regularly? 1.3 What is the basis/strategy of converting roads from one category to another category? Please provide data on roads converted in the last two years. 1.4 What is the strategy of entrusting roads to Road Corporations/Boards? Please provide data on roads entrusted in last two years.	Yes/No. If yes, please attach a copy of document and provide a summary of salient features, goals and targets. Yes/No																								
	- Congestion free, mobility (Plan Roads) 1.5 Total Length of																									
	<table border="1"> <thead> <tr> <th>Category of Roads</th> <th>Length in km (as of March 31, 2009)</th> <th>Under Construction (km)</th> <th>Total (km)</th> </tr> </thead> <tbody> <tr> <td>4 lane roads</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2 lane roads</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Intermediate lane roads</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Single lane roads</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Any Other</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Category of Roads	Length in km (as of March 31, 2009)	Under Construction (km)	Total (km)	4 lane roads				2 lane roads				Intermediate lane roads				Single lane roads				Any Other				
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4 lane roads																										
2 lane roads																										
Intermediate lane roads																										
Single lane roads																										
Any Other																										
	- Comfortable ride 1.6 Whether road condition surveys are being done regularly?	Yes/No (Obtain copy of the latest survey, if Yes)																								
	1.7 Safety	<table border="1"> <tbody> <tr> <td>Historical Accident Statistics/ Scenario</td> <td> No. of accidents No. of deaths No. of injuries </td> <td> • Per 1,000 vehicles • Per 100,000 population </td> </tr> <tr> <td colspan="3">Loss due to accidents per annum</td> </tr> </tbody> </table>	Historical Accident Statistics/ Scenario	No. of accidents No. of deaths No. of injuries	• Per 1,000 vehicles • Per 100,000 population	Loss due to accidents per annum																				
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Loss due to accidents per annum																										

* Similar questionnaires were developed for Bangladesh, Nepal, Pakistan and Sri Lanka

	Highway Agency (States)	Measurable/Identifiable Parameters/Indicators	
	- Accessibility 1.8 Total Length of Network, Category-wise		
	- Traffic Growth 1.9 Please obtain an abstract of the latest traffic volume on SHs and MDRs or any other traffic data, e.g., total registered vehicle in the state or total vehicles on the road, etc., available 1.10 Number of total permanent traffic count stations on the network. 1.11 Number of automated traffic count stations on the network (if any) 1.12 When (year) their location was reassessed? 1.13 What is the strategy and frequency of traffic data collection?		
2.	Investments in Provision of Road Infrastructure	Annual Amount (2008-09)	
	2.1 Please obtain a copy of the Budget (2008-09)		
	2.2 Government budget (including external assistance)	Total Budget Allocated (INR million)	Expenditure (INR million)
	a) New construction (including external assistance)		
	b) Upgradation, rehabilitation		
	c) Maintenance i. Routine maintenance ii. Periodic maintenance (renewal of surface) iii. Emergency maintenance		
	d) Budget on project preparation		
	e) Budget on training		
	f) Budget on R&D		
	2.3 Private sector financing a) BOT (Toll) b) BOT (Annuity) c) MOT (O&M Contracts) d) Project Specific SPV (Please include a brief note on PPP initiatives in the last 5 years by the state)		
	2.4 Force Account		
	2.5 Administrative Cost		

	Highway Agency (States)	Measurable/Identifiable Parameters/Indicators																																																	
	2.6 State Road Funds a) For development b) For maintenance																																																		
	2.7 Any other sources of funds (NABARD, TFC, CRF, etc.)																																																		
	2.8 Gap in Availability of Funds (2008-09)																																																		
		Funds Required	Funds Available																																																
	For development																																																		
	For maintenance																																																		
	IRC norm																																																		
	Any other (e.g. , state's own) norm																																																		
	Total																																																		
3.	Organizational Structure and Functions	Measurable/Identifiable Parameters/Indicators																																																	
	3.1 Please collect an organization chart of the agency																																																		
	3.2 Please include a note on the quality control set up of the organization.																																																		
	3.3 Please include a note on the site visit/inspection policy of the department for all posts.																																																		
	3.4 Availability of duty list/responsibility chart	Yes/No – Obtain a copy, if Yes																																																	
	3.5. Classes of roads for which responsible	<table border="1"> <thead> <tr> <th>NH</th> <th>SH</th> <th>MDR</th> <th>RR</th> </tr> </thead> <tbody> <tr> <td>Yes/No</td> <td>Yes/No</td> <td>Yes/No</td> <td>Yes/No</td> </tr> <tr> <td>Length (km)</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		NH	SH	MDR	RR	Yes/No	Yes/No	Yes/No	Yes/No	Length (km)																																							
NH	SH	MDR	RR																																																
Yes/No	Yes/No	Yes/No	Yes/No																																																
Length (km)																																																			
		Mark cross in the box																																																	
	3.6 Existence of core competence functions and cells (relating to roads)	<table border="1"> <thead> <tr> <th>Yes</th> <th>No</th> <th>Remarks</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </tbody> </table>		Yes	No	Remarks																																													
Yes	No	Remarks																																																	
	a) Planning for development, programming of projects (database) b) Design of roads c) Design of bridges d) Central level lab + R&D cell e) Social impact assessment, land management f) Environment impact assessment g) Traffic assessment, safety record h) Contract administration, dispute resolution i) Maintenance planning and programming j) IT related functions k) Asset management cell l) Financial management information system																																																		

	Highway Agency (States)	Measurable/Identifiable Parameters/Indicators																											
	m) Procurement of PPP projects n) Project monitoring and debottlenecking o) Library p) Public relations officer q) Legal cell r) Highway patrolling s) Mechanical t) Electrical u) Others																												
	3.7 Sectors other than roads - Buildings - Any other (please specify)	<table border="1"> <tr> <td>Yes</td> <td>No</td> </tr> <tr> <td>Yes</td> <td>No</td> </tr> </table>				Yes	No	Yes	No																				
Yes	No																												
Yes	No																												
	3.8 (Provide information only for roads) * a) Number of Chief Engineers b) Number of Superintending Engineers c) Number of Divisional Engineers for Execution - Provincial Divisions - Field level PIUs d) Number of Sub-Divisional/Assistant Engineers e) Number of Junior Engineers f) Number of Divisions for maintenance, if exclusively existing for this purpose	<table border="1"> <tr> <th colspan="2">Number</th> <th rowspan="2">Avg. Length (km)</th> <th colspan="2">Workload per Unit (INR million)</th> </tr> <tr> <th>Field</th> <th>Others</th> <th>Highest</th> <th>Avg.</th> </tr> <tr><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td></tr> </table>	Number		Avg. Length (km)	Workload per Unit (INR million)		Field	Others	Highest	Avg.																		
Number		Avg. Length (km)	Workload per Unit (INR million)																										
Field	Others		Highest	Avg.																									
	3.9 Total number of personnel excluding gang labor - Technical - Non-technical o Accountants o Administration o Others	<table border="1"> <tr> <th>HQ</th> <th>Field</th> <th>Total</th> </tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </table>				HQ	Field	Total																					
HQ	Field	Total																											
	3.10 Personnel (cadre situation) a) Obtain a copy of the latest pay scales and obtain a copy of 'Cadre and Recruitment Rules of the PWD' (or equivalent) if existing. b) Describe government policy on recruitment at Junior, Assistant and Executive Engineer levels and its implementation.																												

* If functions of roads and other sector are combined, please specify.

	Highway Agency (States)	Measurable/Identifiable Parameters/Indicators																															
	c) Does the state have an outsourcing policy for recruiting contract workers / specialists d) When was the last recruitment done at JE/AE level? Give details. e) Describe steps taken by government for career progression f) Average age and tenure of officers (refer to table) <ul style="list-style-type: none"> - Technical head of organization - Chief Engineer - Superintending Engineer - Executive Engineer - Assistant Engineer - Junior Engineer 	<table border="1"> <thead> <tr> <th rowspan="2">Minimum qualifying service for next level (years)</th> <th colspan="2">Age (years)</th> <th>Tenure</th> </tr> <tr> <th>Max.</th> <th>Ave.</th> <th>(Average years)</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Minimum qualifying service for next level (years)	Age (years)		Tenure	Max.	Ave.	(Average years)																								
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	Max.	Ave.	(Average years)																														
	3.11 Skill Enhancement Number of officers sent to training at various levels (in 2008 -09) a) Top management cadre: E-in-C/CE/SE b) Divisional level: EEs c) Sub-divisional/sectional level <ul style="list-style-type: none"> - AEs - JEs 	<table border="1"> <thead> <tr> <th colspan="2">Measurable/Identifiable Parameters/Indicators</th> </tr> <tr> <th>Within India (Number)</th> <th>Outside India (Number)</th> </tr> </thead> <tbody> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </tbody> </table>	Measurable/Identifiable Parameters/Indicators		Within India (Number)	Outside India (Number)																											
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Within India (Number)	Outside India (Number)																																
	3.12 Types of training courses to which officers are exposed a) Public -private partnership b) Project preparation, geotechnical surveys, topographic surveys c) Contract management/administration quality control, total quality management d) Social and environment impact assessment e) Pavement and geometric design f) Bridge design g) Traffic studies h) Road safety i) Asset management, pavement and bridge maintenance management systems HDM ₄ j) Financial management system k) Legal, disputes, arbitration l) Others	<table border="1"> <thead> <tr> <th>Number per year</th> <th>Level of officers</th> </tr> </thead> <tbody> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </tbody> </table>	Number per year	Level of officers																													
Number per year	Level of officers																																
	3.13 Preparedness for delivery/implementation a) Number and amount of projects <ul style="list-style-type: none"> • Projects carried over at the beginning of 2008 -09 • Project sanctioned in the year 2008-09 b) Ratio of Bank of sanctions with respect to annual outlay	<table border="1"> <thead> <tr> <th>Number</th> <th>Amount INR million</th> </tr> </thead> <tbody> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </tbody> </table>	Number	Amount INR million																													
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	Highway Agency (States)	Measurable/Identifiable Parameters/Indicators																																																															
	3.1 4 Professional affiliations and education levels a) Membership of Indian Roads Congress <ul style="list-style-type: none"> • CE/Head of Department • SE • EE • AE b) Membership of IRC Committees <ul style="list-style-type: none"> • CE/Head of Department • SE • EE • AE c) Membership of IRC Council d) No. of PhDs e) No. of Post-graduates f) No. of MBAs g) No. of Law Graduates h) Any other skills	<table border="1"> <thead> <tr> <th>Number</th> <th>Percent to Total</th> </tr> </thead> <tbody> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </tbody> </table>	Number	Percent to Total																													<table border="1"> <thead> <tr> <th>Number</th> <th>Percent to Total</th> </tr> </thead> <tbody> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </tbody> </table>	Number	Percent to Total																														
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Number	Percent to Total																																																																
6.	NGOs, Road Transport Associations a) Provide list of NGO's concerned with road sector and interacting with the department b) Provide list of bus/trucking services association interacting with the department c) Road user satisfaction surveys carried out? If so, obtain a copy of the latest report.	<table border="1"> <tr><td></td></tr> <tr><td></td></tr> <tr><td></td></tr> </table>																																																															
7.	Legal Framework <ul style="list-style-type: none"> • Give a list of various acts including State Highway Act, Road Maintenance Policy, Transparency in Public Procurement, etc., at the state level applicable to roads and road transport. Obtain a copy of all acts. 	<table border="1"> <tr><td></td></tr> </table>																																																															
8.	Road Financing 8.1 Whether there is a legal framework for PPP? 8.2 Whether the state has a Toll Policy? 8.3 Whether the state has raised finances for road development through market borrowings? 8.4 Any other innovative financing methods used by the state for road development or maintenance?	<table border="1"> <tr><td></td></tr> </table>																																																															
9.	Reforms Undertaken 9.1 Whether any institutional strengthening study was carried out and an action plan was developed towards modernization of the agency? Obtain a copy of the study 9.2 Whether the road agency has a five year investment plan/business plan?	<table border="1"> <tr> <td>(yes/no)</td> <td></td> </tr> <tr> <td>(yes/no)</td> <td></td> </tr> </table>		(yes/no)		(yes/no)																																																											
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	Highway Agency (States)	Measurable/Identifiable Parameters/Indicators
	<p>9.3 Whether the road agency publishes any Annual Report s/MIS Reports ?</p> <p>9.4 Describe major reforms undertaken in the last 5 years</p> <ul style="list-style-type: none"> a) Any procurement strategy/standard bid documents developed? b) PPP initiatives undertaken c) Road funds established d) Road Corporation/ Board established e) Website launched f) Computerization g) RIS/RMMS established h) Any financial management strategy developed (move towards double entry accounting system, etc.) i) RTI compliance j) Grievance redressal k) HR/training strategy l) Budget tracking studies m) Any other 	(yes/no)

B2 QUESTIONNAIRE PHASE II

Preamble

This questionnaire should be completed on behalf of the principal/national road administration of the named state/country. It will help establish best practices on governance for road administrators in different circumstances. The notes for guidance will assist you with completing the questionnaire.

Exact name of Road Administration (RA):

Name of country/ state your RA is working for	
Contact name	
Address	
Tel No	
Fax No	
E-mail	
Date submitted	

GOVERNANCE

STRATEGIC ASPECTS OF THE ROAD ADMINISTRATOR

Q1	
Rank the long-term external main drivers of your organization in order (1 is the top priority, 6 is the lowest, use every priority once if possible):	Priority
Economic development	
Social objectives (accessibility, etc.)	
Environmental (benefits/mitigation)	
Safety	
Integration (with land use planning and/or other modes of transport)	
Others (this includes concern for cross-cutting issues such gender, people with disabilities, etc.)	

Q2	
Rank the long-term priorities of your organization in order (1 is the top priority, 6 is the lowest, use every priority once if possible):	Priority
Extension of the road network serving major cities and centers of economic activity	
Extension of the road network in rural (or less densely populated) areas	
Rehabilitation and upgrading of the road network serving major cities and centers of economic activity	
Rehabilitation and upgrading of the road network in rural (or less densely populated) areas	
Maintenance and rehabilitation of the existing road network serving major cities and centers of economic activity	
Maintenance and rehabilitation of the existing road network in rural (or less densely populated) areas	

GOVERNANCE ARCHITECTURE: STRUCTURE AND PROCESSES

Q3.				
Which products and services are delivered by which organization? Options: tick no box, tick one box or give % in each box The percentage is a ballpark quantitative indicator, budget or revenue	Delivered by my organization	Delivered by my organization through procurement	Delivered by another organization, namely (indicate name)	Does this other organization use procurement?
Development of state/national transport policy (also for other modalities or road networks)				
Development of road network policy				
Developing rules and regulations				
Planning and development				
Construction and reconstruction				
Maintenance				
Operations				
Licensing of road users				
Registration of vehicles				
Monitoring and enforcement of rules and regulation				

Q4				
Indicate by ticking boxes	Government	Road administrator	Independent research institutes	Consultancy firms & others
Who has the main 'body of knowledge' concerning national transport policy and policy for the total network?				

Q5	
How would you best describe the ownership and legal configuration of your organization?	Please tick the description which resembles your situation best
Government department directly accountable to (state) minister	
Public organization, e.g., an agency	
Private company, stock is owned by government	
Joint venture with public and private stock owners	
Private company, revenue is governed by market forces	

Q6					
Indicate by ticking boxes	National (no federal or state levels)	State/ federal	Province/ region	Local/ urban	Other
Please indicate the administrative levels that are present in your state/country					
Please indicate your administrative level					
Please indicate the road network(s) your administration is responsible for					
Are there any road administrators that operate on another level that are also active at your level? If so, indicate their level?					

