

**PROJECT DELIVERY OF TOLL ROAD SECTOR IN CHINA  
-- A STUDY OF APPLICABLE POLICIES**

by

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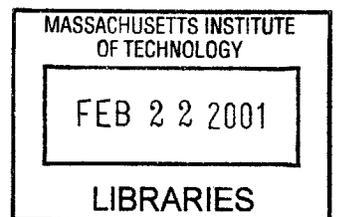
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Submitted to the Department of Civil and Environmental Engineering  
on January 19, 2001 in partial fulfillment of the requirements  
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## **ABSTRACT**

The trend towards greater private participation in infrastructure development is firmly established in many developing countries. The benefits of the initial wave of privatization and new investments are becoming obvious. The move towards private infrastructure began primarily in the power sector in the mid-1980s. More recently, however, investors have become active in other types of infrastructure such as toll road. Governments who are typically capital constrained also promote private involvement in sectors that are traditionally controlled within the public regime.

The theme of this thesis emphasizes on policy concerns and challenges in successfully engaging private participation in China's toll road development. This is approached through an initial review of several unsuccessful toll road projects in other developing countries, balanced by other successful experiences in relatively more developed areas. Without exception, toll roads require cooperation between the public and private sectors. Key principles for fostering such cooperation, mainly from the perspectives of the public sector are analyzed. These include sustained commitment, maximum competition, transparent processes, incentive-based regulatory structures and essential financial assistance. These principles represent the pillars that will collectively form a fundamental framework that China can utilize to deal with its development agenda.

It was concluded that private toll road development is likely to experience only a modest growth in the near future in China due to two main reasons. Firstly, tolling might not be the best or even a feasible solution in some projects. Secondly, a number of factors inhibiting toll road development still exist locally that are linked to the political, social and economic environment of China. This study ends with several recommendations that would help to circumvent some of these problems. These include improving the legal and policy framework for toll roads, developing standard and transparent concession models, promoting broader acceptance of tolling to the public and utilizing assistance from multilateral institutions. These findings have implications for both policymakers who are planning for toll road development involving private sector participation, and private investors who are seeking to invest their capital in such projects.

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## **CHAPTER 1. INTRODUCTION**

Road transport has long been, and will be for a long time, the dominant form of transport for freight and passenger movement throughout the world. In Latin American, for instance, road transport accounts for more than 80 percent of domestic passenger and over 60 percent of freight movements – over 85 percent in some countries such as Brazil. In Africa, the proportions are even higher. Not only is the sector large, but also it is still growing rapidly in many parts of the world. In Asia, from 1984-1994, the road networks of Indonesia, Korea, Malaysia, and Pakistan grew in length by more than 5 percent per year. In Eastern Europe, countries historically dominated by rail are now witnessing a rapid expansion in the demand for road transport. In Russia, the total freight moved by road is expected to increase from just over 10 percent to almost 40 percent with the first decade after the end of the Soviet Union.

Because most road projects require investments with slow amortization periods and because many of these projects will not generate sufficient demand to make them self-financed through some type of user fee or toll, the road sector continues, and will continue to be, in the hands of the public sector to a much larger extent than the other transport activities. But fiscal crisis and competing demands from other sectors such as health and education are bringing changes in the extent of public-private partnership in the expansion and operation of road networks. Governments throughout the world, including many poor African and South Asian countries, are commercializing their operations to cut costs, improve user orientation and increase sector specific revenue. These partnerships are not only aimed at convincing the private sector to finance its investment needs but also to participate in reforms to cut costs in its operation and maintenance.

The trend toward increased tolling of roads is clear. The precursors were in the United States and Europe. The latest wave of toll roads is in developing countries, where economic and population growth and growing links with international markets led to pressures for more highways. Mexico launched perhaps the most ambitious program of new roads, to build more than 5,000 kilometers of new roads between 1989 and 1994, the majority of which have not met the projections and have had to be restructured with significant public contributions. Expansion of existing toll road systems has met better,

although still mixed, success in other Latin American countries, most notably Chile. Private or public-private toll concessions also have been pursued in China, Colombia, Hungary, Indonesia, Malaysia, the Philippines and Thailand.

The challenges in achieving substantial private risk-taking are many. China has adopted an incremental approach to private participation in toll road development. It has sought private investment mainly for specific projects, ring-fenced to insulate them from the existing structure of delivery. The result has been variable flows of investment, typically backed by substantial government support, while China cannot expect to meet its entire staggering infrastructure needs that way. Having recognized the limits to private involvement under this approach, China is undertaking broader policy and institutional reforms aimed at creating an environment more conducive to private participation, but these efforts are still at an early stage. Designing such reforms, improving methods of contracting with private parties, building regulatory capacity, and developing domestic capital markets remain on the China's policy agenda.

The chapters in this paper illustrate the policy concerns and options in moving toward efficient private involvement in China's toll road development. An overview of the impact of transportation to national, even global, economies and a big picture of China's transport development will be given in Chapter 2. Chapter 3 draws on experience in a range of countries – mainly focusing on East Asia and Latin America area – to show what difficulties the countries encountered and what strategies the governments have followed. Based on the reflections from the case studies, Chapter 4 emphasizes the coordinating roles of the government and the cooperation between the public and private sectors. The key principles for fostering such cooperation are also analyzed. Substantiated by the successes in the relatively developed areas of East Asia and Latin America, some underlying theories of important role of government are going to be revealed in Chapter 5. Chapter 6 will illustrate that the options, available to China's toll road development, must be made in the methods for contracting and regulation, the management of environmental and resettlement issues, and the development of financing mechanisms to increase access to long-term funds. Lastly, Chapter 7 marks the end of the thesis by drawing conclusions and making recommendations.

## **CHAPTER 2. IS TRANSPORT INFRASTRUCTURE EFFECTIVE?**

### **§2.1 INFRASTRUCTURE DEVELOPMENT AND ECONOMIC GROWTH**

Infrastructure can be broadly defined as the facilities that provide society with the services necessary to conduct daily life and to engage in productive activities. In any modern society, infrastructure plays a pivotal – often decisive – role in determining the overall productivity and development of a country's economy, as well as the quality of life of its citizens. Growth in economy activity since 1820 has been much startling throughout the world. Between 1820 and 1992, Maddison's estimates of the volume of world merchandise exports have increased by a factor of 540. These dramatic expansions in domestic products and in international exports were consistently supported by corresponding improvement in the technological and infrastructure base. It has been realized by various countries' leaders that infrastructure development and economic expansion are fundamentally complementary in nature. Thus infrastructure provision has been linked closely to the objective of spurring economic growth.

The ex-President of Mexico, Carlos Salinas de Gotari (1988-1994) identified high-quality infrastructure as critical to the Mexico's long-term economic growth. He proposed a massive new program to build private sector toll roads and international bridge crossings. The plan was supposed to provide an immediate stimulus to the country's moribund construction industry, while helping reinvigorate the economy overall when the Mexican economy began to pick up after the oil 'glut' of the 1980s.

Taiwan (China) in the 1970s experienced a hard time. Its infrastructure lagged behind its economic growth. Simultaneously, Taiwan (China) lost the formal diplomatic relations with many of its leading trade partners, including Japan, the United States, and was also removed from membership in many international organizations, including the United Nations and the World Bank. Nevertheless, the government proceeded with efforts to initiate a large-scale infrastructure development program, known as the Ten Major Projects.<sup>1</sup> The Ten Major Projects provided much needed infrastructure

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<sup>1</sup> The Ten Major Projects include: North-Sough Freeway, Railway electrification, North Link Railway, Taichung Harbor, Suao Harbor, Chiang Kai-Shek International Airport, Nuclear power plant, etc.

improvements and proved to be an important boost to employment and economic growth. The capacity of road, rail, port, and power generating facilities on the west coast had been significantly upgraded. These projects also generated 40,000 new jobs at a time when unemployment had been rising, enabling Taiwan (China) to show positive economic growth in 1974 and 1975.

A continued push to develop infrastructure services is especially critical in developing countries to their future as they enter the 21<sup>st</sup> century.

**GROWTH.** Demand for modern infrastructure grows at least as fast as the overall economy – and for many sectors significantly faster. Failure to meet this demand could undercut the potential rapid growth. In details, when infrastructure problems result in congestion and negative net impacts on the environment, the potential growth from urbanization will be sacrificed. While, infrastructure developments, such as improved transport, which reduce workers' time spent on nonproductive activities, will raise the economic returns to labor. In other words, the lack of affordable access to adequate infrastructure is a key factor determining the nature and persistence of poverty. As a result, if investment is not boosted in China's increasingly congested transport system, the economy's growth will be choked off.

**COMPETITIVENESS.** In an aggregate sense, the character and availability of infrastructure influence the productivity of private capital. Public investment thus complements private investment. Good power, transport, and telecommunication services provide access to applications of modern technology, which are going to increase quality and reduce cost and in turn to enhance competitiveness of products in this increasingly integrated world. In Indonesia the firms that use captive power pay more than twice the price of power from the grid. No doubts the competitiveness of these firms in the international market, even in the domestic market, has been considerably weakened.

**QUALITY OF LIFE.** Poor infrastructure services mean a poor quality of life despite rapidly rising income. And improvements in infrastructure are central to the quality of life and enjoyment gained from both the natural and man-made environment – especially in urban areas, such as cleaner water, land and air, and transportation and

communications services, by contributing to improved personal health and national integration. In many countries households' access to services remains far lower than would be predicted on the basis of income levels. Poor households that have to buy water from vendors pay some sixty times the price of piped water in Bandung and almost twenty times the price in Manila and Ho Chi Minh City. Congestion in cities from Bangkok to Shanghai adds hours to people's daily commute, in air quality conditions way below World Health Organization standards.

## **§2.2 INHERENT DIFFICULTIES WITH ROAD DEVELOPMENT**

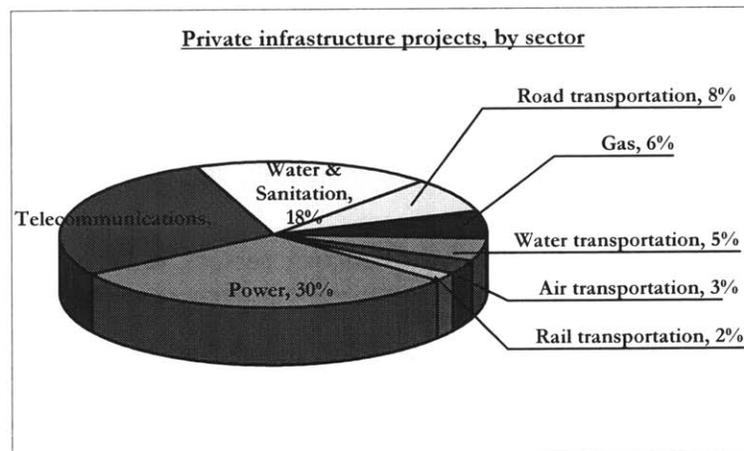
Many of the challenges to developing and financing toll roads are similar to those faced by other infrastructure projects, which are typically capital-intensive and share certain risks, including construction risk, political risk, currency risk, and force majeure risk. But toll road projects face greater risks in certain important areas, including acquisition of long segments of right-of-way, unforeseen geological and weather conditions that may increase costs and cause delays, and, perhaps most important, the unpredictability of future traffic and revenue levels. Power projects, on the contrary, may face fewer risks than toll roads because the physical plant is in one location (which facilitates land acquisition) and future revenues are generally secured by a long-term power purchase agreement.

In addition, compared with other infrastructure sectors, toll road is closely tied with the political and economic surroundings, which adds more risks into projects. A project's ability to obtain financing is not solely determined by its underlying cost and demand. The country and concession environment and the nature of public-private risk management also have important effects on the viability of toll road programs. A stable economic and political context has been essential for a sustained toll road program. Since toll roads typically are high performance highways, they are particularly dependent on income levels and economic activity. Moreover, since toll roads also tend to be politically visible, they may be subject to attempts to influence projects selection, implementation and operation, especially through attempts to delay tariff increases and to evade toll collection entirely.

Because of the unique barriers facing toll road projects, the toll road industry is less developed than other private infrastructure sectors, most notably the private power industry. Even with respect to the six East Asian economies,<sup>2</sup> where the infrastructure investments are substantial, the road infrastructure development is uneven. Japan increased the length of its paved roads substantially, and at 631 meters per 100 persons in 1990, it now has the highest road density in the world. Korea's road density grew by 10 percent a year, which is impressively high. The city economies of Hong Kong and Singapore increased their road capacity only modestly, while the growth of roads in Malaysia barely kept pace with population growth.

In light of the World Bank's estimates, the private toll road development accounts for 8 percent of the US\$60 billion annual market for private infrastructure projects worldwide (Figure 1). If private toll road development is to expand and provide a more significant portion of highway funding, the considerable challenges to toll road development must be understood and overcome.

FIGURE 1. PRIVATE INFRASTRUCTURE PROJECTS, BY SECTOR



<sup>2</sup> The six East Asian economies include Hong Kong, Japan, Korea, Malaysia, Singapore, and Taiwan.

## **§2.3 CHINA'S HUGE DEMAND FOR ROADS.**

“Transport provides an essential framework for our national economy. It gives the foundation and serves as a precondition for establishing and developing a socialist market economy. However, transport system capacity falls far behind demand, and that lack of capacity has led the sector to become a serious bottleneck that restricts the development of the national economy. The problems are mostly caused by three factors: insufficient strength of reform, inadequate investment, and problems of management and operation.”

Director, Transportation Department  
State Planning Commission of China  
December 1993

China's economic transformation and development since the opening of its economy in the late 1970s have resulted in 9.4 percent (from 1978 to 1995) average annual rate of economic growth, which has had a sweeping impact throughout the economy. Worldwide experience points to transport demand elasticities relative to the gross domestic product (GDP) greater than one, at least in the early stages of economic development. Without exception, transport is playing a vital role in China's reorientation of its economy, from a planned and centralized system to one that is increasingly dynamic, decentralized and market-based. Unless there is adequate physical access to jobs, health, education and other amenities, the quality of life cannot improve. Without the ability to reach resources and markets, growth stagnates and poverty reduction cannot be sustained. Inappropriately designed transport strategies and inadequately funded program, as China has experienced, result in transport systems that fail to provide the necessary conditions for economic growth. Additionally the movement toward a market economy will increase demand for market-responsive transport services, which will favor a shift to road transport.

### §2.3.1 HIGH GROWTH

Road transport has been growing in importance with accounting for 51 percent of passenger volume and 13 percent of freight volume in 1995, up from 39 percent of passenger volume and 10 percent of freight volume in 1985. The numbers of trucks, buses, cars, motorcycles, and tractors on the roads are increasing steadily and rapidly, despite the severe constraints posed by inadequate road standards, small coverage of the system, and high traffic congestion. Since 1979, China has experienced rapid growth in freight and passenger traffic Table 1.

TABLE 1. FREIGHT AND PASSENGER TRAFFIC GROWTH IN CHINA

	<b>Freight Traffic (billion ton-km)</b>	<b>Freight Growth</b>	<b>Passenger Traffic (billion passenger-km)</b>	<b>Passenger Growth</b>
1979	74.5		60.3	
1980	76.4	2.6%	73.0	21.1%
1981	78.0	2.1%	83.9	14.9%
1982	94.9	21.7%	96.4	14.9%
1983	108.4	14.2%	110.6	14.7%
1984	153.6	41.7%	133.7	20.9%
1985	169.3	10.2%	172.5	29.0%
1986	211.8	25.1%	198.2	14.9%
1987	266.0	25.6%	219.0	10.5%
1988	322.0	21.1%	252.8	15.4%
1989	337.5	4.8%	266.2	5.3%
1990	335.8	-0.5%	262.0	-1.6%
1991	342.8	2.1%	287.2	9.6%
1992	375.6	9.6%	319.3	11.2%

The following factors, which include:

- sustained high economic growth rates of agriculture and industry;
- radical changes in the composition of economic output;
- gradual but sustained changes in the location of economic activities as location decisions become increasingly based on cost rather than on political decisions;
- growing attention given to removing administrative and physical barriers to spur interprovincial trade; and
- increasing foreign trade.

will exert big impacts on China's transportation development. Existing transport infrastructure is currently being used to saturation levels, creating high logistics cost for producers and consumers. The large-volume, long- distance flows of bulk commodities, such as coal, timber, fertilizers, and grains, will continue to grow with the fast economic growth of agriculture and industry. In the medium term, patterns of industry location will change substantially. Initially in the Special Economic Zones (SEZs), but increasingly in the rest of the country, the more traditional industry is likely to move gradually from the cities to countryside and suburbs based on lowering cost, and vacates valuable urban space for higher value-added industries. This trend is likely to increase significantly short- and medium-distance freight movements between the cities and the new industrial areas. The new geopolitical and economic setting of the eastern central European republics, and the inland extension of China's SEZs will favor increased cross-border trade between the republics and China's border provinces. While the volume of trade will initially be comparatively small, it will likely grow quickly and require the expansion of transport facilities.

### **§2.3.2 UNDERINVESTED ROAD SECTOR**

Neglected by central economic planners and handicapped by inadequate provincial resource, transport sector in China suffered from chronic underinvestment for a long time. Investments were essentially focused on the needs for moving large quantities of essential minerals (particularly coal), heavy machinery, grain, and military equipment long distances. Such needs preeminently favored the development of railways, but even here resources were inadequate. The current 1,200,000 km total road network in China, which is antiquated, congested and underfinanced, ranks among the smallest in the world relative to either population or geographic area.<sup>3</sup> Given more than 10,000 kilometers per million people in industrial countries, 1,000 kilometers of paved roads per million people in China hardly meets the requirements that the high economic growth puts on the transportation. Although the highway system has expanded nine fold because of provincial efforts and funding since the establishment of this country,

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<sup>3</sup> About 30 percent of China's villages have no access to roads suitable for motor vehicles.

most roads are for county and intraprovincial roads, which were built mostly to low standards, with obsolete technologies and with small budgets. They have turned out to be too small and too weak structurally to carry current traffic, and need upgrading in addition to the normal maintenance and rehabilitation.

Over the last decade, China has kept a high investment rate of economic development, investment in transport – and particularly its highway infrastructure – continued to be neglected. Road length has increased by only 2.1 percent per year, significantly below the country's GDP growth rate. The overall investment in transport infrastructure represented only about 1.3 percent of GDP, compared with 2-3 percent for countries such as the Republic of Korea, India, and Brazil.

### **§2.3.3 NATIONAL TRUNK HIGHWAY SYSTEM**

The construction of high-class roads in China has accelerated greatly in recent years. In order to reduce the transport investment backlog, and the Government of China (GOC) has planned a major highway development program to address under-capacity in the sector. The 35,000-km National Trunk Highway System (NTHS) planned by the State Development Planning Commission (SDPC) includes a network of twelve – five vertical and seven horizontal – trunk highways that will link all of the provincial capitals and most cities with populations of greater than 500,000 by 2010, as shown in Table 2 and Figure 2 (see next page).

The first phase of the NTHS, totaling about 14,500 km, comprises four of the 12 national trunk highways. Two of the priority trunk highways will run from east to west (i.e., Lianyungang in Jiangsu Province to Huocheng in Xinjiang Province and from Shanghai to Chengdu in Sichuan Province) and two will run from north to south (i.e., from Tongjiang in Heilongjiang Province to Sanya in Hainan Province and from Beijing to Zhuhai in Guangdong Province).

Although there remains a substantial shortfall in the financing available for implementing this enormous task, nevertheless, China has been laying the foundation for substantial and longlasting private sector participation in its express highway sector. China's banking sector continues to present a substantial challenge. Performance of the

four major state banks still suffer from declining capital-asset ratios and losses on loans to state enterprises. Reforms in the sector have, however, accelerated under the prompting, first, of the Asian financial turmoil and, more recently, of approaching accession to the WTO and the associated commitments to liberalize and open up the financial sector to foreign competition. The People's Bank of China (PBOC), the central bank, is pursuing a broad program of reforms intended to strengthen management of the four major banks, reduce accumulation of their non-performing loans through transfer of these loans to Asset Management Companies (AMCs), enhance bank supervision, further tighten risk management, raise loan-loss provisioning, liberalize now regulated interest rates, and promote use of international accounting standards as well as an improved loan classification system.

The demand for road services will continue to grow and hence so will the need for investment. The challenge here is to bet on the right horses.

TABLE 2. LIST OF CHINA'S PLANNED NATIONAL TRUNK HIGHWAYS.

HIGHWAY NAME	LENGTH (KM)	PRIORITY STATUS
<b>North – South Highways</b>	15,590	
1. Tongjiang, Heilongjiang – Sanya, Hainan	5,700	Yes
2. Beijing – Fuzhou, Fujian	2,540	
3. Beijing – Zhuhai, Guangdong	2,310	Yes
4. Erenhoc, Inner Mongolia – Hekou, Yunnan	3,610	
5. Chongqing – Zhanjiang – Guangdong	1,430	
<b>East – West Highways</b>	20,300	
6. Sufenhe, Heilongjiang – Manzhouli, Inner Mongolia	1,280	
7. Dandong, Liaoning – Lhasa, Tibet	4,590	
8. Qingdao, Shandong – Yinchuan, Ningxia	1,610	
9. Lianyungang, Jiangsu – Korgas, Xinjiang	3,980	Yes
10. Shanghai – Chengdu, Sichuan	2,770	Yes
11. Shanghai – Ruili, Yunnan	4,090	
12. Hengyang, Hunan – Kunming, Yunnan	1,980	
<b>Total</b>	<b>35,890</b>	<b>14,760</b>

Source: Ministry of Communications of the PRC and J.P. Morgan

FIGURE 2. NATIONAL TRUNK HIGHWAY SYSTEM



Note: The thicker lines (also numbered with 1,3,9,10) represent the four highways – ‘two horizontals and two verticals’ (refer to Table 2) – given priorities, and the thinner lines represent the other eight components of the NTHS.

## **CHAPTER 3. STUDIES ON PROBLEMATIC PROJECTS**

Developed and developing countries throughout the world have accumulated a diverse base of experience with respect to the institutional, regulatory, and financial aspects of building and operating toll road system. Intending to complete the construction of trunk road networks rapidly, China has already introduced toll road systems, and private financing is playing an increasing important role in the mix of capital for highway construction. Arguably, however, China does not yet have clear or comprehensive visions and strategies for the future development and management of its toll road networks. For instance, in the absence of a mature legal and regulatory framework, for private investors, long term debt in the capital markets is generally not available for new toll road projects. It would therefore be valuable for China to learn the lessons derived from the successes and failures of toll road development in other countries in order to formulate appropriate institutional and regulatory frameworks suited to its needs.

