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A Review of Institutional Arrangements for Road Asset Management: Lessons for the Developing World

Cesar Queiroz and Henry Kerali



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Cover photo: Toll booth, Rio de Janeiro to Juiz de Fora expressway. By Cesar Queiroz. 2008.

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ABSTRACT

The type of institutional arrangement for managing roads adopted by a country depends on the objectives and performance that it sets for its road networks. This paper reviews such arrangements for selected countries; China, Brazil, Slovenia, New Zealand, United Kingdom, and the Slovak Republic. These countries have adopted different approaches in several dimensions, such as decentralization, sources of financing, management structure, and modal responsibility.

Different structures can be efficient in achieving stated objectives and performance targets. For example both the Chinese and Brazilian approaches have been efficient in creating expressway networks within relatively short periods of time. By 2008, China and Brazil reached expressway densities of about 31.5 km/million population and 72.2 km/million population, respectively.

Despite the differences between institutional arrangements, the following trends seem to be common in most countries regarding the management of their road infrastructure:

- a. Increased involvement of private sector in building, maintaining, managing and operating road infrastructure; and
- b. More emphasis placed on road users, with the development of methods to communicate with roads users to take into account their needs and concerns in the provision of road infrastructure.

New Zealand provides an interesting example of experimenting with the split of responsibilities by function between several institutions to manage the country's road system. For about a decade it had two separate agencies, one to manage highways, and the other to provide the funds. As of August 1, 2008, the two agencies were merged "to provide an integrated approach to transport planning, funding and delivery."

This paper reviews main factors affecting the efficiency of road agencies and describes the steps taken in creating a new institution, or transforming an existing one, and assesses the effort required to achieve such results. In all countries reviewed, the ministry responsible for the transport sector remains the authority responsible for the overall transport policy and for putting in place checks and balances for good governance and management of fiscal risk. The main aspects of institutional reforms that can contribute to increase the efficiency of road and transport agencies include: improved institutional structures, separation of the client and supplier functions, separation of client and supplier organizations, privatization of the supplier organizations, establishment of an executive agency or a commercialized (client) organization, user participation through oversight boards, improving management information systems, and seeking additional sources of financing.

1 INSTITUTIONAL ARRANGEMENTS FOR MANAGING AND FINANCING ROADS

1.1 Introduction

This paper presents an analysis of the structures adopted in selected countries for the management and financing of roads (China, Croatia, Brazil, Slovenia, New Zealand, the Slovak Republic and the United Kingdom). These countries have chosen approaches to manage their road networks that are specific to their needs and circumstances. Brazil considered that it was not necessary to have a separate Ministry of Transport and had established a Ministry of Infrastructure responsible for several sectors including transport, housing, energy and mines for a couple of years in the 1990s. However, this led to a loss of focus on each of the sectors and a separate Ministry of Transport was soon reinstated. Nevertheless, there are still a few countries (for example Croatia, Georgia) that have a Ministry of Infrastructure with responsibility for transport among its functions.

Under the overall framework of the ministry responsible for transport, most governments have usually established a separate agency or administration to manage each subsector, such as roads, railway, ports, and airports. However, countries with large subsectors, such as China and India, have a separate Ministry of Railways, independent from the Ministry of Transport, to manage their railway subsector. The Russian Federation, which used to have a similar structure, abolished its Ministry of Railways, *inter alia*, to improve transport coordination and planning.¹ Among the countries reviewed, only Brazil is an exception, with the Brazilian National Department of Transport Infrastructure (DNIT) responsible for roads, railways and ports. Nevertheless, there is a separate agency (the National Agency for Land Transport - ANTT) under the Ministry of Transport which has been established to manage federal road concessions.

The key element to establishing the institutional structure is the need to improve the efficiency of management and financing of transport infrastructure. The main factors affecting the efficiency of transport agencies include outdated management structures, lack of clear responsibilities, human resource constraints, weak management information systems, inadequate financing, and perception of roads as a public good. This paper focuses on the roads subsector, sometimes drawing lessons from other transport subsectors as well.

1.2 A Diversity of Institutional and Financial Arrangements

This paper presents a review of the various institutional and financing arrangements in the roads subsector for several selected countries including China, Brazil, Slovenia, New Zealand, and the Slovak Republic. These countries have adopted different approaches in several dimensions, such as:

- (i) Decentralization – larger countries tend to be more decentralized, China is an example of a very high degree of decentralization (management of the entire tolled expressway network construction and operation is delegated under the responsibility of the provinces), while smaller countries such as Slovenia and the Slovak Republic, as expected, are very centralized;
- (ii) Sources of financing for the construction of highways/expressways – while countries such as China have relied on public borrowing to be repaid mostly from toll revenues, countries like Brazil have opted to award concession contracts to private concessionaires;

¹ A similar measure has often been recommended to China and India by IFIs.

- (iii) Management structure – China and Slovenia manage their expressway networks through public corporations, while Brazil has issued concessions for most of its expressway and railway networks to private concessionaires; and
- (iv) Modal responsibility – while China has single mode entities, Brazil established in 2001 an agency to manage both highway and railway concessions, as well as another agency to manage non-concessioned roads, railways, ports and waterways.

Different structures can be efficient in achieving a country's objectives. For example, the approaches adopted by China, Brazil and the Slovak Republic have been efficient in creating expressway networks. By 2008, China, Brazil and the Slovak Republic reached expressway densities of about 31.5 km/million population, 72.2 km/million population, and 80.4 km/million population, respectively. These investments required expenditures of about 0.53 percent of GDP for China, 0.49 percent for Brazil, and 0.27 percent for the Slovak Republic, over a 10 year period.

Despite the differences between institutional arrangements, the following trends seem to be common to these countries regarding the management of their road infrastructure:

- a. Increased involvement of private sector in building, maintaining, managing and operating road infrastructure; and
- b. More emphasis placed on road users and the development of methods to communicate with road users to take into account their needs and concerns in the provision of road infrastructure.

New Zealand provides an interesting example of experimenting with the split of responsibilities by function between several institutions to manage the country's road system. For about a decade, New Zealand had two separate agencies, one to manage highways and the other to provide the funds. As of August 1, 2008, the two agencies were merged, *inter alia*, "to provide an integrated approach to transport planning, funding and delivery."

In all of the countries reviewed, the Ministry of Transport remains responsible for the overall transport policy and for putting in place checks and balances for good governance and the management of fiscal risk.

A summary of how several countries have adopted different approaches to develop their motorway or expressway infrastructure is given in Table 1-1, taking into account three dimensions: (i) degree of decentralization; (ii) source of financing; and (iii) current management structure.

As expected, the degree of decentralization tends to be lower in smaller countries. Nevertheless, larger countries, such as Brazil, Russia and Ukraine, could probably benefit from a higher degree of decentralization. As to the source of financing, a number of the countries reviewed have not taken advantage of toll collection and would likely benefit from this financing option (except where traffic volumes are relatively low). The management structure remains entirely public in most of the countries surveyed. They could probably benefit from more private sector involvement.

Table 1-1. Features of Motorway and Expressway Development and Operation in Selected Countries

Country	Degree of Decentralization	Source of Finance	Current Management Structure
USA	High	Budget, Tolls, Earmarking	Public, Private (PPP)
France	Low	Budget, Tolls	Public, Private (PPP)
China	High	Budget, Tolls	Public
Brazil	Medium	Budget, Tolls	Public, Private (PPP)
Ukraine	Low	Budget	Public
Slovenia	Low	Budget, Tolls, Vignettes	Public
Slovak Republic	Low	Budget, Vignettes	Public ^a
Latvia	Low	Budget	Public ^a
Russian Federation	Medium	Budget ^b	Public ^a
New Zealand	High	Budget, Tolls	Public, Private (PPP)
Finland	High	Budget, Vignettes	Public, Private (PPP)

^a Countries where the first highway PPP projects have been launched, the construction of which is expected to start in 2010.

^b Although there has been some localized toll collection in Russia for more than a decade, the resulting revenues have been very limited.

Source: Authors' assessment

1.3 Performance Management in Road Agencies

Some mature road organizations, such as the U.K. Highways Agency² and the Swedish Road Administration,³ use performance management systems to demonstrate accountability to elected officials and to the public. More specifically, performance management can be used by road agencies to: (i) establish goals and performance targets to manage, explain, deliver, and adjust their roads budgets and internal activities; (ii) establish effective and achievable performance levels based on input from the public, elected officials, and the business community; and (iii) demonstrate good governance and accountability in meeting or exceeding performance expectations.

Examples of key performance measures used by the U.K. Highways Agency include:⁴

- a. Road Safety: By 2010 reduce by a third (i.e., to 2,244) the number of people killed or seriously injured on the core network compared with the 1994-98 average of 3,366.
- b. Road Maintenance: Maintain the strategic road network in a safe and reliable condition, and deliver value for money, with the following targets: (i) maintain a road surface condition index of 100 ±1 within the renewal of roads budget; and (ii) maintain benchmark unit costs for maintenance renewals at a level at or below inflation.
- c. Customer Satisfaction: Improve road user satisfaction by at least 0.25 percentage points compared with the level achieved in 2008-09.

² UK Highways Agency Business Plan 2009-10.

http://www.highways.gov.uk/aboutus/documents/Business_Plan_09-10_Web_Version.pdf

³ As summarized in "Linking Transportation Performance and Accountability." U.S. Federal Highway Administration. 2010. Washington, D.C. USA. <http://www.international.fhwa.dot.gov/pubs/pl10009/pl10009.pdf>

⁴ HA Business Plan 2009-10, Annex B.

2 ROAD MANAGEMENT AND FINANCING IN SELECTED COUNTRIES

This section identifies the various institutional arrangements for managing roads in selected countries. Depending on government objectives, some structures are used more often, or are more efficient than others. Countries selected for the review include countries having a sizeable investment program, China, Brazil and the United Kingdom, as well as Slovenia, New Zealand (which introduced significant reforms in August 2008), Croatia, and the Slovak Republic. Also included is a brief overview of the results of a study comparing road administrations in seven West European countries.⁵

In several countries, the current structure resulted from reforms that took place in the last decade. More emphasis in the review is put on road agencies, given the relative importance of road assets and investments.

2.1 China

The Ministry of Transport (MOT) in China is responsible for policy and regulation of all transport modes, except railways. The implementation of the transport programs is the responsibility of the 27 Provincial Transport Departments (PTD) and the transport bureaus for the four mega cities; Beijing, Chongqing, Shanghai, and Tianjin (which have the status of a province).

In the case of expressways, the provinces typically finance 66–90 percent of the capital cost through their own budgets and through debt. MOT sets policies, standards and provides investment support toward the construction cost. Once the expressways are opened, they are managed by the PTDs through an operating company or other authorized entities. The private sector provides finance on a limited scale through different types of concession schemes.