Q7
If there are other road administrators also active at your administrative level, please describe the situation (for example, the national authority or a private toll operator managing part of a state road network)

Q8				
Indicate by ticking boxes	National government	State government	Road administrator	Other
Who is the legal owner of the road network you are responsible for?				

Q9
If you have indicated "other" in the previous question, please indicate who is the legal owner

Q10.					
Please indicate who has the mentioned authority within your organization? If other, please state the person or organization (tick boxes).	Legislature	(State) minister of transport	Head of road administration	Road board	Other (specify)
Appointment of executive management					
Dismissal of executive management					
Approval and evaluation of a (strategic) business plan					
Approval and evaluation of a general performance agreement					
Approval and evaluation of individual (re) construction projects					
Approval and evaluation of regional/ local deviation of performance levels					

Q11.		
Please indicate any transitions or reform process the RA is in (more than 1 is possible) (tick boxes)	Yes	No
Give central government more influence on daily operations of RA		
Give central government less influence on daily operations of RA		
Give the public more influence on performance levels and project designs		
Give tasks or parts of infrastructure away from RA to local or regional government		
Retrieve tasks or infrastructure to RA from local or regional government		
Give more tasks or parts of infrastructure from RA away to contractors or concessionaires where the contractor remains governed by RA		
Give more tasks or parts of infrastructure from RA away to contractors or concessionaires where the contractor will not be governed by RA		

Q12

Please comment on your answer if you have indicated “yes” anywhere in the previous question, providing more details on the reform process

Q13

Please indicate the stakeholders that you consult regularly (tick box)	Twice a year or more	Once a year	Incidentally
Government			
Road users and their representatives			
Other members of public			
External funders			
Business community			
Environmental protection agencies			
Voluntary organizations like pressure groups			
Other transport operators			

Q14

Please indicate in what way road users are involved in the activities of your organization regarding maintenance and operations (tick box, more than one tick is possible).

Through the regular democratic process (e.g., elections and court)		
Through periodical user surveys		
Through local or regional consulting		
Through local or regional agreement on performance levels		
Is there a Road Board involved in any decisions regarding maintenance and operations?	yes	no

Q15

Please indicate in what way road users are involved in the activities of your organization regarding upgrading and (re)construction projects (tick box, more than one tick is possible)

Through the regular democratic process (e.g., elections and court)		
Through local or regional consulting		
Through local or regional interactive planning		
Is there a Road Board involved in any decisions regarding upgrading and (re)construction projects?	yes	no

Q16

Please provide some additional comments on how road users are involved, as background information

Q17

Indicate in % terms the proportion of the source of funds for your maintenance and construction program	Operations	Maintenance	(Re)construction	No split
Loans from funding institutions				
General taxation through budgetary negotiations				
General taxation related to the use of network or vehicle (e.g., shadow toll)				
Dedicated road users charges/fees directly related to the use of network or vehicle (e.g., toll)				
Other (please specify below)				

Q18

Indicate in % terms the rough proportion of the financial or other contribution from the public or private sector to the following activities:	Financial		Other input (e.g., staffing)	
	Public	Private	Public	Private
Policy making				
Administration (budgeting, monitoring, planning)				
Providing maintenance – upholding the network				
Providing maintenance – adding asset value to the network				
Design of new infrastructure				
Construction of new infrastructure				

EXTERNAL REPORTING & USE OF PERFORMANCE INDICATORS

Q19					
What kind of monitoring, evaluation, and control measures are used in your organization? (tick boxes, more than one is possible)					
		On all projects	On a sample of projects	On all programs	On a sample of programs
Internal verification/audit	Technical Financial				
External verification	Technical Financial				
Official inquests - special reviews	Technical Financial				

Q20			
	Yes	No	Comment (who, what, which, how, how often)
Does the RA publish an annual profit & loss account and balance sheet?			
Does the RA disclose a list of individual assets?			
Is the RA guided by a strategic plan for organizational development?			
Is the RA guided by a long-range plan for infrastructure development?			
If so, does the plan have performance indicators guiding capital investments?			
Is the RA guided by quantitative performance targets?			
Are performance indicators used in the budget or funding process?			
Are indicators used for public reporting and accountability (e.g., through performance levels)?			
Are indicators used to manage operational processes?			
Are indicators used to manage construction project development?			
Are indicators a part of a performance agreement with an external guiding or financing entity, such as a ministry or legislative body?			
Are risks analyzed as part of standard processes such as the planning & control process or of standard project management procedures?			
If so, are actual risk control procedures defined and implemented?			
Is there a periodical review and simplification of internal rules and regulations?			

Q21			
Is basic data obtained for:	Yes	No	Brief description of data available
Economic indicators			
Social indicators			
Health indicators			
Environment indicators			
Delivery indicators			
Road system			

HUMAN RESOURCES

Q22	
Please indicate the proportion of the number of staff directly employed by your organization requiring the following skills:	
General management	
Professional – engineering	
Professional – other (e.g., finance & economics)	
Administrative	
Other professional or technical staff, please specify	

Q23			
(tick box)	Yes, some	Yes, a lot	No
Does your RA set competence levels in recruiting and reviewing staff performance?			

Q24				
tick box)		Yes, some	Yes, a lot	No
Do you assess competencies internally (with your own Human Resources specialists) If YES, at what levels in the organization are these tools used?	Professional/management			
	Technical			
	Field supervision			
	Finance			
	General support staff			
	Others.....			

Q25

Are there some competencies which you need and are having serious problems obtaining? Please list up to maximum 5, in order of priority

1.

2.

3.

4.

5.

Q26

Are there other types of competencies that you expect to be required much more in the next 5 years to meet expected challenges for your RA (please list and explain how they relate to expected challenges)

Q27

Are there any changes to training and education curricula that you are encouraging in response to these needs? Please explain.

Q28.

(tick box)

Yes

No

Do you have problems in carrying out your human resource management policy?
If YES, what is the biggest problem?

INCENTIVES AND DISINCENTIVES

Q29

Please check all boxes that are appropriate for the following questions

Formally

Actually

Road admin

Minister/ road board

Road admin

Minister/ road board

Who faces the consequences of poor output performance?

Who faces the consequences of poor socio-economical outcomes of road policies?

Who faces the consequences of poor financial performance, including budget overruns and inefficiency?

Q30.		
Is individual performance subject of a reward system (bonuses, career opportunities)?	Yes	No
For staff		
For executive management		

Q31		
Do the results on performance agreements have any consequences for:	Yes	No
Financial bonuses or penalties for RA management (e.g., no bonus or a salary freeze or cut for senior staff)		
Financial bonuses or penalties for the RA organization (e.g., budget cuts)		
The level of supervision on the RA by external parties (like the ministry, external auditors, etc.)		
Other consequences? (please state)		

INSTITUTIONAL INTEGRITY

Q32			
General questions	Yes	No	Comment
Has the RA taken steps to ensure that its members exercise leadership by conducting themselves in accordance with high integrity values?			
Has the RA adopted a formal code of conduct defining the standards of behavior to which individual governing body members and all employees of the entity are required to subscribe?			
Does the RA periodically review adherence to the code of conduct?			

Q33

Which of the following measures are in place to promote the prevention of influence by prejudice, bias or conflicts of interest?

	RA specific		General application		Don't know
	Yes	No	Yes	No	
<i>Institutional measures</i>					
Anticorruption special unit					
General law and regulations					
Specific anticorruption law					
Whistleblower protection					
Ombudsman					
Public complaint department					
<i>Preventive measures</i>					
Code of conduct					
Special anticorruption program					
Please specify the name(s) of the program(s)					
Others, please specify below					
Please specify the name(s) of the program(s)					

SATISFACTION WITH GOVERNANCE ARCHITECTURE

Q34					
How do you rate the level of performance and the level of satisfaction of the RA and your stakeholders on: 0 – not relevant 1 – very unsatisfied 2 – not satisfied 3 – satisfied 4 – very satisfied	Road administrator	Legislature	Ministry of transport	Road board	Road users/ customers
Outcome/socioeconomic objectives					
Economic development					
Social objectives (accessibility, etc.)					
Environmental (benefits/ mitigation)					
Safety					
Integration (with land use planning and/or other modes of transport)					
Output					
Extension of the road network serving major cities and centers of economic activity					
Extension of the road network in rural (or less densely populated) areas					
Rehabilitation & upgrading of the road network serving major cities and centers of economic activity					
Rehabilitation & upgrading of the road network in rural (or less densely populated) areas					
Maintenance and rehabilitation of the existing road network serving major cities and centers of economic activity					
Maintenance and rehabilitation of the existing road network in rural (or less densely populated) areas					
The content of formal or informal service level agreements					
Actual achievement of RA on formally or informally agreed service levels					
The content of formal or informal agreed project deliverables					
Actual achievement of RA on formally or informally agreed project deliverables					

Q34.					
How do you rate the level of performance and the level of satisfaction of the RA and your stakeholders on: 0 – not relevant 1 – very unsatisfied 2 – not satisfied 3 – satisfied 4 – very satisfied	Road administrator	Legislature	Ministry of transport	Road board	Road users/ customers
Input					
The size of your organization					
The cost of products and services of your organization					
Process					
The process of approval and evaluation of a (strategic) business plan					
The total control loop, including reaching objectives, reporting, feedback, sanctions & rewards and adjustment of future objectives					
The process and approval and evaluation of a general performance agreement					
The process of approval and evaluation of individual (re)construction projects					
The process of approval and evaluation of regional/ local deviation of performance levels					
Q35					
What parts would the RA like to improve and how?					

ANNEX C: INTERNATIONAL CASE STUDIES

C1 SOUTH AFRICA

C1.1 SOUTH AFRICAN ROAD INFRASTRUCTURE AND UTILIZATION

Classification and Management of Roads

The road network in South Africa consists of several types of roads, classified according to their functionality and management. The following distinction can be made:

- **National roads** are managed by SANRAL, a public agency with the Ministry of Transport as the only shareholder. SANRAL was established by means of the South African National Roads Agency Limited and National Roads Act (Act 7 of 1998). It is an independent statutory company operating along commercial lines and with considerable autonomy from the government²³.
- **Provincial/regional roads** fall under the responsibility of the nine provinces. Each province has its own provincial government, with legislative power vested in a provincial legislature and executive power vested in a provincial premier, exercised together with the other members of a provincial executive council. Eight of the nine provinces operate on a traditional road authority structure that typically includes departments such as Roads and Public Works for management and delivery of roads.
- **Local/municipal roads** are managed using multiform institutional arrangements. Most municipal road authorities have a traditional roads authority structure under the ownership of the council. Two or more municipalities can form a transport authority to take over municipal road functions and, currently, there are more than 250 “municipal road authorities” in operation.

In some metropolitan areas, like Johannesburg, Metropolitan Municipalities Roads Agencies have been established as their delivery arm, under the guidance of a Roads Agency Board. The ownership of roads still resides with the city, but the Metropolitan Roads Agency is responsible for the delivery of roads, based on a performance contract that it has with the city’s contracting unit.

The coordination of and responsibility for the planning and delivery of the primary metropolitan road network requires particular attention with many municipal road networks having both provincial and national road components within their set-ups, where the “higher” spheres of government have tended to dominate.

Moreover, some 220,000 km of roads are unproclaimed, meaning that they were never formally adopted by a particular government department as part of the official networks. Legally, no authority can spend money on roads that are not proclaimed. These are typically access roads in rural areas.

Quality of the Network

The general state (or condition) of a gravel or paved road network system is described in terms of a Visual Condition Index (VCI). The VCI of a road network is ideally quantified (bi-) annually and, if given over time, shows the trend in road conditions. The VCI uses a five-point scale, that is, very good, good, fair, poor, and very poor. Considering non-toll roads only, about 35 percent of provincial and 15 percent of national roads are assessed as being in poor or very poor condition²⁴. Figure C1 provides an overview of the quality and the expected quality of the non-toll national roads.

²³ SANRAL (2010). *Our history*. http://www.nra.co.za/live/content.php?Category_ID=21

²⁴ Council for Scientific and Industrial Research (2010). *The condition of provincial road networks*. www.csir.co.za

Figure C1: Forecasted quality of non-toll roads in South Africa

Source: The Strategic Vision of SANRAL for the year 2010

Utilization

The road network is the basis for by far the largest proportion of land transport, including public transport, and more than 70 percent of all freight and passenger movement takes place on roads.

The national roads account for 3 percent of the total road network in South Africa, however approximately 22 percent of the total vehicle km are travelled on the national roads. Traffic on national roads increases by some 2.6 percent per year.

Although reliable motor vehicle data have not existed before 1992, it is estimated that, as of 2000, South Africa had an estimated 141 vehicles per 1,000 people, of which almost 70 percent were cars for personal use.

Government Policy for the Road Sector

Road sector policy and objectives are incorporated in the main policy documents governing the transport sector as a whole and in the policy and strategy documents of SANRAL.

Long-term Policy and Strategy for the Transport Sector

The South African Ministry of Transport provides the transport policy framework, regulation and implementation. Its White Paper on National Transport Policy (DoT, 1996) formulates the long-term vision for transport in South Africa and the strategies to attain these goals. Recently, it has been replaced by the National Transport Master Plan, NATMAP 2005-2050 (DoT, 2010). The national plan for transport will guide planning, implementation, operations and management for all modes of transport in all different spheres of government. Planning and implementation will be scheduled over five-year cycles throughout the 45-year period.

Medium-term Strategy and Action for the Transport Sector

The National Land Transport Strategic Framework (NLTsf) embodies the overarching,

national five-year (2006 to 2011) land transport strategy, which provides guidance on transport planning and land transport delivery. It is a five-year “rolling plan” that is intended to be updated annually. It calls for the establishment of the road network based on:

- Transport needs;
- Social and economic development imperatives;
- Linkage between the primary sea, air and dry ports and public transport nodes;
- Spatial development initiatives, tourism needs, commuter travel and freight movements; and
- Integration with other modes to avoid duplication.

Also the Ministry of Transport publishes a three year policy outlook, calling for:

- An effective and integral infrastructure network that serves as a catalyst for social and economic development;
- A transport sector that is safe and secure;
- Improved rural access, infrastructure and mobility;
- Improved public transport systems;
- Increased contribution to job creation; and
- Increased contribution to environmental protection.

In addition, SANRAL has drafted a long-term vision Horizon 2010 - Strategic Vision of the South African National Roads Agency Limited for the year 2010, which was published in 2002. Based on this long-term vision, it publishes a Declaration of Intent covering SANRAL's aspirations for the next three years. This declaration is updated each year through the annual budget submitted to Parliament; the funds are received from the National Treasury and as circumstances may dictate.

C1.2 INTRODUCTION TO SANRAL

Strategy

SANRAL's business is guided by the following vision, mission, and goals and objectives²⁵.

Vision	To be recognized as a world leader in the provision of a superior primary road network in Southern Africa
Mission	As the custodian of a public good, SANRAL is committed to the advancement of the Southern African community through: <ul style="list-style-type: none"> • a highly motivated and professional team; • state-of-the-art technology; • proficient service providers; and • promoting the 'user pay' principle
Goals and Objectives	<ul style="list-style-type: none"> • The management of a national road network ensuring best value for money • To continuously improve the efficiency of business practices • To maintain market confidence • To carry out Government's targeted programs to better the life of all citizens • Safer roads for all • To work in cooperative partnership with road users, transport providers, relevant authorities and the private sector • To be a good employer managing SANRAL's business efficiently and effectively and to seek continuous improvement • To achieve international best practices • To encourage innovation in knowledge and practice • To research, discover and excel • To market SANRAL's solutions to road users

²⁵ SANRAL (2010). *Vision & Mission*. http://www.nra.co.za/live/content.php?Category_ID=127.