## §3.1 ARGENTINA

Argentina's economic progress has been marked over the last 10 years, with the initiation of regulatory reforms and privatization programs in 1989 and the so-called Convertibility Plan in 1991. GDP increased at an equivalent average annual rate of 8.9 percent between 1990 and 1994, decreased by 4.6 percent during 1995 (the year of the Mexican currency crisis), and then recovered with 4.8 percent annual growth in 1996 and 8.6 percent annual growth in 1997. In the road sector, the private sector has been increasingly involved in road construction, reconstruction, and maintenance, resulting in better roads and a shifting of the financial burden from the public sector to the user through tolling.

Argentina's toll road concession program began when the government concessioned about one-third of the intercity road system to private operators, with a series of concessions awarded in early 1990. A second wave of concessions was initiated in 1992, mainly involving access roads to Buenos Aires.

### §3.1.1 FIRST PHASE OF TOLL ROAD CONCESSIONS

In early 1990, in the first phase of its road concession program, 12-year concessions for 9,579.5 km of the country's 28,000 km intercity system were awarded to private firms, mainly domestic construction companies. The most important selection criterion was the highest fee paid to the government, but many other criteria were also used (e.g., lowest toll, highest quality, largest investment). The right to collect tolls was granted in return for the duty to carry out a program of maintenance, rehabilitation, and capacity improvements. For all concessions, tolls were set based on a uniform value per kilometer by class of vehicle.<sup>4</sup> Toll levels were updated using a formula giving about equal weight to the consumer price index, the wholesale price index, and the value of the United States dollar. The government did not provide revenue guarantees to the concessionaires, but neither did it benefit from upside potentials.

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<sup>4</sup> The basic toll for cars was about US\$1.50 per 100 km.

In February 1991, after only five months of operations, the Argentina's government suspended the concession contracts and (bilaterally) renegotiated them. This decision was taken for a number of reasons:

- complaints from users that tolls were being collected before improvements;
- the voiding of contract escalation clauses by the Convertibility Plan of 1991, which established a fixed peso-United States dollar exchange rate;
- the location of toll booths, which tended to create "captive" trips.<sup>5</sup>

### §3.1.2 SECOND PHASE OF TOLL ROAD CONCESSIONS

Drawing upon the lessons of the first-phase program, the Argentina government initiated a second wave of toll road concessions in 1992, with concessions for 22 years and eight months for improvement and new construction of three strategic highways radiating from the national capital.<sup>6</sup> One change in approach compared to the initial phase was the longer concession period, which provides a more reasonable period for concessionaires to recover costs and earn a fair return. Also, concession terms and bidding criteria were simplified. One bidding criterion – lowest toll – was used, an approach that provides transparency in the bidding process. A comprehensive contract was provided, which among other provisions, assigned the concessionaire responsibility for risks related to land expropriation. Also, the concessionaire must carry out specific works before charging tolls, and other works must be executed during the concession. The concessionaire may obtain revenues not only from tolls, but also from the commercial exploitation of service areas as authorized by the regulator.<sup>7</sup>

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<sup>5</sup> The lack of access alternatives resulting from the spacing of toll booths close together or near urban centers tended to create captive trips.

<sup>6</sup> The three highways are: Acceso Norte (Northern Access), 118.3 km, US\$495 million; Acceso Ricchieri (Ezeiza-Ricchieri Access), 57.3 km, US\$158 million; and Acceso Oeste (Western Access), 55.9 km, US\$215 million.

<sup>7</sup> The improvement of the roads radiating from Buenos Aires has stimulated housing and commercial development in the suburbs.

### **§3.1.3 MAJOR ISSUES AND IMPLICATIONS FOR BEST PRACTICES**

#### **1. BENEFITS OF SIMPLE AND TRANSPARENT BIDDING CRITERIA**

The Argentina experience demonstrates the benefits of simplified, transparent bidding procedures. While during the first phase of toll road concessions, bidders had to satisfy a large number of technical and financial criteria, a single criterion – lowest toll offered – was used in the second phase, providing transparency and avoiding the difficulty of trading off many disparate factors.

#### **2. NEED FOR SUFFICIENTLY LONG CONCESSION PERIODS**

Toll road operators require a reasonable time period to generate sufficient revenues to recoup their investment and earn some returns. The concession period as short as 12 years in the first phase could be the indirect, if not direct, reason to explain why the concessionaires pre-collected tolls prior to improvements and set toll booths at close spaces, since they were short of time to recover the huge costs. As a consequence during the second phase the concession period was increased from 12 years to 22 years and eight months.

#### **3. BENEFITS OF PUBLIC RELATIONS CAMPAIGNS**

The high levels of usage of the concessioned toll roads in Argentina were reportedly partly a consequence of a successful promotional campaign aimed at overcoming public resistance to tolling by stressing the limited availability of government monies to carry out proper maintenance on a continuous basis. Public relations can aid implementation of toll road programs, but the programs themselves must be well-crafted if they are to be successfully “sold” to a doubting public.

#### **4. IMPORTANCE OF INSTITUTIONS**

The experience in Argentina also shows the importance of institution building. The Dirección Nacional de Vialidad (DNV), which is now the planning and coordination agency for national roads, lacks sufficient capacity to adequately supervise the concessionaires. The Secretariat of Public Works, the responsible agency for access

roads, reportedly suffers from a similar deficiency. These deficiencies were reflected on the conflicting regulations and insufficient contractual arrangement preparations.

#### **5. NEED FOR A WELL-DEFINED LEGAL AND REGULATORY REGIME**

The Argentina case demonstrates the need for well-defined law and regulations covering bidding documents, administration and enforcement of concession contracts, and pricing mechanisms. The detailed regulations in individual sector should be kept consistently with the general laws. Otherwise, the case, as the toll rate formula indexed to the exchange rate was voided by the Convertibility Law, would be repeated.

## §3.2 HUNGARY

The government of Hungary, in 1991, approved a long-term motorway development program, aiming to triple the length of motorways from the existing 250-km. Because of persistent budgetary constraints, it had been decided that private capital, in addition to available budgetary sources, should be sought for expansion of the motorway program. As a result, Hungary turned to the development of a toll motorway network on a BOT basis. Studies by international consultants had confirmed the practicability of attracting private capital for motorway financing, but emphasized that substantial government contribution would be necessary to make the financially less viable projects bankable. Hungary's pioneering experience in pursuing the BOT option has not been without difficulty, however, and the trend is more in the direction of a Private-Public Partnership (PPP) approach to the development of road infrastructure.

### §3.2.1 M1/M15 PROJECT

The M1/M15 project, the first motorway concession in the region, includes 43 km on M1<sup>8</sup> and 14 km on M15 (a branch toward Bratislava), with the complete design and construction of a dual carriageway. The concession company, ELMKA involved French, Austrian, and Hungarian operators, contractors, oil companies, and banks. In the financing structure equity represented 17 percent, long-term debt 81 percent, and generated cash 2 percent, and the total estimated cost was about \$300 million.

Government support for the project included:

- Preliminary design, building permits, and environmental clearance;<sup>9</sup>
- Land acquisition, amounting to 5 percent of project costs;
- Undertaking of no tolls on the existing 126 km of motorway prior to 2005; and
- Some restrictions on heavy goods vehicle movements on a parallel road.

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<sup>8</sup> A critical element in the Transport European Network – the last missing link of the 260 km motorway between the Hungarian and the Austrian capitals, e.g. Budapest - Vienna.

<sup>9</sup> This was not a trivial operation given Hungary's stringent and costly environmental requirements to safeguard the habitat of the native fauna.

All commercial, operational and financial risks were borne by the concessionaire and the debt providers; there was no state guarantee for traffic or cash-flow levels.

After 22 months of construction the first privately-financed motorway in the region, the M1 section was opened substantially in January 1996 (on schedule and within budget), and the M15 section was completed by mid-1998. Traffic volumes on the M1 section have been about 6,350 vehicles per day or about 45 percent of the forecast; there has been little truck traffic, perhaps a consequence of poor project design – a relatively short tolled motorway section between two untolled sections can easily be avoided. Generally, corridor traffic has been significantly less than forecast, due to a lack of market growth, continuing delays at the border between Hungary and Austria due to nonphysical barriers, lower than forecast diversion from elsewhere in the region,<sup>10</sup> and forecasting errors.<sup>11</sup>

One year after the project opening, the head of the legal committee of the Hungarian Automobile Club appealed to court that the tolls, equal to about one day's salary for an ordinary worker, were too high and therefore ordered a 50 percent reduction in the toll rate, without any government compensation to the concessionaire.<sup>12</sup>

With the revenue shortfall well below the "worst-case scenario" level defined in the concession contract, i.e., revenues 30 percent less than the target, the concession company required restructuring as it couldn't meet its principal payments. As of September 1998, negotiations were underway to address the problem.

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<sup>10</sup> While the Hungarian government promised to restrict truck through-trips on the competing free routes, problems with police enforcement, municipal control of secondary roads, and the collection of fines have left road transport operators with free route choice

<sup>11</sup> A major problem was the lack of historical evidence on traffic from Austria, as the border had been opened only relatively recently.

<sup>12</sup> The original intention that the tolls on this new, short section should 'carry' the rest of the M1 Motorway within Hungary, resulted in these relatively high toll rates; but these rates, and indeed the whole concept of tolling, proved difficult for users to accept.

### §3.2.2 M5 PROJECT

The M5 project, the second toll motorway concession in Central and Eastern Europe, involves 157 km from Budapest to the southern border. The project involves the complete design of 30 km of existing dual carriageway, to be followed by construction of 27 km of single and 40 km of dual carriageway, all in the first stage; two subsequent phases were to involve a total of 60 km dual carriageway. Project costs have been estimated at US\$634 million, with lenders including EBRD, 16 Western European, and four Hungarian banks.

A substantial government contribution – estimated at 30-40 percent of project costs – was provided in the form of:

- Land acquisition and delivery;
- Provision of existing road sections to be operated as a toll road after their rehabilitation or reconstruction;
- A standby subsidy, disbursed from the Road Fund, available for the initial six years of operation as a cash-flow deficiency guarantee;
- Construction a 15 km, two-lane connecting road to channel excess traffic from Road No. 4 to M5; and
- Some restrictions on heavy goods vehicle movements on a parallel road.

This substantial government support was the consequence of renegotiations occasioned by an updated traffic forecast reflecting the effects of civil instability in the former Yugoslavia; in return, the government has a profit-sharing arrangement with the concession company.

After opening of the toll road, residents along a parallel road protested against the new facility because of the adverse impacts of the diverted traffic on the free road; traffic increased by 30 percent on these roads as local residents and trucks from Ukraine and Turkey sought to avoid tolls. Political pressures led to negotiations with the concession company, which agreed to extend an existing commercially based system of toll discounts for local users, with the state offering cash support to cover losses from these non-commercial discounts.

### **§3.2.3 MAJOR ISSUES AND IMPLICATIONS FOR BEST PRACTICES**

#### **1. ENOUGH SUPPORT FROM THE GOVERNMENT.**

From the government viewpoint, and in retrospect, it was appropriate to attempt to attract private finance in the case of M1, but it was a mistake to limit the government contribution essentially to land acquisition. Although, in the original concept, all project costs would eventually be carried by road users, the allocation of all traffic-linked commercial risks to the private sector proved impossible to maintain. The lesson to be learnt is that under the conditions of relatively low traffic volumes and weak purchasing power of road users, stand-alone financing will not be successful, and considerable government contribution is needed if a Private-Public Partnership (PPP) for motorway development is to be successful.

The Hungarian Government's role in the projects is not without its fairly positive features, however. The Hungarian Government has contributed rights-of-way without charge to projects, having resolved all resettlement and environmental issues before the concession agreement was signed. This practice is generally recommended because to have these matters outstanding puts project sponsors at risk for decisions and actions best assumed by the Government.

#### **2. NEED FOR RELIABLE TRAFFIC FORECASTS.**

The traffic/revenue study may somehow impact the viability of the toll road projects, since the results of the study are going to be used to prepare credible financial plans, and to define the appropriate support that would be needed from the Government.

Overestimated traffic has proved to be a major problem with the development of the M5/M15 toll road concession, for which the traffic turned out to be only 45 percent of forecast levels. Except a number of reasons stated in the case above, there is another reason resulting in this too optimistic forecast – the forecasts were prepared by a subsidiary of Transroute (using parameters suitable for France, but not for Hungary), one of the firms involved in the concession company. This practice is no longer

encouraged by EBRD that won't accept forecasts from companies affiliated with concession holders.

### **3. IMPORTANCE OF PUBLIC ACCEPTANCE.**

The Hungarian experience also points to the importance of achieving public acceptance of BOT and PPP approaches, which may be a particular problem in transitioning economies. In the case of M1, the opposition was chiefly against the 'user pay' principle, while, with the M5 the complaints were from villages that were being impacted adversely by traffic diverting from the toll road. Issues that were inadequately addressed in Hungary include public perceptions relating to:

- The relationship between toll levels and local standards and ability to pay;
- The "unfairness" of charging tolls on existing non-tolled facilities, improvements notwithstanding;
- The impact of diversions to non-tolled, local roads.

In a word, a possible negative reaction of the populace should never be discounted.

### §3.3 INDONESIA

The transport system and flows of Indonesia have been shaped by the economic resource base of the islands and the distribution of population across the nations.<sup>13</sup> The country's transport system is multimodal, comprising a public road network, railway networks, an extensive inter-island and coastal shipping network, an extensive domestic and international air transport network, and inland waterway systems. Road transport is the dominant mode, accounting for more than half of all freight and passenger transport.

Strong economic and wage growth, coupled with a slow pace of improvement in public transport, led to a dramatic increase in the demand for transport by private vehicles over the past decade. This trend has caused many Indonesian roads, particularly in urban areas, to become increasingly congested and has compelled the Government of Indonesia to place a high priority on increasing highway investment and toll road construction.<sup>14</sup>

#### §3.3.1 HISTORICAL DEVELOPMENT OF TOLL ROAD FINANCING

The historical development of toll road financing methods in Indonesia may be divided into two phases. In the first phase, from 1978 to 1990, the Government fully financed all of the toll roads, while the state toll road operating agency, *Jasa Marga*, operated them. The second phase, beginning in 1990, saw toll road financing decisions made in cooperation with the private sector, using the BOT approach. In 1994, *Jasa Marga* introduced a BOT system with modified terms (including revenue sharing and land acquisition costs sharing).

Under Article 38 of Government Regulation No. 8 of 1990 on Toll Roads, the Minister of Public Works granted *Jasa Marga* the authority to develop, construct, and operate toll roads throughout Indonesia, and encouraged them to develop, construct, and operate toll roads in cooperation with other parties, upon the grant of a concession

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<sup>13</sup> Nearly 60 percent of the Indonesian population inhabits less than 7 percent of the nation's land area.

<sup>14</sup> Indonesia's Sixth National Economic Development Plan, *Repelita VI*, envisaged the construction of 688 km of toll roads by 1999, and 1,935 km by 2020.

license from the Minister of Public Works. Private investors responded positively to this opportunity, and most interested private-sector parties have formed joint ventures with Jasa Marga because of the large investment required and long debt repayment periods involved. In the typical project structure, Jasa Marga is only involved as an equity partner, the investors gain a return on their investment through toll revenues during the concession period.

### **§3.3.2 THE TENDER PROCESS**

The Indonesian Government's Toll Road Investment Team sends invitations to all companies that are eligible to participate in toll road investment bids for certain sections. The selection criteria for toll road investors is divided into two classes, administrative, and technical, financial, and legal. The administrative criteria require the lead firm to fulfill its financial obligations, while the technical, financial, and legal criteria consist of:

- the given scope of works and technical specifications;
- the construction period;
- the concession period; and
- the cooperation scheme offered to Jasa Marga.

No request for a guarantee may be made to Jasa Marga nor to the Government of Indonesia during the bidding process.

The Toll Road Investment Team reviews and evaluates the bid documents from bidders, and based on the evaluation it recommends to the Jasa Marga Board of Directors a maximum of three bidders whose proposals are judged to be the best. These proposals are then forwarded to the Minister to make the final decision and request Presidential approval.

### **§3.3.3 NATURE OF CONCESSIONS**

Prior to 1993, land procurement expenses for toll roads were borne entirely by the Government. However, since 1994 the Government's funds for the construction toll roads have been very limited. Therefore in a number of more recent authorization

agreements, the investors have been obliged to bear the expenses for the procurement of land, including interest, within the period of the toll road authorization.

According to Law No. 13 of 1980, and Article 40 of GR 8/1990, proposals of initial toll tariff and for the subsequent adjustment of tariffs must be submitted to the Minister of Public Works and authorized directly by the President. Although not a legal requirement, the tendering process administered by Jasa Marga requires that the toll tariff must not exceed 70 percent of the vehicle operation expense savings that may be attributed to the road. While a tariff adjustment may be applied for by the concessionaire every two years based on a formula incorporating the consumer price index, the Presidential approval cannot be guaranteed by the Government.

Since 1994, foreign investors have been allowed to work with Indonesia companies in order to promote toll road development and technology transfer. These foreign investors are required to cooperate with Jasa Marga through a domestic joint venture in BOT-type projects only. The private sector participation-based approach to toll road development was considered to have a promising future in Indonesia until the advent of the financial crisis. The collapse of the domestic commercial banking sector due to the extreme devaluation of the rupiah has brought all ongoing toll road projects to a halt.<sup>15</sup> The Government of Indonesia has taken steps to restructure the toll road program in light of the economic crisis.

### **§3.3.4 MAJOR ISSUES AND IMPLICATIONS FOR BEST PRACTICES**

#### **1. UNCERTAINTY OF PRESIDENTIAL APPROVAL**

As described above, the designation of a road section as a toll road and the determination of initial toll tariffs require that a proposal be made by the Minister of Public Works and approved by the President. Not surprisingly, this process can be highly unpredictable, and has represented a particularly large obstacle to obtaining private sector financing. However there is currently a proposal to amend the tariff

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<sup>15</sup> As a result of devaluation of the rupiah, the hard currency portion of project debts suddenly increased by a factor of as much as 6 or 7 times. At the same time, domestic interest rates have increased from 19 percent to over 60 percent per annum.

adjustment provisions such that Presidential approval will only be necessary to establish the initial toll tariff and then adjustments to the tariff would only require the approval of the Ministry of Public Works.

The Presidential approval is also required for opening a new toll road, and concession companies face the risk of whether or not such approval will be obtained in a timely manner. If the approval is not obtained quickly after the completion of construction, the facility cannot generate the cash required for debt repayment. One Japanese company abandoned its plan to invest in an Indonesian toll road project due to uncertainties with respect to approval for opening and toll rate adjustments.

## **2. LACK OF TRANSPARENCY IN TOLL ROAD CONCESSIONS**

Cronyism has been a persistent issue with toll road concessions in Indonesia. Companies closely tied to a family member of the former President now operate a number of the most profitable toll roads. For investors in these projects, the involvement of presidential family members meant a reduced risk in approval procedures, but inevitably created a nontransparent environment for negotiating toll road concessions. The Ministry of Public Works is now investigating such issues. A recent government initiative to prepare clear prequalification and bidding procedures should help to encourage private-sector participation and attract foreign investors in future toll road projects in Indonesia.

## **3. NEED FOR AN APPROPRIATE PLANNING FRAMEWORK**

The Ministry of Public Works has been responsible for the initiation of toll road projects, but various sections of the current toll road program were conceived in isolation and implemented through both solicited and unsolicited procedures. The program is not derived from a long-term strategic interregional network development plan and is not well coordinated with plans for capacity expansion of non-toll highways.

## **4. NEED FOR CLARIFICATION IN LAND ACQUISITION PROCEDURES**

Presidential Decree No. 55 of 1993 states that the land on which toll roads are built will be state property and therefore land acquisition should be conducted by the

Government and the cost also borne by the Government. Due to the lack of public funds, however, concession companies have been asked to pay the right-of-way acquisition costs while the government still received title to the land. As this practice is not based on any official guidelines, there is a need to clarify the responsibility for land acquisition in order to avoid confusion among investors.

## §3.4 MALAYSIA

Transportation infrastructure in Malaysia is characterized by a road network of more than 94,500 km, of which nearly 80 percent are paved. Toll road development in Malaysia has been given a boost during the last 10 years, largely due to the Government's privatization policy. The Government is also allowed to grant private companies the right to collect tolls on federal roads and to hand over sections of completed roads to private companies for upgrading and subsequent maintenance over a concession period.

### §3.4.1 NORTH-SOUTH EXPRESSWAY

The North-South Expressway (NSE) is an 848 km toll road running along the west coast of peninsular Malaysia from the Thai border to Singapore. It passes through the country's major cities and industrial estates and provides an efficient way to move products from agricultural regions to population centers.

The highway was built between 1988 and 1994 at a total cost of US\$2.4 billion. United Engineers Malaysia, Berhad (UEM), the winning bidder, created a new company, Projek Lebuhraya Utara-Selatan Bhd (PLUS), to act as the project concessionaire. Under the terms of the concession, PLUS was responsible to construct 462 km of NSE.<sup>16</sup> In return, the Government agreed to transfer to PLUS 309 km of NSE that were either already completed or under construction.<sup>17</sup> Upon expiration of the concession in 2018, PLUS's right to collect tolls will revert to the Government and PLUS will be obligated to hand over the expressways in good condition.

Because of the size of the project and its technical uncertainties, the major portion of the project was awarded on a bidding basis to separate contractors.<sup>18</sup> Many of the most prominent contracting firms in the world were involved in construction, with

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<sup>16</sup> In addition, PLUS was obligated to construct the 35 km New Klang Valley Expressway from Kuala Lumpur to the coast, and to make improvements to 15 km of Federal Highway Route 2.

<sup>17</sup> The Government also transferred to PLUS the existing toll-collecting sections of Federal Highways 1 & 2 extending 61 km.

<sup>18</sup> There are two types of contract awarding process in Malaysia: (i) competitive bidding, based on projects identified by the Government, and (ii) private sector initiated projects, some of which conform to the government development plan and some of which do not.

Japanese, Korean, Taiwanese, and other contractors active in the Asian region winning many of the large contracts. About two-thirds of the contracts were smaller ones, however, and many of these were awarded to local companies. The contracts were awarded over a four-year period, while the construction program lasted for five years.