The rapid expansion of the Chinese expressway network over the past 15 years owes much to this tiered approach: a central entity being responsible for overall planning and standards definition and several concurrent PTDs being in charge of the detailed planning, engineering design and building of the selected roads. The setting of specific provincial targets under five-year plans also contributed to the large-scale implementation capacity that allowed the construction of many parallel projects.

Investment in transport infrastructure in China has been massive.⁶ For example, in 2004, it amounted to a total of about \$76.1 billion, distributed among the several transport modes as follows:⁷

Ports and other coastal construction	5.5%
Inland waterway construction	1.2%
Highway construction	76.3%
-Trunk highways	28.4%
-Other road networks	27.7%
-County and township roads	20.2%
Railways	13.7%
Others	3.3%

⁵ Rijkswaterstaat - RWS. 2007. "International Comparison - Road Administrations." Rijkswaterstaat AVV Transport Research Centre, The Netherlands. http://www.rijkswaterstaat.nl/dvs/Images/Comparing%20RA%20werkdoc%20def_tcm178-160558.pdf

⁶ The US system is probably the only one in the world physically and financially of the same order as the Chinese.

⁷ "China's Expressways: Connecting People and Markets for Equitable Development." World Bank, EASTR Working Paper No. 13, January 2007.

The respective sources of funds for such investment were (excluding railways):

State budget	14.3%
Domestic loans	40.4%
Foreign investment (mainly IFIs)	1.3%
Self-financing and others ⁸	44.0%

The government of China together with the provincial governments has created a network of high capacity expressways that now provides a foundation for ongoing economic development in all sectors of the Chinese economy. In 2005, the tolled expressway network size of about 41,000 km was a startling achievement, as there were only 522 km in 1990. Nevertheless, all links of the planned National Trunk Highway System (NTHS) have not yet been completed.⁹ The government intends to expand the national expressway network to 85,000 km.

In the process of expanding its NTHS, the government of China decided to adopt a toll-based network, and to use debt as a key financing vehicle for such development. While management and finance of most of the expressway network remains in the public sector, China has adopted a rather unique form of PPP financing for a limited number of expressway projects. Provincial governments first build a toll expressway and, after the expressway is complete and most construction and traffic risks have matured, it sets up an expressway corporation as a public limited company. The company is then listed on the stock exchange and the government sells shares in the toll expressway corporation. The shareholders earn dividends on their shares – with profitability depending primarily on the growth of traffic, inflation and approved toll increases – and the provincial government invests the money paid by shareholders into constructing new toll roads.¹⁰ Private investments have accounted for about 7 percent of expressway financing in China. From 2005 to 2010, the annual investment on expressways was about US\$17 billion.¹¹

Most expressways have been built in China through the “one road – one company” model. This has allowed for control of debt, proper examination of the feasibility of each major road segment, time structuring of the investments, targeted management of the capital formation, and contracting and supervision of construction, and has in most cases provided a smooth transition to operations. The one road – one company model accommodates most forms of joint venture, securitized ownership, direct private sector investment, and different forms of leasing and concessions.¹²

Tendered build-operate-transfer (BOT) concessions have recently been introduced in China. Under the concession, the concessionaire finances, builds and operates the toll road for a defined period, and takes on most categories of risk. As an example, in 2005 Sichuan offered the first of its BOT projects, the 137-km Leshan-Yibin expressway, through open tender.¹³

Several provinces in China have implemented tolls for goods vehicles, which vary depending upon the weight of the vehicle. This can help to control overloading and to recoup some of the investment costs arising from the damage caused by overloaded vehicles. As an example of this mechanism, in Hubei

⁸ This consists of the contribution of provinces, counties, local townships, villages, and the private sector, and debt taken on by the secondary and tertiary levels of government.

⁹ “People’s Republic of China: China Expressway Retrospective Study.” W. Greg Wood, May 2006.

¹⁰ “Private Financing Options for Roads.” Ian G. Heggie, University of Birmingham, 2008.

¹¹ “Expressways of China.” Wikipedia. http://en.wikipedia.org/wiki/Expressways_of_China#cite_note-0

¹² “People’s Republic of China: China Expressway Retrospective Study.” W. Greg Wood, May 2006, p 106.

¹³ “People’s Republic of China: Toll Roads Corporatization Strategy – Towards Better Governance.” Asian Development Bank (ADB), Project Numbers: RSC-C51814 & RSC-C60519, December 2006, p. 13.

the standard truck toll is set at RMB 0.08 per ton-km (about US\$0.01/ton-km). This applies up to the point where the vehicle is 30 percent overloaded. Above that point the toll rates for the overload portion increase to RMB 0.16/ton-km for up to 60 percent overloading, RMB 0.24/ton-km for up to 80 percent overloading, RMB 0.32/ton-km for up to 100 percent, and RMB 0.4/ton-km for more than 100 percent overloading.

An interesting comparison of road development in China and India was made by Postigo¹⁴ in 2008. While China gave high priority to the development of high-standard highways and expressways, India previously concentrated investments on lower level district and rural roads, but has now begun to construct the golden quadrilateral system of expressways. Comparing the outcome of their experiences suggests that a middle way approach could have been more appropriate. China has invested about 3.5 percent of the country's GDP in roads; India, only about 0.5 percent.

2.2 Brazil

The Brazilian transport system was reformed through Law 10.233 of June 5, 2001. It established and de-established several entities under the Ministry of Transport.¹⁵ The Law established: (i) the National Department for Transport Infrastructure; (ii) the Brazilian National Agency for Land Transport; (iii) the Brazilian National Agency for Ports and Waterways; and (iv) the National Board for Integration of Transport Policies. The Law also de-established: (i) the Brazilian National Highway Department; and (ii) the Brazilian Transport Planning Agency.

The Brazilian National Department for Transport Infrastructure¹⁶ (DNIT), under the Ministry of Transport, is responsible for implementing the government's transport policy, including construction, maintenance, and operation of federal highways, railways, waterways, and ports. DNIT's main source of funds is the federal budget. DNIT can implement its work program directly or through contracts and delegations to other public agencies or the private sector. Its activities by mode include:¹⁷

- a. Ports and waterways: maintenance, modernization, expansion, dredging;
- b. Railways: planning, study, and construction of new railways; and
- c. Highways: most of DNIT's investments are used to maintain, upgrade, and expand the 56,000 km long federal highway network.

The Brazilian National Agency for Land Transport¹⁸ (Agência Nacional de Transportes Terrestres – ANTT) is responsible, among other things, for the part of the Federal Highway Concession Program that remains under the Ministry of Transport, as well as the railway concession program. The Federal Highway Concession Program comprises 13,781 km of tolled expressways, including concession contracts awarded by the federal and several state governments.

¹⁴ Postigo, Antonio. 2008. "Financing Road Infrastructure in China and India: Current Trends and Future Options." *Journal of Asian Public Policy*, 1: 1,71 – 89.

<http://www.informaworld.com/smpp/content~content=a791731899~db=all~jumptype=rss>

¹⁵ Link to the Law: <http://www.dnit.gov.br/menu/institucional/legal>

¹⁶ DNIT home site: <http://www.dnit.gov.br/>

¹⁷ Links to the modes: http://www.dnit.gov.br/menu/institucional/modal_aquaviario

http://www.dnit.gov.br/menu/institucional/modal_feroviario

http://www.dnit.gov.br/menu/institucional/modal_rodoviario

¹⁸ ANTT home site: <http://www.antt.gov.br/>

Tolled expressway concessions under ANTT's responsibility (6,684 km in total) were awarded in two phases.¹⁹ The first phase comprised 12 concession contracts, with a total length of 4,083 km awarded to private concessionaires between 1994 and 1998 for 25 years. The second phase included seven concession contracts covering 2,601 km of federal highways, which were awarded to three different private concessionaires in 2008 for 20-year terms. As the next phase of the road concession program, ANTT plans to invite bids for an additional 3,675 km of road concessions in six states: Bahia, Minas Gerais, Espírito Santo, Goiás, Federal District, and Santa Catarina.²⁰

The railway concession program, under ANTT's responsibility, includes a total of 30,374 km awarded to 16 different private concessionaires. Most concessions were awarded for a 30-year period, with a possible extension for another 30 years.

The Brazilian National Agency for Ports and Waterways²¹ (ANTAQ), under the Ministry of Transport, regulates and supervises port and waterway services and infrastructure.

2.3 Slovenia

In December 1993, Slovenia established the Motorway Company of the Republic of Slovenia (DARS), as a joint-stock company. In accordance with a decision of the Slovenian National Assembly, DARS is in charge of financing, engineering, preparing, organizing, and managing construction and maintenance of the country's motorway network.²²

Through a January 1, 1994 contract, Slovenia transferred the management of all existing motorways, as well as relevant infrastructure and plant, to DARS. This included 198.8 km of two-lane and four-lane motorways and expressways and 67.5 km of access roads. DARS was granted the right to collect tolls as a source of income necessary for the management and maintenance of Slovenia's motorway network, as well as for funding the construction of new ones.

Since the beginning of the implementation of the National Motorway Construction Program²³ (NMCP) in Slovenia in 1994, about 265 km of four-lane and two-lane motorways have been built and opened to traffic. This is 49 percent of the planned length of motorways in the NMCP. As of July 2008 there were a total of 486.7 km of four lane motorways and expressways and more than 130 km of access roads to them, managed by DARS. Sources of funds for the NMCP include earmarked fuel tax, tolls, EU funds, and loans.

In accordance with the amendment of the Public Roads Act, approved by the National Assembly in April 2008, the use of vignettes became obligatory for all vehicles with a permissible maximum weight of up to 3,500 kg (formerly first and second toll-rate categories) on motorways and expressways in Slovenia.²⁴ The toll-collection system with vignettes, introduced in Slovenia on July 1, 2008, aims to improve traffic flow and reduce emissions to the environment, as it decreases congestion on toll

¹⁹ Amorelli, Lara. 2009. "Brazilian Federal Road Concessions: New challenges to the regulatory framework." Institute of Brazilian Business and Management Issues, Minerva Program, George Washington University, Washington, D.C., USA. <http://www.gwu.edu/~ibi/minerva/Spring2009/Lara.pdf>

²⁰ Perrupato, Marcelo. 2009. "Logistic Infrastructure Scenario in Brazil." Toll Road Summit of the Americas: A Bridge to the Future, International Bridge, Tunnel and Turnpike Association (IBTTA), Sao Paulo, Brazil, November 16-17, 2009. <http://www.ibtta.org/Events/pastpresdetail.cfm?ItemNumber=4365&navItemNumber=883>

²¹ ANTAQ home site: <http://www.antaq.gov.br/Portal/default.asp#>

²² Slovenia DARS: <http://www.dars.si/?lang=2>

²³ Slovenian NMCP: <http://www.avtoceste.si/?lang=2>

²⁴ Vignettes in Slovenia: <http://www.avtoceste.si/?id=19766>

stations. The vignette prices for two-axle vehicles (up to maximum weight of 3.5 tons) and motorcycles (that is, the two vehicle categories for which vignettes are charged) are available on DARS website at: http://www.dars.si/Dokumenti/Toll/Vignette_308.aspx

Yearly, monthly and weekly vignettes can be purchased. At toll plazas, cars with vignettes use special lanes that can be traversed at speeds of up to 40 km/h. Trucks and buses (or vehicles weighing more than 3.5 tons) can pay tolls through an ABC card, DARS card, credit card or cash,²⁵ and have to stop to make the payment.