Structure

As can be seen in Figure C2, SANRAL has a strong regional focus, with a head office being responsible for a limited set of core services.

Figure C2: Organizational structure of SANRAL²⁶

Road Infrastructure Network Managed by SANRAL

SANRAL is responsible for the national roads in South Africa, some 16,175 km of which a little over 3,000 km is tolled (Table C1). Over the past 10 years, SANRAL has incorporated certain provincial roads identified to be of long-term strategic importance into the national network. The total length of the strategic network amounts to about 20,000 km of roads. It is envisaged that the remaining strategic provincial roads will be incorporated and be under SANRAL jurisdiction by 2013.

Table C1: Length of tolled and non-tolled roads owned by SANRAL²⁷

Design	Length of roads in category (km)
Toll, BOT	1,290
Toll, state	1,835
Non-toll	13,050
Total	16,175

C1.3 MAIN TASKS OF SANRAL

SANRAL has been entrusted with the task of developing and maintaining the national road network. To that end the following three tasks are identified:

- Planning and programming;
- Execution of works and delivery of services; and
- Audit and control.

Within the scope of these tasks, there is a further distinction between technically oriented and financial or budgetary activities.

²⁶ www.nra.co.za/live/content.php?Category_ID=23

²⁷ SANRAL (2010). *Statistics*. www.nra.co.za/live/content.php?Category_ID=35

Planning and Programming

In order to maximize the return on investment, SANRAL has developed a medium- and long-term asset management strategy. This strategy aims at holistic management and clear funding prioritization. The responsibility for planning is placed at different levels within SANRAL. The higher echelons are responsible for strategic planning, leaving the further detailing of these plans to the lower echelons of the organization. Figure C3 shows this distribution of responsibilities.

Figure C3: Planning responsibilities within SANRAL²⁸

In the planning process, the following inputs are used to develop road works plans:

- Historical performance;
- Materials availability;
- Availability of funds/financial constraints;
- Traffic volume and composition;
- Road classification and adjacent land use; and
- Environment.

However, planning is driven by the impact of the quality of the road network experienced by its users. Financial constraints are incorporated through a Medium Term Expenditure Framework (MTEF), at least where it concerns non-toll roads. This MTEF details future allocations of available tax-based revenues and thus describes budget constraints.

Execution of Works and Delivery of Services

Road Network Management

SANRAL employs an integrated approach to road network management. This approach is based on regular data collection to monitor the performance of the network. Maintenance and rehabilitation requirements are determined based on this approach. Supporting road network management are several smaller management programs. There is a united focus on delivering results that can be monitored through KPIs and the integrated approach to the network and individual stretches/projects which form part of the network. The overview presented in Figure C4 shows the overall performance management framework of SANRAL.

²⁸ SANRAL (2009). *Declaration of Intent 2009 – 2012*.

Figure C4: Overall performance management system for SANRAL's road network²⁹

Asset Management

The approach to asset management, as employed by SANRAL, affects the full range of activities where it concerns extensions of its asset base, for example, planning, engineering, finance, programming, and actual works. Figure C5 describes this approach.

Figure C5: Road asset management system³⁰

²⁹ SANRAL (2008). *Annual report*. Reg. No. 1998/009584/06.

³⁰ SANRAL (2009). *Declaration of Intent 2009 – 2012*.

Safety Management

Road Safety Management System

SANRAL has an integrated approach to road safety, consisting of the “three Es of road safety”: Engineering, Education, and traffic law Enforcement. To support this integrated approach, SANRAL has adopted an internationally recognized Road Safety Management System (RSMS), consisting of four layers³¹:

- Safety strategy;
- Tactical planning;
- Operational planning; and
- Safety performance indicators.

The RSMS (Figure C6) is used to manage road safety efficiently and effectively; it allows for a structured implementation approach to road safety and is an integrated part of the overall management system employed by SANRAL. RSMS allows SANRAL to constantly take road safety into account in all phases of their projects.

Safety in Road Concessions

Concessionaires (BOT operators) operate and maintain several toll roads. Each is contractually required to undertake road safety initiatives with communities alongside and surrounding their areas of operation. Such activities could be related to, but are not limited to, awareness campaigns.

³¹ SANRAL (2006). *Annual report*. Reg. No. 1998/009584/06.

³² SANRAL (2009). *Declaration of Intent 2009 – 2012*. Page 46. Reg. No. 1998/009584/06.

Environmental Management

SANRAL activities have been certified to comply with the ISO 14001 Environmental Management System (EMP). SANRAL uses a general EMP and a site-specific EMP in all its contracts. During the planning phase, the preliminary investigations include environmental screening and environmental impact assessments. The higher goal of this is to contribute to the realization of the Millennium Development Goal of ensuring environmental sustainability

The Environment Conservation Act, 1989 (Act No. 73 of 1989) regulates the control of activities which may have a detrimental effect on the environment. The environmental impact assessment (EIA) process is aimed at assessing the potential environmental impacts and the proposed mitigation measures, and to ensure that all issues, concerns and queries raised are fully documented and carried forward in the EIA process. Interested and/or affected parties can contribute and express their views in the process. The term 'environment' in the context of an EIA refers to both biophysical and socioeconomic issues.

Private Sector Participation and Procurement

Procurement

SANRAL has a management and financial focus with all service delivery outsourced which includes design, inspection, surveying, supervision, overload control (apart from law enforcement), traffic and safety management, and the carrying out of maintenance and construction works.

Procurement opportunities at SANRAL are published publicly, including the opportunities for small contractors. The publication is the start of a process of prequalification, adjudication and, finally, award of the contract. Social objectives in opportunities relate to the use of local labor and women, thereby complying with the principles of the Reconstruction and Development Program. Project Liaison Committees, the main contractor and members of the local community, are established for each of these projects to oversee the socioeconomic requirements.

SANRAL's procurement policy is aimed at stimulating growth of SMEs, promoting Black Economic Empowerment and training for historically disadvantaged South Africans. In particular for routine road maintenance, SANRAL revisited its model contract resulting in a situation where:

- The main contractor operates as a management contractor while 80 percent of the work or more carried out by small contractors; the main contractor is responsible for training and mentoring the subcontractors;
- Consulting engineers are hired for the design and supervision in addition to a SANRAL road manager;
- Low entry barriers for small contractors are maintained; and
- There is no exploitation of small contractors.

Public Private Partnerships

Over the past 10 years, SANRAL has successfully completed three PPPs: N4 Maputo Development Corridor, the N3 Toll Road, and the N4 Platinum Highway. These toll roads are financed and maintained by private sector companies. No funding is undertaken by SANRAL for these projects and they do not form part of the balance sheet. SANRAL applies, inter alia, the BOT model or variants thereof. The concessionaire is required to fund, design, build, operate and maintain the road for the duration of the concession period. In this instance, the toll revenue accrues to the account of the concessionaire. The Model Concession Agreement (over a 30-year term) sets out a precise and regulatory framework to reduce uncertainties, and apportion risks and rewards between public and private partners. As a result, additional resources are available from the fiscus for non-toll roads and ensure an economically balanced national road network. Furthermore, it allows for the integration of new technologies such as IMS and Intelligent Transport System in the pursuit of reducing congestion, and increased road safety.

At the end of the concession period, the asset reverts to SANRAL free of charge in the specified condition.

Audit and Control

Audits

An Audit and Risk Committee regularly (four times annually) checks whether internal controls and systems have been put in place and whether these controls have functioned effectively. It checks, amongst others, whether identified risks are being addressed and have been disclosed.

The Audit and Risk Committee audits SANRAL on several aspects, including:

- Reduction of the organization's risks to an acceptable level;
- Meeting the business objectives of the organization;
- Ensuring the organization's assets are adequately safeguarded; and
- Ensuring that the transactions undertaken are recorded in the organization's records.

The actual internal audit function was outsourced to an independent service provider (three-year contract). The Audit Committee approves an Internal Audit Charter which stipulates the terms of reference for internal audit. The members of the Audit Committee are rotated at regular intervals to encourage greater auditor independence.

Other committees ensure a further transparent and good management of SANRAL, for example:

- A human resource and remuneration committee;
- A contracts committee; and
- An assets and liabilities committee.

The primary tool of communication on SANRAL's (corporate) performance is the Annual Report. It provides an independently audited, objective report on financial and management performance. The Auditor-General of the country is SANRAL's external auditor.

Risk Management

SANRAL's Board of Directors is ultimately responsible and accountable for risk management within SANRAL, following the Public Finance Management Act of 1999.

A dedicated management team (Risk Management Cluster) has the delegated responsibility to design, implement and monitor the process of enterprise-wide risk management.

The main tool used is the risk register. All employees are encouraged to express their concerns relating to the strategic and operational risks faced by the company. The risks are analyzed and published in the risk register along with mitigating measures which is available to all staff. It forms a basis for the Internal Audit Coverage Plan.

Fraud and Corruption

SANRAL has a zero tolerance policy to all malpractices that affect efficient delivery of its services and infrastructure. Several initiatives support this policy. SANRAL, for example, subscribes to a fraud hotline service, operated by an independent service provider. This subscription works both proactively and reactively in the sense that it prevents staff noncompliance and identifies and punishes those that do not comply with SANRAL's standards.

Further, there is an annual governance road show that is held for the benefit of all the employees at the corporate and regional offices. This road show is dedicated to preventing fraud.

Independent corporate governance reviews have been conducted regularly (biannually)

during the past years. These have, without exception, confirmed SANRAL's clean reputation. Over the course of time, performance in terms of the integrity of governance practice has improved. To achieve this, internal controls at all levels and compliance with legislation and relevant standards has been actively pursued and promoted.

C1.4 HUMAN RESOURCE MANAGEMENT, KNOWLEDGE DEVELOPMENT AND RESEARCH

SANRAL has some 180 employees and has put in place a number of initiatives to support their development in view of its own tasks.

It is worth noting that SANRAL was recognized as one of the best employers in South Africa in 2009-10. Quoted reasons for this success are the attention to the development and training of its employees as well as its HIV/AIDS campaign. Moreover, SANRAL aims to achieve equality within the company by hiring both black and white employees, men and women, and offering positions for physically challenged persons.

SANRAL supports the development of its staff as well as potential future staff. Staff is encouraged to develop skills in fields related to SANRAL's activities, for example, community and economic development, project management, marketing and communication, and general administration. Yearly training programs are being provided based on a continuous assessment of training needs.

SANRAL has built partnerships with the Gordon Institute of Business Science, the University of Stellenbosch and the Engineering Council of South Africa to provide training programs to management staff, tailored to SANRAL's needs. Some 10 percent of staff can attend yearly training courses.

Also SANRAL developed a Construction Management Program for all SANRAL employees who are involved in the management of construction delivery. This prestigious program is a collaborative effort between the Universities of Stellenbosch, Witwatersrand, Cape Town and Pretoria. Every year SANRAL appoints a number of project engineers/managers to attend the program.

Furthermore, SANRAL grants bursaries for private study to staff who indicate an interest in further study. In recent years, more than 50 percent of the total of 180 staff attended annual training sessions. Training areas included engineering, financial management, employee relations, human resources management tools, environmental assessment, computer training, occupational safety, and motivational skills.

Finally, financial support can be offered to students, provided these studies are relevant to the agency. Examples of such studies are civil, electronic, and transport engineering.

Based on the 2009 annual report, SANRAL spent some R 2.8 million on internal staff training courses.

Research and Knowledge Development

SANRAL runs a road infrastructure research program that aims to improve efficiency in road design and delivery. The focus is on developing economically favorable road techniques, including the development of performance-related design systems and improved building materials, but social science studies are also funded, for example, research on the current practice in HIV/AIDS education and training on SANRAL projects.

SANRAL ensures that sustainable long-term research funding is available through its own funds and through partnerships with other road authorities and the industry. An advisory committee on road infrastructure research has been established to provide strategic direction and input on the best use of limited research funding, and for enhanced communication between industry participants. SANRAL will continue to fund various

research projects, including:

- Accelerated pavement testing (rigid and flexible pavements);
- Updation and revision of technical methods for highways and technical recommendations for highway documentation;
- Cost-effective ways to upgrade gravel roads;
- Large tri-axle testing; and
- Pedestrian safety management.

C1.5 FINANCING ROAD INFRASTRUCTURE

SANRAL uses two mechanisms for financing its assets. The SANRAL Act (1998) stipulates a distinct separation in the funding of its operations:

- **Non-toll roads** are funded by government allocations, and are not allowed to borrow or be cross-subsidized from toll road income, and vice versa; and
- **Toll operations** can be divided into two types – those funded by SANRAL itself and operated on its behalf, and roads concessioned to private parties under PPPs.

Toll Operations

Financing

Revenues from toll and funds raised on the capital market are used to finance toll roads.

SANRAL is backed by a government guarantee of US\$820 million.

All borrowings are repaid by the toll fees collected from users in accordance with the “user pays” principle that SANRAL has employed since 1998. Consequently, the cost of borrowing has an impact on road-user costs. The initial toll tariff is generally determined in the range of 80 percent of the user benefit provided by the toll route. These tariffs are adjusted annually for the consumer price index, approved by the Minister of Transport and gazetted.

The volatility of construction, maintenance and operations costs has led SANRAL to examine other toll-tariff structures. SANRAL is considering shifting from a user-benefit model to a cost-plus model. The user-benefit model is based on savings in distance, vehicle operating costs and time, for which a percentage in the range of 80 percent is used to determine tariffs with the result that benefits to the road user exceeds the value of the tariff. The cost-plus model is based on the actual cost of providing the toll road, a margin of which is used to determine the tariff.

Two principles have been introduced by SANRAL into its toll road business portfolio: Comprehensive Toll Road Operations and Maintenance (CTROM) contracts and the Concessioning of Toll Roads.

Roads under CTROM contracts are operated and maintained by the private sector in accordance with set performance criteria. The latter broadly provide that the operators take responsibility for the complete range of operations and maintenance of the toll route in return for a publicly tendered fee. CTROM contracts are now firmly established, and plaza and routine road maintenance operations are running well on the toll road network.

Also PPPs have been introduced where the road is concessioned for a period of time (30 years) to a concessionaire that is responsible for the funding, maintenance and operation, including future upgrades of the road. Each road is a self-contained financial entity, run in terms of conventional company law (including paying tax as any company). An overall concession price is negotiated that could include some form of shadow tolling agreement.

C1.6 PERFORMANCE INDICATORS

SANRAL monitors its activities and performance through a set of performance indicators.

C2 NEW ZEALAND

C.2.1 INTRODUCTION TO ROADS IN NEW ZEALAND

Classification and Management of Roads

New Zealand has a widespread road infrastructure, consisting of state highways and local rural and urban roads.

State highways are administered by NZTA. The state highway network provides a strategic road link between districts and regions. A state highway is a road that is declared to be a state highway under section 11 of the National Roads Act 1953 (section 60 of the Government Rounding Powers Act 1989) or section 103 of the Land Transport Management Act 2003. Currently, their length is around 11,000 km.

Local roads are those which are primarily administered by 'territorial authorities' (city and district councils) and make up about 80,000 km (88 percent) of all New Zealand's roads.

Territorial authorities, along with regional councils and unitary authorities – collectively known as 'local government' – play a key role in the planning and funding system. Local government is responsible for developing, maintaining and operating the large network of local roads and for delivering public transport infrastructure and services.

Regional transport committees are appointed by the regional councils and unitary authorities. They consist of members of various government and public interest representatives. Regional transport committees prepare regional land transport strategies and regional land transport programs and provide advice as requested by the regional council. These programs are prepared every three years to set out a region's land transport activities.