NSE's US\$2.4 billion total cost was financed entirely on the Malaysian domestic capital market. The initial construction budget was about US\$1.4 billion. The financial advisor suggested PLUS raising as much of the required funding as possible on the domestic market in order to limit foreign currency exposure. PLUS was finally able to obtain all required financing locally. There were a total of 46 financial institutions in the syndicate.

The PLUS project encountered substantial cost increases. Several reasons were included:

- some project investments in capacity expansion that were planned for several years in the future during the operation phase were moved forward in order to accommodate higher-than-expected traffic levels;
- the Government requested additional work to upgrade some of the original contract specifications;
- the unusually high inflation related to Malaysia's emergence from a recession; and
- the impact of the Gulf War on construction material costs.

The budget overrun was financed entirely by PLUS, yet there is a considerable portion that they consider to be the Government liabilities. PLUS is still negotiating with the Government for repayment. However, a large amount of compensation was paid to PLUS based on the preferential terms negotiated between PLUS and the Government,<sup>19</sup>

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<sup>19</sup> PLUS negotiated three general forms of support from the Government. The first was a loan on preferential terms to compensate PLUS for unprofitable sections of the expressway and below-market-rate tolls. The second was a traffic volume "supplements" agreement that provided a loan to PLUS if toll revenues did not reach a certain level. The third was about exchange rate risk, if the Malaysian currency lost more than a certain percentage of its value in relation to a currency of foreign borrowing, the Government would step in and provide the support needed to service the debt. The second and the third support had turned out to be unnecessary due to economic growth and the lack of foreign borrowing. Nevertheless, a large amount of compensation was paid to PLUS in terms of the first of the three forms of support.

since the Government did not increase the toll rate as agreed in the concession contract.

### **§3.4.2 MALAYSIA-SINGAPORE SECOND CROSSING**

Malaysia-Singapore Second Crossing (MSSC) was initiated by private sector. The consortium led by United Engineers Malaysia, Berhad (UEM) submitted a comprehensive privatization proposal for MSSC in July 1989. On November 23, 1990, the Malaysian Government's Economic Planning Unit (EPU) accepted the proposal in principle. As the overall project was to involve development of a new town in Johor State, agreement with the State Government was also required. A tripartite agreement among the Federal Government, the State Government, and UEM was signed on November 12, 1992. The award was valued at 1.6 billion ringgit plus a 600 million Singaporean dollar component from Singaporean investors. An open toll system was planned, incorporating three toll plazas. In addition, some 9,500 ha of land were to be acquired by the State Government of Johor for the development of a new town, Bandar Nusajaya. This additional development was meant to be a supplementing factor to improve the weak project economics of the original scheme.

The MSSC was opened in 1998. As of late 1998, the traffic volume on the MSSC was one third of that originally estimated, which was causing the company to risk defaulting on its debt service payment. The major cause is no sufficient advanced planning in place, while this situation has also been attributed to both the Singaporean Government's imposing a toll on their section of the Crossing (despite having originally indicating that they would not), and delays in the development of Bandar Nusajaya. Renegotiation of the basic terms and conditions of the concession contract is ongoing to avoid a default by the concessionaire.

### **§3.4.3 MAJOR ISSUES AND IMPLICATIONS FOR BEST PRACTICES**

#### **1. NEED FOR A MORE FLEXIBLE BOT CONCESSION MODEL.**

The NSE was planned in part to stimulate Malaysia's stagnant economy in the early 1980s. Given its size and the level of both public and private sector involvement in executing such a large project, there were many risks that would have been difficult for

the private sector to assume alone. A primary issue was the control of construction risks in a project that involved so much simultaneous work (more than 600 km of construction in total). Construction expenses ultimately exceeded the initial US\$1.3 billion budget by more than 70 percent. The long construction period (5 years) with four-year contracts awarding, totally spanning nine years, also caused or suffered from many other problems such as increased traffic volumes, unexpectedly high inflation, and additional work brought on by unforeseen construction difficulties and unforgiving terrain.

The current BOT model is not well suited to addressing the economic risks inherent in large toll road projects that involve a lengthy road over difficult terrain, a long construction period, and many contingencies. A more flexible model would be needed to cope with the built-in risks in large projects like NSE. Such a model should incorporate adjustment and negotiation mechanisms for reallocating construction responsibilities and toll revenues. Most critically, the toll road development model would ideally allow for the straightforward reassignment of risks related to economic assumptions over long-term construction and operation period.

## **2. DIFFICULTY OF ORDERLY NETWORK DEVELOPMENT WITH A PRIVATE SECTOR-DRIVEN APPROACH.**

The toll road development process in Malaysia is largely driven by private sector project proponents. This practice very likely results in little advance planning and coordinating undertaken by government agencies in order to coordinate proposals and work towards development of an expressway system. As a consequence, the project would suffer from the less-than-anticipated traffic volume, because of either the disorderly pattern of expressway network that lacks of strategic connections to other major traffics, or the competing routes resulting from the little overall coordination from the government level.

In addition, the toll road development initiated by private sectors may hardly lead to competitive bidding process. In some cases, no other company appears to be interested except the company who promotes the project, and then the project will turn

out to be sole-source procurement.<sup>20</sup> The drawbacks of without head-to-head competition include: (a) the contractor has great potential to escalate costs; (b) the operation of the toll road concession by the only-available concessionaire may not be the most cost-efficient or cost-effective.

### **3. SOCIAL POLICY-BASED HURDLES TO FOREIGN INVESTMENT IN PUBLIC INFRASTRUCTURE.**

For reasons of social equity, the Government has adopted a National Development Policy with the objective of securing at least 30 percent of the ownership of the Malaysian economy by the indigenous people of Malaysia and at least 40 percent by Malaysians generally (indigenous and otherwise), leaving a maximum of 30 percent foreign equity ownership. Furthermore, with respect to equity holdings in toll road concessionaires, EPU has adopted an even stricter policy of permitting no more than an aggregate of 25 percent foreign equity. Such social policy-based preferences in awarding contracts present challenging implications for risk assessment and other aspects of project implementation.

### **4. RISK ASSOCIATED WITH COMBINING REAL ESTATE AND HIGHWAY DEVELOPMENT.**

The case of Malaysia-Singapore Second Crossing (MSSC) is a good example of an attempt to improve a toll road project's economic and financial viability by granting adjacent real estate development rights to the highway concessionaire. New town development has the potential to generate real estate income and introduce travel demand along the highway corridor. However, over-dependence on real estate investment earnings to structure a transport concession is highly risky, particularly given the volatility of real estate markets. As a general proposition, the viability of the toll road alone should drive the project financing decision-making.

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<sup>20</sup> As a matter of fact, there is no statutory requirement that toll road projects be awarded only by way of competitive bidding.

## §3.5 MEXICO

Mexico embarked upon an extensive program of private concession toll roads through 1989 to 1995. It was to become the largest program of its kind worldwide. A few years earlier, with the country in the grip of a continuing recession and affected by depressed oil prices, the government, short of funds, had investigated the option of privately financed toll highways. The success of three pilot toll highway concessions encouraged government to go ahead, and the ambitious concession program resulted in the awarding of 53 concessions for 5,500 km of road. More than US\$13 billion had been raised to build these roads. However, financial instability due to gross miscalculation of investment costs and operating income (sluggish traffic), coupled with the December 1994 devaluation of the peso, the combination of macroeconomic and project-level factors, brought the concession program to a standstill in 1995. A comprehensive restructuring of the entire program in 1997 ended up costing the Mexican Government an estimated US\$8 billion.

### §3.5.1 PROGRESS OF TOLL ROAD DEVELOPMENT

#### 1. MECHANISM

A massive program of 4,000-km toll roads and seven new international new bridge crossings was proposed by the Mexican ex-President Carlos Salinas de Gotari to stimulate the domestic economy in 1989. The Secretariat of Communications and Transportation (SCT) was in charge of administering the new private toll road plan. The toll roads were to be developed under the following conditions:

- SCT would select the routes to be offered for concession;
- A parallel free route must be available as an alternate for all concessioned routes;
- SCT would specify the allowable range for tolls, subject to twice-yearly adjustments reflecting the consumer price index;
- SCT would supply the bidders with preliminary designs, cost estimates, and traffic projections;

- The concession would be awarded to the bidder that offered the shortest concession period.<sup>21</sup>

The concessionaires were to be consortia of construction companies and banks, wherein the banks would finance 70 to 75 percent of project costs, and the construction companies were to contribute the remaining 25 to 30 percent by discounting their construction cost (“sweat equity”). An independent trustee would be appointed to review bills, disburse bank financing, and distribute toll proceeds to the investors.

Direct government assistance under the original plan was to come only in the form of right-of-way, and extensions of the concession period.<sup>22</sup> Both the single bidding criterion – the shortest proposed concession duration<sup>23</sup> – and an open prequalification process were utilized by the Government to try to promote a fair and competitive tendering process that was highly transparent to all bidders.

## 2. PROBLEMS

Within a couple of years, the program began to have major problems:

### 1) Financial Feasibility and Government Contribution.

The program included many highways that were not financially viable by themselves. Once the most profitable highway segments were built, the Government was called upon to participate in the financing of roads with less traffic or more difficult construction, but only up to 25 percent. By 1992, as a result of cost overruns and low traffic, only 4 out of the 12 concessions had returns exceeding 6 percent, while 6 had negative rates of return.

### 2) Concession Period.

The average duration of the first 22 concessions was just under 12 years, and 2 were for 5 years only. The shortest-length concession criterion encouraged the concessionaires to charge the maximum allowable toll with the goal reducing the

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<sup>21</sup> As originally planned, not to exceed 15 years.

<sup>22</sup> The extensions were to be authorized in the case of: (i) traffic levels falling below the SCT forecasts; (ii) cost overruns resulting from government-imposed delays or design modifications; and (iii) cost overruns in excess of 15 percent of the original budget.

<sup>23</sup> This single bidding criterion satisfied both legislators who were eager to see the roads return to public control and domestic financiers who had no access to long-term debt.

payback time. The high toll resulted in some of the toll roads being almost empty while the parallel toll-free roads were congested.

### **3) The Quality of the Preparation Work.**

The designs, cost estimates, and traffic forecasts provided by SCT were often of very poor quality and highly inaccurate. The sheer size and pace of the program completely overwhelmed the SCT staff resources to adequately prepare the designs, or to study how the road users would react to the tolls.

### **4) Underbidding by Contractors.**

The design of the program encouraged unrealistically low bids because concession extensions were possible in the case of cost overruns, at the same time, the contractors were exaggerating the value of “sweat equity” that they provided. Despite a clause in the concession law requiring scrutiny of construction bills, nationalized banks that were pressed by the government to lend to the concessions, were not adept at monitoring construction documentation.

With these emerging problems, local commercial banks were saddled with nonperforming toll road loans estimated at US\$4.5 billion to US\$5.5 billion; Concessionaires and their affiliates were faced with writing off significant portions of their investments. Moreover, the government has been unable to unclog the road construction program and has been under severe pressure to inject scarce financial resources to rescue investors. Users, in the meantime, were left with some of the most expensive road tolls in the world.

## **§3.5.2 MAJOR ISSUES AND IMPLICATIONS FOR BEST PRACTICES**

### **1. IMPORTANCE OF WELL-DESIGNED LEGAL, REGULATORY, AND INSTITUTIONAL FRAMEWORKS.**

The experience of Mexico has showed that the lack of the awarding of legal and regulatory institutional arrangements discouraged lenders and builders from respecting their agreements. Formal mechanisms were never established for soliciting or channeling inquiries or requests from private sector participants before, during, or after

the bidding process. This situation led to an often adversarial and less than transparent relationship between the parties. The independent regulatory authority for supervising contractual arrangements was insufficient, and contracts were subject to the local court system,<sup>24</sup> which represented a significant risk to international investors who were unfamiliar with the domestic legal system. With projects that needed direct government support, SCT's dual role as government regulator as well as concession partner sent somewhat conflicting signals to the private concessionaires.

## 2. NEED FOR ADEQUATE PROGRAM PREPARATIONS AND PLANNING.

Mexico has no comprehensive transportation development strategy, and as such it was impossible to design the projects to fit in with long-term regional development plans. For instance, this greenfield program sought to establish five main road corridors, three of which were to run between the main industrial centers in Mexico and the principal crossings into the United States. Nonetheless, some high priority segments were never concessioned, while other toll roads lacked important links to other highways in the network. This piecemeal pattern of contracting reduced the near-term attractiveness of the toll roads to long-distance traffic. Compounding matters, the Mexican Government was fostering parallel free-alternatives that even dispersed the traffic on the concessioned routes.

The deficient planning can be attributed to the insufficient institutional capability. It is apparent that in many cases both the public and private sector organizations involved lacked sufficient technical, organizational, staff, and financial resources to plan for and implement the proposed projects successfully. From the poor quality and highly inaccurate of the design, cost estimates, and traffic forecasts provided by SCT, it was hard not to come to a conclusion that SCT was understaffed and had inadequate overall institutional capabilities to take on the commitments demanded by the scale and nature of Mexico's private toll road program.

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<sup>24</sup> Legal disputes in Mexico arising between a private party and the government were to be resolved within the constraints of the Mexican court system and were not subject to international arbitration.

### 3. NEED FOR ADEQUATE CONCESSION DESIGN.

In the case of Mexico, the prequalification standard was not rigorous enough. For example, bidders were not required to submit a detailed financing plan. Also there was no efficient pre-selection process to screen out potential bidders that lacked the capacity to assume the essential risks of construction design and management, completion of large projects, and commercial management of toll road operations.<sup>25</sup> As a result, the project awards had mostly gone to a handful of local construction companies that were interested in the construction work than in the long-term financial viability of the projects. On the other hand, some of the larger companies were stretched too thin, given the speed at which different concessions were awarded to the same firm.

### 4. TRAFFIC AND REVENUE FORECASTS, TARIFF RATES, AND OPERATION ISSUES.

For many concessionaires involved in the Mexican projects, cash flow has been significantly below expectations. Reasons for this include:

- insufficient information coupled with flawed traffic analysis and forecasting methodologies;<sup>26</sup>
- prohibitively high tolls; and
- the free parallel route requirement.

In some projects, trucks were expected to account for 20 to 45 percent of users. In reality, trucks were less than 5 percent of the traffic on many roads, while counterfeit toll tickets made matters even worse. General road users also shied away from the toll highways, despite obvious time and cost advantages of the new roads. Aside from the extremely high tariffs, this unwillingness was also due to the fact that most concessionaires also did little or no marketing to increase public awareness of their roads and the travel benefits provided over the parallel free roads, and they have given minimal attention to the development of auxiliary services such as gas stations, rest areas, restaurants, and emergency towing. The tariff adjustment procedures have also

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<sup>25</sup> While operating a toll road is fairly simple, managing a toll road program is much more complex. It includes estimating competition from the free alternatives, adjusting tolls to optimize revenues, planning maintenance to minimize long-term cost, and so on.

<sup>26</sup> In several cases, traffic growth rate assumptions were unrealistic and often data from SCT were inadequate or unavailable.

been highly uncertain for the concessionaires. Both toll increases and decreased typically required SCT approval.

## **5. COST ESTIMATES AND CONSTRUCTION ISSUES.**

During the design and construction stages of project implementation, the private concessionaires had their hands full with a wide range of problems. Inadequate plans, insufficient information, right-of-way conflicts, unanticipated design changes, community resistance and permitting problems all contributed to frequent cost overruns and delays. Construction often started with only preliminary engineering and design work completed. In the case of the 267 kilometers Cuernavaca-Acapulco toll road, for example, this led to cost overruns of 200 percent and time delays of thirty months. Construction also often began without first securing the right of way. This failure was often exacerbated by mounting resistance from local farmers and community groups, environmentalists, and historical conservationists. Compounding matters, poorly defined procedures and bureaucratic delays with permits often brought construction to a standstill. Throughout the implementation period, SCT supervision was poor and became known for often mandating universal change orders. In a project where four pedestrian bridges were expected, the final number reached almost 60 as a result of government-mandated change orders, often required to appease local interest groups.

## **6. LONG-TERM CONCESSION PERIODS AND LONG-TERM FINANCING.**

Longer-term concession periods are in general beneficial to the private sector concessionaires, and support the financial and operational stability of the projects. Long term concessions allow the sponsors to spread their debts over a longer period, and reduce the annual cash flow (revenue) needs to levels that may be met with more reasonable toll rates. Unfortunately, the Mexican Government used the single bidding criterion – shortest concession period – to push the thing to the opposite direction.

While, long-term concession periods are based on a “mature” domestic financial markets, able to provide long-term financing. In the case of Mexico, underdeveloped local financial markets were incapable of providing long term fixed rate financing. A lack of liquidity in local financial markets, and local debt instruments that were limited

to short-term high-cost floating-rate notes severely limited the conditions under which the toll roads could be operated profitably. Once toll road revenue (and debt service) problems became apparent, local and international investor interest in most projects dried up.

## §3.6 THAILAND

In the transportation sector, road transport is the dominant mode in Thailand, accounting for about 90 percent of passenger and freight traffic. The country is serviced by a road network of nearly 60,000 km, of which more than 90 percent is paved. The Royal Thai Government had made huge efforts to improve and upgrade its road system aggressively. However, attempts since the late 1980s to attract private investment in the toll road projects have been unsuccessfully. The experience from Thailand is telling that the proper government behaviors are very critical to the success of the private sector involved projects. In addition, the overlapping master plans, which are the prominent feature of toll road development in Thailand, contribute the failure practices as well.

### §3.6.1 MASTER PLANS FOR TOLL ROAD DEVELOPMENT

Thailand currently has three overlapping toll road development plans:

- A national intercity motorway network master plan being implemented by the Department of Highways (DOH), which recommended developing a 14-route, 4,354 km nationwide network of high-speed access-controlled highways over a 20-year period;<sup>27</sup>
- A Bangkok-centered plan of the Expressway and Rapid Transit Authority (ETA) of Thailand, which recommended a total network of more than 770 km, with 11 expressway routes serving not only metropolitan Bangkok but also neighboring provinces;<sup>28</sup> and
- A combined road and railway scheme of the State Railway of Thailand (SRT).

As suggested by their overlapping master plans, both ETA and DOH may build toll road anywhere in Thailand. In fact, there is no exclusivity over toll highway development, as evidenced by the State Railway of Thailand's sponsorship of the

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<sup>27</sup> The plan, now under implementation, calls for a total of 13 total routes covering 4,150 km to be built by 2016. When completed, Bangkok will be linked with all major towns in Thailand, and all parts of the country will be within an hour's drive of the motorways network.

<sup>28</sup> The plan was originally developed for the staged construction of an elevated toll expressway system in Bangkok. As Bangkok's traffic congestion worsened in the early 1990s, the plan was expanded and the road projects stretch as far as Pa Moak and Nakron Ratchasima in the North, Pran Buri on the Western Seaboard, and Ban Chang on the Eastern Seaborard.

Hopewell toll road/railway scheme (discussed in the later section). This redundancy of responsibilities, has contributed to a large number of problems with the project implementation, particularly when the private sector has been involved. The projects presented in the following sections are going to discuss on it in depth as well as other major problems in Thailand's toll road projects.

### §3.6.2 DON MUANG TOLLWAY

The Don Muang Tollway (DMT), a 28.0 km elevated highway, presently links central Bangkok and the Bangkok International Airport and will ultimately connect the airport to the Second Stage Expressway (SES). In 1989 the Don Muang Tollway Public Company Limited (led by a German firm), received a 25-year concession from DOH to build the US\$407 million 15.4 km initial segment of the project. A major issue during the initial project stages was the removal of two flyovers serving the local road beneath the tollway. These were to have been eliminated so as to not compete with the tollway, but this didn't happen due to the political pressures. The traffic volumes and revenues were consequently less than forecast, and by October 1996 the tollway company was unable to service its cash flow obligations any more. An agreement had been reached then between the concessionaire and the Government whereby the situation of the DMT company could be improved.

### §3.6.3 BANGKOK SECOND STAGE EXPRESSWAY

In 1989 the Royal Thai Government signed a 30-year concession contract with Bangkok Expressway Company Limited (BECL),<sup>29</sup> to construct and operate the Second Stage Expressway (SES), and elevated toll highway linking with the First Stage Expressway (FES) to form a loop road around the central city. The SES project was supervised by ETA. There were some agreements reached between two parties:

- ETA was to be responsible for land acquisition;

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<sup>29</sup> Upon inception, BECL was a Thai company 65 percent owned by construction giant Kumagai Gumi of Japan.

- Toll collection on the FES and SES would be integrated and shared between BECL and ETA;<sup>30</sup>
- Toll rates were to be adjusted when the SES opened and indexed to inflation.

First problem arose due to the difficulty of land acquisition, which led to ETA transferring land not timely and often in non-contiguous parcels to BECL. Then, in November 1992, BECL informed ETA that it had finished a 2km “priority” component and was therefore entitled to begin SES operations and to share the revenues from the combined FES/SES system. However, ETA considered this as unreasonable because of the small length of the priority section. In March 1993 BECL was forced to stop work when its banks cut off disbursements saying that the Government’s refusal to share revenue in November 1992 constituted a default on loan terms. Consequently BECL refused to open the two sections completed by this time and continued to claim a share of tolls from November 1992. The situation was further complicated by the Government’s coming under political pressure to decrease rather than raise tolls at that time. Eventually, ETA sought a court order to open the expressway, and the judge ruled was in favor of the government agency about whether toll sharing was to have commenced in November 1992. When BECL refused to follow the court order, ETA itself commenced operation of the completed segments on September 1993.

After ETA’s “takeover” of the expressway, all negotiations between ETA and BECL broke down. In February 1994, the Government arranged for Kumagai Gumi’s equity stake in BECL to be sold to a Thai construction company and principal project contractor.<sup>31</sup>

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<sup>30</sup> The combined revenues would be divided 60:40 between BECL and ETA during the initial nine years of operations, equally in the following nine years, and 40:60 in the last nine years of toll road operations.

<sup>31</sup> While some observers have termed ETA’s actions “expropriation”, the Government has argued that Kumagai Gumi’s interpretation of the concession contract violated the spirit, if not the word, of the agreement. They have also stated that Kumagai Gumi may have wished to withdraw from the Thai toll road market, as a part of its corporate consolidation following the bursting of Japan’s “bubble economy” in the early 1990s.

### **§3.6.4 BANGKOK ELEVATED ROAD AND TRACK SYSTEM**

In 1990 the State Railway of Thailand (SRT) granted Hopewell Holdings Ltd. (Thailand) a 30-year concession to develop the Bangkok Elevated Road and Track System (BERTS) without adequate project studies and analyses. A tollway was to be built on the top level of the proposed 80-km “triple deck” facility, a privately operated express commuter railway was to occupy the middle level, and space for commercial establishments was to be made available at ground level. In October 1998, eight years after the agreement was signed, the Thai Cabinet finally ordered to cancel the toll road component of the BERTS projects and to proceed with the urban rail component.