2.4 New Zealand

The New Zealand Transport Agency (NZTA) was established on August 1, 2008. It brought together the functions of Land Transport New Zealand and Transit New Zealand to provide an integrated approach to transport planning, funding and delivery.²⁶ The government of New Zealand found that such separation of activities was not good for long term planning and decided to merge the two organizations into NZTA.

Prior to NZTA establishment, Transit New Zealand was responsible for managing the state highways, and Land Transport New Zealand was responsible for providing the required funds. Transit New Zealand operated as a road authority. It prepared an annual National State Highway Program and a 10-year Forecast and put this to Land Transport New Zealand for approval. It maintained the state highway network, developed standards, provided assistance and advice, and liaison with the New Zealand Police, Land Transport New Zealand and the National Road Safety Committee. Transit New Zealand also developed major construction programs for improving existing state highways and building new ones. Land Transport New Zealand was also responsible for determining standards of maintenance and construction, undertaking reviews and audits of road controlling authorities, providing advice to local authorities, and developing policies for financial assistance including evaluating projects and establishing competitive pricing procedures.

All these functions are now under the NZ Transport Agency, which contributes to an integrated, safe, responsive and sustainable land transport system, in support of the updated New Zealand Transport Strategy. NZTA works in partnership with regional and local authorities, the transport industry and communities to achieve this.

The main reasons for the merger of the two agencies are indicated in a 2007 Review²⁷ led by the New Zealand State Services Commission²⁸ which found that the benefits of integration would be greater than the benefits of retaining separately focused entities. One entity would:

- a. be required to consider all transport modes and activities and ensure that appropriate trade-offs are made;
- b. be accountable to the Minister;
- c. be required to focus on cost-effective delivery of its activities; and
- d. facilitate more easily the transition, over time, to the fully implemented new planning and funding arrangements.

²⁵ Tolls in Slovenia: <http://www.avtoceste.si/?mod=searchresult&txt=toll>

²⁶ NZ Transport Agency: <http://www.nzta.govt.nz/>

²⁷ The Review resulted from a concern of the Ministers of Transport and Finance that "the Government land transport sector was not fully achieving value for money nor fully delivering on the New Zealand Transport Strategy." <http://www.ssc.govt.nz/display/document.asp?DocID=5912>

²⁸ "Next Steps in the Land Transport Sector Review." New Zealand State Services Commission, April 2007. http://www.ssc.govt.nz/display/document.asp?docid=5917&pageno=1#P10_0

The NZTA is therefore focused on delivering four key outcomes: (i) integration, (ii) safety, (iii) sustainability, and (iv) value for money. NZTA is responsible for managing revenue of \$2.8 billion and allocation of \$2.0 billion, and an operating budget of approximately \$240 million. The agency provides a vital link between government policy making and the operation of the transport sector. NZTA's main tasks include:

- a. land transport planning
- b. managing the state highway system
- c. regulating access to, and participation in, the land transport network
- d. promotion of land transport safety and sustainability, including driver licensing and 'drive safe' advertising campaigns, road signs
- e. allocation of government funding for land transport.

The NZTA manages 10,894 km of state highways, which account for about 12 percent of New Zealand's roads, and about half of the 36 billion vehicle kilometers traveled each year in the country. The NZTA has more than 4,000 agents and outlets. Each year it processes 5 million vehicle re-registrations, 1 million vehicle ownership changes, 2 million road user licenses, and 5.3 million warrants of fitness.

2.5 The United Kingdom

In the United Kingdom, the Department for Transport (DfT) was set up to provide a stronger focus on delivering the government's transport strategy.²⁹ The role of the "center" of the Department is to set strategy and policy context, and to establish and manage relationships with the organizations responsible for delivery.³⁰

The DfT has seven executive agencies that are central to delivering the government's transport priorities and services: (i) Driving Standards Agency, (ii) Driver and Vehicle Licensing Agency, (iii) Vehicle Certification Agency, (iv) Vehicle and Operator Services Agency, (v) the Highways Agency, (vi) Maritime and Coastguard Agency, and (vii) Government Car and Dispatch Agency.

The primary functions of the Highways Agency are to manage traffic, tackle congestion, provide information to road users and improve safety and journey time reliability, while respecting and minimizing the adverse impact on the environment.³¹

The Highways Agency is responsible for the operation and stewardship of the strategic road network in England on behalf of the Secretary of State for Transport. The strategic road network consists of motorways and major trunk roads; other roads in England are managed by local authorities. The Agency's road network is valued at over £81 billion. It carries a third of all road traffic in England and two thirds of all heavy freight traffic.

2.6 Croatia

Croatia has adopted a supply-driven approach to investment in the road infrastructure, and especially in motorways, since the late 1990s. The government was of the view that a new motorway infrastructure was needed for political, strategic and development reasons.

²⁹ Scotland, Wales and Northern Ireland have separate self-government Departments that are responsible for transport.

³⁰ DfT home site: <http://www.dft.gov.uk/>

³¹ Highways Agency home site: <http://www.highways.gov.uk>

Croatia doubled the length of the motorway network in the period 2001-2004 bringing it to more than 800 kilometers, and it has become an example in the region of good program implementation as well as the quality of the motorways. Total public spending on road infrastructure, excluding county and local roads in the period 2001-2004 averaged an estimated 3.5 percent of GDP, of which two thirds were for development and operation of the motorway network.

Croatia's competitiveness depends to a large degree on how much it can keep total transport costs low. Regardless of whether the road infrastructure is provided by the public or private sector, road users and beneficiaries ultimately pay for the investment through user fees or taxes, and this has an impact on the competitiveness of industries and services.

The Public Roads Act passed in 2001 reorganized the Croatian Road Authority into two separate entities: (i) Hrvatske Autoceste (HAC),³² a joint-stock company, 100 percent-owned by the state, responsible for the construction and management of the motorway network, except for that which is constructed or maintained by concessionaires; and (ii) Hrvatske Ceste (HC),³³ also a joint-stock company, responsible for the construction and management of all other state roads (7,000 km), which constitute the vast majority of the network. In addition, county roads are managed by the County Roads Administration (ZUC).

The reorganization also brought with it a new financing model for the development and operation of the road infrastructure. The Public Roads Act allows for the possibility of ceding the motorway construction and operation to a concession company. In this case, the Ministry of the Sea, Tourism, Transport and Development (MSTTD) is responsible for the administration of the concession contract. As of 2009, three concession contracts had been awarded: (i) Bina-Istra: awarded in 1995 to a concession company jointly owned by Bouygues SA, HAC, INA Industrija Nafta, and Istarska Autocesta; (ii) Autocesta Rijeka-Zagreb (ARZ): awarded in 1997 to a 100 percent government-owned concession company; and (iii) Autocesta Zagreb-Macelj (AZM): awarded in 2004 to a concession company jointly owned by Walter Concession Holding GmbH and the Republic of Croatia.

At the policy level, the MSTTD is responsible for the activities of HAC, HC and the Counties and approves their strategic plans through the road development planning and day-to-day administrative processes. Planning for road infrastructure development follows three stages. First, the strategy for the development of public roads is proposed by the Ministry on behalf of the government and adopted, as appropriate, by Parliament. Second, based on the adopted strategy, the Ministry prepares a four-year program. Then, HAC, HC, and the County Roads Administrations prepare one-year implementation plans for the construction and maintenance of public roads.

Besides long-term borrowing, the most important sources of financing of road infrastructure are the dedicated fuel levy and tolls on motorways. The fuel levy has been providing a steady source of funding to HAC and HC, and has particularly allowed HAC to contract long-term borrowing from IFIs and commercial banks, backed by sovereign guarantees, as well as to indirectly raise funds in the capital markets through the Ministry of Finance. The fuel levy channels HRK 0.6 per liter of fuel sold directly to HAC and another HRK 0.6 per liter to HC. In 2006, this dedicated levy was consolidated in the State budget.

³² Croatian Motorways Ltd. - Company for Operation, Construction and Maintenance of Motorways

<http://www.hac.hr/>

³³ Croatian Roads Ltd.: <http://www.hrvatske-ceste.hr/Index.aspx>

Two toll systems are applied on the motorway network in Croatia: the open and the closed toll systems. The open toll system is operated at tolled road structures (i.e., bridges, tunnels) and on shorter motorway sections, where the toll collection station is placed at the point of entry or exit. The closed toll system is operated on motorways with several entrances and exits. In this case, the motorway user receives a toll card while entering the motorway, then makes the toll payment (related to the distance traveled as indicated by the toll card) while exiting the motorway. The toll rates applied to each vehicle category are available on the HAC website.³⁴

2.7 The Slovak Republic

The main goals of the Slovak government policy include promoting a better standard of living in the regions of the Slovak Republic, with the goal of reducing regional disparities.³⁵ The quality of road and rail network capacity is limited, the efficiency and safety of infrastructure services are below EU standards, and a large backlog in rehabilitation and maintenance has accumulated mainly due to inadequate funding in the past.

The aim of the Slovak transport policy is to establish transparent conditions and minimize risks of access to the transport market and infrastructure, and to satisfy the constantly increasing transport demands of the society (transportation of goods and people) in a required time and to a desired quality with a simultaneous decrease in the negative impact of transport on the environment. These aims must be achieved within the framework of ensuring sustainable development that includes economic development, social solidarity and environmental acceptability.³⁶

The main objectives of the transport program, as stated by the Ministry of Transport, Posts and Telecommunications (MTPT) are: (a) development of transport infrastructure to enhance efficiency and quality of the transport system; (b) improve accessibility of the regions to the trunk transport infrastructure (TEN-T – Trans-European Transport Network); (c) improve parameters of transport infrastructure to meet EU standards; and (d) improve the quality and safety of the infrastructure to reduce negative effects of transport on the environment.