Length and Utilization of Road Network

The road network is central to New Zealand's transport system, and carries, on average, 70 percent of New Zealand's freight movement and 84 percent of commuting trips.

Car ownership in New Zealand is one of the highest in the world. Vehicle ownership exceeds 700 vehicles per 1,000 people and is rising. According to a 2006 survey, approximately 82 percent of the people in New Zealand owns a car³³.

Government Policy for the Road Sector

New Zealand has adopted an integrated planning strategy.

Land Transport Management Act 2003

The Land Transport Management Act (LTMA) 2003 is the main statute for New Zealand's land transport planning and funding system. It requires government (transport) policies to contribute to the aim of achieving an affordable, integrated, safe, responsive and sustainable land transport system, and provides the five transport objectives (see New Zealand Transport Strategy overleaf) guiding the New Zealand Transport Strategy and the Government Policy Statement on Land Transport Funding.

Regional councils, city/district councils, NZTA, and other approved organizations under the Act can receive funds from the National Land Transport Fund for land transport activities they deliver, such as the construction and maintenance of state highways, local roads and public transport services.

³³TVNZ (2010). *NZ third in World car ownership*. <http://tvnz.co.nz/content/1107190/425823.html>.

New Zealand Transport Strategy

The New Zealand Transport Strategy (NZTS) 2008 sets out the transport vision, objectives and targets as well as the strategic approach to delivering each transport objective over the next 30 years. It is updated every six years.

NZTS provides direction for all parts of the transport sector. The government's vision for transport in 2040 is that:

'People and freight in New Zealand have access to an affordable, integrated, safe, responsive and sustainable transport system.'

That vision is supported by five transport objectives:

- Ensuring environmental sustainability;
- Assisting economic development;
- Assisting safety and personal security;
- Improving access and mobility; and
- Protecting and promoting public health.

Linked to these objectives are a set of envisaged transport sector outcomes that provide a more detailed description of these objectives with defined targets for the transport sector. This is the first time specific targets have been set for the entire sector. The targets are a basis for measuring progress and many contribute to more than one objective.

The NZTS sets the strategic context for the development of Government Policy Statements (GPSs).

Government Policy Statement on Land Transport Funding

The GPS on Land Transport Funding is issued by the Minister of Transport and sets out the government's priorities for expenditure from the National Land Transport Fund over the next 10 years. The GPS is updated every three years; the current GPS covers the financial period 2009-10 to 2014-15 and provides indicative figures from 2015-19. It sets out how funding is allocated between activities such as road safety policing, state highways, local roads and public transport.

LTMA 2003 requires the NZTA to give effect to the GPS, amongst others, by:

- Adopting an NLTP with the intention that the outcomes achieved or supported by the funding allocations within the NLTP are consistent with the impacts, set out in this GPS, the government wishes to achieve;
- Requiring the NZTA evaluates that Regional Land Transport Programs (RLTPs) are also aligned with the GPS; and
- The total funds allocated and spent are consistent with the expenditure framework provided in the GPS.

National and Regional Land Transport Programs

NZTA develops an NLTP every three years to give effect to the GPS on land transport funding. The NLTP sets out the activities that address the transport priorities of the GPS using the funding provided in the GPS for different activities. The following activities must be included in NLTP:

- An RLTP (including programs concerning state highways) and proposed for funding from the National Land Transport Fund; or
- An activity that will be delivered nationally.

Regional councils develop RLTPs to set out their highest priorities for land transport over the short to longer term -- up to 30 years. Strategies must include an implementation and funding plan that guides the achievement of the council's priorities and targets.

National State Highway Strategy

The national state highway strategy takes a 30-year view and provides a link between the NZTS, LTMA (and other legislation) and NZTA's (formerly Transit) plans and policies and the state highway forecast. It also addresses the need for integration between state highway planning and local land use as well as multi-modal transport planning. It recognizes that highways must respond to differing and, sometimes conflicting, expectations. It sets out NZTA's eight principles for planning, building, operating and managing the state highway network

C.2.2 INTRODUCTION TO NEW ZEALAND TRANSPORT AGENCY

NZTA was created in August 2008 as a Crown entity by merging Transit New Zealand (the highway agency) and Land Transport New Zealand (the funding and planning agency). Its role and composition of the Board are set out in legislation. It has statutory independent decision-making responsibilities with respect to the allocation and investment of the National Land Transport Fund. The agency is responsible for the day-to-day management of land transport related activities. NZTA is thus not only responsible for roads but for all transport infrastructure. NZTA has the following responsibilities:

- Promote an affordable, integrated, safe, responsive and sustainable land transport system;
- Investigate and review accidents and incidents involving transport on land;
- Manage the state highway system, including planning, funding, design, supervision, construction and maintenance operations;
- Manage funding of the land transport system, including auditing the performance of organizations receiving land transport funding;
- Manage regulatory requirements for transport on land;
- Cooperate with, provide advice and assist any government agency or local government agency at the minister's request;
- Provide the minister with advice on its functions;
- Carry out any other land transport functions directed by the minister under the Crown Entities Act 2004; and
- Carry out the functions required by LTMA or under any other Act.

The ministry negotiates an annual performance agreement with NZTA on behalf of the minister; monitors the entities' performance against that agreement; and recommends appointments to the entities' governing bodies.

Strategy

Vision	Building a better transport system for New Zealanders
Mission	Our primary purpose is to promote an affordable, integrated, safe, responsive and sustainable land transport system
Goals and Objectives	<ul style="list-style-type: none"> • Improving customer service and reduce compliance costs • Planning for and delivering roads of national significance • Improving the road safety system • Improving the efficiency of freight movement • Improving the effectiveness of public transport

Structure

NZTA's structure (Figure C7) includes six business groups:

- The Strategy and Performance Group works to promote government themes, objectives and strategies and supports the Board's preparation of the NLTA;
- The Regional Partnerships and Planning Group works in partnership with local government on regional planning and programming processes;
- The Highways and Network Operations Group is responsible for building, maintaining and operating the state highway network;

- The Access and Use Group provides services such as driver licenses and motor vehicle registration, and also regulates transport operators;
- The Organizational Support Group develops and implements corporate strategies and policies to support overall organizational performance; and
- The People and Capability Group is responsible for implementing the human resources policy of NZTA.

The Minister of Transport can appoint up to eight members to the Board. The Board meets monthly from February to December. It is responsible for making independent decisions on allocating and investing funds from the National Land Transport Fund. The Board publishes its planned program of investment annually in the NLTA.

Figure C7: Structure of NZTA

Road Infrastructure Network Managed by NZTA

NZTA is primarily responsible for roughly 11,000 km of state highways. Around half of the 36 million vehicle km travelled each year are driven on these state highways³⁴. The quality of the network is good: in 2008 only 1.5 percent of the road network had a roughness exceeding the threshold level for that type of road.

C.2.3 MAIN TASKS OF NZTA

NZTA is responsible for tasks that range “from ensuring the government’s national priorities are achieved, through to working with local councils in planning for their land transport needs. From building and maintaining state highways to supporting the use of buses and trains. From licensing cars to providing cycleways and walkways for use.” These tasks are set out in a comprehensive framework of legislation and performance is constantly monitored³⁵.

In order to fulfill these tasks, three underlying competencies are identified:

- Planning and programming;
- Execution of works; and
- Audit and control.

Within these three competencies, a distinction can be made between the technical activities and financial or budget related activities.

Planning and Programming

NZTA has an integrated planning strategy (Figure C8). In this approach, different aspects of planning are considered jointly, and activities of different organizations relevant to transport infrastructure are also incorporated. The strategy aims to provide a clearly defined framework to guide the work with planning partners and local authorities at all levels – national, regional and local. NZTA has its own policy standards and guidelines on transport planning and land use planning as well as the integration of both approaches.

Figure C8: Integrated planning strategy used by NZTA

³⁴ NZTA (2010). <http://www.nzta.govt.nz/about/who-and-what/what-we-do/role-priorities.html>.

³⁵ NZTA (2010). *What we do*. <http://www.nzta.govt.nz/about/who-and-what/what-we-do/index.html>.

The National State Highway Strategy envisages the development of the road network over the next 30 years. The strategy is a touchstone for NTZA's work, influencing all its operating policies and plans and the funding proposals in the state highway works program.

Also within the National Infrastructure Plan, the government has recognized seven roads of national significance that require special focus for investment to reduce congestion and improve safety.

The goals and objectives of the strategy are adopted in the NLTP which provides the initial framework for implementing actions that lead to the realization of the strategy and to advance the delivery of the identified roads of national significance.

The NZTA also publishes a three-yearly Statement of Intent which defines immediate outcomes and five strategic priorities for the next three years based on the strategic directions.

The State Highway Asset Management Plan (SHAMP)³⁶ links the requirements of these policy and strategy documents to the actual road assets. SHAMP provides a national view based on a review cycle relating to the three-year NLTP, and draws from the perspectives of a number of other detailed plans, including the National State Highway Strategy, Investment and Revenue Strategy and State Highway Classification System (Figure C9). The plans join together to set out how the network should develop over the next 30 years.

Figure C9: Strategic context of SHAMP

³⁶ NZTA (2010). *Interim State Highway Asset Management Plan*. July 2010. ISBN: 978-0-478-36438-5.

SHAMP has a national 'operational business' focus and currently sits beside the Capital Plan. While the Capital Plan is developed and agreed at the political level, the asset stewardship expectations of SHAMP are recognized in capital program decision-making and project development. These two plans are closely coordinated and together define the state highway business and management of state highway assets.

This is a key strategic management document for the NZTA that translates the long and short term goals and objectives into a plan to manage the assets, identifies the actual service required and expenditure that goes with it.

Execution of Works and Services

Network management aims at enabling efficient movement of people and goods across New Zealand's infrastructure. NZTA does this through management of its assets and the ways people use the network.

Asset Management

NZTA uses a strategic and systematic process of operating, maintaining, upgrading and expanding physical assets to manage the effectiveness of transportation assets throughout their lifecycle.

This approach results in the publication of SHAMP which covers all infrastructure assets that together form the state highway network, including road carriageways, bridges and structures, drainage features, traffic facilities, lighting, Intelligent Transport System assets, landscaping and miscellaneous assets within the road reserve.

The asset management cycle shown in Figure C10 summarizes how asset-related demands are assessed and met. SHAMP is structured to address each stage of this cycle and describe key improvement initiatives and targets for the next three years with respect to the asset and associated management practice.

Operating the Network³⁷

To efficiently operate the network, several tools are used:

- A central traffic management center enabling NZTA to optimize the use of the network

³⁷ NZTA (2010). *Operating our network*. <http://www.nzta.govt.nz/network/operating/index.html>.

- in real time, for example, by using various technologies such as access quota regulation; and
- Travel time surveys monitor the user experience of the network and identify areas where congestion occurs and interventions are required; this is a medium to long-term tool.

*Maintenance*³⁸

In 2008-09, approximately US\$360 million was spent on maintaining and operating New Zealand's road network. The maintenance in New Zealand is organized through Network Management Areas.

Licensing and Registration

Under a contract with the Ministry of Transport, NZTA is responsible for operating the motor vehicle register and delivering motor vehicle registration and licensing services. Under this contract, NZTA is also responsible for developing standards and procedures, and monitoring and auditing transport service operators and agent service delivery (including driver testing, license administration, and vehicle certification services).

Overload and Access Control

NZTA holds responsibility for the preparation of the New Zealand's Police's Road Policing Program, for recommendation to the Minister of Transport. The program is entrusted with land transport enforcement activities delivered by New Zealand Police. Activities include speed control, drinking and/or drugged driver control, and commercial vehicle investigation, overload control and road user charges enforcement.

Traffic Management

NZTA has state highway traffic management centers in Auckland, Wellington and Christchurch that use a network of remote cameras and sensors to monitor traffic flow and respond to conditions or to incidents that are halting or slowing traffic.

The Traffic Management Unit is a business unit within the Highways and Network Operations Group that operates in partnership with the local authorities in Auckland to deliver traffic management services and maintain related assets in the Auckland region. It operates under a Memorandum of Understanding entered into by the Territorial Local Authorities and NZTA.

Safety Management

Safety is an important consideration of operating the network, and two notions are relevant in this respect:

- A Safe System Approach is used for a more holistic view of road safety and putting the focus on the road system design. In such an approach, the principle is acceptance of the fact that users will make mistakes and the system should forgive such mistakes; and
- The State Highway Safety Plan provides guidelines on how engineering can make roads safer.

NZTA provides ongoing assistance and advice for road controlling authorities in the development and implementation of their safety management systems.

The application of safety management systems throughout New Zealand was one of the key aspects of the government's Road Safety to 2010 strategy. The strategy aims to achieve a greater degree of consistency in how the national road environment appears to road users. The national Safer Journeys strategy promotes a safe systems approach to road safety.

Environmental Management

The Resource Management Act 1991 is New Zealand's primary environmental act and establishes a framework within which the environmental effects of NZTA's activities

³⁸ NZTA (2010). *Maintenance and management*. <http://www.nzta.govt.nz/network/maintaining/management/index.html>.

can be identified and dealt with. When developing, maintaining and operating transport infrastructure, both central and local governments are required to comply with the Act.

An environmental plan, outlining the strategic environmental vision of NZTA, describes specifications and standards for contractors undertaking road works.

Private Sector Participation and Procurement

External Linkages

Part of the work is outsourced to private sector suppliers on a competitive basis to ensure that the investments achieve the best value for money. Those consultants and contractors are mostly used in maintaining the network. In New Zealand too, PPPs are used for the funding of new projects³⁹.

NZTA maintains close working relationships with:

- Transport operators and the general public, who use the network;
- Transport committees, regional councils and territorial local authorities, which are responsible for implementing transport projects and other activities funded through NLTP;
- Suppliers, including contractors and consultants;
- NZ Police which provides a range of road policing services; and
- The Ministry of Transport which is responsible for developing the strategic transport policy and monitoring performance of state entities in the sector.

Procurement and Tendering

To obtain best value for money, all state highway improvement, maintenance and operations works are outsourced. Around 200 contracts are tendered on a competitive basis yearly. NZTA uses a range of delivery models, which are based on international best practice.

Within the Network Management Areas, the following four contract types to procure maintenance and operations are used:

- *Performance-specified contracts*, which are awarded for 10 years to single suppliers who are responsible for providing all services. Most resurfacing work is done through performance-specified contracts;
- *Hybrid contracts* which are awarded for five years and involve consultants and contractors working in a partnering arrangement to deliver services;
- *Traditional contracts* which are awarded for varying terms and involve consultants managing suppliers who deliver physical works on the highway network, similar to traditional road engineering construction contracts. Most pavement strengthening works and bridge repairs are managed through this type of contract; and
- *Alliances*, arrangements in which groups of organizations combine in partnership and work together.

Audit and Control

Audits

Both central and local governments have a responsibility to contribute to economic, social and environmental outcomes. Monitoring enables action to improve these outcomes. The monitoring activities of NZTA involve:

- The performance of the land transport system;
- Auditing organizations that receive public funds for developing, operating and maintaining land transport infrastructure and services;
- Checking that appropriate procurement procedures are used for projects involving public funds;
- Checking that good practices are being used when activities are implemented;
- Monitoring the costs associated with publicly funded activities; and
- Carrying out post implementation reviews to check that the forecast results are being delivered.

³⁹ NZTA (2010). <http://www.nzta.govt.nz/network/operating/efficiently/toll-roads.html>.