The planned construction period was eight year, but after many delays and much bitterness between Hopewell and SRT only 12 percent of the project was completed by the time construction was suspended in January 1998. Problems have been contributed to the inadequate preliminary feasibility study, the overlapping master toll road development plans and the political impacts from the Thai Government, which resulted in:

- Delays in the approval of the construction design;
- Delays in the handing over of construction sites and in addressing physical interface coordination issue with other mass transit projects;
- Environmental issues;
- Undermined Hopewell’s efforts to secure full project financing due to the frequent threats by the Thai officials to terminate the project.

As of November 1998, Hopewell had not filed a suit against the Government but was still calling for appointment of an independent expert from outside of Thailand to assess damages from cancellation of the contract.

### **§3.6.5 MAJOR ISSUES AND IMPLICATIONS FOR BEST PRACTICES**

#### **1. OVERLAPPING RESPONSIBILITIES AMONG PUBLIC AGENCIES.**

A central issue emerging from the Thai experience is the problem of redundancies and overlapping responsibilities among the various agencies responsible

for toll road planning, implementation, and regulation.<sup>32</sup> The primary manifestation of this problem, with respect to network development, has been the preparation of separate, sometimes competing toll road projects, which resulted in either a disorderly network system or construction difficulties resulted from physical (right-of-way) conflicts between projects. It has been manifested that the investors had been fed up with the delays of construction sites handing over in both SES project and BERTS project.

## **2. NEED FOR BETTER PROJECT PREPARATION.**

Public policies to toll road development in Thailand have generally been reactive and sometimes even pre-empted. This is clearly illustrated in the case of BERTS, which was approved without advance detailed planning or other studies to ensure that the project would be in the public interest, take account of all costs, and be effectively integrated into the transport network.

This issue is also closely related to the feasibility of private sector driven projects that has been discussed in Malaysia section. The experience of BERTS, where the concession was awarded directly to Hopewell based on their project proposal without competition, once again proves that private sector initiated projects that lack of enough involvement of the government are hardly successful.

## **3. ARGUABLY AMBIGUOUS CONTRACT PROVISIONS.**

Toll road projects developed by the private sector in Thailand have also been hindered by uncertainty regarding toll rate adjustment. In the SES case, for example, there have been a number of disputes between the Government and BECL concerning the allowed toll rate. In the light of the contract, toll rates were to be triple when the SES opened and indexed to inflation, while the Government turned out to ask to decrease rather than raise toll rates under the political pressures.

In addition, uncertainty with respect to toll-free alternative routes has been a problem. For example, in the case of the Don Muang Tollway, the Government

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<sup>32</sup> The Master Plan for the Intercity Motorway Network, adopted by the Cabinet in 1997, is to be implemented by DOH, while ETA and SRT each have master plans of their own, albeit less comprehensive than that of DOH.

(responding to political pressures) proved unable to remove two parallel overpasses, as called for in the concession contract. The removal of the overpasses considered into the concessionaires' traffic and revenue forecasts that directly influenced its financial plan.

Problems have also arisen with respect to other contract provisions where the Government played with ambiguous contract language. When BECL required sharing in the revenues from the integrated FES/SES system right after it completed the 2-km "priority" component according to the agreement, ETA countered it unreasonable and argued the BECL misunderstood the spirit, if not the word, of the agreement. Also in the SES case, one provision allowed BECL staff to operate the toll booths, while according to Thai law only ETA staff could do so.<sup>33</sup>

It seems apparent that such major provisions of concession agreements need to be fully disclosed and discussed from the outset – before the issue becomes a political crisis.

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<sup>33</sup> There was a dispute between BECL and ETA regarding who should collect the tolls at the SES toll gates.

## **CHAPTER 4. GOVERNMENT AND MARKET ARE NOT OPPOSITES**

Seeing through the projects discussed in the previous chapter, we are able to get at the essence of current global infrastructure development – increasing private sector participation. Expanding global demand for infrastructure is driving an emerging industry for the private provision of roads, power, water and sanitation, telecommunications, and other services. Interest in private toll roads is particularly strong because governments require alternative methods of financing their extraordinary transport needs. It is especially so in developing countries, where economic and population growth and growing links with international markets lead to pressures for more roads. Governments increasingly feel incapable of providing the financial resources to carry out all that is needed on a highway system. The increased private sector participation in the road sector applies to national, high traffic roads as well as to roads falling under the responsibilities of all government levels. From Argentina to Thailand, Australia to Canada, major arterial roads are being built under toll road concession schemes. This applies not only to construction but also to operation and maintenance of the system, which may themselves required substantial amounts of funding. In the US, for example, it is estimated that \$55 billion will be required annually over the next twenty years simply to maintain the highways and bridges in their current condition. Given these massive investment needs and the inability of governments to finance the needs themselves, it is natural that they would look to the private sector to provide capital. But there are other good reasons for involving the private sector, to do with the efficiency of operations, and the need to provide a service that is responsive to the needs of the ‘customers’.

The openness of infrastructure to market gives government endless opportunities to acquire private sector technology, equipment, expertise and investment. If governments had packaged these opportunities in ways that made them widely visible to private sector, much of the government’s task in acquisition would have been

complete. Consequently government and market are not opposites, instead they complement and reinforce each other.

In terms of the various countries' experience, although there does not exist a universally applicable model for the private participation in infrastructure, there is a set of common principles for fostering such cooperation. These principles ("the Principles")– sustained commitments, maximum competition, transparent processes, incentive based regulatory structures and essential financial assistance– are the pillars of a basic framework that each country can customize to fit its priorities and institutions. In a nutshell, this framework serves only one goal – to ensure the sustainability of large-scale private investments in infrastructure.

## **§4.1 GOVERNMENT SUSTAINED COMMITMENT**

Paradoxically, although private sector is providing a growing share of infrastructure investment, the government's responsibility for setting up a favorable environment and guiding the process may be greater than it was when the system was exclusively public. This increased responsibility stems from the fact that adding a private component to the system makes the system more complex and hence requires more sophisticated government management.

The government determines the exact nature of the project and must be very clear about what it is going to achieve in order to prevent confusion and frustration on all sides. At the same time, the government must be convinced that private provision of infrastructure makes sense, and they must be willing to follow through on the commitment. Without such commitment the contribution of private sector to the burgeoning infrastructure will be only marginal. The several reflections of the government sustained commitment are addressed below.

### **§4.1.1 CLEAR LEGAL AND REGULATORY FRAMEWORK**

Legal and regulatory framework is one of the least visible aspects of toll road development, but is nevertheless vitally important element. Private investment requires

clear and stable rules established by law. When the private sector is to be involved in toll road development, concession laws need to be well drafted. The host government must provide the basic legislative and regulatory authority for a given project to be built and operated by the private sector; this includes designation of the individual ministries, government agencies, or local governments authorized to grant concessions.

In Mexico the lack of clear legal and regulatory institutional arrangements discouraged lenders and builders from respecting their agreements. There were no formal mechanisms for the Government to obtain and address requests or inquiries from private sector parties before, during, or after the bidding process, which led to an often adversarial and less than transparent relationship between the parties. The contracts were subject to the local court system, which may not be able to provide adequate assurance to investors that they can obtain an objective settlement of contract disputes. With projects that have required direct government support, the Mexico's Secretariat of Communications and Transport's (SCT's) dual role as government regulator as well as concession partner sent somewhat conflicting signals to the private concessionaires.

#### **§4.1.2 STRATEGIC NETWORK PLANNING**

The countries having successfully developed toll road networks generally have well-established strategic planning relative to those less successful countries. A strategic planning is well established in Japan where strategic nationwide toll road plans are clearly defined every five years and issued as ministerial regulations. The Japanese experience demonstrates the importance of setting clear goals or principles on which highway development is to be based. Japan now has nationwide highway coverage, which has helped build a political consensus for network expansion, as well as perhaps for maintaining a uniform level of toll rates within the network.

On the other hand, many developing countries have shown some weaknesses with respect to the strategic network planning of their toll roads. Indonesia and Mexico may be cited as examples of countries requiring a stronger master planning. The Indonesian Ministry of Public Works has been responsible for the initiation of toll road projects in the country, but various sections of the current toll road program were

devised in isolation and implemented through solicited and unsolicited procedures. The program was neither derived from a long-term development plan nor has it been well coordinated with plans for capacity expansion of non-toll highways. Mexico had neither an intermodal transport development strategy, nor did it design projects to fit in with regional long haul development plans. Consider, for example, that some key segments of the five “priority corridor” roads were never concessioned, and other toll roads lacked important links to other highways in the network. The Thailand case demonstrates the other side of the matter – the overlapping, redundant master planning may also result in competing routes and physical conflicts between projects during construction.

### **§4.1.3 STRONG PUBLIC SECTOR INSTITUTIONS**

Even if a private sector approach is adopted, strong public sector institutions are important to assure efficient planning and implementation of toll roads. In many cases the public (and private sector) organizations involved with toll road development in Mexico, lack sufficient technical, organizational, staff, and financial resources to plan for and implement the proposed projects successfully. The Mexican Secretariat of Communications and Transport (SCT) is understaffed and has inadequate overall institutional capacity to take on the commitments demanded by the scale and nature of Mexico’s private toll road program.

The issue of how to enhance government planning capability can be one of the most challenging in most developing countries. The Chilean government has given us a good demonstration.<sup>34</sup> In terms of the importance of eligible public institutions, the Chilean government is promoting administrative and legal reforms in order to strengthen technical capabilities and enhance the power and autonomy of regulatory agencies. Recruitment of highly qualified staff at the regulatory agencies is a main concern. Attractive job opportunities and good salaries in the private sector make it difficult to attract top professionals needed in the public sector. A number of incentives are being considered, including improved salary schemes for regulators and use of

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<sup>34</sup> The Chilean practice will be discussed in details in the following chapter.

external consultants for highly specialized tasks. The government is also thinking about to give greater legal authority to ensure enforcement of regulatory norms. Likewise, arbitration mechanisms are being considered for resolution of disputes between agencies and companies that would minimize the need for court litigation.

#### **§4.1.4 PROPER PROJECT PREPARATION**

Before inviting the private sector to undertake toll road concession projects, the grantor should establish the basic information, which addresses:

- selection of a project with strong economic and financial justification, in view of its transport system impacts;
- retaining of financial advisor to structure the project and prepare the legal documentation;
- design of the bidding process to attract quality investors, e.g., through carrying out a well-targeted promotional campaign and using clear bid evaluation criteria focused on the few parameters most related long-run efficiency;
- providing bidders with detailed engineering data, while giving them the time to prepare their own estimates;
- state-of-the-art traffic forecasts;
- advance consideration of social and environmental issues and advance purchase of right-of-way, i.e., before financial close; and
- drafting a concession contract with incentives to improve performance and flexibility to manage uncertainty while avoiding opportunistic renegotiations.

Less successful cases may be found in Malaysia and Thailand, where the government's policy has generally been reactive and sometimes pre-empted since private-sector proposals have generally been approved. Such decisions were made without prior adequate master planning or other analysis to assure that the projects are in the public interest. Consequences of inadequate project preparation have included:

- parallel, competing projects, as Don Muang Tollway (Thailand) competing with the other two flyovers beneath it;

- few bids, resulting little competition, as Malaysia-Singapore Second Crossing (MSSC in Malaysia) granted to the concessionaire without any competition;
- poorly structured concession agreements, not based on sound risk allocation principles and an underlying detailed financial analysis;
- diminished confidence in the private sector about the Government's commitment to follow through on signed concession agreement.

## **§4.2 TRANSPARENT PROCESS**

Transparent procedures for dealing with investors prior to and during the bidding process are required. Bidding should be competitive to minimize the level of government support and reduce residual risk bearing by the government. A clear bidding and negotiation process requires that:

- project requirements to be specified closely, to ensure evaluation is of like-for-like;
- clearly defined government support measures in the bidding documents, rather than held back for negotiation; and
- simple evaluation criteria.

The experience in Argentina demonstrates the benefits of simplified transparent bidding procedures. While during the first phase of its toll road concessions bidders had to satisfy a large number of technical and financial criteria, a single criterion – lowest toll offered – was used in the second phase, providing transparency and avoiding the difficulty of trading off many disparate factors. Some BEST practices are also found in other countries, such as Chile and Hong Kong. Chile recognized the importance of transparent and competitive bidding procedures, with the terms of the contract clear and equal for all participants, leaving as little as possible to future negotiations. The regulatory framework in the Hong Kong SAR has been devised so as to ensure a “level playing field” through such means as clear and straightforward tender process and criteria for proposal assessment. In addition, the whole of the tender process is monitored closely by the Central Tender Board and the Independent Commission Against Corruption. The resulting “competition” for procurement has meant that equity

participation in the bidding teams over years has included not only the major contractors but also other interests such as land developers.

On the contrary, the lack of transparency has long been an issue in toll road concessions in Indonesia. Although no request for a guarantee may be made to Jasa Marga or to the Government of Indonesia within the bidding process, the requests for guarantees were possibly held back and made during negotiations, which are opaque due to the cronyism. Thailand is another country with an at least perceived lack of transparency. For example, in the case of the Second Stage Expressway (SES) concession to Bangkok Expressway Company Limited (BECL), five consortia purchased the bidding documents, only two bids were received, and the second bidder was disqualified ostensibly for lack of experience. In the case of the Bangkok Elevated Road and Track System project, the concession was awarded directly to Hopewell based on their project proposal, without competition. Also, the tendering process in Mexico lacked strict prequalification procedures and did not require the bidders to submit detailed financing plans. Consequently, many small-to-medium sized concessionaires relied on commercial bank loans for their equity commitments, which became problematic as soon as project revenues began to falter. Potential concessionaires also faced challenges during the bid preparation process, as there was insufficient time between the release of bidding documents and their due date. This precluded independent consultants from being able to perform effective field survey work on behalf of the project investors.

## **§4.3 INCENTIVE BASED REGULATORY STRUCTURE**

### **§4.3.1 FOREIGN DIRECT INVESTMENT**

#### **1. REGULATION**

General laws and regulations concerning foreign investment may provide incentives or disincentives to foreign investment in toll road concessions. The Government of Malaysia, for instance, in pursuit of equity objectives has adopted a National Development Policy with the aim of securing at least 30 percent of the

ownership of the Malaysian economy by Bumiputras, the indigenous people of Malaysia and at least 40 percent by Malaysians generally (Bumiputras or otherwise), leaving a maximum 30 percent foreign equity ownership. Moreover, in respect of equity holdings in toll road concessions, the Government has adopted an even stricter policy of permitting no more than an aggregate of 25 percent foreign equity. Though this policy has helped to develop domestic private sector, it effectively precludes foreign direct investment.

## **2. CURRENCY**

Currency risk is a major issue for toll roads financed with foreign capital because a project may be unable to pay a return on foreign currency if local earnings are not convertible at the expected exchange rate. Not well-addressed currency risk would considerably impair the enthusiasm of foreign investors. Although generally the private sector assumes the exchange rate and inconvertibility risk, the government can mitigate these risks by indexing the toll rates to local inflation or to the exchange rate of the foreign currency, which is quite common practice among various nations.

## **3. DISPUTE RESOLUTION**

Although no one hopes for disputes on a toll road project, the regulatory framework must provide for adequate dispute resolution procedures in event that such dispute occurs. The ambiguous jurisdictions can substantially stop potential foreign investors away. Malaysia and Mexico restrict the application of foreign law, and the governments insist that the concession agreement be governed by local law and that parties submit to the exclusive jurisdiction of local courts. This represents a significant risk to foreign investors who are new to the local legislative system.

### **§4.3.2 PUBLIC-PRIVATE RISK SHARING**

The rule of thumb is that private road infrastructure projects work best when project risks and responsibilities are assigned to the party that can best bear them. The private sector generally is better at managing commercial risks, such as associated with construction, operation and financing. Nonetheless, toll roads also depend on public

participation in areas such as acquisition of right-of-way, political risk and in some cases, traffic and revenue risk. Successful projects have been characterized by a broad level of risk-sharing between the public and private sectors.

The main risks facing toll road projects are pre-construction, construction, traffic and revenue, currency, political risk and financial risk. Some of these risks need to be addressed in a satisfactory manner with public entity showing the willingness to share risks with private partners, in order that debt and equity investors commit to project financing.

### **1. PRE-CONSTRUCTION – LAND ACQUISITION**

Land acquisition and resettlement may have major impact on the whole implementation of toll road projects. While it is possible that government agencies and public corporations may be authorized to expropriate land under the relevant laws, it is difficult to provide such right to the private sector; and this would lead to an increased cost of toll road development. The good example has been demonstrated by Malaysia where the government make all land required for highway construction available to the concessionaire free of charge. On the contrary, in Indonesia, although by law the responsibility of expropriating land has been assigned to the government, concession companies are asked to share the cost of land acquisition due to the strains on public funds.

In Thailand, a 1987 law and subsequent Royal Decrees govern the acquisition of land for transport infrastructure projects, but efficient adjudication mechanisms and well-defined procedures for land acquisition have not yet been established. In the case of the Second Stage Expressway, the Expressway and Rapid Transit Authority was unable to deliver key plots of land to the concessionaire on a timely basis, which under the concession contract enabled the company to consider the affected section as “delayed works” subject to compensation in the form of a share of revenues from the (existing) First Stage Expressway.

## **2. CONSTRUCTION – RELATED FACILITIES**

The private sector typically takes primary responsibility for cost overruns and delays during the construction period and often allocates these risks to a construction contractor through a fixed price contract. While the public sector's contribution would be very advantageous for pushing the project going smoothly, such as completing the connecting facilities and removing the conflicting ones. The Don Muang Tollway Project in Thailand provides an example of the government's not fulfilling its obligation of removing a related facility. One clause in the concession agreement specified that the government would remove flyovers on a parallel road with competes with the toll road and would then construct new flyovers to allow radial movement. However, the government did not deliver for more than two years due to intervening political pressures. Additionally, it blocked toll rate increases until the completion of the new flyovers. As a result, toll revenues were almost 30% lower than had been forecast for the period. The sponsor ended up close to bankruptcy.

## **3. POLITICAL RISK**

Political risk concerns government actions that affect the ability to generate earning. These actions include:

- terminating the concession or imposing taxes or regulations on the project that severely damage its value to investors;
- not allowing the private partner to charge the collect tolls as specified under the concession agreement;
- preventing investors from transferring earning out of the country; or
- not allowing for contract disputes to be settled fairly under neutral jurisdiction.

Governments generally agree to compensate investors for termination of the concession and violations of the concession agreement, although in practice, governments may cite justifications for their actions to delay or prevent such payments. Thus, private investors generally assume the risks that are associated with dispute resolution and the ability to obtain compensation in the event of a government violation of concession agreement.

The contractual obligations, willingness, and creditworthiness of governments to provide compensation to cover political risks are critical issues for attracting private capital. This is especially true for foreign capital, which is perceived by investors as being more vulnerable to political risks. The issue of meeting financial obligations while a dispute is being resolved can be addressed through such measures as debt service reserves and standby financing, provided that disputes are resolved within a reasonable period of time.

#### **§4.4 ESSENTIAL FINANCIAL ASSISTANCE**

Most private toll roads are undertaken on a project finance base, whereby investors rely on the performance of the project for payment rather than the credit of the sponsor. This arrangement is also referred to as limited recourse financing, which indicates that lenders have limited recourse to the sponsors for payment if the project fails to generate adequate returns.

A primary benefit of project finance structures is that they allow sponsors to leverage their resources and expertise with outside capital in order to undertake projects that they otherwise would not be able to finance on the strength of their own balance sheet. However, toll road project financing normally involves: complete investment environment analysis, detailed project studies, complex financial documentation, and protracted agreement negotiations. The complicated financial and contractual arrangements required for project financing make the closing of financing a difficult and lengthy process for many toll road projects.

In theory, financial risks are best borne by the private sector, but in toll road projects there is likely to be substantial government risk-sharing, either through guarantees, grants or other financial contributions that serve to improve the project's rate of return on private finance. In some cases government risk assumption and financial support may be necessary to support a project that would otherwise be unable to close financing because of weak project economics or an unfavorable country and concession environment.

## **§4.4.1 GOVERNMENT FINANCIAL PARTICIPATION**

Governments should seek to minimize the need for public financial support for toll road concessions in order to maximize the benefits of concessioning relative to its costs. However, public financial support may be appropriate, if it helps mobilize large amounts of private capital. If public financial support is appropriate, a variety of mechanisms can be used to support private toll financing, and also the governments need to ensure all forms of support should come transparently and sustainably.

### **1. EQUITY GUARANTEES**

Equity guarantees provide that a concessionaire with the option to be bought out by the government at a price that guarantees a minimum return on equity. Although the liability is contingent, the government effectively assumes project risk and reduces the corresponding private sector incentives.

### **2. DEBT GUARANTEES**

Debt guarantees guarantee that the government will pay any shortfall related to principal and interest payments. The government may also guarantee any refinancing that is scheduled. This creates significant government exposure and reduces private sector incentives, although it may decrease the cost or increase the amount of debt available to the project.

### **3. EXCHANGE RATE GUARANTEES**

Exchange rate guarantees are when the government agrees to compensate the concessionaire for increases in financing costs due to exchange rate effects on foreign financing. Exchange rate guarantees expose the government to significant risk and increase the incentive to utilize foreign capital.

### **4. GRANTS/SUBSIDIES**

Grants or subsidies are contrary to equity and debt guarantees that create contingent liability for the government. Alternatively, governments can furnish grants or subordinated loans at project inception, buying down the size of the project that

needs private finance. In Chile the size of the government grant was one of the criteria used in awarding the South Access toll road concession.

## **5. SUBORDINATED LOANS**

Subordinated loans can fill a gap in the financing structure between senior debt and equity. From the government's perspective, they also have the attractive feature that they can be repaid with a return if the road is successful. Subordinated loans improve feasibility by increasing the debt services coverage ratio on senior debt and by reducing the need for private equity, which requires a higher return. However, because subordinated debt does eventually require repayment, it does not improve project feasibility to the same degree as a similarly sized grant. Another alternative would be for the government to contribute financing that has characteristics of both debt and equity. One such instrument would be a "reverse convertible" contribution that would remain as equity unless the project was successful, at which point it would convert to debt for repayment.