In order to accomplish the above objectives, an indicative financial plan was prepared by MTPT amounting to a total of EUR 7,311 million for the 2007-2013 period, or an average of about EUR 1.2 billion per year.

Sources of funds to support the 2007-2013 transport infrastructure program are: (a) the state budget, EUR 3,158 million; (b) EU funds, EUR 630 million; (c) infrastructure charges, EUR 2,887 million; and (d) public-private partnerships (PPP) in motorways and expressways, EUR 636 million.

Road transport is now the primary transport mode in the Slovak Republic. Road transport is increasingly gaining ground at the expense of rail, and has effectively replaced rail transport for short distance, high value, and time sensitive cargo. In 2006, the road market share of freight, in terms of ton-km, was 70 percent. For passenger transport, in terms of passenger-km, it was 85 percent.

The Slovak Republic has about 337 km of motorways, 105 km of expressways and 17,840 km of Class I, II and III roads. Motorways and expressways are managed by the National Motorway Company³⁷

³⁴ HAC website: <http://www.hac.hr/index.php?task=ces&stask=22>

³⁵ "Convergence Program of the Slovak Republic for 2007-2010." Update, November 2007, page 40.

³⁶ "Transport Policy of the Slovak Republic until 2015." (Approved by the government of the Slovak Republic, No. 445, 8 June 2005) <http://www.telecom.gov.sk/index/index.php?ids=7751&lang=en>

³⁷ NDS home page: <http://www.ndsas.sk/index/index.php>

(NDS). The public road network includes about 3,080 km of national roads (Class I) directly managed by the Slovak Road Agency³⁸ (SSC), as well as 14,760 km of Class II and III roads managed by the country's eight regions.

The Slovak Republic has a vignette system for charging heavy goods vehicles for infrastructure use. The annual proceeds have been about 1.9 billion SKK (EUR 58 million). An electronic toll collection (ETC) system is expected to replace the vignette system. The annual proceeds of the system are expected to be about 9 billion SKK (EUR 273 million) in 2013, from vehicles weighing more than 3.5 tons.

2.8 Experience from Western European Countries

A review of road administrations in seven West European countries (the Netherlands, Austria, Denmark, England, Finland, France and Sweden), carried out by the national Road Administration of the Netherlands, Rijkswaterstaat (the Directorate-General for Public Works and Water Management, RWS), has shown differences in the way such administrations manage their networks. Such differences are related to the institutional setting and the political and societal context of each country, as well as the type of road network managed by the road administrations.³⁹

Despite the observed differences between road administrations, all countries included in the study seem to have common notions regarding the management of their road infrastructure. These include, in particular:

- a. Increased involvement of private sector in building, maintaining, managing and operating road infrastructure; and
- b. More emphasis on user orientation and the development of methods to communicate with roads users to take into account their needs and concerns in the provision of road infrastructure.

The RWS study also identified two common areas that require improvements by road administrations:

- c. Coordinating network management between the national and local levels; and
- d. Further developing road user charging systems to be able to manage road traffic in the future.

A workshop including representatives of the participating countries identified the following driving forces as reasons for organizational changes in road administrations:

- Change of government and administrative reform,
- The need to have more traffic management powers in one agency,
- Decentralization,
- Economic efficiency,
- Change of management,
- The state's finances,
- Separation of policymaking and implementation,
- The use and interest of the private sector for funding and financing infrastructure.

³⁸ SSS home page: http://www.ssc.sk/user/view_page.php?page_id=1170

³⁹ Rijkswaterstaat - RWS (the Netherlands Directorate-General for Public Works and Water Management). 2007. "International Comparison - Road Administrations." Rijkswaterstaat AVV Transport Research Centre, The Netherlands.

http://www.rijkswaterstaat.nl/dvs/Images/Comparing%20RA%20werkdok%20def_tcm178-160558.pdf

3 REFORM FEATURES OF ROAD AND TRANSPORT AGENCIES

This section reviews the main factors affecting the efficiency of road and transport agencies. Such factors include outdated management structures, lack of clear responsibilities, human resource constraints, weak management information systems, inadequate financing, and perception of roads as a public good. It also highlights several aspects of institutional reforms that can contribute to increase the efficiency of road and transport agencies.

3.1 Factors Affecting Efficiency of Road Agencies

The main factors that affect the efficiency of agencies responsible for managing road networks are:

- a. Outdated Management Structures. Some countries have traditionally managed their road networks through roads departments embedded within several layers of administrative bureaucracy inside a large Ministry of Transport (MOT). These arrangements date back to the time when roads accounted for a small proportion of the Ministry's total spending program. However, spending on roads has grown enormously, now typically absorbing 5—10 percent of the government's recurrent budget and 10—20 percent of the development budget. Despite their large asset values and high annual turnover (particularly with maintenance fully funded), roads in some countries are still administered like a small government department, resulting in three structural weaknesses: (i) too many layers of administration; (ii) over-centralization of administrative functions, and (iii) reduced authority of the Director of Roads who does not report directly to the Minister.⁴⁰
- b. Lack of Clear Responsibilities. Responsibility for roads is often diffused among several central government ministries and local government administrations. In New Zealand, for example, until July 2008 management and funding of the state highway network was split between two agencies under the MOT.⁴¹ The management of the main road network (or trunk roads) is often assigned to the roads department within the Ministry. Although the roads are clearly designated, many roads departments do not have a full record of their assets (that is, an up to date inventory) and will often rely on estimates of the total network size under their responsibility. Data on asset condition (for example roads and bridges) tend to be even more unreliable.
- c. Human Resource Constraints. Some roads departments that are within government administrations suffer from severe human resource constraints brought about by acute shortage of qualified and experienced technical and managerial staff, while at the same time they often have too many unskilled workers. Morale is generally low, primarily because of low salaries that poorly compare with the private sector. The take home pay of engineers working for government roads departments is generally less than half that paid to engineers employed within the private sector.
- d. Weak Management Information Systems. Effective management requires timely collection and analysis of both physical and financial information. Several countries have attempted to introduce road management systems, but with little success. The reasons for this have been attributed to external, institutional, and technical factors. The overriding cause appears to be lack of commitment on the part of the road agency concerned, as well as the introduction of systems that are unsustainable and/or are not central to the day-to-day management needs of the road agency. Few countries have performance budgeting systems. Consequently, it is difficult to achieve efficient road management without appropriate management information systems to assist in setting priorities and monitoring performance of past expenditures.

⁴⁰ "International Trends in Road Management Reforms." Henry G. R. Kerali, World Bank, 2008.

⁴¹ The New Zealand Transport Agency (NZTA) was established on August 1, 2008, bringing together the functions of Land Transport New Zealand and Transit New Zealand. <http://www.nzta.govt.nz/>

- e. Inadequate Financing. Many countries suffer from a shortage of funds for maintenance and improvement of roads. This is manifested in the form of rapidly eroding asset values, increase in traffic congestion, deteriorating road safety, and worsening environmental pollution. In particular, expenditure on road maintenance is well below the level required to stop the steady decline in asset values and keep road networks in a stable, long-term acceptable condition. Many countries built new roads without budgeting for maintenance and rehabilitation. This was a short-sighted policy, as it is commonly accepted that \$1 saved in maintenance costs road users \$2 to \$3 in additional vehicle operating costs.
- f. Perception of Roads as a Public Good. Roads have traditionally been managed as a social service for the good of the public. While lower trafficked roads (for example secondary and rural access roads) may be constructed to provide this service, user charges on highly trafficked roads can become an important source of revenues. While sectors like water and electricity find it relatively easy to charge for their services, roads are often viewed as a “free” service. This is mainly a problem of perception. There is no clear price for roads and road agencies are not subjected to rigorous market discipline. Roads are primarily financed through taxes allocated as part of the annual budgetary process. Furthermore, although the road transport sector in most countries pays more in taxes than it receives back from the government in the form of annual budget allocations, there is little scope for increasing these budget allocations. Nearly all governments are under pressure to cut public spending and there is strong competition for the available funds from other sectors such as health, education, and security.

3.2 The Main Elements of Institutional Reform of Road and Transport Agencies

International studies of transport infrastructure management and financing have highlighted several aspects of institutional reforms that can contribute to increase the efficiency of road and transport agencies. Such measures can be grouped under the following headings:

- Improved institutional structures
- Separation of the client and supplier functions
- Separation of client and supplier organizations
- Privatization of the supplier organizations
- Establishment of an executive agency or a commercialized (client) organization
- User participation through oversight boards
- Improving management information systems
- Seeking additional sources of financing

3.2.1 Improved Institutional Structures

It is usual for central governments to only take responsibility for the main road (or railway) network, except in federal countries where the state or provincial governments may be the designated transport or road authorities. In China, for example the provinces are responsible for managing and financing the road networks in their territories; there is no national (central) road authority. In countries which have roads with high volumes of traffic, toll-roads are built and managed either by the central road agency, by an autonomous toll road agency (for example in Slovenia) or by the private sector under various forms of concession agreements (public-private partnerships). Roads in urban areas are typically managed by municipal or urban authorities while roads in rural areas are managed by local government authorities. When new development takes place in an urban area, the required new roads may be built initially by the developer and then proclaimed and taken over by a designated road authority.

The remaining undesignated roads are regarded as private roads and generally receive no public support for construction or maintenance. Some countries have introduced procedures that encourage the owners of unproclaimed roads to register their interest in a specific road in return for support with construction and/or maintenance. For example, in Finland, adjoining land owners are encouraged to

form road co-operatives for the purposes of managing private roads.⁴² In such cases, there are usually government financial incentives to encourage participation in the schemes.

3.2.2 Transforming Road Administrations

The transformation of the traditional national road administration into a streamlined executive agency typically follows a five-phase process,⁴³ although in some countries, the process has skipped certain stages. Countries such as Sweden, Finland, the United Kingdom, Ireland, New Zealand, Australia, Chile, and many others are at relatively advanced stages of the process of transforming road management. The five-phase process is not necessarily sequential – the primary advantage of a sequential reform is that the government and the road organization will benefit from the learning and experience generated from each phase. The 5-phase process includes:

Phase 1: Traditional Roads or Public Works Department. This is the starting phase which is still common in many developing countries. The road administration is a single organization employing thousands of people. Indeed, one of the roles of the organization may be to provide public sector employment. The road administration is centralized and the Ministry above it micro-manages the budgets and project selection, with political objectives as the accepted norm for resource allocation and project prioritization.

Phase 2: Separation of client and supplier functions. The road administration adopts a de-concentrated organizational structure with implementation of works separated from project management (this is now taking place in several countries in Eastern Europe). Several units are created with specific responsibilities, such as planning, management, inspection/supervision, and works implementation.