NZTA has a legal obligation to audit organizations that are funded through NLTP. The audits typically take place in a cycle of two to four years. The audit program is published in May, in time for the upcoming NLTP year which starts in July. The categories of audit are:

- Post implementation reviews which examine the effectiveness of completed projects;
- Procedural audits covering financial accountability, procurement, passenger transport;
- Road infrastructure safety assessments which assess safety on the road network;
- Technical reviews covering road network assets; and
- Theme audits which examine topics affecting all organizations.

In addition, the Auditor-General performs yearly audits focusing on the financial position of NZTA.

Risk Management

Over the course of the last few years, NZTA has continued to advance the implementation of risk management, building on the work of the predecessor organizations. The implementation supports decision-making and provides confidence in achieving the objectives. An NZTA risk management approach has been adopted and a strategic risk profile and plan initiated with the Senior Leadership Team, with oversight from the Board Audit, Risk and Assurance Committee. Risk management is actively encouraged at all management tiers and for all critical activities performed by or for NZTA.

C.2.4 HUMAN RESOURCE MANAGEMENT, KNOWLEDGE DEVELOPMENT AND RESEARCH

As already mentioned earlier, NZTA consists of six business groups. In total some 1,400 employees work for NZTA (Figure C11)⁴⁰.

Figure C11: Overview of staff in different organizational units of NZTA

⁴⁰NZTA (2009). *Organizational profile*. March 2010.

In 2009, the training expenditures were approximately US\$1.1 million⁴¹ for technical and nontechnical skills development.

Internal assessment and on-the-job training opportunities play a key role in assisting staff to gain contact center, business administration and other qualifications. NZTA has a Professional Development Partner Program in partnership with the Institution of Professional Engineers New Zealand to offer a Graduate Development Program.

NZTA has a strong focus on developing leadership within the organization. It has adopted a new leadership competency framework for all leadership roles. The expectations from its leaders are clearly articulated in the position descriptions for each role and are measured specifically through the performance management system that the organization has adopted for all positions.

Research and Knowledge Development

NZTA is responsible for the administration of a contestable land transport research fund. It is intended that NZTA's research program will set out a rolling three-year plan of research activity to align itself with the new three-year NLTP funding cycle.

The research program⁴² consists mostly of industry-generated research, with a small amount of directed research. Industry-generated research comprises research projects developed by researchers in conjunction with end users, and funding is awarded on a contestable basis via a two-stage application process.

Directed research comprises research projects that NZTA has commissioned and requested researchers to submit a proposal on. This 'top-down' approach is designed to fill the gaps not covered by industry-generated research.

The NZTA uses a Research Reference Group to advise it on research proposals. The Group is chaired by NZTA and comprises representatives of key stakeholder groups with appropriate expertise.

The stakeholder groups include representatives from various government levels, policing, consultants, contractors, universities and research institutes, road users, and other public interest groups.

C.2.5 FINANCING ROAD INFRASTRUCTURE

Financing

The National Land Transport Fund is a primary source of funding for New Zealand's land transport system, and funds all types of roads, road policing program, public transport and other activities such as research and sector training. Figure C12 describes the overall funding allocation.

A fuel excise duty, charges on diesel and heavy vehicles (road user charges), and vehicle licensing and registration fees are the main sources of funds. Fuel excise and road user charges revenue are fully dedicated to the National Land Transport Fund for allocation to land transport activities. In addition, more funding comes directly from the government and local authorities as well as developers' contributions in some cases.

New Zealand has toll bridges only since 2009 when NGTR opened on State Highway 1, north of Auckland. To bring forward construction, NZTA borrowed against future revenue to be generated through toll collection.

⁴¹ NZTA (2009). *Annual report*. Page: 69.

⁴² NZTA (2008), NZ Transport Agency's Approach to Research 2009–12, GPS activity class: sector research, October 2008.

Figure C12: NZTA in the context of the land transport funding system

Tolling was made possible by LTMA under which:

- Tolls may be imposed for a new road or an existing road that is substantially improved;
- Toll revenues may only be used for the road on which they were levied;
- There must be a 'feasible' alternative un-tolled route;
- Tolls must be ended when the road's original costs are paid for; and
- The toll road must be shown to have social, safety, environmental and economic benefits after study and public outreach.

C.2.6 PERFORMANCE INDICATORS

In its Statement of Intent for 2009-12, NZTA introduced several performance indicators on different desired outcomes (Table C2)⁴³.

Table C2: Performance indicators used by NTZA

	Actual 2007-08	Target 2008-09	Actual 2008-09
Regulatory implementation and enforcement			
Management of the funding allocation system			
Delivery of an agreed roads development program that meets the quality and timeliness requirements in the agreement for roads development services	Yes	Yes	Yes
Delivery of an agreed audit program meeting agreed standards and covering:	Yes	Yes	Yes
<ul style="list-style-type: none"> • regulatory compliance of rail license holders and licensed transport operators, e.g., passenger services (including taxis) and goods services • agent service delivery (including driver testing, license administration, and vehicle certification services) 			
Audits of regulatory compliance and agent service delivery carried out according to agreed standards	Yes	Yes	Yes
Licensing activities			
Operation of the Transport Registry Center carried out according to agreed standards	New	≥90%	94%
Road user charges collection, investigation and enforcement			
Identified evasion revenue recovered	69.5%	>30%	65.1%
Research and performance monitoring			
Delivery of a land transport annual achievement report	Yes	Yes	Yes
Delivery of a published research program	Yes	Yes	Yes
Management of the funding allocation system			
Development and delivery of an NLTP that meets all its statutory requirements	Yes	Yes	Yes
Delivery of a performance monitoring audit program	Yes	Yes	Yes
Preparation of the NZ Police's road policing program for recommendation to the Minister of Transport	Yes	Yes	Yes

⁴³ NZTA (2009). Statement of intent 2009 – 2012. July 2009. ISSN: 1173-2296.

Table C2: Performance indicators used by NTZA (continued)

	Actual 2007-08	Target 2008-09	Actual 2008-09
Regulatory implementation and enforcement			
All allocations consistent with the funding allocation process	Yes	Yes	Yes
New and improved infrastructure for state highways			
Development and delivery of a state highway improvement program that is consistent with performance guidelines	New	Yes	To be confirmed
All funds allocated to best eligible activities	New	Yes	Yes
Forecast benefits of completed projects accrue over time	Yes	Yes	Yes
Capital projects (block) completed within expected time and cost parameters	86%	<103%	93%
Large capital projects completed within expected:			
• budget to cost ratio	1.0	<1.0	0.95
• timeliness parameters	New	>96%	100%
Maintenance of state highways			
Development and delivery of a state highway renewal and maintenance program that is consistent with performance guidelines	New	Yes	To be confirmed
All funds allocated to best eligible activities	New	Yes	Yes
New and improved infrastructure for local roads			
Delivery of a local road improvement program that is consistent with performance guidelines	Yes	Yes	To be confirmed
All funds allocated to best eligible activities	New	100%	100%
Lessons learned %	<103%	93%	>95%
Large capital projects completed within expected:			
• budget to cost ratio	1.0	<1.0	
• timeliness parameters	New	>96%	

C 3 SWEDEN

C.3.1 INTRODUCTION TO ROADS IN SWEDEN

Classification of Roads and Management

The road network in Sweden can be classified into the following types:

- State roads (98,400 km);
- Municipal roads (41,00 km); and
- Private roads (284,000 km).

Until recently, Sweden maintained vertical separation of its modes of transportation. The Swedish Road Administration (SRA) was the lead agency for the country's road network. As SRA was responsible for national and regional roads, there are only a few other road infrastructure providers with whom it dealt. Although 90 percent of the almost 300 municipalities have responsibility over some of the roads in the most populated areas, this basically only concerns the municipalities of major cities. No counties or unincorporated areas exist in Sweden. Cooperation with local government is needed for traffic management and maintenance works, but SRA also built close contact with local governments on other issues. Using outreach, promotion of best practices, benchmarking, small grants to encourage behavior, and continuous dialog, SRA extended national government objectives into the practices, processes, and projects of the local municipalities. A substantial part of the Swedish road network is in private hands, largely in those of timber companies. The maintenance of some of these roads was being subsidized by SRA in view of their availability for public transport services.

Although, independently, the separate transport modes became quite developed, synergies were needed to bring the transport network as a whole to the next level. So, in April 2010, the Swedish Transport Administration (STA) was established to bring the management of road, rail and transport communications under one roof. The Swedish Rail and Road Administrations as well as the Swedish Institute for Transport and Communications Analysis have been phased out.

Restructuring of the transport network was aimed at strengthening the management of the transport system. Clarity was provided to roles, responsibilities and targeted outputs of the lead agency as well as the core group of ministries and agencies to be involved. Changes brought about to the three main supporting bodies for the road network are:

- The Swedish Transport Agency was established by Swedish Parliament to enforce public authority for the entire transport sector, taking over tasks of the Traffic Registry, Road Traffic Inspectorate and parts of SRA's public authority activities;
- Vägverket Produktion, engaged in construction, operation and maintenance of road and civil works projects, would become corporatized under the name Svevia; and
- SRA Consulting Services was planned to join Banverket Consulting as a state company called Vectura Consulting AB.

In addition, Transport Analysis is a separate entity responsible for the evaluation of facts, statistics and other data for the decision-making process.

Much of the documentation on road transport matters used in this report largely refers to SRA. For convenience, both the activities and performance as currently carried out by the STA or in the past by the SRA are described here.

Utilization of the Network

Over the past decade, road transport has continued to make up a large part of total transport mileage in Sweden. Passenger transport mileage by road was 79.4 percent in 1999, compared with 86.6 percent in 2008. Utilization here is measured by the number of km driven by vehicles on each type of road. While state roads comprised only about a

quarter of total roads in Sweden in 2008, they were subject to 70 percent of road usage. State roads include European highways, national roads and other country roads, all of which are managed by STA.

Quality of the Network

Of the total state road network in Sweden, a road length of 78,634 km (79.9 percent) is paved. Most unpaved roads in Sweden are found in the forest counties, and are given priority for maintenance.

Road quality in Sweden is defined by winter road conditions, road surface smoothness, and friction and bearing capacity restrictions. Roughness is measured quantitatively along a scale of the International Roughness Index (IRI) based on vehicle cost and travel speed of the road in question. New roads are assigned an IRI of 1, the poorest roads a 5. In Sweden, priority is given to those roads with IRI of more than 4. These are primarily found in forest counties with traffic volumes of below 2,000 vehicles per day. Rut depth is also measured, identifying those roads with ruts of more than 15 mm.

Government Policy for the Road Sector

The Ministry of Enterprise, Energy and Communications has sole responsibility for national transport policy. Once policy has been designed, and refined to include stakeholder feedback, it is the task of the Parliamentary Committee of Transport and Communications to give approval.

At the government level, transport policy objectives are set for periods of 10 years. SRA advised and drafted the outlines policy objectives, technical standards and performance indicators as stipulated by the Swedish Parliament. It formulated the Government's National Road Transport Plan for approval by the Riksdag (Swedish Parliament). It proposed policy objectives and actions to achieve these objectives, including the main road construction works for the coming years. The Riksdag gave approval for the most recent policy plan in March 2009.

The focal points of this plan are:

- Accessibility: good quality transport for everyone, gender-equality, and special attention to the disabled and children as transport users; and
- Health, Safety and Environment: reduce fatal and serious accidents by 50 percent from 2007 to 2020.

Safety on the roads is a major guiding theme in policy formalization. The Vision Zero project, started in 1997, laid the foundation for a strategic approach to road safety policy in Sweden. The global objective is to achieve a road system where no one is at risk of fatal or severe injury. From this foundation, interim goals are formulated at different institutional levels.

C.3.2 INTRODUCTION TO THE SWEDISH TRANSPORT ADMINISTRATION

Strategy

The STA has the task of ensuring a holistic approach to the transport system across all modes. This new approach should also achieve a clearer customer perspective, a stronger regional base, greater organizational efficiency and support for innovation and productivity in the construction industry. The STA has the following vision, mission and objectives:

Vision	<p>To make the good journey possible.</p> <ul style="list-style-type: none"> • Focusing on people, the STA creates opportunities for an efficient, safe and environmentally sound transport system for citizens as well as trade and industry.
Mission	<p>To develop the society of today, STA will:</p> <ul style="list-style-type: none"> • Provide increased public benefits, • Provide better value for money, • Make daily life easier for passengers, road-users, shipping and transport operating companies, • Provide conditions for making trade and industry more competitive, • Support the development of Sweden's regions. <p>To develop the society of the future, STA will:</p> <ul style="list-style-type: none"> • Actively participate in the development of society • Plan, manage and develop a socioeconomically effective and sustainable transport system, • Plan for all modes of transport.
Goals and Objectives	<ul style="list-style-type: none"> • To ensure an accessible transport system for everyone, with specific attention to regional and city level, as well as users with functional disabilities and unaccompanied children and young people. • To permit a high level of transport quality for individuals and the business community through design and function of the transport system. • To reduce fatalities and serious injuries by 2020, ensuring a safe use and operation of the road network. • To implement holistic infrastructure planning to preserve and develop ecological functions, cultural values and accessible outdoor leisure with minimal impact on the environment. • To contribute to achieving goals for regional development policy and counteract disadvantages of long transport distances. • To create and maintain a transport system designed to meet the requirements of both women and men.

Structure

Operations for road transport, as administered under the SRA, were categorized by region. The organizational structure included seven departments, each accountable to the Director-General at the Head Office. Internal audits were conducted directly under the Board of Directors by an independent traffic inspectorate.

Changes in the new organizational structure of STA are shown in Figure C13. Eight core units take care of business operations while the tasks specific to the transport network are divided into five different business areas. No distinction is made between individual modes in the organizational structure.

Road Infrastructure Network Managed by STA

Only the state roads are managed by the STA. Though this constitutes only 23 percent of the total road network, it handles 70 percent of Sweden's traffic volumes.

C.3.3 MAIN TASKS OF STA AND MEASURING PERFORMANCE

STA is responsible for all modes of transport within Sweden. Here the focus is on its tasks regarding the 98,400 km of state roads in the road network. The main tasks are grouped into:

- Planning and construction; and
- Operation and maintenance.

Planning and Programming

As indicated in the previous section on road sector policy, SRA had a lead role in determining policy objectives and overall planning.

FIGURE C13: ORGANIZATIONAL STRUCTURE OF STA (2010)

In its annual budget process and mid-term expenditure framework, the Swedish Parliament issues broad, qualitative goals to the transportation agency. It contains general discussion of issues on what Parliament wanted SRA to focus on in line with the overall national transport plan. SRA incorporated this periodic guidance into two key documents:

- SRA's Strategic Plan, which includes an intermediate horizon of 10 years and key priorities articulated by the government; and
- SRA's Operational Plan that has a one to three year focus explaining in more detail the activities to be undertaken in the upcoming budget cycle. The Operational Plan is influenced by government priorities, parliamentary direction, and the extensive public outreach process Sweden deploys.

Execution of Works and Delivery of Services

Asset Management

Road asset management in Sweden mainly consists of the national pavement management system. This system has been operational since the 1980s and provides the main input for formulating (strategic) planning documents. The current system contains several databases:

- The road inventory database consisting of data such as road category and number, AADT (per vehicle class), lanes, width, and so on;
- A pavement action database with information about performed actions, costs, reason for interference, contractor, and so on; and
- A pavement condition database containing data on a range of measured parameters, including rut depth, roughness (IRI, RMS wavelength), alignments, cross profile which are measured over 20 meter sections

It functions at three levels, namely strategic, programming and objective:

- The strategic level serves to support decisions on fund raising and allocation and monitoring of changes in the quality of the network;
- The programming serves to identify candidate projects; and
- The object level serves to support rehabilitation.