## **6. MINIMUM TRAFFIC AND REVENUE GUARANTEES**

Minimum traffic and revenue guarantees are a relatively common form of support for toll roads where the government compensates the concessionaire if traffic or revenue falls below a minimum threshold. Typically, the threshold is set 10-30% below the expected volume, and it is generally more desirable to rely on a revenue guarantee if the goal is to facilitate the access of the operator to the financial market. This trigger reduces government exposure while providing sufficient revenue coverage to support the debt component of the capital structure. In addition, traffic and revenue guarantees help retain financial incentives in the project, unless conditions deteriorate well below what was forecast. If the government shares "downside risk" with the private sector through guarantees, it should also consider seeking instruments that allow profit on the "upside". One way to do this is with a revenue-sharing arrangement where the government receives a portion of revenues above a maximum traffic threshold.

## **7. SHADOW TOLLS**

Shadow tolls are a way of providing subsidies where the government contributes a specific payment per vehicle to the concessionaire. In effect, they are an ongoing revenue stream from the government in lieu of an up-front grant or loan. Because they are paid over time, they may be less of a burden on the public budget. The drawback of shadow tolls is that they may not provide investors with much protection from revenue risks. That is, shadow toll payments are highest when traffic volumes are large. As a result, government payments may be inadequate to protect investors when traffic is low and may be unnecessarily high when traffic volumes are high. In addition, the payment of shadow tolls over time creates a credit risk for concessionaires. These inefficiencies can be reduced in a number of ways, such as by implementing a declining payment schedule as volumes increase or a maximum traffic level beyond which shadow tolls are not paid. Because they tend to “top off” private revenues, shadow tolls may be particularly valuable as support to low volume roads that require upgrading or rehabilitation rather than new construction.

### **§4.4.2 CULTIVATING DOMESTIC CAPITAL MARKETS**

Countries with local capital markets that are capable of providing long-term financing for toll road projects have several advantages in supporting toll road concession:

- Financing denominated in local currency avoids exchange rate risk because payments to capital are in the same currency as the toll revenues generated by the project;
- Local financial institutions and investors may have a better understanding of project economics and government policies, and be more willing than foreign investors to assume local economic and political risk;
- Unlike some infrastructure sectors (such as power), the labor, material, and equipment required for toll road construction can largely be provided locally, which obviates the need to fund construction costs in foreign currencies.

Thus the financial support from governments alternatively could be the efforts of cultivating domestic capital markets that provide the long-term capital required for toll road projects, rather than direct financial guarantees or subsidies.

## **CHAPTER 5. UNTOLD STORIES BEHIND INFRASTRUCTURE DEVELOPMENT**

### **§ 5.1 CHALLENGES TO ‘THE PRINCIPLES’**

The Principles in Chapter 4 are emphasizing the government role in toll road development at the time of opening infrastructure to market, not surprisingly there exists other viewpoints that are against such a level of ‘government intervention’.

First of all, some mainstream economists would argue that a pure market economy, with government intervention kept to an absolute minimum, is the system that will give the best results, always and everywhere – of course, there is no exception with infrastructure investments. They impute imperfections in the performance of actual market economies to excessive government intervention or to misguided attempts to introduce elements of “planning”, or at least “management”, into the market system.

In order to point out the flaws existing in the above argument, we first need to understand the property of toll road, which belongs public goods. Not like private goods, such as a piece of cake, once consumed, which cannot be enjoyed by others, matters are different with public goods. The benefits of public goods are nonrivalrous in consumption and nonexcludable, either at pure or partial extent. Because they are nonrivalrous in consumption and nonexcludable, public goods typically face supply problems, and so are often referred to as a case of market failure. The main problem affecting the provision of public goods is known in the literature as “free riding”. It elicits patterns of behavior that, from the individual agent’s point of view, are quite rational, yet from a collective viewpoint – such as that of a local community, a nation or humanity as a whole – the result is suboptimal and can be disastrous.

It has been widely acknowledged that gaining the cooperation of a thousand citizens to jointly work for the public goods would fail in the face of an individual’s incentive to “free himself of the trouble and expense, and lay the whole burden on others”. People may even fear that indicating an interest, say, in better roads, will trap them into having to foot the bill. As a result, when the government is restrained by the

budget and fails to adequately make the service available, supply and demand cannot reach equilibrium, public goods are undersupplied and resource allocations are suboptimal. In another word, it is not reliable to entirely rely on the private initiatives to supply public goods. Markets are good at providing private goods, for the provision of public goods, however, additional mechanisms such as cooperation are desired.

The solution to market failures and collective action problems is often to bring the government in to improve conditions for cooperation by setting norms and standards, establishing new or clearer property rights, or providing fiscal incentives. In some cases the coercive power of government produces socially optimal outcomes, while in many other instances the government plays an essential catalytic role.

The Interest Group Liberalism, which is motivated by the highest sentiments, and possesses a strong faith that what is good for government is good for the society, would also seek to justify power by avoiding central government planning and by parceling out to competing interest groups the power to make public policy. They define the public interest as a result of the amalgamation of various claims. Accordingly, the requirement of standards has been replaced by the requirement of participation, and the requirement of law has been replaced by the requirement of contingency.

Interest group liberalism is on the basis of three major assumptions:

- organized interests are homogeneous and easy to define;
- organized interests emerge in every sector of our lives and adequately represent most of those sectors;
- the role of government is one of insuring access to the most effectively organized, and of ratifying the agreements and adjustments worked out among the competing leaders.

Taken together, these assumptions look like the Adam Smith “hidden hand” model for politics, where the group is the entrepreneur and the equilibrium is the public interest instead of the lowest price. Especially the third one puts much weight on the issue of democracy, e.g. equity. Consequently, so many of the realities of power from individual competing groups have to be dealt with, and each one would hardly convince or be convinced by other groups since none is superior to the other one. The faith that

bargaining is self-corrective has never been tested one way or the other, and the ends of interest-group liberalism are nothing more than sentiments and therefore not really ends at all.

Honestly in reality there is no such thing as “the goal of society”. There are only the aims and ambitions of particular social groups or classes. The goals of each group or class conflict with those of all the other groups or classes. Some groups have much more power than others, so only their goals will be achieved and the other groups will be exploited. For the masses to achieve their aims and ambitions, power, including ownership of the means of productions, must be in their hands. In other words, people are unpredictable if they do not share some elements of a common theory, and the procedure is never ending if making decision is left to the competing groups without any one taking a lead.

The project of Super-Fund in the 1980s’ the US, as a concrete example, substantiated the weakness of interest group liberalism. The program “Comprehensive Environmental Response, Compensation, and Liability Act”, commonly known as “CERCLA”, was applied to thousands of hazardous waste clean-up projects. CERCLA’s procurement strategy is a graphic example of the triumph of “progress” over “substance”, and has been a dreary failure. Congress boldly asserted plenary legislative control over the field of environmental restoration, but made no coherent, substantive decisions about what was to be done. Environment Protection Agency (EPA), the executive agency, was designated to rely on the adversarial nature of the rule-making system to “process” the competing views of groups interested in implementation of CERCLA. There are numerous participants in the process, including (a) citizens groups, (b) EPA design oversight consultants, (c) EPA staff, and (d) their state counterparts. Each reviews and comments upon each and every submission by Potentially Responsible Parties (“PRPs”) on the site. Liabilities are sufficiently large to make individual positions firm and unyielding. As a result, local decision making by EPA is paralyzed by competing statutory and regulatory policies, and polarized groups of PRPs and citizens. Decisions on remediation schemes are not being made affirmatively by anyone, as local EPA officials await a consensus to emerge from competing technical studies, lengthy litigation, and “transaction-cost weary” participants. EPA is simply hesitant to make

final, binding decisions as to remediation schemes, and even during construction, each and every procedure and work plan is “cleared” through EPA, DEP, and citizen groups. These clearances have caused huge changes and delays, which induce the cost to continually climb. Obviously interest group liberalism doesn’t work here, and a system, grounded in specific congressional policy, would have made everyone better off.

These views make a good starting point for discussion of the government role in the infrastructure development. Although evolving a more effective framework for private participation is still ongoing, it has been generally accepted that the infrastructure development requires the active private participation and continues to test governments’ ability to make the right decisions and to balance many competing interests. In other words, if a sustained development of infrastructure is desired, one thing should be understood first that infrastructure is fundamental to people’s well-being and that governments and markets must work together to provide them.

## **§ 5.2 UNTOLD STORIES BEHIND SUCCESSFUL DEVELOPMENT**

Some relatively successful toll road developments have been achieved in both East Asia and Latin America areas. Although following the different ideologies, they both have substantially proved that the strong government role is one of the keys to the success.

### **§ 5.2.1 EAST ASIAN**

The physical achievements of infrastructure development in the six East Asian economies, which include Hong Kong, Japan, Korea, Malaysia, Singapore, and Taiwan (China), are impressive and the contributions of infrastructure development to economic growth are critical. In retrospect, although each chose the infrastructure strategy differently that was best suited to its economic philosophy, they shared one key feature in common, which is also the most important one, to explain their successes – the government’s substantial and sustained commitments.

Those governments' commitments mainly consist of sustained and powerful government leadership, the nurturing of complex institutions, and adaptability to change.

### 1. GOVERNMENT LEADERSHIP

One prominent symbol of the strong government leadership is high level of investment in infrastructure. These large investments are manifested in rapid infrastructure development (Table 3). Compared with an average infrastructure investment of 4 percent of gross domestic product (GDP) among all developing countries, these six countries rarely fell below 4 percent of GDP and were often higher, reaching 7 or 8 percent in several years. Japan set the example. After a slow start in the first decade after World War II, the Japanese government accelerated investment in transport infrastructure, quickly exceeding 2 percent of GDP and remaining between 2.0 and 2.5 percent ever since. Thus along with private investment, Japan's infrastructure investment has been 6 and 8 percent of GDP.

TABLE 3. PROVISION OF INFRASTRUCTURE IN SIX EAST ASIAN ECONOMIES

Economy	<i>Electric power generation</i> <i>(millions of kilowatts per 100 persons)</i>			<i>Telephone connections</i> <i>(number of connections per 100 persons)</i>			<i>Paved roads</i> <i>(meters per 100 persons)</i>		
	1970	1992	<i>Annual growth rate,</i> <i>1970-92</i>	1975	1993	<i>Annual growth rate,</i> <i>1975-93</i>	1970	1990	<i>Annual growth rate,</i> <i>1970-90</i>
<b>Hong Kong</b>	34.0	154.0	13.4%	6.7	51.0	11.9%	23.0	26.0	0.6%
<b>Japan</b>	66.1	165.4	8.0%	30.8	46.8	2.4%	146.1	630.7	7.6%
<b>Korea</b>	8.8	61.7	17.6%	4.0	37.8	13.3%	11.5	79.9	10.2%
<b>Malaysia</b>	8.7	36.0	12.5%	1.6	12.6	12.2%	143.1	156.1	0.4%
<b>Singapore</b>	31.0	126.8	16.0%	12.3	43.5	7.3%	58.3	101.9	2.8%

Additionally, the governments of the six East Asian economies demonstrated an active commitment to establishing their sophisticated institution. The governments did make substantial investment to promote risky projects in order to have infrastructure keep pace with the tremendous growth. Also, despite the absence of the discipline of market forces, the governments made decisions in the face of emerging demands.

## **2. COMPLEX INSTITUTIONS**

The governments of the six East Asian economies established sophisticated institutions to determine infrastructure priorities and guide construction, financing, operations, and maintenance. Under some circumstances these institutions substituted for the market by allocating resources and providing feedback to policymakers about the outcome of investment decisions. Of equal, or perhaps greater, importance, the institutions accomplished tasks that markets could not, that is, setting strategic agendas and ensuring private sector participation and input in the face of emerging externalities. As a matter of fact, their performance was central to the successful delivery of infrastructure services.

### **1) Setting the Agenda: Infrastructure Development Starts at the top**

The infrastructure agenda in six East Asian economies – its goals, resource allocation mechanisms, and delivery institutions – was determined by top leadership, who maintained close involvement in infrastructure development by using the planning process as a coordinating and feedback device.

The key lesson that emerges from Singapore's successful history of infrastructure development is the importance of government vision, leadership, and commitment. To address economy's problems, Singapore's government articulated a broad national policy of economic expansion and then forged the institutional forces, financial resources, and public consensus needed to implement it effectively. In many ways, the government acted like an entrepreneur. It assessed opportunities and assumed the risks of inherent in infrastructure projects. These projects required a large commitment of public funds, and success was not guaranteed. Fortunately for Singapore, the investment in infrastructure development paid off handsomely.

However, setting the agenda was not enough, especially in the larger economies. The centralization of goal setting had to be balanced by effectively decentralization to obtain the necessary information and to provide local incentives to perform. Two interrelated themes are noteworthy. Given the sector and location specificity of infrastructure, decision making must be delegated, but coordination is also important,

not only for meeting physical logistics, but also for ensuring that various, often competing, interests are represented.

In Singapore the responsibility for developing and managing infrastructure was given to quasi-government agencies – the statutory boards – under the overall supervision of their respective ministries. The government granted these boards significant autonomy in establishing financial policies, recruiting personnel, and allocating line items in their budgets. Along with this autonomy came responsibility for the bottom line. Their drive for efficiency enabled the boards to turn in operating surpluses and to use these surpluses to finance capital expenditures. In Japan policymaking control in specific sectors has rested with the various ministries, which in turn created public corporations<sup>35</sup> as channels for implementing ministerial policy. The government has also appointed advisory boards composed of government officials, academics, and private consultants to monitor each sector and convened commissions to arbitrate disputes about the direction of infrastructure development. In Hong Kong the government has retained almost exclusive institutional control for planning infrastructure development, but it has delegated investment and operations to private parties. In Korea and Taiwan (China) the governments created high-level coordinating bodies under ministerial control. Each body has formed commissions or implemented other monitoring mechanisms to respond to problems.

Why did these top driven processes successfully develop expanding infrastructure of generally sound quality? Why did the coordination function work when similar attempts in other economies have generally led to the poor results? The answers have been found in the ideology the six followed. First, the goal of infrastructure development was simple: the emphasis was on production to support economic growth, with sacrificing with equity considerations to some extent. Second, the number of competing “voices” or competing claims was limited, allowing the focus on growth to proceed.

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<sup>35</sup> The public corporation is a mechanism that introduces commercial discipline to publicly supplied services. By insulating operations through a legislative charter, the goal is to give managers autonomy to make decisions based largely on commercial considerations, autonomy that ideally extends to both financing and operational decisions.

## **2) Organizing for Delivery: Creating Incentives in Nonmarket Settings**

The public corporation has been broadly utilized and relatively successful in East Asia. Pioneered in Japan in the mid-1950s, early applications included a public corporation to run the toll road system. This example is interesting, despite relying on the government for its revenues,<sup>36</sup> the corporation operated and maintained the toll road system efficiently. Korea also used public corporations successfully. For example, although the Korean Electric Power Company charged rates below its long-run marginal costs in accordance with government policy, it was still able to increase its capacity and to deliver high quality services. The inference from these examples is that financial support from the government does not necessarily interfere with investment and operations.

## **3) Using Domestic Resources for Capital Investment**

Reflecting their heavy involvement in infrastructure, the governments of the six East Asian economies have been central to its financing. Direct funding from government budgets has played a major role in every economy, but the governments have also established mechanism for bringing commercial discipline to the financing and operations of infrastructure enterprises.

For long-term financing, all governments tried to minimize their reliance on external sources of funding for infrastructure projects, which generate revenues primarily in local currency. At the same time, each government cultivated domestic sources of financing for capital investment in infrastructure; in particular, long-term investments were supported through funds drawn from long-term private-savings.

## **3. MANAGING CHANGE**

East Asian economies are facing important structural challenges that must be addressed if they are to maintain their rapid economic growth, improve living standards, and continue the momentum toward a greater role in the global economy.

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<sup>36</sup> The road system was financed by tolls, as well as by a special account funded with gasoline taxes, with the rest coming from the general budget.

Two of the challenges broadly confronting the region are meeting the massive demand for infrastructure and adapting the role of the government to the changing economic environment. Unless these challenges are met, the region's strong growth cannot be sustained for long.

To promote growth, East Asia economies have traditionally paid greater attention to infrastructure than other developing countries – and their public delivery mechanisms have generally been more efficient. But the continued growth in demand for services, along with changing technology and regulatory approaches, requires a shift from the public to the private sector in infrastructure ownership and service delivery. In infrastructure and elsewhere, East Asian economies are beginning to see a transformation in the role of government and in the regulatory framework for private business. A more hands-off approach is gradually being adopted as increasingly sophisticated economies make strong government intervention both ineffective and unnecessary.

### **1) Private Delivery of Services the East Asian Way**

Privatization is occurring slowly and grudgingly in East Asia. Even where governments allow private entry, they retain their hold in many ways. With the public corporations, governments are maintaining their stake in shareholding. Where new, stand-alone projects are being constructed, governments are providing substantial support through loans and guarantees.

Japan is developing a fluid mix of public-private participation in infrastructure ownership and service delivery. Infrastructure arrangements have evolved interactively: the government has allowed private entry in most sectors, and the private sectors have relied on government policy and guidance to resolve nettlesome issues that sometimes threatened effective service delivery.

### **2.) Regulating Service Pricing and Quality**

Each government exerts some degree of regulatory control over its infrastructure providers, whether to ensure that suppliers do not exploit their market position or that they have sufficient incentives to perform efficiently. Regulation has acquired greater importance with privatization growing.

Even in Hong Kong, where private activity and investment have been given high flexibility in some sectors, it still has been reluctant to relinquish regulatory control fully and allow competitive forces to flourish. With scarce natural resources, a small geographic area, and a densely concentrated population, the government feels obligated to protect consumers' rights by regulating profit margins. It uses two mechanisms to maintain regulatory control. The government grants franchises to certain infrastructure monopolies – either for specific services or for entire networks of services – to protect them from the entry of competitors and from the expansion of other monopolies into certain service areas. These franchises cover specified lengths of time, usually twenty-five to thirty years, but the government monitors the franchises rigidly to ensure that they maintain delivery and production standards and to ensure that they do not collude in setting prices. The government also uses control schemes to limit profit maximization by infrastructure providers, thereby protecting consumers from high prices. The government negotiates with franchise and other monopolies to set a rate of return that is tied to fixed assets and that take the price of production inputs into account. These control schemes are not static. The government has adapted them as necessary to maintain a balance between consumers' concerns about costs and service providers' concerns about profits.

Generally speaking an essentially centrally controlled economic framework has been dominating the infrastructure development in East Asia, with limited private participation. However, the current global trend in infrastructure development is to shift responsibility for service delivery to the private sector and the market oriented processes may reduce the flexibility of this framework. On the other hand, to deliver services through private, competitive system is not perfect, but implemented with due care it is capable of generating substantial benefits. The experience from Latin America, which offers a contrast to the East Asia strategy and shows striking shifts towards private involvement may demonstrate a better example for China on how to develop a framework more respondent to the changing world.

## **§ 5.2.2 LATIN AMERICA**

The achievement of infrastructure in Latin America also amazes the world, although they followed the quite different philosophy from East Asia. Most Latin American countries have been actively engaged in concessioning road infrastructure projects to the private sector. Since the early 1990s the government of Argentina has granted private firms the right to collect tolls on some of the country's main highways in return for the duty to carry out a program of maintenance, rehabilitation, and construction. Chile plans to build a modern toll motorway network using BOT-style concessions. The government of Colombia has awarded a dozen concession contracts for rehabilitation and construction of highways, and is currently targeting the modernization of 4,900 km of national highways. Lastly, after several decades of limited results building state-run tolled and free highways, Mexico embarked upon one of the world's most extensive privately-concessioned toll road programs in 1989. Among these countries, Chile is the most notable one.

### **1. GUIDING PRINCIPLES**

Expanding infrastructure is a main challenge for the Chilean economy. Rapid economic growth, which has averaged 7.4 percent annually over the past decade, is requiring massive investment in energy, telecommunications, roads, ports, airports, water supply, and irrigation. In order to meet such needs without endangering the budget and diverting resources from pressing social needs, Chile has implemented a policy that allows the private sector to take the lead in infrastructure investment.

Private participation in infrastructure implies more than capital investment. Chilean policymakers also rely on the private sector to plan, build, and operate infrastructure, and to manage the commercial risks associated with infrastructure projects. The Chilean economy benefits not only from the financial resources provided by private investors but also from their managerial and technical skills.

However, the role of public sector was not neglected by the government. Major reforms have been introduced in the Chilean economy in order to involve the private sector in infrastructure, and reforms are still taking place, since the government is

committed to creating new opportunities for private initiative. Private participation in Chilean infrastructure sectors is guided by four basic doctrines, embodied in existing laws and in government policies and initiatives: promote private investment, strengthen competition, protect the environment, and satisfy basic social needs.

### **1) Promoting Private Investment**

Chile has been very successful in promoting private investment in infrastructure. A key incentive has been the persistence of a favorable investment climate in the economy as a whole. A stable political system, a well-developed financial sector, openness to trade and foreign investment, and capable government institutions have contributed to this climate. In addition, regulatory norms established for the main sectors have applied clear and stable rules. The duties and rights of private operators are defined in sectoral laws, which clearly distinguish the regulatory role of the state and the managerial role of both private and state-owned companies.

Favorable business conditions have been important to attract investors from Chile and abroad for the concession system that is being applied to develop road infrastructure. Low political risks and high credit ratings in international financial markets have facilitated private participation in long-term projects.

### **2) Strengthening Competition**

Promoting fair competition is a general policy principle for all infrastructure sectors in Chile, since it has been believed that competition is the best way of ensuring efficient operation and better services to consumers. Chile was a pioneer in deregulating its power and telecommunications industries within a competitive framework. There are no restrictions on investors wishing to enter the market or on customers, who may choose among different suppliers. As a result, capacity shortage has been completely eliminated, the most modern technology is being used, prices have gone down, and companies are still earning fair returns.

In the case of roads and other transportation infrastructure, the state has kept a key planning role but grants concessions to private parties allowing them to build and operate infrastructure and charge user fees. This system ensures a competitive,

transparent, and open bidding process that allows the best projects to be chosen. The only state guarantee is one safeguarding minimum earnings from user charges.

### **3) Protecting the Environment**

Environmental protection has become a major political priority in recent years. New norms and legislation have been approved to provide clear rules to investors and ensure that all infrastructure projects are developed in a sustainable manner. Preventing environmental damage is the reigning principle.

A clearly defined review process, with fixed deadlines for final authorization, has recently been established, including detailed regulations. It requires environmental impact assessment studies for most large projects, indicating any mitigation measures required. Many large projects undertaken in recent years have performed such studies on a voluntary basis even when not required to do so by law.