Phase 3: Separation of client and supplier organizations. Greater reliance on the market mechanism drives the separation of the client and supplier organizations. The client function remains with the road administration which decentralizes its own activities: the Headquarters administers and manages, and the regional offices supervise/monitor the quality and quantity of the services. Several regional implementation organizations are created and carry out road works in accordance with contracts issued by the road administration or its regional offices. The Ministry delegates budgetary and other responsibilities to the (client) road administration. The Ministry defines the mission of the administration, its goals - which may change from time to time - and sets the annual budget.

Phase 4: Privatization of the supplier organizations. The supplier organizations are privatized, and the road administration continues to report to the parent Ministry and to the Parliament through the Minister. The Ministry exercises periodic oversight through a Board (or Council) and efficiency is monitored through agreed performance indicators. The road administration takes on the responsibility for policy implementation, budget distribution, and performance audits. This is generally a small organization with few staff specializing in planning and project/contract management which adopts modern technology and management systems. The road program is managed by the regional offices which also carry out mandatory performance measurement. All supply functions are procured from the private sector through contracts.

⁴² See, for example "Managing Undesignated Roads," by J. Isotalo and I. Heggie:

http://www.worldbank.org/transport/roads/ism_docs/annex3.pdf

⁴³ Talvitie, A. (1996). "International Experiences in Restructuring the Road Sector." Transportation Research Record No. 1558, pp. 99-108.

Phase 5: Establishment of an executive agency (e. g., the U.K. Highways Agency, the New Zealand Transport Agency) or a commercialized (client) organization (for example Croatia, Slovenia, and Latvia):

- a. Executive Agency. The roads executive agency is usually a streamlined agency (under the Ministry of Transport), which contracts out most of its activities to the private sector, keeping in-house only core strategic functions.
- b. Commercialized Road Entity. The structure of the commercialized road entity is similar to that of a private corporation but is subject to oversight by a Roads Board or Council that reports to the parent Ministry. Its income source is clearly defined either through revenues from road user charges, or public subventions declared in a medium term fiscal framework. This medium (or long) term financial commitment is necessary for the commercialized entity to be able to plan future investments. In some countries, the corporate entity is also empowered to enter into concession agreements with the private sector to build and operate highways (for example in Croatia or Latvia).

In the United Kingdom, for example, the Highways Agency (established in 1994) is an executive agency of the Department for Transport. It is responsible for operating, maintaining and improving the strategic road network in England. Its primary functions are to manage traffic, tackle congestion, provide information to road users and improve safety and journey time reliability, while respecting and minimizing the adverse impact on the environment.⁴⁴

The Highways Agency has packaged parts of the motorway network into commissions and then invites bids from consultants to take on the responsibility for maintaining all roads and related structures within the commission to a prescribed standard. The winning consultant then organizes a competitive Term Contract between the owner (Department for Transport) and the contractor who then carries out all work on instruction from the consultant. In one of the largest commissions (West Yorkshire, with 330 lane-km, 305 bridges, 420 km of drains, 950 road signs and 3,400 lighting columns) costs fell by well over 15 percent as a result of the new arrangement, 29 of the 34 DOT staff who were made redundant were taken on by the consultant (one moved to another job and four took early retirement), and quality and flexibility of the maintenance regime increased.⁴⁵

Examples of commercialized road organizations include:

- a. The Croatian Motorways Ltd., established in 2001, which is responsible for operation, construction and maintenance of motorways in Croatia;⁴⁶
- b. The Latvian State Roads, established in 2004 as a State Joint Stock Company, which operates according to an agreement signed with its main client, the Ministry of Transport of the Republic of Latvia.⁴⁷ Its tasks include implementing the management and maintenance of state roads, preparing the strategy for state road network preservation and development, administering road financing, and procurement; and
- c. The Motorway Company of the Republic of Slovenia (DARS), established in 1993 as a joint-stock company, which is in charge of financing, engineering, preparing, organizing, and managing construction and maintenance of the country's motorway network.⁴⁸

An additional form of transformation is the establishment of a multi-modal agency, an example of which is the Brazilian National Department for Transport Infrastructure⁴⁹ (DNIT), under the Ministry of

⁴⁴ See, for example "The Highways Agency Annual Report 2008-2009."

<http://www.highways.gov.uk/aboutus/24184.aspx>

⁴⁵ "International Trends in Road Management Reforms." Henry G. R. Kerali, World Bank, 2008.

⁴⁶ Croatia Motorways: <http://www.hac.hr/?task=ona>

⁴⁷ Latvia State Roads: <http://www.lad.lv/en/?i=1>

⁴⁸ Slovenia DARS: <http://www.dars.si/?lang=2>

Transport, which is responsible for implementing the government's transport policy, including construction, maintenance, and operation of federal highways, railways, waterways, and ports. DNIT is the legal successor of the former Brazilian National Highway Department.

3.2.3 User Participation through Oversight Boards

An increasing number of countries have found it useful to involve road users in the oversight of the national road agency. Their involvement helps the road agency to recognize that they are in the business of delivering road services to clearly defined customers and that they need to pay more attention to the needs of these customers. A broad-based board also enables the road authority to draw on the skills and contacts represented on the board. The South African National Roads Authority attributes its highly successful toll road program to the contribution made by its oversight board.⁵⁰

3.2.4 Improving Management Information Systems (MIS)

A comprehensive MIS normally consists of a computerized road management system (for planning, programming, budgeting and preparation of road works), and a financial accounting system. Information systems are also required, for example for management of personnel records, and equipment. Several developing or transition countries have had computerized pavement management systems (PMS) supplied and implemented by consultants for their road agencies. However, often the long-term sustainability of these systems has been poor.

The successful implementation of a computerized road management system (RMS) depends on the interaction of three fundamental components: processes, people and technology. If any of these components are lacking, the system will not be successful. The best technology in the world will ultimately fail if implemented in an environment where there are no people to run it, or where the processes are not in place to utilize it.⁵¹

The sustainability of a computerized road management system also depends on:

- the type of management information produced,
- the extent and cost of data required by the system
- availability of local technical expertise on all aspects of the system,
- availability of local computer expertise for the maintenance of both the software and hardware.

The extent to which the management information produced by the MIS meets the day-to-day needs of managers within the roads organization will ultimately determine whether the system is adopted as part of management procedures. If the managers do not use the information, it will probably fail. The cost of data acquisition can be very expensive, and will often be the most expensive aspect of implementing and operating a road management system. As such, it is essential that appropriate data design is undertaken to ensure cost-effective data requirements. It is important that technical staff within the roads organization understand the inner workings of the road management system. A black box system is unlikely to be sustainable as questions will arise on details of how the management information has been produced; for example the rules used for prioritizing periodic road works. It is desirable to use an open system where all algorithms and procedures are published and accepted by those using the MIS.

⁴⁹ Brazilian DNIT: <http://www.dnit.gov.br/>

⁵⁰ "International Trends in Road Management Reforms." Henry G. R. Kerali, World Bank, 2008.

⁵¹ "Success Factors for Road Management Systems." Kevin McPherson and Christopher R. Bennett, World Bank, 2005. <http://www.road-management.info/reports/user/6/05-10-11SuccessFactorsforRoadManagementSystems.pdf>

3.2.5 Seeking Additional Sources of Financing

Once a road organization has attained an acceptable level of efficiency, the next question is how best to put forward the case for improved financing of roads. For this, it is essential that road organizations should prepare medium-term forecasts of budget scenarios, accompanied by the predicted impact on road network performance. The responsibility of road managers is to put forward the case to the political leadership for increased allocation of resources for roads, and highlight the impact of planned budget allocations on network performance. The wider objective should be to demonstrate the importance of roads in underpinning economic development and thereby present the case for appropriate levels of resource allocation from public funds.

However, in developing and transition countries, budget allocations for investments in the transport sector are often less than what is required to keep the infrastructure and transport systems in a sustainable operating condition.

It takes several years for transport infrastructure to deteriorate to a level that would generate public pressure for more financing, and yet it costs three to four times more to rehabilitate transport infrastructure than if timely maintenance had been adequately financed. This is quite a challenge for managers of road networks who must improve their dialogue with politicians. Nevertheless, such dialogue has led several countries to establish specific road user charging systems to generate more funds for roads. These charges usually include tolls (for example, Germany, France, China, Brazil), vignettes (for example Switzerland, the Slovak Republic), or a combination of both (for example Poland, Slovenia).⁵² In the case of China, tolls are the main mechanism for financing expressways.⁵³

3.3 Institutional Structure and Reform of a Road Administration

International experience indicates that the institutions reformed or established following the general principles described earlier in this Chapter tend to better manage the investment programs and transport assets under their responsibility.

There are, however, several strategic choices to be made in defining the most suitable type of organization to manage a country's roads or transport preservation and investment program. These choices include:

- a. Should the transport program be managed through one or several entities? For example in the case of a multimodal program, including new roads, airport runways, ports and railways, a possible option would be to establish an entity to manage each one of the modes. However, this would imply the need for additional coordination and possible less focus on the overall investment program.
- b. What should be the management structure of the entity or entities to manage the program? As described under Phase 5 of the reform process discussed earlier in this Chapter, two relatively successful approaches have been adopted by different countries (i) to establish an executive agency under the Ministry of Transport, or (ii) to establish a commercialized organization, usually as a public enterprise or joint stock company, which operates under a contractual arrangement with the Ministry of Transport.

⁵² For a review of road user charges, see for example: "Road User Charges: Current Practice and Perspectives in Central and Eastern Europe." C. Queiroz, B. Rdzanowska, R. Garbarczyk, and M. Audige. World Bank, 2008. <http://go.worldbank.org/EYOZ8CRSJO>

⁵³ "China's Expressways: Connecting People and Markets for Equitable Development." World Bank, EASTR Working Paper No. 13, January 2007.

- c. Once an entity/entities have been established, how would it/they manage the investments? In the case of an executive agency, best practice would be to contract out as many tasks as possible to the private sector. This principle would also apply to an enterprise, but there are examples where the enterprise is not authorized to award concession contracts. For a more efficient program implementation, it would be convenient that the enterprise be authorized to enter into different contract options with the private sector, including awarding long-term concessions for construction and maintenance/operation of transport assets.
- d. Should the new/reformed entity/entities be dedicated to a new transport investment program, or should it/they remain responsible for the currently existing assets? For large investment programs, it may be more efficient to create a new entity that would be in charge of such program, while the existing agency could be reformed (for example into an executive agency under the Ministry of Transport) and retain responsibility for managing the currently existing assets.