Network Development, Maintenance and Operations

Network development relates to the extension and upgrading of the road network. Whilst the SRA was responsible for the planning of these activities, all work (design, construction, supervision, and so on) was contracted out to the private sector.

Operation means short-term measures that mainly aim to keep a road open to traffic, such as winter road maintenance, cleaning road signs and maintaining rest areas. Maintenance relates to measures to ensure the durability of the road network. These include paving work, bridge repair, drainage work and replacing damaged road signs. These are also contracted to private sector companies (see also section on procurement). SRA had specified an operations and maintenance standard for the state road network, based on the planning parameters of the Government's National Road Transport Plan. This plan contains the requirement that the standard should be achieved at the lowest road maintenance costs. As a consequence, SRA asked its contractors to realize an increase in efficiency of 1 percent per year.

The SRA was responsible for the planning and management of the procurement process with the overall responsibility for the results. Since 2004, the SRA, in accordance with long-term plans, prioritized operation measures mainly at the expense of surfaced road maintenance. This means resources are primarily invested in operation and maintenance received the remaining resources.

Traffic Management

The Road Traffic Management unit in SRA monitored traffic, informed and assisted road users, and controlled and managed traffic based on knowledge of the current traffic situation. Traffic control centers and traffic information centers have been established during the last 10 years. The unit's nationwide traffic management centers act as hubs for its operations. The traffic management centers are manned round-the-clock every day of the year.

The traffic management centers are informed in the event of a traffic incident, in part quickly to solve the traffic situation, and also to forward accurate information to various target groups. Data are collected from a number of sources (emergency services, road users, cameras, detectors, contractors, weather stations) to control traffic (via electronic signs and barriers) and provide relevant information to police and emergency services and road users via mobile message boards, internet and mobile phone services, radio and television.

Licensing and Registration

Licensing and registration activities were previously not part of SRA activities but, in the new institutional set up under the STA, these have become the responsibility of STA. Its Traffic Registry Department administers and develops the road traffic registry, which supplies society with information about vehicles, driving licenses and commercial transport. The Road Traffic Department formulates regulations and grants permits while exercising supervision within the field of road transport over, for example, road traffic, vehicles, driving licenses and commercial transport.

Road Safety Management

STA is committed to following road safety guidelines set in Vision Zero. Vision Zero is based on three principles:

- Ethics: Human life and health are paramount and take priority over mobility and other objectives of the road traffic system;
- Responsibility: Providers and regulators of the road traffic system share responsibility with users; and
- Safety: Road traffic systems should take account of human fallibility and minimize both the opportunities for errors and the harm done when they occur.

Mechanisms for change: Providers and regulators must do their utmost to guarantee the safety of all citizens; they must cooperate with road users and all three must be ready to change to achieve safety.

Figure C14 sets out the framework of actions that are taken to execute the Vision Zero strategy.

The target to reduce fatalities to 270 in 2007 was not met. Nevertheless, the Swedish approach towards promoting road safety is generally recognized as one of the most successful in the world. Fatalities fell from more than 500 in the early 1990s to 397 in 2008, which is one of the lowest road fatality rates in the world.

Performance indicators were reviewed and stakeholder feedback was considered to arrive at new interim targets: a reduction of 50 percent in fatalities and 25 percent in serious injury between 2007 and 2020. Indicators of performance are further categorized by their impact on various road users and the differences between types of road network. Determinants of road safety are found in traffic and travel patterns (average car speeds, separation of roads, vehicle safety).

A particular and much praised approach adopted by SRA to improve road safety (and also to reduce emissions) was partnerships with a wide range of parties/stakeholders, including the trucking industry, car manufacturers, research institutes and government agencies with responsibilities in road safety. The SRA also played a key role in the establishment of the

Figure C14: Actions to be undertaken to promote road safety

European New Car Assessment Program and European Road Assessment Program, both of which monitor vehicle fleet and aspects of road network safety.

Environmental Management

Sustainability is a priority issue in Sweden and its transportation performance measurement system has embraced the reporting of environmental measures. SRA reported performance indicators for emissions (greenhouse gas, hydrocarbons and nitrous oxides), the number of persons exposed to excessive highway noise, and the impacts of highway runoff in water catchment areas.

Private Sector Participation and Procurement

Capital Investment Projects

Capital investment projects are procured almost entirely via the traditional method of Design Bid Build (DBB), with only some bridges using the Design-Build delivery method. It should be mentioned that Sweden is contemplating the DBFO possibility for some future projects. Contractor selection is based 75 percent on price and 25 percent on other criteria and uses a lump sum agreement.

Maintenance Contracts

In principle, the SRA has outsourced its maintenance activities entirely. Three former SRA profit centers have been converted into in-house companies that are now operating in direct competition with private contractors. With this conversion, the SRA is no longer doing any maintenance activities "by itself" (without being tendered). The government converted the in-house companies into independent companies in 2009.

Sweden has tested several maintenance contracts or models and different functions for granting contracts. In general, the maintenance contracts have output-specific criteria, in which the SRA stipulated the technical requirements of the tasks that have to be executed by the contractor. However, these output-specific contracts are being replaced increasingly by outcome-specific contracts in which the contractor is responsible for achieving the tasks given a specified outcome. The newly accepted model for tendering maintenance contracts appears to be for eight years (six + two years) with a lump sum contract. Contractor selection is based 90 percent on price and 10 percent on other criteria.

Audit and Control

The annual report features an extensive analysis of performance, laying out new targets and highlighting the areas of improvement. In addition, the SRA reported the outcome of audits and various impact assessments of road use on children, and male and female users.

Internal audits are administered directly under the Board of Directors by an independent traffic inspectorate. With about 16 staff members, the Traffic Inspectorate operates with a large degree of independence on a separate annual budget, program and decision-making hierarchy. Its aim is to ensure that authorities, municipalities and companies use a systematic working method to prevent road accidents that lead to fatalities and serious injuries. Their quality control is based on the ISO9001:2000. Upon signing the Annual Report, the Board of Directors must conduct a written evaluation of management and control during the year, in accordance with Ordinance (2007:603), effective January 1, 2008.

C.3.4 HUMAN RESOURCE MANAGEMENT, KNOWLEDGE DEVELOPMENT AND RESEARCH

Human Resource Management and Knowledge Development

The STA reported having approximately 6,500 employees in 2010, after the organizational changes. The SRA in 2008 employed 6,593 permanent staff members.

The provision of skills at SRA was governed by a management system that covers policies, guidelines, processes, checklists and templates necessary for personnel support and development. Conscious skill planning was done with special attention to management and leadership, the impact of the work environment, and gender and diversity. A corporate

university based on e-learning on the internet was created. All managers were assessed based on their performance and future potential. Strategic focus areas for long-term improvement included efficiency of resources, attractiveness as an employer, training programs and professionalism.

Regular follow-ups were conducted to check effectiveness of these activities. Improvement has been observed in lower sickness absence levels and in employment satisfaction. In the annual Staff Satisfaction Index, employees rated all areas of the SRA above 60 units since 2006. Also worth noting is that the response rate of the survey continued to rise from an already high level.

Research

SRA funded several Research, Development and Demonstration (RD&D) activities at the cost of SEK 279 million (some US\$40 million). Many of its research activities were conducted within cooperative partnerships with other research institutions. All research activities were aligned with the overall objectives of the road transport sector as set in the national transport plan.

SRA developed a joint strategy for transport-related RD&D in cooperation with Banverket, the Swedish energy agency, and Swedish Governmental Agency for Innovation Systems in 2004. The aim was to secure access to important RD&D environments and to prepare for a joint European RD&D implementation and procurement market. In this strategy, roles and responsibility were divided amongst the authorities to generate stable and long-term planning conditions for important RD&D environments in Sweden. The SRA established six centers:

- Virtual RD&D Center for Bridges and Tunnels;
- Center for a Sustainable Transport System;
- Transport Telematics R&D Group Sweden;
- Swedish Intermodal Transport Research Center;
- Road Technology; and
- Road Planning and Design.

The aim of establishing these virtual RD&D centers was to strengthen international competitiveness.

C3.5 FINANCING ROAD INFRASTRUCTURE

Road network development is financed by a combination of budget allocations and loans taken by the National Debt Office on the capital market. SRA did not operate independently on the capital market. Operational expenses were financed from annual budget allocations. After the election in 2006, the new government opened up the possibility for PPP projects.

Performance Indicators

The STA ensures that transport policy goals of planning and construction, and operation and maintenance are translated into practice at lower levels of the transport industry. Figure C15 shows the framework for assessing the overall performance of STA towards achieving the national policy objectives.

SRA demonstrates a robust performance management system that cascades national transportation performance goals throughout the agency. SRA expressed six broad goals to enable the transportation department to achieve the overall national objectives for transportation:

- An accessible transportation system;
- High transportation quality;
- Safe traffic;
- Good environment;
- Gender equality; and
- Efficient operations.

Figure C15: Parameters and degree of SRA specific goal achievement, 2008

From those, SRA negotiated a comprehensive set of 18 objectives supported by more than 300 individual performance measures it developed for both internal and external reporting. Hard targets for those measures were negotiated between the agency and the ministry.

SRA used a Balanced Scorecard tracking process at all levels of the organization. The results from each unit feed back into the organizational scorecard. All major aspects of the agency's Balanced Scorecard reporting are also tracked on the agency intranet, which includes voluminous reports on agency performance. SRA also had invested in intense leadership training with small groups of managers to ensure they understand the performance management framework of the organization.

Table C3 provides an overview of indicators used by SRA placed within the proposed framework of indicators of this study.

Table C3: Indicators used by SRA

Activities and Services	Outcome	Performance Indicators	Output	Target Indicators
Speed limit system (introduced in 2003) applied to more roads.	Improved travel time	Average and changes in travel time (also measuring congestion during peak hours).	9% of road users have shorter travel times to regional centers and main cities; 13% have longer travel times.	Improved digital road direction signs.
Adapting bus stops to meet usability standards for functionally disabled.	Increased access for various road users.	Number and proportion of functionally disabled that travel (without and with some difficulty)	The road network is accessible to 85% of functionally disabled (70% without difficulty, 15% with some difficulty).	Reduced congestion through better traffic control. Adaptation of 100% of bus stops to meet standards for functionally disabled.
Separation of school routes for children from motor traffic-		Number and proportion of children travelling unaccompanied and the opinion of parents on their safety.	4,000 children have benefited from improved school routes.	Trial speed limits along school routes.
Pedestrian and cycle paths and crossings and traffic calming measures.		Number and proportion of pedestrians, cyclists and bus passengers for short distances (<5km).	Increased opportunities for foot, cycle and bus travel.	
Transport quality				
Priority was given to operation over road surface maintenance.	Road users ranked the condition of paved roads more poorly than in 2007.	Road condition is measured by the length of paved road as a ratio to total state roads and by road user ranking.	Proportion of rough roads remained unchanged, rutted roads increased slightly.	Increased efficiency in operations and maintenance
SRA uses a bridge and tunnel management system (BaTMan) with focus on operational, strategic and tactical management.	Lack of focus on maintenance and repair and rehabilitation in short- and long-term planning has meant deterioration of roads and bridges and high replacement costs.	Surface quality is measured against the IRI: rut depth, road safety and runoff in winter months.		
Improvement of road bearing capacity of the roads in North Sweden.		Bearing capacity is indicated as a percentage of roads with capacity (class 1) and by reduction in bearing capacity during the spring thaw.	Reductions in bearing capacity restrictions. Fewer roads with low bearing capacity.	
Road safety				
Reduction of speed limits, adapted gradually to road conditions.		Number of fatalities and serious injuries recorded by: type of road network type of road user	12 fewer fatalities and 44 fewer serious injuries since 2007. 140 measures for child safety along school routes. 4,000 children benefited.	Application of the new speed limit system to more roads. Installation of new road safety cameras.
Traffic flow separation to avoid frontal collision.		User behavior (seatbelt, helmet, alcohol as applicable)	53% of vehicles now drive on separated roads with speed limits of 80 kmph or higher. This concerns 4,000 km of road.	Continued construction of separated roads, pedestrian and cycle paths, as well as tunnels and passageways for pedestrians and cyclists.
Further involvement of stakeholders.				

Table C3: Indicators used by SRA (continued)

Activities and Services	Outcome	Performance Indicators	Output	Target Indicators
Encouraging competitiveness of safety among car manufacturers		Proportion of separated roads	2,700 km of roads are equipped with automated speed surveillance	Vehicle testing under the European crash test program, Euro NCAP and additional training requirements before getting a driving license. Such training includes risk assessment and specific skills such as driving under slippery road conditions
Supplement police reporting with health care figures from emergency hospitals.		Proportion of roads with speed surveillance		
Reduction of speed limits, adapted gradually to road conditions.				
Environment				
Stricter exhaust requirements for light and heavy vehicles and scrapping older vehicles with high emission values.		Emissions of carbon dioxide, nitrogen oxide, sulphur and hydrocarbon and particulate matter along the state road network.	Carbon emissions were reduced by 72,000 tons (12,000 tons above the target).	Further research to investigate the sources and determinants of air pollution from vehicles and general road use. Any measures to be taken will be coordinated at the local, regional, national and international levels.
Training in eco-driving.		Societal cost (in terms of health) to indicate impact of 'indoor level' of experienced noise.	Air quality improved in urban areas (thought to be a direct result of tougher emission requirements for vehicles).	
Influence on consumers to make a better choice of vehicle and mode of transport.		Number of consumers with protected water supply.		

C4 AUSTRALIA (NEW SOUTH WALES)

C4.1 INTRODUCTION TO ROADS IN AUSTRALIA

Australian Road Infrastructure and Utilization

Classification and Management of Roads

The road network in Australia consists of several types of roads, classified according to their functionality and management. These are:

- National Highways managed by the transport departments of the states, for example, in New South Wales (NSW), this is the New South Wales Roads and Traffic Authority;
- Arterial Roads managed by the transport departments of the responsible state; and
- Local Roads managed by local authorities.

Length of the Network

The main spheres of government manage approximately 811,000 km of road network. The road lengths for different types of roads are given in Table C4. For this case study, focus will be on the Road and Traffic Authority of New South Wales, which contains some 4,260 km of the national network.

Table C4: Overview of the Australian road infrastructure network

	Length (km)	Lane Length (km)
National highway	18,620	41,507
Rural arterial	94,854	188,419
Urban arterial	12,398	37,364
Rural local	600,725	1,196,654
Urban local	84,845	169,502
Total	811,442	1,633,446

Utilization

Car ownership in Australia was about 70 percent in 2006 . Figure C16 shows the traffic volume growth since 1990⁴⁴.

Government Policy for the Road Sector

The Department of Infrastructure, Transport, Regional Development and Local Government works to achieve three outcomes specified by the Australian Government⁴⁵:

- Outcome 1: Assisting the Government to provide, evaluate, plan and invest in infrastructure across industry sectors;
- Outcome 2: Fostering an efficient, sustainable, competitive, safe and secure transport system; and
- Outcome 3: Assisting regions and local government to develop and manage their futures.

⁴⁴ Scoop World (2010). Americans lead the world in car ownership. <http://www.scoop.co.nz/stories/WO0705/Soo103.htm>.

⁴⁵ Annual report Ministry of Transport.

Figure C16: Change in traffic volume and in average speed during rush hours⁴⁶

National

Like India, Australia has a governance system that consists of a federal and state governments, which have a high level of autonomy. Both have their own transport departments. For the former, this is the Department of Infrastructure, Transport, Regional Development and Local Government, for the latter it is, in the case of NSW, the Transport Department.