Some infrastructure projects need to meet specific environmental and safety standards, such as emissions standards for air and liquid pollutants, quality norms for construction materials, and route design constraints for roads and pipes. Such standards are usually based on international experience.

### **4) Satisfying Basic Social Needs**

It is a government objective to provide basic social infrastructure to all Chileans. Yet existing policy recognizes that it may be unprofitable for private investors to serve isolated areas or low income groups. To overcome these limitations the government provides funds for projects that meet minimum social and economic targets. Most infrastructure projects that the government will finance in the next years would very likely not be developed by the private sector because of low profitability or because it is difficult to charge users.

## **2. CAPABLE STATE REGULATION**

Private participation does not imply state withdrawal from the infrastructure sector. In contrast, it requires active and effective involvement of state entities to ensure that private actors operate in line with social goals. To do this, state entities must rely on

highly qualified personnel who understand and can implement the regulatory framework.

Several state entities are involved in Chilean infrastructure. Ministries dictate government policy and are responsible for the overall performance of specific sectors. The Ministry of Public Works oversees transportation infrastructure (roads, ports, airports), water supply, sanitation, and irrigation. The Ministry of Transport and Telecommunications is responsible for the operation of telecommunications and transportation markets. The National Energy Commission oversees oil, coal, gas, and electricity markets.

Technical and economic regulation is carried out by specialized institutions. There are *superintendencias* for water supply and for electricity and fuels, *subsecretarías* for transport markets and telecommunications, and *direcciones generales* for irrigation, roads, and air transportation.

The performance of government institutions helps to explain the positive role that the private sector has played in Chilean infrastructure. However, further modernization may be needed to ensure that regulatory duties are performed more efficiently in the future. Recruitment of highly qualified staff at the regulatory agencies is a main concern. Another concern has been to give regulatory agencies greater legal authority to ensure enforcement of regulatory norms.

### **3. PRIVATE PARTICIPATION IN ROADS AND TRANSPORTATION INFRASTRUCTURE**

The traditional source of financing for construction and maintenance of roads has been the state funds allocated to the budget of the Ministry of Public Works in Chile. Compounding matters, restricting infrastructure investment was a preferred method for fighting inflation in Chile as in many other Latin American countries. It has been estimated that during the 1980s only 30 percent of road investment needs were met. Road traffic has increased almost fourfold in the past twenty-five years, while the road network has remained nearly unchanged.

In the early 1990s the government realized that the road deficit could become a major bottleneck to economic development. It was estimated that the annual losses due

to the road deficit amounted to nearly \$1.5 billion, stemming mainly from congestion, pollution, accidents, and load losses due to inadequate transport infrastructure. Then the government significantly increased investment in roads, but it turned out the state would be unable to meet all investment requirements.

The solution was to involve the private sector in obtaining additional funds and also to introduce new managerial practices and technologies. The concessions law approved in 1991 established the framework that would apply for private firms willing to invest in constructing, operating, and maintaining roads and other transportation infrastructure. Concessions are granted through a bidding process, with potential investors submitting offers that must satisfy specific conditions. No bilateral negotiations will be involved. The Ministry of Public Works has created a Concessions Division to regulate the concession system. This division defines projects to be offered, manages the bidding process, and supervises project construction and operation. Regulations governing the concession system and the bidding process have evolved over time.

Although it is too soon to evaluate the long-term operational outcome, the Chilean experience with the concession system has so far been very positive. The system allows reduction of the road deficit while freeing government resources for other uses. Several factors help to explain the positive response from private investors to concession projects. Internationally, the country is assessed as one with low political risk and institutional and macroeconomic stability. The Ministry of Public Works has carefully overseen thorough preparation of the required studies and undertaken broad promotional efforts. Investors also cannot have failed to notice the steadily increasing demand for this type of infrastructure, which can be expected to keep pace with the economy's sustained growth.

#### **4. CONCLUSION**

Chile has come a long way in deregulating and privatizing its infrastructure sectors. The private sector is now involved not only in financing investment projects but also in planning, building, and operating new infrastructure facilities. Private participation in infrastructure has had strongly positive effects on the Chilean economy.

Massive private investment has been taking place in energy and telecommunications networks and is starting to flow into the road, water supply, and other infrastructure sectors. Such investment is allowing the economy to maintain high growth rates and the government to use its resources for social objectives. Users have benefited from more and better services at reasonable prices. Companies have increased their productivity, earned fair returns, and diversified their operations in Chile and abroad.

## CHAPTER 6. BUILD UP CHINA'S HIGHWAY TO THE FUTURE

There is an old saying in China – *Want to be rich? Build roads first.* Although our ancestors long time ago had recognized the importance of roads in economic development, in highways, the key problem confronting China is its comparative neglect of the sector over several decades. Accordingly, China's road network ranks among the sparsest in the world relative to geographic area or population and is quite unsafe. In order to achieve steady progress for China's highway development, the transport sector should receive adequate attention and be given high priority from the top of the government.

One of the first private toll roads to be completed in China was the Guangzhou-Shenzhen Superhighway, connecting the Pearl River Delta in Guangdong Province to Hong Kong. The project's initial phase, a 122.8-km dual three-lane facility, was constructed on a BOT basis with a 30-year concession period. The developer for this phase was Hopewell Holdings, Ltd. of Hong Kong, in joint venture with Guangdong's Provincial Highway Construction Company (GPHC), and negotiation went on for eight years before China's State Council gave its approval to the project. In the final arrangement, Hopewell was required to accept substantial pre-construction risk, including land acquisition, in return for commercial property development rights at 15 interchanges.

The project turned out to be beset with sluggish traffic growth and expensive change, such as the unanticipated needs to acquire more land than expected and to elevate a 30-km section of the highway due to soft ground conditions. As a result, the final project cost was more than twice the initial budget. Most recently, in January 1999, the provincially owned Guangdong International Trust & Investment Company (GITIC) was allowed to go bankrupt by the Government, leaving US\$4.3 billion in unpaid debts. GITIC had provided cash-flow deficiency guarantee for repayment of subordinated debt to the Guangzhou-Shenzhen Superhighway project, which has been called upon. As of March 1999, toll road project sponsor Hopewell was working to replace GITIC with the Bank of China as obligor, and in the meantime had promised to cover any payment shortfalls using its internal reserves.

In the years ahead, a challenge for the Chinese government will be to meet the needs of the emerging economy to expand and modernize the transport infrastructure. While meeting the challenge will require the cooperation of government and private sector, the role of the government might be more important at the infancy stage of its development. Developing an effective framework for China's toll road development raises several important issues for the Government of China (GOC):

- Under what circumstances should the GOC concession roads to the private sector?
- How should concession be structured?
- What are the critical elements of a concession agreement?
- When and how is it appropriate for the GOC to provide financial support?

## **§6.1 PUBLIC OR PRIVATE?**

Diminishing general budgetary resources have provided the impetus for governments to explore "off-balance sheet" methods to raise financing for infrastructure projects, including private toll roads. A private-public partnership is crafted for the toll road concession project in order to bring additional resources to the project and complete it in a shorter time, freeing scarce governmental resources for other investments, and increase the efficiency in construction and project operation, through market discipline, assuring that the project is completed on schedule and within the budget. Moreover, the private-public sector partnership approach assures adequate maintenance of the roads. Before pursuing a private toll road program, however, the advantages and disadvantages of private tolling relative to public funding or public toll roads should be carefully weighed. Especially in China, where planned economy has been dominating for a long time, going to full privatization in single step might cause some social instability issues.

The primary economic benefits of tolling, public or private, are the user-based funds generated to support road development and the ability to influence road use and traffic patterns through road pricing. Although certain traditional sources of public funding, such as gas taxes and registration fees, are also user-based, they are not

collected at the point of use and therefore are less effective in managing traffic. The primary economic disadvantages of tolling are the time and cost required to implement toll systems and potential delays and excessive traffic diversions associated with toll collection. On purely economic grounds, therefore, tolls should be used after the thorough project-specific studies have proved that the benefits of toll revenues and traffic management exceed the costs of implementation and any delays and excessive diversions caused by the system.

The biggest difference between private toll concessions and public tolling is the financing arrangement. The primary economic advantage private tolling has over public tolling is the strong incentive for financial success created by the use of private debt and equity to fund the project. In addition, in some countries a public entity may be unable to attract capital to a project that a private consortium can finance because of the government's weak reputation among investors. The economic disadvantage of private over public tolling is the potential higher cost of developing, implementing, and administering a private concession program relative to a public tolling scheme. On purely economic grounds, therefore, private tolling should be used whenever the value of the private sector's financial incentive exceeds the additional costs associated with the private concession process. It is important to note that any financing advantage that a public entity may have is due to greater government risk assumption or distortive tax policies (as with the tax-exempt debt market in the United States), not to an inherent ability of the public sector to access lower-cost capital.

In addition to the economic considerations discussed above, policymakers must consider numerous noneconomic issues when evaluating toll road program. These include public acceptance of tolling, the equity of charging tolls for road use, and the impact on the government's flexibility in future road development. In particular, public acceptance is one of the overriding issues in toll road development and may be the greatest impediment to tolling. Noneconomic issues tend to be greater impediments to private than to public toll road development. After taking these important noneconomic issues into consideration, policymakers may make different decisions than those indicated by a purely economic assessment.

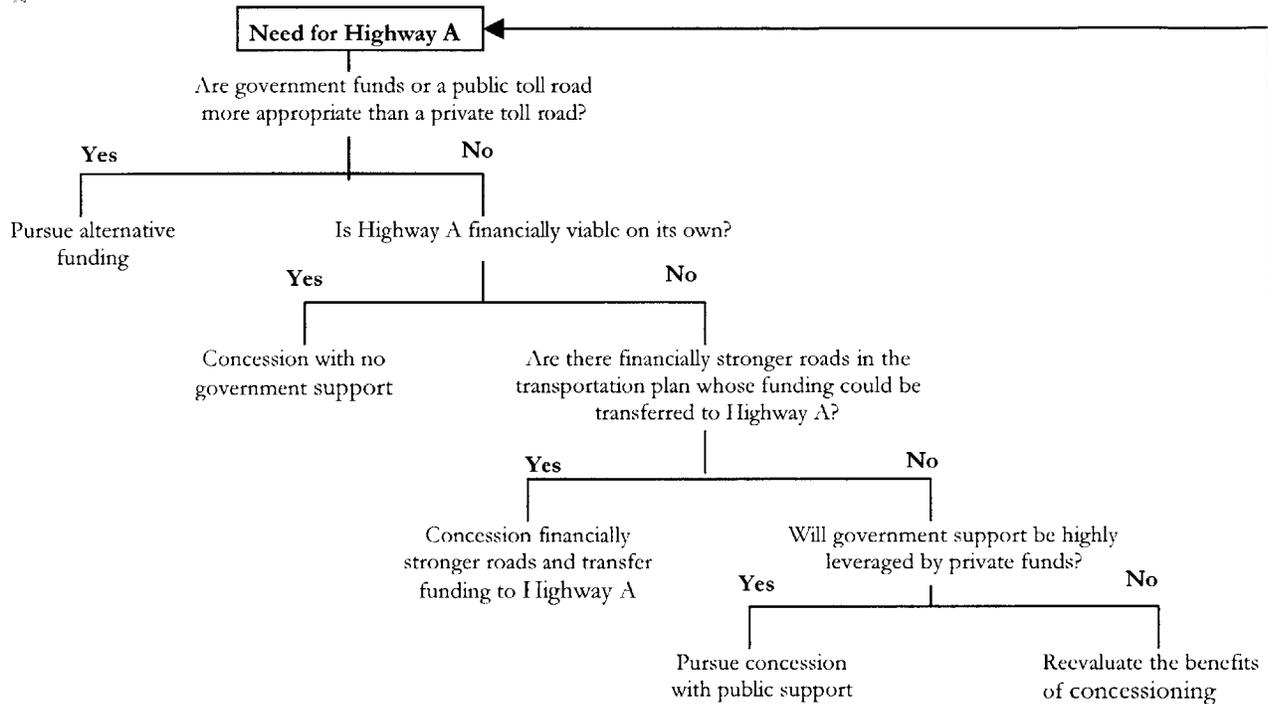
Since China is still in its infancy stage of opening the infrastructure market to private sector, the government should be very conscientious in selecting the initial roads that are the most appropriate or attractive projects to concession. Early successes are important in establishing credibility for China's future programs. It is important to select projects that maximize the benefits of private tolling relative to the costs.

Consequently, profitable projects, like corridors projects in NTHS that have been given high priority, might be proper to go for private tolling, since they are able to fund most, if not all, of their capital requirements through sufficient toll revenues resulting from high volume traffic. While some roads in NTHS serving as links between major corridors are likely unable to generate sufficient revenues to justify the cost of a tolling system, in addition to any delays or excessive diversions created by toll collection, the traditional government sources should fund these kinds of projects. Additionally, the development of toll road concession is unevenly in China. For those provinces not having experience of concession, concession program should begin with a feasible project of manageable size that carries a high probability of success. Rehabilitation and expansion of an existing facility with strong economics and a capital cost that can be financed in local capital markets may be a better initial candidate than a new multibillion-dollar intercity artery requiring foreign capital. New facilities involve substantially higher costs per kilometer than do rehabilitations and expansions of existing facilities. Rehabilitation and expansion not only require less construction work than new facilities, but projects involving exiting tolled facilities can use the toll revenues during construction to offset construction costs, thereby lowering financing requirements. From a strategy viewpoint, contracting out road improvements can provide a smooth phase-in or learning process into the development of a future relationship with potential investors into new roads.

In a nutshell, a concession policy that combines toll financing and public funds for road development should target projects with the strongest economics for concession and fund the weaker projects with public funds. This approach is contrary to the tendency of some governments to fund high-priority and high-demand projects with public funds, and offer low-priority projects with relatively weak economics for

concession. Figure 3 presents some of the questions that should be asked in selecting private toll road projects.

FIGURE 3. CONCESSIONING DESIGN PROCESS



Currently there are mainly four highway implementation and management models being experimented in China's road sector:

*Government built and operated toll road.* The Provincial Communications Department (PCD), a government agency, is the owner and debtor of the toll road. The planning, construction, maintenance and operations of the project are all directly under the management of PCD's departments. This model is a practical model in the centrally planned system and makes it easy for the local governments and beneficiaries to participate in project formulation and implementation. The procurement of required permits for land acquisition and resettlement is straightforward and predictable. The main disadvantage is the lack of transparency in financial responsibility both in terms of project borrowing and debt service. Most of the road projects completed in China used

this model in the past years. For its simplicity and strong latent demand, it is likely to remain in use for several more years, especially in China's western (relatively poor) provinces, but it may be expected that its usefulness will not last long.

*Toll road company*, to which the assets and the rights to the toll revenue and the debt service are transferred or leased from a government owned parent company after the completion of the road for a long period, normally thirty years. The toll road management and operation may be performed by the toll road company itself. The model appears a mixed model, neither a pure planned economy nor a market model, and it has solved many emerging issues in project implementation and operation. In this way, the advantages of governmental functions for permits and other interventions by local government offices and efficient toll road operation by a private manager are achieved. There are, however, limits on competition and accountability, and watchfully monitoring is required to fully evaluate its advantages and disadvantages.

*Joint venture with a foreign company*. In this format, the company is responsible for raising the money and for management from planning to implementation and operation of roads, and is required to take the responsibility for loan liabilities. The foreign partners contribute money to build the highway and may have preferential access to toll revenues. The Chinese counterpart contributes its share of capital in terms of highways, land use rights and even cash. The companies may enjoy tax and other privileges. From practical point of view, the biggest advantage of the model is its direct connection to financial viability and sustainability through the market mechanism. The disadvantages are safeguarding investor interests, protecting the users from the road companies becoming monopolies, and the conflicts of interest in planning.

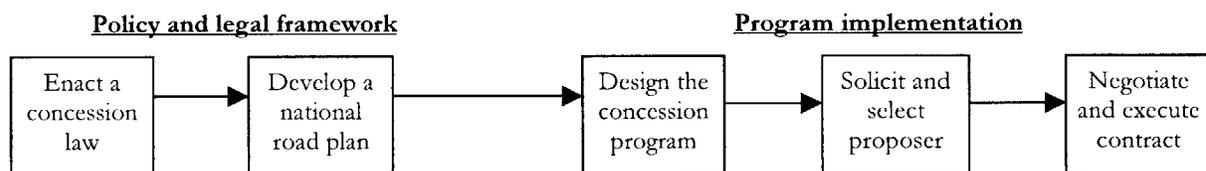
In addition to the above three models, *Build-Operate-Transfer (BOT)*, which was introduced into China with the original intention for power plants, presently is a fourth one being developed for toll road projects. If it works, it is argued, then financing the China's vast road requirements will be much easier. However, China's infant BOT program has shown skeptics within the GOC that the BOT model can deliver infrastructure financing quickly and at an acceptable cost. Moreover, the program can meet the essential requirements of the international lending community without the erosion of national sovereignty that the GOC officials feared. At the same time, foreign

investors have found they are left with a structure that incorporates western-style contractual arrangements that are more legally and financially complex than the regulatory framework in China can handle. The legal framework is still far from what most commercial banks feel comfortable taking back to their head office. The bright side of the thing is that China has started to try to be in line with international practice, while definitely a long and winding learning-by-doing path is ahead.

## §6.2 PROPOSED FRAMEWORK

The overall concession structure can be divided into two critical phases, beginning with the policy and legal framework and followed by program implementation (Figure 4).

FIGURE 4. CONCESSION PROGRAM STRUCTURE



Based on this streamline and “the Principles” in Chapter 4, a framework for China’s toll road development is going to be proposed as following.

### §6.2.1 FAVORABLE CONCESSION ENVIRONMENT

Modernization of the highway system brings with it attendant requirements necessary for improving the country and concession environments, which are directly related to issues of policy and legislation, and concerned institutional capability. Several constraints hamper fulfillment of the new requirements and the corresponding development of China’s transport system.

## 1. LEGAL CONTEXT

China's concession environment is generally considered less favorable, although the legal framework in China has undergone some significant changes in recent years.<sup>37</sup> For a long time, project finance had differed significantly from the international norm in which sponsors and creditors look principally to the income stream generated by the project to satisfy debt payment. Instead, foreign project sponsors and lenders had relied heavily on Chinese government debt guarantees to minimize the project risks and had not been permitted to own or operate projects without first forming a joint venture project company with a Chinese party (See Box 1 for more information of the current project companies in China).

### BOX 1. CURRENT FORMS FOR TOLL ROAD PROJECT COMPANY IN CHINA

*Technically there are three forms for a privately financed toll road project company in China:*

- i). Wholly foreign-owned entities (WFOE);*
- ii). Equity joint ventures (EJV); and*
- iii). Cooperative joint ventures (CJV).*

*Of these, CJVs are the most common, as the right and obligations between the foreign and local parties can be determined flexibly based upon a contractual agreement.*

*The use of CJVs as project companies in China has attracted many foreign investors by effectively addressing some of the critical problems that they face, such as slow recoupment of investment through dividend payments and low returns on investment during the start-up years of the project. In addition, flexible depreciation may be used to leverage project losses in the early years.*

While those two features mentioned above have been abolished following the publication of BOT Circular, the pilot projects in China revealed some problems in implementation. The project sponsor are forced to incur substantial expenses in finalizing all the major project contracts and securing the commitment to financing

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<sup>37</sup> The following legislations have been implemented, the BOT Circular, the Security Law of 1995, the Foreign-Related Security Rules, the Foreign Exchange Control Registrations of 1996 and the Project Finance Measures of 1997.

before the feasibility study report is even approved.<sup>38</sup> The requirement that bids incorporate final input from lenders on the project documents raises the already high cost of bid preparation. Further the timetable for submitting bidding documents, with only one year from feasibility study approval to financing closure, is strictly enforced. Such a timetable puts tremendous pressure on the winning bidder, particularly since neither the State Planning Commission (SPC) nor the concession-granting authority controls many of the approvals that must be obtained during this period.<sup>39</sup> For the Labin B power plant project, the China first BOT project, the documents stipulated that the parties not sign the concession agreement until all financing conditions were met – a case of putting the cart before the horse.

The concessioning air in China remains unclear. It is obvious that the GOC's purpose is not to create more favorable conditions and competitive environment for private sectors. Rather, they seem intended primarily to ensure central control. It poses some questions requiring the policy makers' conscientious consideration – what kind of policies need to be supplied and what kind of role the GOC should play in the construction of China's modern highway networks. To illustrate the specific policy provisions is beyond the scope of this work, while some understandings in this paper may be shared by the Chinese government officials.

Michael Porter, in his book, *the Competitive Advantages of Nations*, has pointed out that government can influence and facilitate, but does not control. Government policies that succeed are those that create an environment in which firms can gain competitive advantages, rather than involve government directly. Hence government could make use of establishing sound policies that stimulate dynamism, competitiveness, and

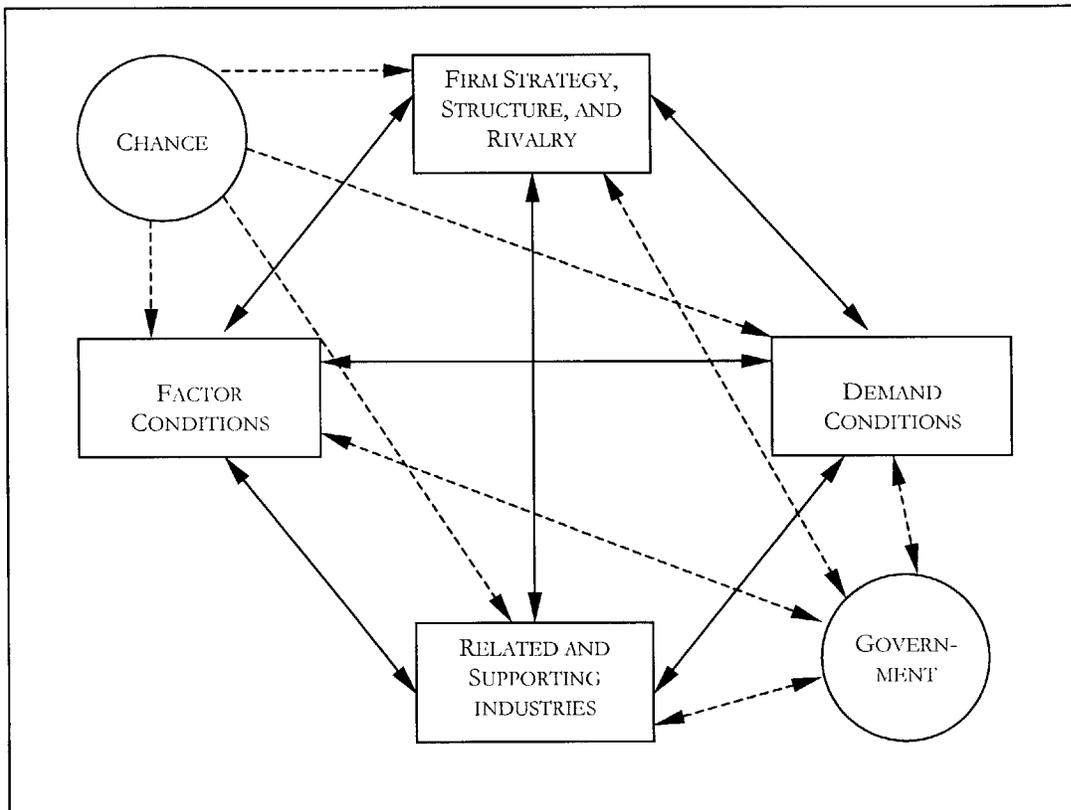
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<sup>38</sup> The feasibility study report for the foreign-funded project must include the following: the qualifications of the projects sponsors and the lenders; agreements for the sharing of risk among the concessionaire, the lenders and other contractual parties to the project; principles and formulas for the determination of the prices of the products; the project financing plan; letters of intent to commit loans issued by the foreign lenders; supporting documents issued by domestic institutions; and draft of all the principal contracts for the project, the substance of which are not alterable.