The transport sector is complex. There is a high number of stakeholders and the scale and multifaceted nature of the reform process usually indicate that specific expertise be used to assist the Ministry of Transport, or other parent ministry, in preparing and implementing the reform agenda. The related technical assistance would normally review the current institutional setup and provide advice on how to implement the desired reform process.

4 KEY CHARACTERISTICS FOR THE SUCCESS OF PUBLIC-PRIVATE PARTNERSHIPS

Public-private partnerships (PPP) are reviewed in this section as a means to elicit the private sector to contribute to reducing the overall cost of delivering infrastructure services through increased efficiency and better management of some risks (such as construction). In successful PPP projects, the private sector's higher cost of financing and the need for a return on its investments are offset by the benefits provided by the private participation. A discussion is also included on the need to ensure good governance in managing PPP programs so that the public reaps the full benefits of the private sector's involvement.

Basic PPP Features. While there is no widely agreed, single definition or model of a public-private partnership, all PPP models have some common characteristics. The term "public private partnerships" has been used since the 1990s as a form of private sector participation (PSP) in infrastructure financing. All definitions, however, are based on the common principle that PPP is a 'procurement process' to provide services or deliver assets through joint public and private cooperation. There are several forms of PPP, such as concessions, BOT,⁵⁴ leases, which are adopted based on the type of project and public sector objectives. Delmon (2009)⁵⁵ provides a description of a variety of available PPP arrangements.

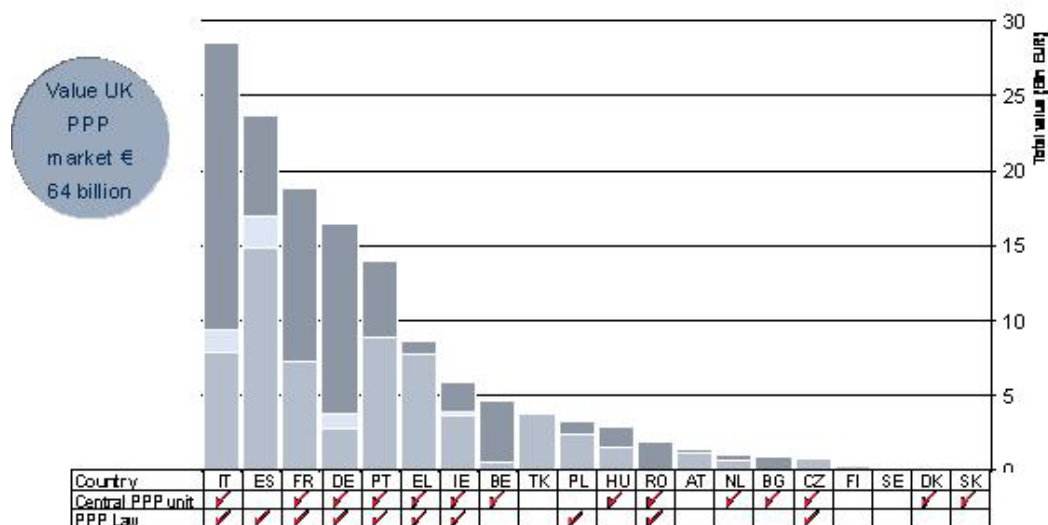
PPP is based on the recognition that the private sector can contribute to reducing the overall cost of delivering infrastructure services through increased efficiency and better management of some risks (such as construction). In successful PPP projects, the private sector's higher cost of financing and need for a return on its investment are offset by the benefits provided by the private participation.

PPP Policy and Institutional Framework. There is no single recipe for the successful implementation of a PPP program. A PPP framework law is not essential as the United Kingdom, the European country with the most developed PPP market, has no specific PPP law and relies on its commercial laws for the implementation of PPP projects. Neither is a PPP unit a requirement for success. Spain which has been especially successful in PPP transport projects does not have a central PPP unit. Moreover, several central European countries (such as Czech Republic) have enacted both a PPP framework law and established a central PPP unit – but yet have not been able to realize many PPP projects.

A similar situation occurs with the Slovak Republic which has PPP units at the Ministry of Finance and at the Ministry of Transport, but only recently has awarded the first PPP contracts in the roads sector. Figure 4-1 shows the state of PPP development in Europe and provides insight in the size of the market as well as in the frameworks available for PPP arrangements.

⁵⁴ Build-operate-transfer.

⁵⁵ Delmon, Jeffrey. 2009. "Private Sector Investment in Infrastructure: Project Finance, PPP Projects and Risks." Co-publication of the World Bank and Kluwer Law International.

Figure 4-1. European PPP development per country (million EUR)

Source: Infranews and ECORYS PPP Database, October 2007

Several countries have used PPP to help develop and maintain their transport systems, and in particular their road networks. Private participation in roads revived strongly in developing and transition countries in 2005–08.⁵⁶ Investment commitments for road projects with private participation grew from US\$7 billion in 2005 to US\$16.7 billion in 2008, reaching a new historic peak.⁵⁷ The main reason for the revival was the willingness of governments to provide support needed to attract the private sector. Nevertheless, governments need to be aware of the potential risks of such support. And because of the monopolistic features of road projects, they also need to ensure good governance so that the public reaps the full benefits of the private sector's involvement.⁵⁸ More recent data indicate that private participation in roads has slowed down with the current global economic crisis.

Charging Tolls for Road Use. There is no international standard on whether tolls should be charged on a country's motorway or expressway networks. Some countries have chosen to create a "toll free" system, some have "tolled" systems and some have "hybrid" systems combining toll-free and tolled highways. It seems the tolled approach is becoming more common because of the current interest in private sector investment, operations, and management of roads, although there are other forms of involving the private sector.⁵⁹

⁵⁶ See the PPIAF website for details: <http://www.ppiaf.org/> The Public-Private Infrastructure Advisory Facility (PPIAF) is a multi-donor technical assistance facility aimed at helping developing countries improve the quality of their infrastructure through private sector involvement.

⁵⁷ Izaguirre, Ada Karina, and Alexander N. Jett. 2009. "Investment in road projects with private participation more than doubled between 2005 and 2008, but was concentrated in a few countries." PPIAF Note 12, December 2009. <http://ppi.worldbank.org/features/October2009/didyouknowOctober2009.aspx>

⁵⁸ "Worldwide trends in private participation in roads: Growing activity, growing government support." PPIAF Gridline Note No. 37. C. Queiroz and A. K. Izaguirre, World Bank, 2008. <http://www.ppiaf.org/content/view/431/485/>

⁵⁹ "Worldwide trends in private participation in roads: Growing activity, growing government support." PPIAF Gridline Note No. 37. Cesar Queiroz and A. Karina Izaguirre, World Bank, 2008. <http://www.ppiaf.org/content/view/431/485/>

China, for example, has developed its expressway network based on tolls. The toll income is mainly used for payment of the principal and interest of the loans, and the remainder used to cover the costs of maintenance, staff salaries and operating expenses. It seems appropriate to continue toll collection after all loans have been repaid for several reasons. First, the justification for charging tolls is strongest on congested roads, where the toll is a useful pricing instrument for rationing the scarce road space to those who value it most—and mature highways are the ones most likely to be congested. Second, the revenues from such roads can readily be redistributed to poorer regions. And third, they could be used to fund road maintenance.

4.1 Constraints of Private Sector Involvement

When a government is considering whether to launch a PPP project, several constraints should be considered. The World Bank Infrastructure and Law Website⁶⁰ provides a good description of such constraints, which can be summarized as:

- a. The private sector will do what it is paid to do and no more than that – therefore incentives and performance requirements should be included in the contract.
- b. There is a cost attached to debt – while the private sector can make it easier to get finance, finance will only be available where the operating cashflows of the concessionaire are expected to provide an acceptable return on investment, that is, the cost has to be borne either by the users or the government (through, for example, subsidies, shadow tolls, annuities).
- c. Bidding and ongoing costs in PPP projects are likely to be greater than for traditional government procurement processes - the government should therefore determine whether the greater costs involved are justified.⁶¹
- d. There is no unlimited risk bearing – private firms will be cautious about accepting major risks beyond their control, such as exchange rate risks or risk of existing assets. If they bear these risks then their price for the service will reflect this. Private firms will also want to know that the rules of the game are to be respected by government as regards undertakings to increase tariffs and fair regulation. The private sector will also expect a significant level of control over operations if it is to accept significant risks.
- e. Government responsibility continues – citizens will continue to hold government accountable for the quality of the facility and services provided. The government will also need to retain sufficient expertise, whether itself or via a regulatory body, to be able to monitor performance of the private sector and enforce its obligations.
- f. A clear legal and regulatory framework is crucial to achieving a sustainable PPP program.

4.2 Risk Allocation in PPP Projects

Risks should be identified for each stage of a project, and responsibility should be allocated for the identified risks. More detailed discussions of the risks involved in a PPP project, as well as their allocation, are provided, for example, by Delmon (2009)⁶² and Irwin (2007).⁶³

⁶⁰ Link to PPP constraints under the Infrastructure and Law Website:

<http://web.worldbank.org/external/default/main?contentMDK=21731548&menuPK=4704603&theSitePK=4817374&pagePK=4710368&piPK=64860384#recognize>

⁶¹ Several PPP units around the world have developed methods for analyzing these costs, usually based on the method adopted by the UK Private Finance Initiative (PFI):

http://webarchive.nationalarchives.gov.uk/+http://www.hm-treasury.gov.uk/documents/public_private_partnerships/ppp_index.cfm

⁶² Delmon, Jeffrey. 2009. "Private Sector Investment in Infrastructure: Project Finance, PPP Projects and Risks." Co-publication of the World Bank and Kluwer Law International.

⁶³ Irwin, Timothy. 2007. "Government Guarantees: Allocating and Valuing Risk in Privately Financed Infrastructure Projects." World Bank, Washington, D.C., USA.

http://siteresources.worldbank.org/INTSDNETWORK/Resources/Government_Guarantees.pdf

As PPPs are legally long-term contractual agreements, responsibilities should be clearly defined as they will determine the costs that the public and private partners will ultimately pay. For example, construction risk is usually transferred to the private sector which means that it will be responsible (and won't be able to claim additional compensation) for delays and cost-overruns in completing the works. The best approach is not to try to transfer all risks to the private sector, as this would result in less interest (or no interest) by the private sector or a much higher cost to the public sector. As a result, risk allocation is a very important component in the assessment of any PPP project.

Good Practice in Risk Allocation. A good practice in preparing risk matrices is to adopt the following structure for each stage of the project:

- Description of the risk,
- Proposed allocation of the risk (usually two columns – 'Grantor' and Concessionaire'- and one of them gets checked for a particular risk),
- Comments.