The Department of Infrastructure, Transport, Regional Development and Local Government provides strategic policy advice to the transport sector. Australia's Infrastructure Act 2008 created an agency called Infrastructure Australia under the Department of Infrastructure, Transport, Regional Development, and Local Government (Australia wide). The primary function of Infrastructure Australia is to advise all relevant government organizations, including the national and state governments, as well as investors and owners of infrastructure on a variety of matters related to infrastructure. These include transportation needs, prioritization of projects, regulatory and price issues, infrastructure user needs, and mechanisms for infrastructure financing. In addition, it has authority to perform audits on the adequacy, capacity, and condition of Australia's infrastructure.

The Nation Building Program is the Australian Government's policy for planning and development of Australia's land transport infrastructure. Through the Nation Building Program, the Australian Government is investing in road and rail infrastructure over the six year period 2008-2014. The investments are delivered through a range of road and rail programs and projects across the National Land Transport Network. The Nation Building Program includes plans for development, maintenance and road safety measures (black spot recovery) on the national network as well as projects not situated on the national network.

⁴⁶ RTA (2009). *Annual report*. Page 32.

The Nation Building Program has the following core components relating to roads:

- A defined national network of important road infrastructure links that is part of the National Land Transport Network; a single integrated network of land transport linkages of strategic national importance, which is funded by federal, state and territory governments;
- The National Land Transport Plan which outlines the Government's approach to improving and integrating the national network and the investments it will make;
- A single funding regime for the national network (details are set out under national projects); and
- Funding for local and regional transport improvements including:
 - Roads to recovery
 - Black spot treatment

Under Australia's Constitution, the states and territories are largely responsible for regulating road transport. Each state and territory has traditionally made its own laws in such areas as road rules, vehicle standards and driver licensing. The National Road Transport Commission (NRTC) was established in 1991 to develop uniform arrangements for vehicle regulation and operation, national arrangements for the carriage of dangerous goods, and consistent charging principles for vehicle registration.

State Level

Since Australia has a federal government, states and territories have considerable freedom to develop and implement their own policies. Consequently, all states and territories have a department involved in transport and road infrastructure. This report covers the state of NSW and the situation with regards to highway administration there.

Transport NSW is the lead agency of the NSW transport portfolio, with primary responsibility for:

- Transport coordination;
- Transport policy and planning;
- Transport services; and
- Transport infrastructure.

One of the agencies within the NSW transport portfolio is the Roads and Traffic Authority.

The New South Wales State Plan is its overall long-term policy and development plan addressing eight strategic pillars ranging from better transport and liveable cities to supporting business and jobs, and better education. It sets 34 policy priorities across all policy fields, which have been allocated across NSW agencies and each lead agency works with key partners to achieve priorities. All lead agencies are required to deliver, measure and report on their success.

Under the direction of the State Plan, the RTA is the lead agency for safer roads and a partner agency for:

- Cleaner air and progress on greenhouse gas reductions;
- Improving the efficiency of the road network;
- Increasing share of peak hour journeys on a safe and reliable public transport system;
- Maintaining and investing in infrastructure; and
- Increased customer satisfaction with government services.

In addition, the RTA has a key role in contributing to the implementation of other state government plans, priorities and strategies, including the State Infrastructure Strategy.

The State Infrastructure Strategy is a rolling 10-year plan for infrastructure projects to support service delivery. First published in 2006, it is updated every two years. The State

Infrastructure Strategy is further specified in local action plans⁴⁷. State departments, like the Transport Department, use this State Plan as input for their corporate plan for 2010-14. Special plans and programs further specify this corporate plan.

The RTA has a corporate plan that covers the period 2008-12. This corporate plan is directly linked to the State Plan and is in line with the plans from the Transport Department. The projects that are planned for the coming year are specified in the yearly budget.

C4.2 INTRODUCTION TO NSW ROADS AND TRAFFIC AUTHORITY

Strategy

The business of RTA is guided by its vision and mission as described below.

Vision	A safe, sustainable and efficient road transport system
Mission	Delivery of the best transport outcomes, balancing the needs of public transport passengers, cyclists, pedestrians, motorists and commercial operators by: <ul style="list-style-type: none"> • Maintaining a strong customer focus • Working with innovation, openness and integrity • Achieving value for money • Being environmentally responsible
Responsibilities	<ul style="list-style-type: none"> • Manage the road network to reduce travel times • Provide road capacity and maintenance solutions • Test and license drivers and register and inspect vehicles • Improve road safety
Goals and Objectives	<p>The three general goals are:</p> <ul style="list-style-type: none"> • meeting the community's expectations of providing safe and efficient roads, and professional licensing and vehicle services • continue to develop our network, our people and our organization • assess our performance, define and redefine our goals and be willing to change <p>For the period 2008- 12, the more concrete goals or objectives are:</p> <ul style="list-style-type: none"> • Reduce the road toll as directed by government under the State Plan • With other parts of government, do more to address congestion • Improve customer service, especially by increasing electronic transactions • Meet appropriate road maintenance standards • Deliver freight productivity solutions meeting the needs of our growing economy • Pursue business opportunities to improve services and generate investment for the road network • Ensure the highest environmental standards are met and continue our push for cleaner vehicles • Invest in our workforce to help our people achieve their own career goals

Structure RTA

The RTA is made up of seven directorates supported by the Environment branch, Governance branch and General Counsel that work closely together to achieve results in all key areas. These business areas and their key tasks are outlined in Figure C17.

Road Infrastructure Network Managed by RTA

The RTA was established on January 16, 1989, under the Transport Administration Act 1988 through an amalgamation of the former Department of Main Roads, Department of Motor Transport and the Traffic Authority. RTA manages the roads and traffic system of NSW, in conjunction with several other state and local government agencies (such as the State Transit Authority and the Transport Safety Regulator).

⁴⁷ New South Wales Transport department (2010). *Investing in a better future*. March 2010. ISBN: 978-0-7313-3428-5.

Figure C17: Organization structure of RTA

The road network that the RTA manages includes:

- 17,981 km of RTA-managed state roads, of which 4,269 km are national road network (AusLink Network) for which the Australian Government provides a funding contribution, and 163 km of privately-funded toll roads;
- 2,946 km of regional and local roads in the unincorporated area of NSW;
- 5,051 bridges, major culverts and 22 tunnels; and
- 3,751 traffic signals and other traffic facilities, systems and corridor assets.

It provides financial assistance to local councils to manage 18,474 km of regional roads and also provides some funding and support to the 144,750 km of council-managed local access roads which are funded by local ratepayers and federal road assistance grants.

Quality of the Network

Performance indicators are used to monitor the condition of the infrastructure. Ride quality and pavement durability are most frequently used. In 2009, the ride quality for about 90 percent of the state roads was classified as good, fair for about 6 percent and poor for about 4 percent. The pavement durability of the state roads was good for about 77 percent of the roads, fair for about 15 percent of the roads and poor for the remaining 8 percent. The indicators are frequently updated and published.

In terms of use of the network, amongst others, changes in urban traffic volume (rising between 0.5-1 percent annually in the past few years) and travel speed on seven major routes (slightly decreasing) are monitored, as well as road safety and environment indicators.

C4.3 MAIN TASKS OF RTA

RTA has the following tasks for the period 2008-12⁴⁸:

- Managing Sydney roads;
- Managing rural and regional roads; and
- Transporting freight.

In order to fulfill these tasks, three underlying competencies can be utilized:

- Planning and programming;
- Execution of works; and
- Audit and control.

⁴⁸ RTA (2007). 2008 to 2012; RTA corporate plan.

Planning and Programming

RTA has established an integrated network planning approach such that safety, traffic and asset performance are considered together. This helps to identify those parts of the network that are performing well and other areas requiring more detailed investigation and possibly works.

The planning procedures are subject to guidelines. The statutory planning guidelines, as defined by RTA in 1999⁴⁹, ensure a smooth planning process. A significant part of the planning process is subject to environmental restrictions, as laid down in the Environmental Planning and Assessment Act. It contains provisions relating to community involvement, environmental protection and dispute resolution. RTA guidelines⁵⁰ are aimed at ensuring that all statutory town planning and EIA requirements are part of the project planning, implementation, operation and maintenance.

Moreover, the RTA has a number of corporate level strategic plans that describe expectations for and commitments to the future. These are linked to the more general long-term policies of the state government. The agency has a 10-year Transportation Asset Management (TAM) strategy, supported by three year Results and Services Plans (RSP), Corporate Plan, and Budget Plans. Figure C18 shows the different plans and their relations.

The TAM strategy describes the strategic management of physical assets to best support the delivery of RTA's services. The TAM approach requires RTA to assess what assets are needed to support successful service delivery. It then calls for detailed plans for the management of those assets which are to be acquired, maintained or disposed of.

The Service Delivery Strategy defines what services RTA will deliver to achieve the outcomes defined by the government with a three-year outlook. The Strategy identifies and measures the outcomes to allow the agency to balance the requirements for services against available resources. The RSP is a contract-like document that is not publicly disclosed. It operates in parallel with TAM with the intention to keep the shorter-term political budgeting process linked to long-term highway asset management needs.

Figure C18: Different levels of planning and budgeting

⁴⁹ RTA (1999). *Statutory planning guidelines*.

⁵⁰ RTA (2008). *Network and corridor planning: practice notes*.

Two budget papers are published annually outlining the expenditures foreseen for the following period. One paper covers the coming year, whilst the others have a multi-annual outlook. The budget papers are eventually a part of the federal budget.

The RTA corporate plan, a blueprint, sets the priorities and milestones for the short term. The blueprint agenda does not cover all aspects of the RTA's operations, but clearly demonstrates areas of focus (including improving maintenance, safety, services career development, commercial activities, and so on).

Collectively, these plans help to drive and coordinate the allocation and management of resources and activities of the organization in order to deliver its intended outcomes. These are drafted in consultation with the Government of NSW and are in line with NSW Treasury's requirements, and link agency funding with achievement of government priorities through demonstrating agency results and services and represent a considered approach to planning and asset management.

Execution of Works and Services

Maintenance

RTA spends about US\$820 million⁵¹ yearly on maintenance. These expenditures reduce vehicle operating costs through improved ride quality. Moreover, maintenance is aimed at improving road safety. The department's infrastructure maintenance program establishes priorities on a risk basis to protect assets and safeguard motorists. A strategic risk-based approach to maintenance determines minimum levels of service and ensures consistent requirements for identifying and rectifying defects. In allocating maintenance funds, the RTA gives priority to programs which:

- Achieve the best overall return on maintenance investment;
- Provide community-wide benefits from reduced accidents and travel time; and
- Reduce environmental impacts of road infrastructure maintenance.

One of the challenges indicated in the Auditor-General's report (2006) was lack of standards for road maintenance at that time. Since then, these standards have been developed and are under permanent review.

Licensing and Registration

RTA is responsible for providing registration and licensing services. During 2008-09, the RTA provided registration and licensing services in relation to 4.72 million license holders and 5.33 million registered vehicles in NSW. RTA conducts regular internal and external audits on motor registry operations, other service delivery outlets, and back offices supporting licensing and registration.

Access and Overload Control

RTA funds the Enhanced Enforcement Program, which is a partnership of the RTA and the NSW Police to support police operations targeting speeding, drink driving, fatigue, heavy vehicle safety, and seatbelt and helmet use.

The RTA runs seven Heavy Vehicle Checking Stations, a key part of the RTA's heavy vehicle enforcement program. The RTA has equipped its busiest stations with automated screening lanes, Weigh-in-Motion, Safe-T-Cam and Truckscan technology to perform compliance checks for gross mass, group axle mass, vehicle height, speed, tailgating, registration status, defect status, valid vehicle configuration for road type, Safe-T-Cam checks for driver fatigue, and non-compliance history checks.

⁵¹ RTA (2007). 2008 to 2012: RTA corporate plan

Also the responsibility for the Red Light Camera Program was handed to the RTA from the NSW Police Force.

Road Network Management

RTA uses advanced technologies for an efficient management of traffic, both structurally and for planned and unplanned events. To this end, RTA encourages people to reduce car use and maximizes the capacity of its existing road network. The Travel Demand Management unit assists by implementing initiatives that support the use of alternate modes active, for example, walking, cycling and public transport. It also seeks to reduce single occupants using a vehicle by promoting car pooling and teleworking.

Operationally, traffic management takes place round the clock. The systems used for traffic management also provide an input to longer term decision making procedures. These activities are centralized in one Transport Management Center for the entire state.

Also RTA's Transport Management Center is responsible for responding to and clearing incidents such as crashes and breakdowns.

Safety Management

RTA recently established the NSW Center for Road Safety, fully operational since January 1, 2008. As a Directorate, it reports directly to the Chief Executive. The center focuses on vehicle improvements, behavioral change, safer road environments and improvements in technology. A range of performance measures is used to monitor progress against the State Plan target of "reducing road fatalities to 0.7 per 100 million vehicle km travelled by 2016"⁵².

RTA is implementing a 'Safe System Partnership' approach. This approach recognizes that human error is inevitable and requires roads and roadside environments that are forgiving of driver error, an approach effectively used in Sweden, the UK and the Netherlands. The approach focuses on the way different elements of the road system interact with each other to reduce impact on road trauma. RTA uses modeling software to identify safety risks, based on a variety of inputs, including accident analysis.

Finally, the Local Government Road Safety Program is a partnership between the RTA, NSW councils and the Motor Accidents Authority. RTA and the councils fund the positions of road safety officers employed across NSW councils to develop and implement educational and behavioral road safety projects within their local communities.

Environmental Management

Environmental management is an important aspect of RTA's decision-making and activities, as expressed in its Corporate Plan:

Valuing the Environment - Striking a balance between the natural and built environment and provides direction to ensure that the environmental impact of our activities is managed well.

A variety of tools is used to realize this; examples are EIAs, environmental audits and inspections of construction sites. These are bound by guidelines. RTA engages specialist ecologists to assist in its work and environmental awareness training is provided to RTA staff and council workers.

Instruments deployed by RTA are an Environmental Management System and public reporting. In its Annual Report and Annual Environment Report, several environmental KPIs are published.

⁵² RTA (2007). 2008 to 2012: RTA corporate plan

The New South Wales Roadside Environmental Committee was formed in 1994 to encourage better management of the roadside environment. It currently comprises 11 organizations, including RTA.

Private Sector Participation and Procurement

Procurement

RTA uses tender procedures to contract private parties for works and services. The procedure's current opportunities are published on the RTA website. Activities that are outsourced include, amongst others:

- Maintenance works (routine and periodic);
- Design and construction;
- Site supervision;
- Traffic Management Center activities; and
- Supply, implementation and maintenance of data center processing and communication services, surveying (travel time).

Public Private Partnerships

PPP activity in Australia has occurred primarily as a state affair. Like other states (Victoria and Queensland), NSW has used highway PPP arrangements almost exclusively to facilitate the development of major segments of highway infrastructure in its major urban center, Sydney.

In NSW, RTA has oversight of its highway system as well as its PPP program. It entered into its first arrangement via an unsolicited proposal for the Sydney Harbor Tunnel, which opened for service in August 1992. Subsequently, the state has used seven additional PPP contracts to complete the orbital (perimeter or ring road) around Sydney, the most recent being three projects delivered in a five-year period: the Cross City Tunnel, the M7 Motorway, and the Lane Cove Tunnel.

While governments may propose either a lump sum or an annual contribution to the contractor in their request for proposals, respondents (bidders) have typically proposed the elimination or reduction of these contributions by government in their proposals. In NSW, the government now typically specifies the initial toll rate and uses indexing techniques for escalation.