<sup>39</sup> Under Administration of project financing conducted outside China 1997, the written proposal and the feasibility study for a project must be issued by the planning department of the province where the project is to be located or of the authority under which the project falls. There is a three-stage approval process with the preliminary examination by the authority in charge of the industry, and additional approval by the SPC and the State Council.

innovation to achieve sustained productivity growth. Here is one thing noteworthy, short-term policies are often selected to show movement: subsidies, protection, and arranged mergers; while long-term policies have short-term negatives: deregulation, privatization. Government's role is to unleash and amplify the forces within the diamond (Box 2 the Determinants of National Advantage), to create opportunities, and pressures for continued innovation. As it has been proved in some successful countries' experience, especially in Chile, government's role is partial, not plenary, pusher and challenger, signaling opportunities.

BOX 2. THE DETERMINANTS OF NATIONAL ADVANTAGES



An economy in transition must cope with two apparently contradictory objectives of the transport sector: maximizing the intensity of use of assets and satisfying the demands of users. The former one is inherited from the era of China's planning economy. Since output was not subject to considerations of demand (and, therefore, of cost and quality of service), the negative impacts of high asset utilization were largely

unimportant and more than compensated for through cost savings. In contrast, the primary objective of the emerging socialist market economy is to produce the quantity and quality of services that users are prepared to pay for. Competition is the means of determining which services are demanded, how and by whom they should be provided, and at what price. From the perspective of a planned economy, this results in a misuse of resources, since it requires more assets to transport a given volume of freight and passengers. From a market perspective, however, it results in a better allocation of resources and greater economic efficiency, and in turn is able to better tackle the problems China is currently facing -- congested roads, inadequate investment, and dissatisfying services.

John B. Miller has revealed in his book – *Principals of Public and Private Project Delivery*, “Competition is a concept at the root of virtually every public procurement statute [federal, state, and local] – in the United States and in many other nations of the world.” Competition is the principal means by which a market economy maximizes net social benefits. Consequently the government should cultivate a favorable environment for genuine competition by following the policies to bring about more competitors and to supply freedom of operators.

Presently although there are many contractors and operators in the sector, most of them are SOEs that conspire among themselves to limit competition. Through their dominance, they constitute a barrier to the entry of new private competitors. Despite few formal barriers to the entry, informal barriers are formidable. Established contractors or operators, mostly SOEs, have long exercised monopoly powers and have a close relationship with the government, giving them special access to capital and favorable relationships with major customers, also SOEs, and protecting them from competition. Most of these enterprises are heavily subsidized and poorly equipped. While the finance of such participants continue to be managed on a noncommercial basis, they can provide services below cost and manage to stay in business even with insufficient revenues. Many are industrial and service conglomerates that utilize both direct and cross-subsidies to support uneconomic transport activities.

Right now they are unable to adapt to the changing requirements of socialist market economy, and do not meet the requirements for building efficiently and with

excellence the modern highway system that China plans to develop. One potential reform would comprise clearly specified action and incentives to restructure and modernize the industry, and to move them to be based on market rather than government "protection" that keeps them from competition, and to provide special encouragement to the more autonomous, commercially oriented enterprises, which compete with other participants for the transport contracts in the transport market.

On the other side, the government should remove social policy-based hurdles and lower the entry barrier for foreign investors. At the time when China is seriously short of capital to update her highway system in order to keep up with the economic development, the investors from the industrial countries are going to bring additional resources to projects and increase efficiency, also help China to cultivate a favorable competition environment. While some issues in the current regulations are to substantially impair the investment enthusiasm of foreigners. Except the limits on forming joint venture with Chinese parties, else is: (a) Limits on the amount of security a foreign-invested enterprise may provide to a foreign party, which can affect the determination of how highly leveraged a project foreign lenders are willing to finance; (b) Regulations restricting the availability of guarantees to foreign parties, including regulations that limit the capacity of the Chinese party to a joint venture from guaranteeing a foreign party's investment return.

Formal and informal barriers to entry to the sector need be minimized. Informal barriers to entry are the most difficult to reduce, and the temptation to introduce multiple regulations at different levels for this purpose must be resisted strongly. A better approach is to eliminate those regulations that are often the basis for an informal barrier. There is always a choice as to whether to leave the management of competition to a central agency responsible for the whole economy or whether to delegate this to lower provincial level sector ministries. The former has the advantages of compatibility of practices throughout the economy and efficiencies in specialization of staff. The latter has the advantage of better knowledge of the sector issues, responsiveness to local needs, and efficiencies of smaller size. The government of the United Kingdom has changed its regulation of competition in financial markets from different regulatory

agencies to a single agency for the whole market, while there is no uniquely correct resolution of this choice.

The remaining state controls on tariff continue to inhibit the emergence of genuine competition. Restrictions on tariff make it difficult for operators to offer new services at rates that would allow better service, attract new traffic and improve the worsening financial position. As such, they should be eliminated. One of the principal advantages of allowing operators to set their own prices is that ensuing price discrimination can result in levels of asset utilization as high as possible. Highway operators in market economies have developed sophisticated techniques for maximizing the revenue yield of their assets based on price discrimination. Increased freedom to apply these techniques could bring about lower logistics costs, since companies that suffer from delays would be prepared to pay more for faster and more reliable services. Although the operators will be given freedom to determine their own prices, the revised institution would set the principles for charging for using highway infrastructure. It would monitor final user prices as part of its competition policy, but would not establish or recommend specific prices or tariffs. It would investigate complaints of monopoly practice from users of highway service and have the power to penalize operators found to have indulged in them, by revoking their operating license.

Generally speaking, in order to keep private sector projects financially viable, there is a need to provide the private sectors with incentives and room to maneuver in order to face their associated commercial and financial risks. Successful arrangements will also protect the Government and taxpayers from ultimately being responsible for the financial condition of the private sector entities. While contractual arrangements alone may be sufficient for encouraging the commencement of private sector participation in infrastructure development, a broader regulatory and legal framework (for both the concessionaires and financiers) is perhaps necessary to sustain private sector involvement in infrastructure operation and management. Thus the central government needs to continue reforming policies and regulations with a view to fostering sound concession environment for foreign investors by creating more competition. Without more competition, the sector will be unable to provide the quality of service that is increasingly demanded by sophisticated users. At the same time,

without an adequate regulatory system, users may be exploited by monopolies and cartels, which have potential to destroy nascent competition. Revised regulations should encourage more equitable competition between private operators and transport SOEs. Taking advantage of the many opportunities to increase competition is the greatest challenges facing the transport sector. If these opportunities could be realized, the result would be lower operating cost and tariffs, improvements in service quality, and a transport system more attuned to the needs of its users.

While market forces can do a better job than institutions in producing transport services, planning is still needed. This function is particularly relevant in a transition economy where coordination of large infrastructure projects by private sector is still in its infancy, where most infrastructure investment is still made by the state, and where the investment needs are so great that the costs of wrong decisions are too high to be tolerated. At the same time, the central institutions, such as MOC, would need to strengthen the capacity for highway planning and economic evaluation, and investment analysis. Thus a necessary precondition for success is a new institutional structure, which recognizes both the need for more competition and the advantages of greater coordination, and has a strong policy.

## **2. INSTITUTION CAPABILITY**

Institutions are rules of the game in a society, or more formally, they are the limitations created by man to shape human action. As such, they structure incentives for human exchange, be it political, social or economic. History has shown that where institutions create positive incentives, people act on them productively and where institutions create disincentives, initiative is effectively deterred.

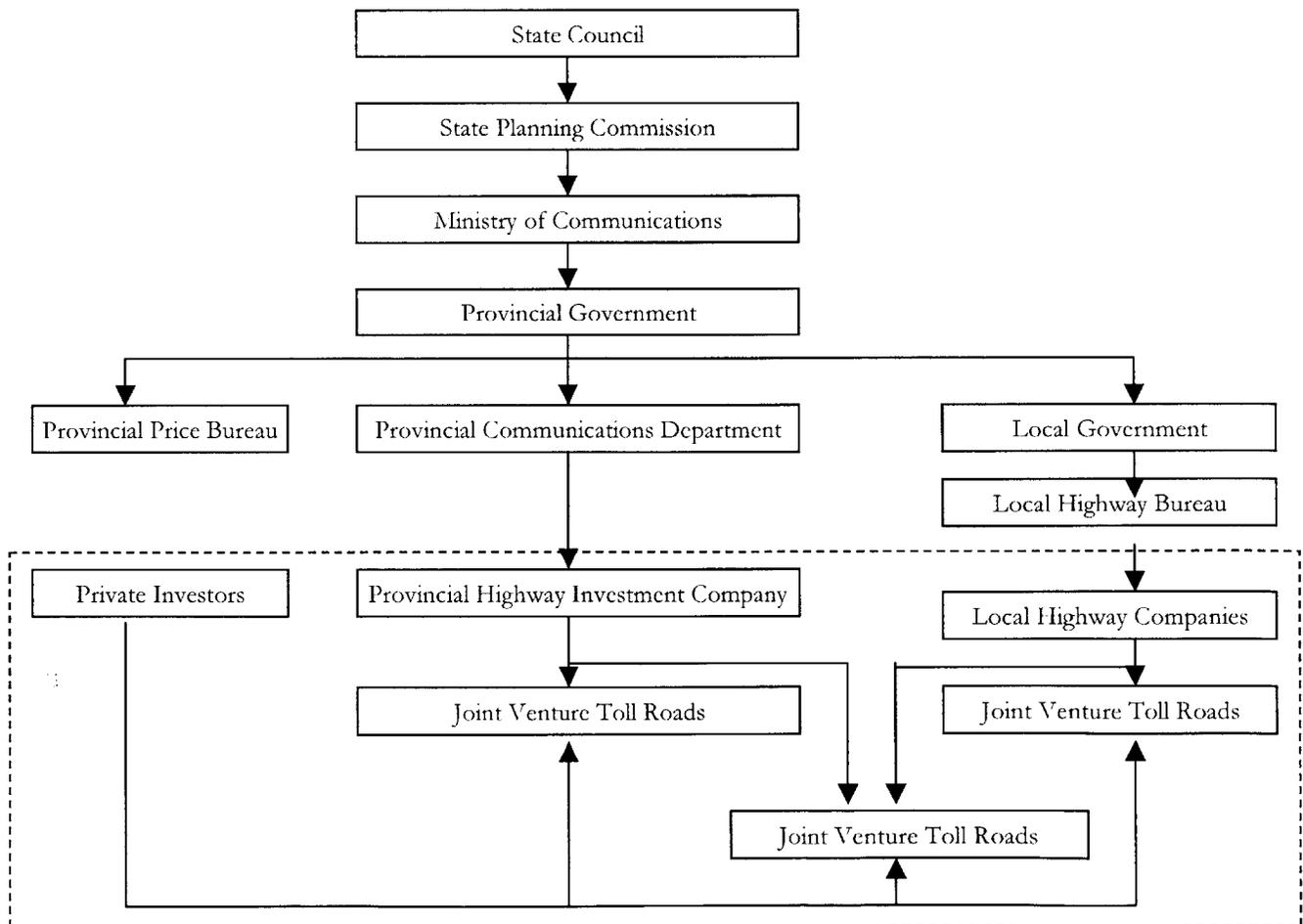
Douglass C. North, "The New Institutional Economics and Development," a paper presented to the Conference on Public Choice and Development, London, September, 1993

Until the early 1990s, China's highway administration was straightforward. The Ministry of Communications (MOC) set the policies and guidelines and the Provincial Communication Departments (PCD) implemented them. Major policy issues dealing

with highway development and land use, intermodal planning and coordination, and highway financing strategies were dealt with at the SPC and the State Council levels. MOC had the overall responsibility for planning and allocating Vehicle Purchase Fee revenues for the national highway system. The SPC departments reviewed national highway plans and project proposals and helped develop financing at both the program and project levels. This structure served the transport sector well in the past, and is still in effect for some inland provinces.

The liberalization of the economy set in motion rapid economic growth and required prompt responses to meet the ensuing traffic demand. After utilizing loans and credits of multilateral and bilateral organizations, foreign private investment sources were tapped for developing the highway network. Fast developing coastal provinces evolved complicated organizational structures for highway administration (Figure 5).

FIGURE 5. INSTITUTIONAL STRUCTURE OF HIGHWAY ADMINISTRATION IN CHINA



The economic reforms in China have changed the role of the central government vis-à-vis provincial and local authorities. The transformation from a command economy to one with a key market role is transferring more decision-making power to the lower levels of government, dictating a reassessment of the scope and focus of central government's functions. In many sectors, such a decreased role of the center has translated into the sharpening of the center's role from micromanagement to policy guidance and macromanagement, as is the case of the Ministry of Communications' (MOC) role in the management of the ports.

China's peculiar conditions, the economywide trends for administrative decentralization, and the urgent need to modernize its highway system pose the special challenge of establishing the most efficient role for the central authorities in regard to developing and managing the highway system. Trends in China's public administration signal that the provinces will retain their primary responsibilities of planning, financing, constructing, and maintaining the highway network, and the MOC will continue overseeing the sector and coordinating the development of the National Trunk Highway System. However, the government must take the leadership in the planning and would need to play a stronger role in several areas where policy adjustments and institutional changes are essential, because the private sector involvement in China's road construction, which provides essential financial resources to meet highway demands, complicates the administration of the sector.

In light of other countries' experiences, both good (Chile) and bad (Mexico), to possess adequate institution capability is one of the key issues for GOC to take on the commitments called on by the scale and nature of the national road programs. The policy focus will shift as transport operations are increasingly transferred to private sectors, and the State takes a more prominent role in monitoring and regulating private operations. Given that stimulating competition and satisfying the increasing demands are not always compatible roles, it is imperative that implementation of the strategy should achieve a balance between them. Devising an institutional structure that will achieve this balance will require skill and imagination.

The first thing is to create a strong planning authority for maintaining regulatory oversight, determining investment priorities, ensuring efficient delivery by coordinating

input from various departments and levels of governments. Secondly, the responsibility to implement the program should be assigned to a single government entity by the policy. Although input and support may be required from several government entities (such as environmental and fiscal agencies), dividing responsibility for program implementation among multiple entities can greatly complicated and delay the process. Because of the continued decentralization trend, the centralization of good setting is to be balanced by effectively decentralization with providing local incentives to perform. The government as a consequence is required to enhance the power of the lower level governments by granting adequate autonomy in establishing financial policies, allocating budgets, and recruiting personnel.

Other issues may include: to create ownership and service delivery entities that could construct, operate, and maintain the infrastructure effectively in the sector, in the absence of a market environment, these bodies would be responsible for ensuring services at fair market prices; to hold formal training periodically to strengthen technical capability of individual government departments; and to offer decent salary schemes to attract top professionals coming to the public sector.

## **§6.2.2 PRACTICAL IMPLEMENTATION MODEL**

In retrospect, the practice of each studied country is telling the importance of a thorough implementation planning. China should realize from those experience that the quick (and superficial) planning progress means that project implementation starts right away, but it ends up taking too long, financing is never fully secured, and the whole endeavor would be eventually unsuccessful. Perhaps a more deliberate planning /preparation process may take longer, but ultimately would lead to a more rapid and successful financing and implementation stage.

### **1. WELL-PREPARED MASTER PLAN**

The demand for a toll and hence the risk associated with a road often depend on the fact that the toll roads have to be build into integrated networks. It is often forgotten that the tolled part of a road network benefits tremendously from the existence of a public road network around it. In fact, the value of a specific road depends a lot on the

extent to which it benefits from a complement of public and private roads. More specifically, the network characteristics of the sector means that benefits from investment at one point in the system can depend on service flows and capacities at other points. This implies that a strategic planning framework incorporating network analysis is important to optimize the benefits and minimize the costs of toll road development, and a number of service obligations, including identification of individual projects, need to be taken account by public sectors, who generally have a better view of the big picture of development.

However, instead of the government supplying the clear description of the “scope of work”, which is to be acquired by the government, in practice, there always exists an alternative, which expects PRODUCERS/private sectors to take the lead in defining the projects themselves. Chapter 3 has already narrated several failures of private sector driven road project due to the lack of strategic connections to major traffics or the parallel roads that substantially distract traffic, such as Malaysia-Singapore Second Crossing (MSSC) project of Malaysia. Additionally, the failure of the government to define and commit to a particular scope for an infrastructure project will cause another fundamental error, which completely diffuses competition. First of all, each private sector initiated project would be unique and non-comparable with each other, there in turn is no such a playing field upon which private sector competitors offer their qualifications, technical and price proposals to win government contracts in the public infrastructure market. Secondly, each project would be sole-source procurement, and no other competitors except the proposer himself/herself.

As a result, a well-prepared master plan is able to not only efficiently avoid competing routes or isolated roads, also help create more genuine competition that is deadly needed by the China's highway development.

At the moment, at the central level of China, the basic strategy is to develop a National Trunk Highway System (NTHS) (as mentioned in Chapter 2). MOC, as the responsible sectoral central agency, is in charge of planning the 35,000 km and connecting 95 major Chinese cities, and carries out three types of plans in conjunction with the provincial authorities:

- the long-term strategic plan, which focuses on strategic development perspectives over a span of 10 to 20 years;
- the five-year plan (FYP), which identifies highway investment projects proposed for implementation during the plan period; and
- the annual plan, which specifies a yearly construction program for the projects approved under the FYP.

At the provincial/regional level, the strategy is to concentrate on network maintenance and the expansion and improvement of provincial and rural road networks currently totaling more than 1 million km, to provide greater mobility and to stimulate socioeconomic development, particularly in less developed areas.

The good thing is that the Government of China, learning from other countries' experiences, has realized the role of a strategic planning in the road development and started with a master plan in good shape. While GOC must keep updating and modifying this plan in order to better guide its toll road development. Components of such planning should include:

- refining the strategic road network and the most appropriate alignments of the key links;
- firming up the appropriate timing of construction of individual links based on corridor studies; and
- establishing clear economic and financial viability.

The regulator of GOC needs to be informed of the fact that toll road projects, whether wholly private or mixed in character, should be coordinated with broader transport and road planning. In addition, the entire process should be designed to be competitive, transparent and based on reasonable evaluation criteria.

## **2. TRANSPARENT CONCESSIONING PROCESS**

By developing its toll road program on a project-by-project basis, China had lacked a structured process founded in government policy decisions. This has resulted in a lack of standard documents and fixed procedures, and private negotiation of contracts rather than the use of transparent competitive procedure.

Generally speaking, potential competitors in the acquisition system would like to see and understand the acquisition process prior to making a commitment to participate, and expect government to impartially implement this process to its conclusion. In another word, if they elect to spend their time and resources, and to offer their expertise and their proprietary technology in response to a government solicitation, they hope to be treated in ways that are expected, are predictable, and are reliable. The underlying theory, of course, is that potential competitors will not participate in a time consuming, costly procurement contract award process where the rules, the requirements, and the evaluation factors are not disclosed in advance.

At this moment, lots of investors in industrial countries, mainly in North America and Europe, are interested in investment opportunities in developing countries, especially in Asia. Thus China is competing the available capitals from the western world with other Asian developing countries. The Government of China (GOC) urgently needs to establish a transparent process signaling fair treatment to potential investors. Otherwise, these investors would be scared away by the Chinese ambiguous laws and uncertainty policies and turn to other Asian markets.

A concessioning process covers the issues of *bidding criteria, financial regulation, design, and negotiations*. Transparent process means all these issues must be explicitly addressed before the solicitations. At the same time the government should realize these issues involve tradeoffs between transparency and competitiveness on the one hand and flexibility and private sector innovation on the other.

### **1) Bid Selection Criteria**

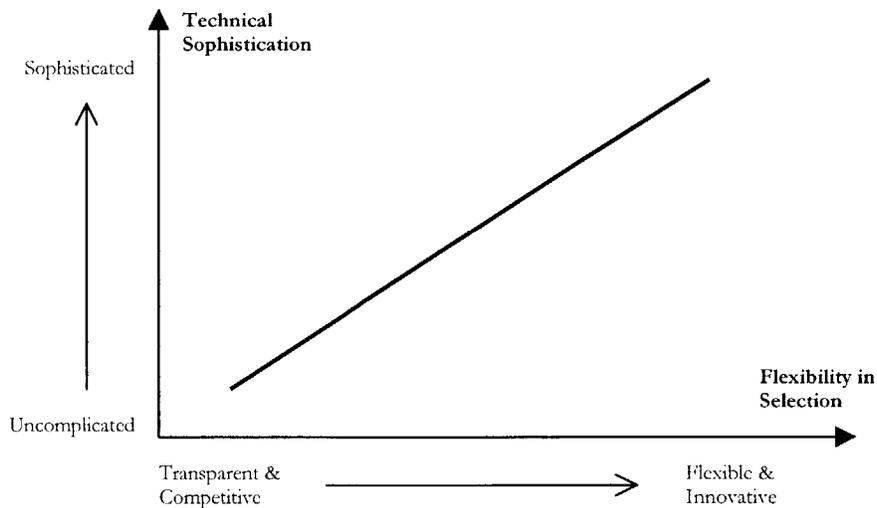
There are two broad approaches to establishing bid selection criteria. The first is based on a qualitative scoring of technical and financial proposals; the second is based on objective and quantifiable factors such as the maximum toll rate or the minimum government contribution to the project. The qualitative scoring approach allows the selection committee to consider a range of important factors in choosing a concessionaire. It also affords the concessionaire the flexibility to propose innovative solutions. This approach, however, generally requires comparing nonuniform proposals

on a somewhat subjective basis, and thus reduces the transparency and competitiveness of the process.