The general rule is that risks need to be allocated to the party that is best capable to manage them. This means that the government would need to take some risks that it can manage better, or because the costs of the private sector assuming such risks would be too high. The private sector will price the risk of the project based on how individual risks are allocated, their likelihood of occurrence, and impact. If the private sector is transferred a risk that it cannot control (for example, inflation being higher than forecast) it will either take a very conservative scenario (such as assuming a very high inflation rate) or simply not accept it (and therefore will not make any proposal). The risk allocation exercise requires a very good understanding of the market and project finance principles in order to allocate the risk in a way that balances the public and private sector concerns and interests.

The preparation of a risk matrix would help the government to decide which risk should be allocated to which party. Risk framework is a useful tool that provides the basis for discussions on potential structuring of the transaction and relevant policy choices, and allows the government team preparing the project to discuss with the decision makers the proposed risk allocation and obtain approvals for moving ahead with the transaction. The risk matrix should be prepared with a legal perspective in mind because it should provide the basis for drafting the PPP legal agreement / concession agreement.

Potential bidders will carefully examine the risks and proposed risk allocation and will prepare their bids based on their perceived risks and how comfortable they are with taking on some of them. In view of the volatility of the market resulting from the current global economic crisis and the limited experience with PPP in some countries, it is likely that the investors will be uncomfortable with assuming many risks that are usually borne by the private sector in established economies with good track record of PPP projects.

The risk allocation matrix should be updated and refined as project preparation evolves. It is usually prepared with the support of transaction experts and in consultation with potential bidders. Ultimately the risk allocation will determine if a PPP project is financeable (that is, lenders will not finance it if they believe the risk allocation is not appropriate), so the public sector should remain flexible when designing such a matrix.

Countries with limited PPP experience, in particular, may be seen as risky environment for private investment, and the use of risk mitigation instruments can help reduce the risk perception and facilitate private sector investment.⁶⁴

4.3 Risk Mitigation in PPP Projects

Several risk mitigation instruments can be used to facilitate the mobilization of private capital to finance PPP projects, particularly in those infrastructure sectors in which financing requirements substantially exceed budgetary or internal resources. Risk mitigation instruments are financial instruments that transfer certain defined risks from project financiers (lenders and equity investors) to creditworthy third parties (guarantors and insurers) that have a better capacity to accept such risks. These instruments are especially useful when the public partner is not sufficiently creditworthy or does not have a proven track record in the eyes of private financiers to be able to attract private investments without support. The advantages of such instruments are multifaceted:⁶⁵

- The public sector is able to mobilize domestic and international private capital for infrastructure implementation, supplementing limited public resources.
- Private sector lenders and investors will finance commercially viable projects when risk mitigation instruments cover those risks that they perceive as excessive or beyond their control and are not willing to accept.
- Governments can share the risk of infrastructure development using limited fiscal resources more efficiently by attracting private investors rather than having to finance the projects themselves, assuming the entire development, construction, and operating risk.
- Risk mitigation instruments facilitate the flow of local and international private capital, support the creation of commercial and sustainable financing mechanisms for infrastructure development, and promote the provision thereof.

Types of Risk Mitigation Instruments. Commonly used risk mitigation instruments include guarantees and insurance products. Guarantees typically refer to financial guarantees of debt that cover the timely payment of debt service. Procedures to call on these guarantees in the event of a debt service default are usually relatively straightforward. In contrast, insurance typically requires a specified period during which claims filed by the insured are to be evaluated, before payment by the insurer. Examples of risk mitigation instruments available include:⁶⁶

- a. Credit Guarantees. These cover losses in the event of a debt service default regardless of the cause of default (that is, both political and commercial risks are covered with no differentiation of the source of risks that caused the default).
- b. Political Risk Guarantees or Insurance. These cover losses caused by specified political risk events. They are typically termed Partial Risk Guarantees (PRGs) which may be termed as Political Risk Guarantees (PRGs), or Political Risk Insurance (PRI) depending on the provider.

⁶⁴ Cuttaree, V., M. Humphreys, S. Muzira, and J-P Strand. 2009. "Private Participation in the Transport Sector: Lessons from Recent Experience in Europe and Central Asia." Transport Papers Series TP-24, World Bank, Washington, D.C., USA.

⁶⁵ "Review of Risk Mitigation Instruments for Infrastructure Financing and Recent Trends and Developments." Trends and Policy Options No. 4. 2007. World Bank and PPIAF. Tomoko Matsukawa and Odo Habeck. http://www.ppiaf.org/documents/trends_and_policy/Riskmitigationinstruments.pdf

⁶⁶ *ibid.*

Partial Risk Guarantees cover commercial lenders in PPP infrastructure projects. They typically cover the full amount of debt. Payment is made only if the debt default is caused by risks specified under the guarantee. Such risks are political in nature and are defined on a case-by-case basis. PRGs are offered by multilateral development banks (such as the World Bank) and some bilateral agencies.

4.4 The Need for Good Governance in PPP Projects

Because PPP projects in transport infrastructure tend to have monopolistic features, good governance in managing them is essential to ensure that the private sector's involvement yields the maximum benefit for the public. Good governance in this case requires;⁶⁷ (i) competitively selecting the strategic private investor, (ii) properly disclosing relevant information to the public, and (iii) having a regulatory entity oversee the contractual agreements over the life of the concession.

The competitive selection of concessionaires, usually considered essential for economy and efficiency of the selection process, involves public advertisement, invitation to bid, bid evaluation, and award of the concession contract to the candidate that provides the best offer.⁶⁸ While competitive selection of the private investor or operator is usually the preferred approach, sometimes private companies approach governments with new project ideas, typically called "unsolicited proposals." Such proposals often become controversial if governments negotiate the project rights directly with the original proponent without sufficient transparency or competing proposals. To avoid those situations, some countries have developed effective systems to channel unsolicited proposals into processes that incorporate transparency and competition.⁶⁹

Full disclosure of concession agreements, an indication of good governance, helps ensure that the users know what to expect from the facility under concession, thus increasing transparency in the role of the regulator. Nevertheless, not all concession contracts are open to public scrutiny. Excuses range from a claimed need for confidentiality to the cost of photocopying.⁷⁰ In one country in Central and Eastern Europe, the main text of a concession agreement was published but key annexes including financial and technical obligations of the concessionaire were not open to the public. In a Latin American country, the full final drafts of the concession agreements are published, but the signed version is kept confidential. As a result, potential last minute negotiations conducted behind closed doors between the successful bidder (that is, the concessionaire) and the highway agency responsible for the project, if inserted in the contract, are not made available to the public or to the other contenders in the competitive bidding process.⁷¹ Full disclosure, in every case, increases accountability of both the concessionaire and the regulator.

⁶⁷ Queiroz, Cesar, and Ada Karina Izaguirre. 2008. "Worldwide Trends in Private Participation in Roads: Growing Activity, Growing Government Support." Gridlines series, no. 37, Public-Private Infrastructure Advisory Facility-PPIAF, Washington, DC. <http://ppiaf.org/documents/gridlines/>

⁶⁸ World Bank. 2004. "Guidelines: Procurement under IBRD Loans and IDA Credits." Washington, D. C. <http://go.worldbank.org/1KKD1KNT40>

⁶⁹ Hodges, John, and Georgina Dellacha. 2007. "Unsolicited Infrastructure Proposals: How Some Countries Introduce Competition and Transparency." Working Paper No. 1, PPIAF, Washington, DC., USA. http://www.ppiaf.org/documents/working_papers/Unsolicited_Proposals_Experience_Review_Report_FINAL_2006.pdf

⁷⁰ Economist, The. 2007. "Who Benefits from the Minerals?" Volume 384, Number 8547, September 22, page 62. www.economist.com

⁷¹ Queiroz, Cesar. 2009. "Financing of Road Infrastructure." Proceedings of the 5th Symposium on Strait Crossings. Trondheim, Norway, June 21-24, 2009. ISBN 978-82-92506—69-1. Pages 45-57. <http://www.straitcrossings.com/>

Many countries have established regulatory agencies that monitor the performance of roads under concession. For example, in 2001 Brazil established the National Agency for Land Transport, which, among other things, monitors federal road concessions.⁷²

Roads and other transport infrastructure concession contracts typically include required standards for construction, operation, maintenance, and toll collection. For monitoring the quality of the road during the life of the concession, several indicators of condition are usual, such as roughness, skid resistance, luminescence of pavement markings, and the presence and condition of signs, lighting, and other safety features. Performance on these indicators that falls outside the boundaries of acceptability may lead to penalties for the concessionaire. Enforcing such standards helps the government and the users to reap maximum benefits of road concessions.

⁷² More details are available at: <http://www.antt.gov.br/>

5 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

This paper presented a review of the various existing institutional and financing arrangements in the roads sector for several selected countries, including China, Brazil, Slovenia, Croatia, New Zealand, the United Kingdom, and Slovak Republic. The experience of road administrations in seven West European countries was also summarized.

Public-private partnerships (PPP) were reviewed as a means to elicit the private sector to contribute to reducing the overall cost of delivering infrastructure services through increased efficiency and better management of some risks (such as construction). In successful PPP projects, the private sector's higher cost of financing and the need for a return on its investments are offset by the benefits provided by the private participation. A discussion was also included on the need to ensure good governance in managing PPP programs so that the public reaps the full benefits of the private sector's involvement.

A summary of how several countries have adopted different approaches to develop their motorway or expressway infrastructure was presented, taking into account three dimensions: (i) degree of decentralization; (ii) source of financing; and (iii) current management structure.

5.2 Conclusions

The review has indicated that countries have adopted different approaches to manage roads in dimensions that include decentralization, sources of financing, management structure, and modal responsibility. Different structures can be efficient in achieving countries' objectives. For example, the approaches adopted by China, Brazil, Croatia and the Slovak Republic have been efficient in creating expressway networks.

As expected, the degree of decentralization tends to be lower in smaller countries. Nevertheless, larger countries, such as Brazil, Russia and Ukraine, could probably benefit from a higher degree of decentralization. As to the source of financing, about half of the countries reviewed have not taken advantage of toll collection and would likely benefit from this financing option (except where traffic volumes are relatively low). The management structure remains entirely public in the other half of the countries surveyed; such countries could probably benefit from more private sector involvement.

Despite the differences between institutional arrangements, the following trends seem to be common to most countries regarding the management of their road infrastructure:

- a. Increased involvement of private sector in building, maintaining, managing and operating road infrastructure; and
- b. More emphasis on user orientation and the development of methods to communicate with roads users to take into account their needs and concerns in the provision of road infrastructure.