The agreements with the concession holders have been signed to finance, design, construct, operate and maintain the infrastructure. Under the terms of the Project Deeds, 'ownership' of the infrastructure will revert to the RTA either after a fixed period or, in some cases, on the earlier achievement of specified financial returns outlined in the Deed or a fixed period from the commencement date. The periods vary per contract between 25 and 48 years.

Audit and Control

Financial Audits

An independent assessment of risks and compliance with policies, procedures and Treasury guidelines is conducted yearly. An ongoing review and update of financial policies and procedures is conducted to ensure that RTA has a robust financial management framework to mitigate risk and, eventually, to support RTA's statutory and business requirements. In 2008-09, one of the initiatives was to develop a dedicated management system to track the financial aspects of PPPs over the full span of each contract.

The Auditor-General yearly performs an independent audit and provides recommendations for improvement. The 2006 audit recognized that "the RTA has done well to recognize the importance of measuring structural condition and progressively improve its methods to do so"⁵³.

⁵³ RTA (2009). *Annual report*.

Apart from external audits, internal procedures and committees are the first 'line of defense'. The Audit and Risk Committee is established to:

- Review performance of internal and external audit functions;
- Review internal control frameworks;
- Approve external reporting of financial information;
- Review compliance with audit and finance related policies, procedures, central agency requirements and applicable laws and regulations;
- Review risk management practices and the corporate risk profile;
- Review compliance with risk management standards, policies, central agency requirements, relevant legislation and regulations; and
- Approve internal and external risk reporting.

Fraud and Corruption

The RTA Statement of Business Ethics aims to reduce the susceptibility of RTA officers to fraudulent behavior in dealing with the private sector. The Statement provides guidelines on what can be expected from RTA and explains the mutual obligations, roles and constraints of all parties. The Statement is in line with the NSW Government guidelines for procurement, contracting and market testing⁵⁴ and must be adopted by the suppliers of RTA. The Statement is actively promoted amongst staff members.

RTA performs a range of (preventive) internal corruption and fraud investigations, as well as investigations into maladministration, and serious and substantial waste. When relevant, cases are forwarded to RTA senior management for action, including possible disciplinary action.

General Risk Management

RTA acknowledges that it faces considerable challenges and risks in managing its road network and large bridges. The NSW TAM Manual describes risk management as a systematic process to identify risks that may impact the organization's objectives, analyze their consequences, and develop ongoing measures to treat them. To offset these risks, RTA aims to accurately forecast the structural conditions and their subsequent remaining useful life. Specific attention is paid to high-volume roads which are at high risk of eventual failure, but the concept of risk management permeates the RTA in virtually every decision area of the organization. These are scheduled for rehabilitation or replacement on a priority basis.

Next to the audit and risk committee, there are several other committees effectively working to manage risks. These committees are the:

- Executive Road Safety Management Committee oversees a coordinated approach to road safety. Its main task is to review the RTA's development and implementation of road safety strategy, policy and initiatives;
- Legislation Committee has the task to oversee the RTA's legislative program;
- Environmental Committee, reviews the RTA's environmental performance and provide strategic direction on programs and policies;
- Commercial Development Committee steers the RTA's commercial strategy and ensures the appropriate and coordinated identification, prioritization and delivery of commercial opportunities; and
- Finance Strategy Committee has a governance role, including the direction of funding allocations and review of program and resource budget performance

C4.4 HUMAN RESOURCE MANAGEMENT, KNOWLEDGE DEVELOPMENT AND RESEARCH

RTA currently employs some 7,100 full time equivalent staff across NSW. About 52 percent are employed at the head office. The composition of the staff is diverse, consisting of engineers, officers with economic and business administration training, as well as other staff, for example, motor registry officers, ecologists.

⁵⁴ RTA (2010). <http://www.rta.nsw.gov.au/doingbusinesswithus/businessethics/index.html>.

The RTA has strengthened its resources in critical areas such as workforce planning, professional, technical and leadership development, succession management and knowledge management. These moves are in response to increased global competition for scarce roads-based technical skills such as engineers, road designers and surveyors.

New staff entering the RTA workforce is assessed; this includes apprentices and trainees retained after the completion of their training in civil construction.

RTA supports on-the-job and formal training delivered by RTA's technical experts or external specialists, to maintain and grow its capability as a leading provider of technology, professional and technical skills in many areas including road safety, traffic management, road and bridge building and maintenance.

The RTA has established a Professional and Technical Skills Advisory Board made up of senior professionals to oversee and inform the skills development program. Staff development and training initiatives include:

- RTA careers development strategy;
- Developing workforce strategies for skill priorities in areas such as civil engineering, road designers, traffic and transport management and policy professionals;
- An RTA and Engineers Australia Development Program for engineers called e+; and
- RTA graduate, apprenticeship and traineeship programs.

The RTA has also implemented a Leadership Initiative and Framework as part of its workforce strategy in response to an ageing workforce and skills shortages in general management. An online assessment tool and coaching have been implemented to gather objective information and benchmark senior executives and managers.

During 2007-08, a total of 5,199 staff attended approved training courses numbering 3,322 at a cost of US\$2.25 million (excluding GST).

Research and Knowledge Development

The RTA has an R&D Program which identifies and develops innovative solutions to materials, products, equipment, systems and processes to achieve business improvements as well as range of research projects focusing on road safety. In 2008-09 more than US\$4 million was devoted to R&D activities throughout the RTA.

The RTA (co)funds and cooperates with a large number of research institutes on research topics that relate to all aspects covered by RTA. Amongst others, the RTA is currently working with the University of Technology to identify a suitable model for prediction of the future condition of bridges, whilst with the Australian Road Research Board, RTA works on the development of a pavement condition model.

Also RTA is co-funding several Australian Research Council Linkage Grant projects on road safety and pavement system. The RTA also contributes to R&D work by Austroads.

C4.5 FINANCING ROAD INFRASTRUCTURE

Financing

Table C5 shows the sources of income for the activities of the RTA. It shows that the state government provided the majority of funds, some US\$2.4 billion, almost 60 percent of RTA's funds.

Of the Australian Government contribution, 47 percent was destined towards the Auslink Network and non-network projects, 45 percent towards the Pacific Highway Accelerated Program, and the rest for the Australian Transport Safety Bureau Blackspot Program, King's

Table C5: RTA revenues 2008-09	
	US\$ million
RTA revenue	530
Consolidated fund allocation (state)	1,140
M4/M5 cash back (state)	105
Motor vehicle taxes (state)	1,170
Commonwealth	1,125
Total	4,070

Highway, Strategic Regional Programs and Interstate Registration Scheme.

Additional funding for the RTA roads program was achieved through RTA-sourced revenue of US\$530 million. The RTA generates revenue from, for example, number plate sales and sales of surplus properties⁵⁵. Also RTA operates a number of commercial businesses. These currently sell technology solutions to more than 93 cities in 21 countries around the world. These generate funding invested back into roads, road safety programs, and vehicle and licensing services.

Expenditures

The RTA Roads Program amounted to some US\$4.9 billion in 2009. Operating expenditure amounted to US\$2.8 billion, whereas capital expenditure reached some US\$2.1 billion.

When comparing actual with budgeted expenses and revenues, it becomes clear that the overall budget is fairly well met. However, individual budget items sometimes show considerable differences – this applies to both revenues and expenses (Table C6).

⁵⁵ RTA (2009). *Annual report*.

Table C6: Operating statement for 2008-09 (thousands US\$)			
	2009 Budget	2009 Actual	2008 Actual
Expenses excluding losses			
Operating Expenses			
– Employee related	437,209	487,125	459,979
– Other operating expenses	399,593	368,375	262,109
Maintenance	690,916	634,326	612,901
Depreciation and amortization	765,677	779,205	763,660
Grants and subsidies	91,214	31,513	256,573
Finance costs	51,066	93,614	102,085
<i>Total Expenses excluding losses</i>	<i>2,435,676</i>	<i>2,394,158</i>	<i>2,457,307</i>
Revenue			
Sales of goods and services	330,170	352,707	355,710
Investment revenue	12,221	9,155	14,016
Grants and contributions	19,808	43,556	173,775
Other revenue	144,098	102,883	95,203
Total Revenue	506,297	508,302	638,705
Gain on disposal	209	1,107	14,327
Other losses	(913)	(31,064)	(144,125)
<i>Net Cost of Services</i>	<i>1,930,083</i>	<i>1,915,813</i>	<i>1,948,400</i>
Government contributions			
Recurrent appropriation	1,452,700	1,441,195	1,297,576
Capital appropriation	1,957,978	1,957,945	1,625,877
Total government contributions	3,410,678	3,399,140	2,923,452
SURPLUS	1,480,595	1,483,327	975,052

C4.6 PERFORMANCE INDICATORS

RTA has a wide range of KPIs. Some concern the performance of the network, whereas others are more related to the organization itself (Table C7).

Table C7: RTA's KPIs

Activities and Services	Outcome	Performance Indicators	Output	Target Indicators
Road Maintenance & operation	<i>General</i> Travel speeds User satisfaction	<i>General</i> Travel speeds (km) on major corridors Level of satisfaction with services (% of customers) Maintenance & reconstruction expenditure per km of road	Travel speed (AM peak): 30 Travel speed (PM peak): 41 Satisfaction: 94% Expenditure: AU\$45,000	Travel speed (AM peak): 31 Travel speed (PM peak): 43 Satisfaction: > 90% Expenditure: AU\$47,000
	<i>Surface / pavements</i> Pavement durability	<i>Surface / pavements</i> Pavement durability (good) Pavement durability (poor)	<i>Surface / pavements</i> Good durability: 78. Poor durability: 8.5	<i>Surface / pavements</i> Good durability: 76.3 Poor durability: 8.7
	<i>Bridges</i> Availability	<i>Bridges</i> Number of bridges with limited legal usage due to structural condition	<i>Bridges</i> Number: 0	<i>Bridges</i> Number 0
Construction	<i>General</i> Benefit	<i>General</i> Benefits of development program	Benefits: AU\$4,612 million	Benefits: AU\$4,174 million
Upgrading/ rehabilitation/ improvements	-	-	-	-
Environment	Environmental compliance	Number of environmental penalty infringement notices issues to the RTA Number of non-compliances with environmental protection licenses held by the RTA	Notices: 0 Licenses: 1	Notices: 0 Licenses 0
Road Safety	<i>General</i> Improved transport safety Safer roads, road sides Safer road use Safer vehicles	<i>General</i> Fatalities (per vehicle-km) Fatalities (per 100,000 population)	Vehicle-km: 6.2 Population: 0.66	Vehicle-km: n/a Population: 0.78
Licensing and Regulation	<i>Regulation & enforcement</i> Compliance when involved in fatal accident	<i>Regulation & enforcement</i> <ul style="list-style-type: none"> • % of fatalities where speed was a factor • % of fatalities where illegal levels of alcohol was a factor • % vehicle occupant fatalities who were not wearing an available restraint • % of fatalities where driver fatigue was a factor 	<i>Regulation & enforcement</i> <ul style="list-style-type: none"> • Speed: 41% • Alcohol: 22% • Restraint: 19% • Fatigue: 16% 	<i>Regulation & enforcement</i> <ul style="list-style-type: none"> • Speed: n/a • Alcohol: n/a • Restraint: n/a • Fatigue: n/a
	<i>Licensing & registration</i> Heavy Vehicle Inspection Scheme	<i>Licensing & registration</i> Number of inspections % of defect free vehicles	<i>Licensing & registration</i> Number: 100,278 Defect free: 56%	<i>Licensing & registration</i> Number: 96,000 Defect free: 52%
Planning	Timely completion of works	Major works completed within planned duration or within 10% over planned duration	% of works: 92	% of works: 90
Community outreach	-	-	-	-
Human Resources	Workplace safety	Workplace injuries/100 full time equivalents Liability workplace claim costs	Injuries: 4.9 Claims: AU\$ 2.2 million	Injuries: 5.6 Claims: n/a

ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
API	Asset Preservation Index
BCE	Bridge Condition Exposure
BOT	Build Own and Transfer
BRTA	Bangladesh Road Transport Authority
BRTC	Bangladesh Road Transport Corporation
CAGR	Compound Annual Growth Rate
CEO	Chief Executive Officer
CPI	Cost Performance Index
CRN	Core Road Network
CTROM	Comprehensive Toll Road Operations and Maintenance
DBB	Design Bid Build
DBFO	Design Build Finance Operate
DBMOT	Design, Build, Maintain, Operate and Transfer
DBO	Design Build Operate
DFID	Department for International Development
DOLIDAR	Department of Local Infrastructure Development and Agricultural Roads
DOR	Department of Roads
EEI	Expenditure Efficiency Index
EIA	environmental impact assessment
EMP	Environmental Management System
FY	financial year
GDP	Gross Domestic Product
GIDB	Gujarat Infrastructure Development Board
GIS	geographic information system
GPS	Government Policy Statement
GSRDC	Gujarat State Road Development Corporation Ltd.
HCM	Highway Capacity Manual
HR	human resource
HTE	High Texture Exposure
IAS	Indian Administrative Service
IFC	Infrastructure Finance Corporation

IFI	international financial institution
IRC	Indian Roads Congress
IRI	International Roughness Index
IRR	Internal Rate of Return
IT	Information Technology
JE	Junior Engineer
JICA	Japan International Cooperation Agency
km	kilometer
km ²	square kilometer
KPI	Key Performance Indicator
LOS	level of service
LRE	Low Rut Exposure
LTMA	Land Transport Management Act
LTMC	Long Term Maintenance Contract
m	meter
MDR	Major District Road
mm	millimeter
MoT	Ministry of Transport
MTEF	Medium Term Expenditure Framework
NABARD	National Bank for Agriculture and Rural Development
NGO	nongovernmental organization
NGTR	Northern Gateway Toll Road
NH	National Highway
NHA	National Highways Authority
NHAI	National Highways Authority of India
NHDP	National Highways Development Project
NLTP	National Land Transport Policy
NLTSF	National Land Transport Strategic Framework
NQI	Network Quality Index
NRDI	National Road Development Index
NRRDA	National Rural Roads Development Agency
NRTC	National Road Transport Commission
NSW	New South Wales
NZTA	New Zealand Transport Agency
NZTS	New Zealand Transport Strategy
OCI	Overall Condition Index
PIARC	World Road Association

PMGSY	Pradhan Mantri Gram Sadak Yojana
PPP	Public Private Partnership
PSII	Private Sector Investment Index
PWD	Public Works Department
R&D	research and development
RBN	Roads Board Nepal
RCE	Return on Construction Expenditure
RDA	Road Development Authority
RDC	Road Development Corporation
RD&D	Research, Development and Demonstration
RFD	Results Framework Document
RHD	Roads and Highways Department
RIS	Road Information System
RLTP	Regional Land Transport Program
RME	Road Maintenance Effectiveness
RMMS	Road Maintenance Management System
RSMS	Road Safety Management System
RSP	Results and Services Plan
RTA	Road Transport Authority
RTC	Road Transport Corporation
RTI	Right to Information
RTMC	Road Traffic Management Corporation
RUSI	Road User Satisfaction Index
SANRAL	South African National Roads Agency Limited
SE	Superintending Engineer
SH	State Highway
SHAMP	State Highway Asset Management Plan
SHE	Safety, Health and Environment
SME	small and medium enterprise
SPI	Schedule Performance Index
SPV	Special Purpose Vehicle
SRA	Swedish Road Administration
STA	Swedish Transport Agency
STE	Smooth Travel Exposure
TAM	Transport Asset Management
USI	User Satisfaction Index
VCI	Visual Condition Index

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