New Zealand has provided an interesting example of experimenting with the split of responsibilities by function between several institutions to manage the country's road system. For about a decade it had two separate agencies, one to manage highways, and the other to provide the funds. The two agencies were subsequently merged in 2008, among other things, "to provide an integrated approach to transport planning, funding and delivery."

In all countries reviewed, there is a designated Ministry responsible for Transport that sets the overall transport and roads policy and is responsible for establishing checks and balances for good governance and management of fiscal risk.

5.3 Recommendations

The set of countries included in the paper shows wide variations of physical size, per capita incomes, and political orientation, but was limited in number and geographical coverage. Expanding the review to cover a broader range of countries would increase the robustness of the conclusions.

Some road organizations, such as the U.K. Highways Agency⁷³ and the Swedish Road Administration,⁷⁴ use mature performance management systems to demonstrate accountability to elected officials and the public. It would be helpful to carry out a study to show how road organizations in developing countries could (i) use goal setting and performance measures to manage, explain, deliver, and adjust their roads budgets and internal activities; (ii) establish effective and achievable performance levels based on input from the public, elected officials, and the business community; and (iii) demonstrate good governance and accountability in meeting or exceeding performance expectations.

Other areas recommended for further research include:⁷⁵

- a. There are many paths to an effective and efficient road system: the specific combination of organization (for example, centralized, decentralized), management (for example, extent of public vs. private involvement), and financing instruments (for example, budgetary allocations, dedicated road user charges) selected by a country depends on many factors. It would be useful that a follow-up study identify a set of drivers (such as size of the country, stage of sector development, political economy) and present a taxonomy illustrated by country examples.
- b. The paper identified generic reform features and phases. It would be helpful if further studies could be carried out to see how country specific reforms link with the generic approach provided, illustrating progression, for example from the traditional public works department to an executive agency.
- c. The paper indicated the dimensions of diversity among the countries surveyed. It would also be helpful to look at what factors influence the choices along these dimensions. Such factors might include, for example, the degree of maturity of the transport system, and the traffic levels and growth rates. Countries such as China and the United Kingdom are at different stages in their sectoral development. While the latter has more mature transport systems and is more concerned with congestion and demand management, the former is massively building its highway network. Such differences and their relevance to the nature of the road agency, level of decentralization, and financing instruments used could be further explored.
- d. While the paper focused on roads, exploring the organization and reforms in the railways, ports and airports sector would be desirable. The port sector, for example, has seen a lot of reform in recent years and could offer interesting comparisons, within and across countries, to the roads sector reforms.

⁷³ UK Highways Agency Business Plan 2009-10.

http://www.highways.gov.uk/aboutus/documents/Business_Plan_09-10_Web_Version.pdf

⁷⁴ U.S. Federal Highway Administration. 2010. "Linking Transportation Performance and Accountability." Washington, D.C. USA. <http://www.international.fhwa.dot.gov/pubs/pl10009/pl10009.pdf>

⁷⁵ These recommendations are mostly the result of a personal correspondence from Ms. Kavita Sethi on February 5, 2010.

REFERENCES

- Amorelli, Lara. 2009. "Brazilian Federal Road Concessions: New challenges to the regulatory framework." Institute of Brazilian Business and Management Issues, Minerva Program, George Washington University, Washington, D.C., USA.
<http://www.gwu.edu/~ibi/minerva/Spring2009/Lara.pdf>
- Asian Development Bank (ADB). 2006. "People's Republic of China: Toll Roads Corporatization Strategy—Towards Better Governance." Project Numbers: RSC-C51814 & RSC-C60519, December 2006, p. 13.
- Brazilian National Agency for Land Transport (ANTT). 2009.
<http://www.antt.gov.br>
- Brazilian National Agency for Ports and Waterways (ANTAQ), 2009.
<http://www.antaq.gov.br/Portal/default.asp#>
- Brazilian National Department of Transport Infrastructure (DNIT). 2009.
<http://www.dnit.gov.br>
- Croatian Motorways Ltd. 2009.
<http://www.hac.hr/>
- Croatian Roads Ltd. 2009.
<http://www.hrvatske-ceste.hr/Index.aspx>
- Cuttaree, V., M. Humphreys, S. Muzira, and J-P Strand. 2009. "Private Participation in the Transport Sector: Lessons from Recent Experience in Europe and Central Asia." Transport Papers Series TP-24, World Bank, Washington, D.C., USA.
- Delmon, Jeffrey. 2009. "Private Sector Investment in Infrastructure: Project Finance, PPP Projects and Risks." Co-publication of the World Bank and Kluwer Law International.
- Economist, The. 2007. "Who Benefits from the Minerals?" Volume 384, Number 8547, September 22, page 62. www.economist.com
- Heggie, Ian G. 2008. "Private Financing Options for Roads." University of Birmingham, the United Kingdom.
- Hodges, John, and Georgina Dellacha. 2007. "Unsolicited Infrastructure Proposals: How Some Countries Introduce Competition and Transparency." Working Paper No. 1, PPIAF, Washington, DC., USA.
http://www.ppiaf.org/documents/working_papers/Unsolicited_Proposals_Experience_Review_Report_FINAL_2006.pdf
- Irwin, Timothy. 2007. "Government Guarantees: Allocating and Valuing Risk in Privately Financed Infrastructure Projects." World Bank, Washington, D.C., USA.
http://siteresources.worldbank.org/INTSDNETWORK/Resources/Government_Guarantees.pdf

Isotalo, J., and I. Heggie. 1996. "Managing Undesignated Roads." World Bank, Washington, DC, USA.
http://www.worldbank.org/transport/roads/ism_docs/annex3.pdf

Izaguirre, Ada Karina, and Alexander N. Jett. 2009. "Investment in road projects with private participation more than doubled between 2005 and 2008, but was concentrated in a few countries." PPIAF Note 12, December 2009.
<http://ppi.worldbank.org/features/October2009/didyouknowOctober2009.aspx>

Kerali, Henry G. R. 2008. "International Trends in Road Management Reforms." World Bank, Washington, DC, USA.

Matsukawa, Tomoko and Odo Habeck. 2007. "Review of Risk Mitigation Instruments for Infrastructure Financing and Recent Trends and Developments." Trends and Policy Options No. 4. 2007. World Bank and PPIAF.
http://www.ppiaf.org/documents/trends_and_policy/Riskmitigationinstruments.pdf

McPherson, Kevin and Christopher R. Bennett. 2005. "Success Factors for Road Management Systems." World Bank, Washington, DC, USA.
<http://www.road-management.info/reports/user/6/05-10-11SuccessFactorsforRoadManagementSystems.pdf>

New Zealand Transport Agency. 2009.
<http://www.nzta.govt.nz/>

Perrupato, Marcelo. 2009. "Logistic Infrastructure Scenario in Brazil." Toll Road Summit of the Americas: A Bridge to the Future, International Bridge, Tunnel and Turnpike Association (IBTTA), Sao Paulo, Brazil, November 16-17, 2009.
<http://www.ibtta.org/Events/pastpresdetail.cfm?ItemNumber=4365&navItemNumber=883>

Postigo, Antonio. 2008. "Financing Road Infrastructure in China and India: Current Trends and Future Options." Journal of Asian Public Policy, 1:1,71 – 89.
<http://www.informaworld.com/smpp/content~content=a791731899~db=all~jumptype=rss>

Public-Private Infrastructure Advisory Facility (PPIAF). 2009.
<http://www.ppiaf.org>

Queiroz, Cesar. 2009. "Financing of Road Infrastructure." Proceedings of the 5th Symposium on Strait Crossings. Trondheim, Norway, June 21-24, 2009. ISBN 978-82-92506—69-1. Pages 45-57.
<http://www.straitcrossings.com/>

Queiroz, Cesar and A. Karina Izaguirre. 2008. "Worldwide trends in private participation in roads: Growing activity, growing government support." PPIAF Gridline Note No. 37. World Bank, Washington, DC, USA.
<http://www.ppiaf.org/content/view/431/485>

Queiroz, C., B. Rdzanowska, R. Garbarczyk, and M. Audige. 2008. "Road User Charges: Current Practice and Perspectives in Central and Eastern Europe." World Bank, Washington, DC, USA.
<http://go.worldbank.org/EYOZ8CRSJ0>

- Rijkswaterstaat - RWS (the Netherlands Directorate-General for Public Works and Water Management). 2007. "International Comparison - Road Administrations." Rijkswaterstaat AVV Transport Research Centre, The Netherlands.
http://www.rijkswaterstaat.nl/dvs/Images/Comparing%20RA%20werkdok%20def_tcm178-160558.pdf
- Slovakia National Motorway Company (NDS). 2009.
<http://www.ndsas.sk/index/index.php>
- Slovakia Road Agency (SSC). 2009.
http://www.ssc.sk/user/view_page.php?page_id=1170
- Slovenia Motorway Company (DARS). 2009.
<http://www.dars.si/?lang=2>
- Slovenian NMCP:
<http://www.avtoceste.si/?lang=2>
- Talvitie, A. 1996. "International Experiences in Restructuring the Road Sector." Transportation Research Record No. 1558, pp. 99-108.
- United Kingdom Department for Transport (DfT). 2009.
<http://www.dft.gov.uk/>
- United Kingdom Highways Agency. 2009.
<http://www.highways.gov.uk>
- United Kingdom Highways Agency Business Plan 2009-10.
http://www.highways.gov.uk/aboutus/documents/Business_Plan_09-10_Web_Version.pdf
- U.S. Federal Highway Administration. 2010. "Linking Transportation Performance and Accountability." Washington, D.C. USA.
<http://www.international.fhwa.dot.gov/pubs/pl10009/pl10009.pdf>
- Wood, W. Greg. 2006. "People's Republic of China: China Expressway Retrospective Study." World Bank, Washington, DC, USA.
- World Bank. 2004. "Guidelines: Procurement under IBRD Loans and IDA Credits." Washington, D. C.
<http://go.worldbank.org/1KKD1KNT40>
- World Bank. 2007. "China's Expressways: Connecting People and Markets for Equitable Development." EASTR Working Paper No. 13, January 2007.

ADDITIONAL RESOURCES

A full list of all recent and forthcoming World Bank transport sector studies, toolkits, guidance notes, and related information can be found at:

Transport Anchor Website

<http://www.worldbank.org/transport/>

Africa Region Transport Website

<http://www.worldbank.org/afr/transport/>

Sub-Saharan Africa Transport Policy Program (SSATP)

<http://www.worldbank.org/afr/ssatp/>

East Asia and Pacific Transport Website

<http://www.worldbank.org/eaptransport>

Europe and Central Asia Transport Website

<http://www.worldbank.org/eca/transport/>

Latin America and Caribbean Transport Website

<http://www.worldbank.org/lactransport/>

South Asia Transport Website

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