The objective approach allows for a transparent and competitive process focused on the factors of most importance to the government. This approach, however, requires that all other factors – such as road design and risk-sharing terms – be held constant. Doing so may limit the private sector's flexibility to propose what it considers to be an optimal project. In addition, when this approach uses numerous factors that are evaluated through a formula – such as in the South Access to Condepción project, which used seven factors – the competitive focus on the one or two most important factors may be diluted.

The tradeoff between these variables and the implications for the preferred approach are summarized in Figure 6.

FIGURE 6. ALTERNATIVE SELECTION APPROACH



In general GOC should avoid complex weighted multiple criteria, which is a source of opaque and often subjective if not corrupt decision-making that usually exceeds the benefits of innovation flexibility it brings. At this moment it is true for China that simpler is better, while the government need to be cautious to choose selection criterion if deciding to focus on a single criterion. Obviously the shortest concession

period (as in the initial Mexican toll road program) presents significant incentive problems, and more favorable criteria would be those related long-term efficiency.

## 2) Financial Regulation

Financial regulation can employ a variety of mechanisms, including a maximum toll rate indexed to inflation, a return on investment ceiling, traffic or revenue ceiling, and public-private profit sharing. As long as well structured in terms of the country's conditions, these mechanisms can be useful in providing comfort to investors concerned about downside risk while protecting the public interest by limiting private sector returns.

TABLE 4 COMPARISON OF DIFFERENT FINANCIAL MECHANISM

Financial Regulation	Advantages	Disadvantages
Indexed Maximum Toll Rates	Ease of administration and explicit limitation on toll rates	Increases the revenue risk of toll road projects. If traffic is lower than expected, rates cannot be adjusted upward to their optimal profit-maximizing level; if traffic is higher than expected, the government cannot limit the concessionaire's returns by lowering toll rates. In addition, toll rate regulation limits the flexibility of the concessionaire to manage traffic through market-based tolls.
Return on Investment Regulation without Toll Rate Ceiling	Highly flexible in allowing toll rate adjustments to optimize revenues and profits, and more precise than toll rate regulation in limiting the returns of investors.	Cumbersome administration -- carefully monitoring is needed to make sure the concessionaire does not exceed the return on investment; unable to provide an incentive for the concessionaire to invest and operate efficiently once it has reached the return on investment ceiling.
Public-Private Profit Sharing	Allow for a flexible toll rate policy.	Not effective in regulating the private return on investment.

## 3) Design Specifications

Design specifications can range from virtually no public sector responsibility for design to public sector responsibility for preliminary design to public sector specification of detailed design plans. A lower level of public sector responsibility for design allows the private sector to propose innovative solutions and better match the

design specifications to market demand. But allowing private sector design flexibility results in incomparable proposals, since different bidders may take different approaches to project design.

#### **4) Negotiations**

Approaches to contract execution range from full negotiations (with either one party or multiple parties simultaneously) to immediate execution of a predefined contract with no negotiations. Because toll road concession negotiations can be complex and time consuming, a predefined contract can be appealing. In addition, a predefined contract makes the selection process more transparent and competitive since all proposals are subject to the same contract terms. Developing a predefined contract that is acceptable to all bidders may be difficult, however. This approach also limits the flexibility for structuring innovative arrangements for sharing project risks and responsibilities that are responsive to the needs of specific bidders and investors.

If negotiations are preferred, competitive sessions with multiple parties can enhance the power of the public sector in negotiating contract terms. However, competitive negotiations require extensive resources and stamina on the part of the public sector. Competitive negotiations may also reduce the interest and focus of the private partners in participating in the concession program.

### **3. CONTRACTUAL ARRANGEMENT**

The transaction costs in toll road projects are fairly high. It is not uncommon that sponsors end up close to bankruptcy due to the inability of paying back the loans, and governments are forced to provide significant compensation to help refinance the loans. One way of reducing transaction costs is to come up with a clear and straight contractual arrangement between governments and private sectors. The general principle is the same: credible, rule-driven decisions are always easier for the regulator to implement.

#### **1) Project Selection and Design**

In order to have a well-structured agreement, it is required for GOC to understand the function of the proposed road at first. The private sectors may have quite

different roles in the projects with different economic characteristics. The main characteristics of toll roads are typically classified as follows:

- **Congestion relievers** are relatively short roads that are built to relieve traffic on existing urban routes, generally have significant revenue potential because they tend to serve heavy traffic demand. Thus pricing decision and regulatory oversight become very important.
- **Inter-city arterial roads** are built to improve access between major cities, to airports or to port/terminal complexes. These roads tend to be expensive since they are generally long, high capacity, and built to serve heavy truck traffic.
- **Development roads** link more remote areas with urban centers or with major transport routes. While development roads can provide a stimulus to economic growth, traffic volumes generally are not financially sufficient in the early years, and thus are seen as speculative investments that require substantial public participation.

Additionally, deduced from the experience of other countries, there are three key project selection and design issues that are particularly important to the China's current development stage and should be addressed by GOC early in the concession process: whether a parallel free road should be required; the feasibility of cross-subsidies; and whether concessions should be for a single road in network or for a "package" of roads.

#### A. Parallel Free Roads

The original intention of requiring a free parallel road is to create competition and the idea is good one in principle, while the evidence so far suggests that traffic levels in most developing countries are unable to keep the projects financially healthy. The best argument in favor of free parallel roads is one of social equity, to ensure that the poor can still have access to the road network, but this often detracts from the new toll road's effectiveness in alleviating congestion and may also cause problems for cost recovery of toll cannot produce enough revenue. Based on the condition of the country, the existence of a free parallel road in China should be avoided. First of all, the automobiles running on toll roads in China are mainly company owned cars and private cars of high-income families. There is still a long way to go to have the China's low-income families own their own cars. Consequently the equity problem can be less significant for

the government concerns at this point. Secondly the people would appreciate timesavings in travel less than expected. For a long time the China's economic activities were running at very low efficiency level, and the thing that people didn't lack was time. To the extreme, a workday of some people, especially those who worked at state owned enterprises or government departments, could be described as "a piece of newspaper, a cup of tea and a whole day". While things have been changing with reforms going, the process is gradual and there still exists a substantial portion of population that would like to spend more time if free services are available.

#### B. Using Existing Concession Revenues to Fund New Projects

The cross-subsidies usually refer to that existing roads have been tolled in order to provide revenue for the construction of new segments in the network. The Japanese have been very committed to this concept, and similar stories can be told about several Asian toll roads programs. While those examples illustrate that tolling can assist in releasing funds for new construction, this concept may cause the government the regional equity problem, especially so in China where the economic development is very geographically uneven. The cross-subsidies mean that those who are paying tolls on the existing road are thereby paying for the construction of a new road, which would otherwise have been funded by taxpayers and will provide benefits for other future users. This may be part of GOC program of regional development that needs to be explicitly recognized.

#### C. Should Concessions Be "Packages" or Individual Projects?

The worldwide experience suggests that traffic volumes must be in the range of 10,000-15,000 vehicles per day in order for toll revenues to be sufficient to cover construction, operating and financing costs. In China's NTHS, only a few such corridors exist. So it may possible for GOC to bundle a package of roads into a single concession, rather than concessioning each road as a separate project. An entire network can be concessioned at one time or begin with a core segment and phase in additional segments over time. The pooling reduces the volatility of overall concession cash flows and may thus increase financial viability. Toll road networks are easier to finance than standard-alone projects because they rely on a diversified revenue stream from several projects

rather than just one. This advantage is particularly strong if the concessions are phased in over time and the financing for later facilities can be secured, in part, by the revenues of the earlier segments. A potential disadvantage of concessioning networks is that, because of their size, they may be more difficult for one concessionaire to develop and finance than for several concessionaires to undertake, particularly if the network is to be constructed within a short period. In addition, concessioning a network to a single concessionaire, whether all at once or over time, may limit competition for traffic.

## **2) Risk Allocation Option**

Risk allocation is a complex and difficult process, and for all practical purposes, it is a negotiated process. Contractual arrangement should be based on the central idea – risks should be shared by both sides. In Guangzhou-Shenzhen Superhighway project, design changes and problems with right-of-way acquisition caused projects costs to run 60 percent higher than was originally anticipated. The concessionaire bore the primary risk for cost overruns, resulting in an additional \$700 million equity investment by the sponsors.<sup>40</sup> Additionally the project allocated full traffic and revenue responsibility and full risk of currency to the private sector. Currently given the size of the China's national highway program, many risks will be very difficult for private sectors to assume alone, and the assistance from GOC will be very desired.

### A. Pre-construction Risks

Land acquisition and resettlement of affected people has led to implementation difficulties, including delays, in Chinese highway projects. A large number of people are typically affected by resettlement in China, particularly along important economic corridors where highways are being upgraded and constructed. The bottom line here is that risks related to land acquisition are best borne by the Government, not the developer, and all resettlement and environmental issues should be resolved before the concession agreement is signed. The institutional requirements for resettlement of these numbers of people are significant. Under the NH3 project in China, resettlement has received considerable attention to ensure institutional capability to provide adequate compensation and to implement Resettlement Action Plans.

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<sup>40</sup> In return for the additional investment, the sponsor negotiated an increase in the profit sharing agreement for the first ten years of operation, with similar increase for subsequent years.

### B. Construction Risks

Typically the private sector bears primary responsibility for construction risks, however, GOC may assume responsibility for risks under its control, such as completing complementary facilities (connecting roads or interchanges) or allowing cost increases associated major design changes. GOC also can cost share in projects that face major construction uncertainties (e.g., toll roads through mountains, such as one of the two horizontal priority highway in NTHS, Hurong Highway, which goes to Sichuan province where is well known as "City of Mountains".)

### C. Traffic and Revenue Risks

Since road investments are "irrecoverable" or "sunk" in the sense that, once built, they cannot be converted to other uses or moved elsewhere, the traffic forecasting where the private sectors' confidence of recovering their investments comes from becomes one of the key issues. While forecasting demand, which involves a great deal of uncertainty, is a challenging task and not an exact science. Compared with the factors as land development, population growth along the route, and various economic indicators which have inherent uncertainties, the willingness to pay might be more unpredictable. In Mexico, road users shield away from the toll highways despite obvious time and cost advantages of the new roads. While, definitely the analysis of the willingness to pay for a toll road has to be combined with forecasting, in order to fairly assess the traffic and revenue risks, the government can help private sector to improve the predictability by extensive promotional campaigns to enhance the public acceptance to tolling.

### D. Financial Risks

Because toll road are long-lived investment with high start-up costs, countries with local capital markets that are capable of providing long-term financing have many advantages in supporting toll road concessions. In theory, financial risk is best borne by the private sector, but if GOC could dedicate itself to cultivating a function domestic capital market, the financial risk borne by the concessionaires would be fundamentally mitigated and the competitiveness of China in the world market in turn would be substantially enhanced.

### E. Other Risks

There are also other major risks, such as regulatory risks, political risks, dispute risk, and so on. In order to avoid unnecessary regulatory risks, GOC should try to make sure that the rules cover the possibility of adapting the contract terms during the tenure of the concessionaire, such as allowing renegotiation, giving room for traffic growth, toll rate adjustment, and as a result making more room and flexibility to adapt to the changing conditions available for itself.

GOC needs to recognize that the credibility of GOC to uphold contractual obligations and their willingness and ability to provide compensation for political risks are key issues to private investors in toll roads. This is especially true for foreign capital, which is perceived as particularly vulnerable to political risks. GOC may require support from multilateral or bilateral financial institution to reduce this risk exposure. In addition, the further political reforms would be another contribution since pretty much political risk in China results from the government official corruptions.

After all, risk factors can be pulled together in the concept of cost of capital, which represents the required rate of return that all investors might expect on a project, and gives the regulator a single quantitative indicator to assess the project risk level as a whole. Algebraically it can be simplified and written in Box 3.

#### BOX 3. QUANTITATIVE INDICATOR OF PROJECT RISKS

$$\begin{aligned} \text{Cost of Capital} &= [\text{Required Rate of Return on Debt}] \times [\text{Percentage of Debt in the Project}] \\ &\quad + [\text{Required Rate of Return on Equity}] \times [\text{Percentage of Equity in the Project}] \\ \\ \text{Required Rate of Return on Debt} &= \text{Risk-free borrowing rate} \\ &\quad + \text{Premium for country/financial risks} \\ &\quad + \text{Premium for currency risk} \\ &\quad + \text{Premium for construction risk} \\ &\quad + \text{Premium for regulatory risk} \\ \\ \text{Required Rate of Return on Equity} &= \text{Risk-free borrowing rate} \\ &\quad + \text{Equity risk premium (adjusted by project beta)} \\ &\quad + \text{Premium for country/financial risks} \\ &\quad + \text{Premium for currency risk} \\ &\quad + \text{Premium for construction risk} \\ &\quad + \text{Premium for regulatory risk} \end{aligned}$$

After all of these major project design and risk allocation rules have been addressed, another issue is also worth for GOC to pay much attention – the need for more rigorous review of concession contract from a legal perspective at the drafting stage, in order to avoid vague contract language inclined to cause confusions between concessionaires and the government, as well as cumbersome law suits.

### **§6.2.3 SUPPORTIVE FINANCIAL MECHANISM**

The China project is ordinarily considered to have a high share of public sector risk assumption because of the government's extensive involvement in supporting financing for the project.

The Guangzhou-Shenzhen project includes a government cash flow deficiency guarantee for the \$800 million in senior project debt. The cash flow deficiency guarantee covers any difference between project cash flows available to pay debt service and required debt service payments. With extensive guarantees at the provincial level to close the debt financing for this highway, it is clear that China does not want a repetition of this project type. China recognizes that heavy government guarantees are not the answer to a BOT highway program.

In Chapter 5 it has been addressed that guarantees, grants, subordinated loans, shadow tolls, and traffic and revenue guarantees, as long as exploited properly, all of these government financial assistances balance government financial exposure with their impact on a project's ability to raise financing. Furthermore, in light of the six Asian East Asian experience, the financial assistance generating from governments does not necessarily interfere with investment and operations. An important issue for China's policymakers to consider is under what circumstance these methods of government support are appropriate and how much they should be. There are two reasons for government to provide support to toll road projects: to reduce capital requirements or improve revenues to the extent necessary for a project to be capable of covering debt service and to earn a reasonable return on equity based on the expected cash flows of the project; and to protect investors (principally lenders) from the risk that actual cash flows will fall below expected cash flows and be inadequate to cover debt service.

Subordinated loans are the preferred means of addressing the first reason for government support. Subordinated loans improve feasibility by increasing the debt service coverage on senior debt and reducing the need for private equity, which requires a higher return than debt instruments. Another benefit of subordinated debt is that it provide for repayment of the contribution to the government with a return. However, because subordinated debt requires repayment of interest and principal, it has less of an impact on project feasibility than grants. Grants may be the most direct and efficient means of supporting projects that require a substantial boost to become feasible. Both subordinated loans and grants can mitigate revenue risk by improving coverage ratios. However, these instruments may not provide adequate protection when traffic is low, and they involve government support even when traffic is high and government support is unnecessary.

Minimum traffic and revenue guarantees are poor mechanisms for supporting infeasible projects because they do not address the core issue – that expected cash flows are too low to cover debt service. If a minimum guarantee is set below expected cash flows, the project remains infeasible, while setting the minimum guarantee above expected cash flows would expose the government to considerable financial risk. However, they are the best means of addressing revenue risk for feasible projects because they provide a defined floor on revenues that is generally set at a level sufficient to cover senior debt service payments. In addition, minimum guarantees have the benefit of requiring a government contribution only if traffic or revenues fall below a specified level.

In general, the most advantageous types of support for the concessionaires are those which provide early funding streams (when revenues from the toll road are low or non-existent during the construction period and which give guarantees for unexpected problems. The least significant are those that themselves are unpredictable, i.e., additional right for development around the road.

The Government of China could consider to use these various mechanisms of government support in combination when a project is not feasible on its own and where revenue risk is substantial. In such cases, grant plus minimum revenue guarantees may be sufficient to induce private participation. At the same time, GOC should avoid broad

guarantees that reduce lender's scrutiny and due diligence. In Guangzhou-Shenzhen Superhighway project, the substantial guarantees from GOC induced the lenders to provide funds based on guarantees rather than underlying project risks and revenues. Generally speaking, concession extensions and equity, debt, and exchange rate guarantees should be avoided. Concession extensions have a limited value in supporting financing, while financial guarantees require the government to assume a high level of financial risk.

Finally GOC should realize that the value of government support to investors also depends, in part, on the credibility and credit risk of the government itself. Investors may be particularly inclined to discount the value of support mechanisms that are extended over long period. On the other hand, it is sometimes tempting for the government to increase support far above expected levels when the sponsors are well connected politically (not uncommon case), or threaten to withdraw at the last minute. To prevent all of these requires GOC to be well prepared with the specification and design of its part of that preparation. The outcome is that determining if a project requires government support and how such support should be structured, and it requires a detailed analysis of project costs, revenues and risk, as well as an understanding of what debt and equity investors require. Before bidding a concession, GOC should be aware of the project's critical elements, including environmental issues, traffic and revenue potential, preliminary design and costs, permit requirements, and the views of potential investors. The cost of ignoring the importance of this information could be very expensive.

Direct financial support from government is able to play a major role, while China should establish mechanism to bring commercial discipline in financing toll road projects. Learning from the six East Asian economies, the better strategies for China are to generate revenues mainly in local currency and to mobilize domestic sources of funding to avoid relying on external debt or on government subsidies. The huge Chinese household savings might be the most prominent one waiting to be tapped. Savings, as much as growth, is China's real economic miracle. According to official statistics, China's savings rate averaged 37 percent of GDP between 1978 and 1995. This rate is among the highest in the world. As a result, the Chinese government should be

dedicated to a more market-oriented banking system, which, once established, will help intermediate China's high savings into more productive investment. Capital market development also needs to gain momentum. Establishment of bond market, pension funds will provide the alternative financing sources to transportation development.

#### **§6.2.4 HELPFUL MULTILATERAL FINANCIAL INSTITUTION**

Since demand for new highway in China is well beyond any similar requirement existing in the world today and certainly outstrips available public funding by a wide margin, the multilateral organization, such as the World Bank, involvement in the construction of the new highways is a positive addition to the resources of China. Although these resources are hardly sufficient to close the funding gap, these multilateral organizations are able to play important formative role in the establishment of a BOT concession framework, conducive to the attraction of private financing for China's highway program.

China has successfully expanded its foreign borrowings in the road sector during the last two decades, mainly from the World Bank, the Asian Development Bank (ADB), and the Overseas Economic Cooperation Fund (OECF) of Japan. The World Bank support for highway infrastructure in China commenced in December 1985, and since then nearly a score of highway projects have been developed with Bank support, with the focus on the NTHS. Some of these roads help to provide vital missing links in the national highway network; others help to ease severe congestion in parts of the network or provide access to remote areas. The projects are also designed to provide foreign technical assistance and training of Chinese personnel in areas such as supervision and quality control of road construction, design, and planning. Also the Bank has leveraged private financing for highway construction from institutional investor in North America and Europe. The highway projects constitute the Bank's first major involvement in civil works in China, and they have successfully introduced competitive bidding for the procurement of works. The Bank is now actively assisting China in the development of a policy framework conducive to attracting private capital for new toll roads. A new BOT framework is to be put forward as a provisional decree on infrastructure projects with private investment, pending approval from the State Council.

## CHAPTER 7. CONCLUSION

Road transport has long been the dominant form of transport for freight and passenger movement throughout the world. Because most road projects require investments with long amortization periods and because many projects do not generate enough demand to become self-financing through some type of user fee or toll, the road sector remains in the hands of the public sector to a much greater extent than other transport activities.

But governments throughout the world, including those of many poor African and South Asian countries, are commercializing their operations to cut costs, improve user orientation, and increase sector-specific revenue. There seems to be demand for toll roads in specific settings, but the problems met by many of this “first generation” of road concessions – from Mexico to Thailand – have given toll projects a bad reputation.

The toll road industry in China is still in the early stage of development. Many mistakes were made, and tolling obviously might not be the best solution for every road. A number of factors inhibit toll road development, including public resistance to tolling, the time and cost of implementing concessions relative to traditional public procurement, and the ability to attract capital to projects in China, generally considered as a risky country. While there are compelling reasons that trend toward toll road, even private tolling, is likely to continue – most important, the severe public funding shortfalls for road maintenance, rehabilitation and construction. On balance, toll road development of China is likely to experience a modest increase over in the future.

Continued growth in toll road financings will be supported by a number of factors:

*Funding Needs.* The Government of China (GOC) will continue to experience severe funding shortfalls for road maintenance, rehabilitation, and construction. As noted in Chapter 2 of this paper, the GOC has seriously underinvested in road infrastructure. Although highway needs are expanding, public funding sources are constrained by limited resources and spending priorities in other even needed areas.

Private and public tolling will be an increasingly attractive option for closing a portion of the road funding gap.

*Success of Toll Roads in Raising Capital.* Since 1994, the road sector has attracted private capital exceeding US\$1 billion per year, now totaling US\$6 billion, and expected to increase in the coming years. Compared to other developing countries in Asia, Latin America, and Europe, China remains ahead in attracting private capital to highway projects.

*Privatization Trends.* A global trend toward commercializing and privatizing state-owned enterprises and reducing government's role in the economy has increased support for private toll roads. China is following it. Concessions attract private capital and technical expertise and use market incentives to promote more efficient road usage.

*Supportive Legal and Policy Frameworks.* As the GOC gain more experience with toll roads and other types of infrastructure concessions, the legal and policy frameworks for implementing toll road concessions should become more sophisticated and supportive.

*Increasing Sophistication of Public and Private Partners.* All players know much more about the challenges involved in getting highways and urban access roads: the sponsors are more prepared to face risks that they understand better; the construction companies are probably even more anxious to get involved; and the users have also learned about how to fight for their rights more effectively. Regulators also know much more on designing and implementing workable concession structures, but their knowledge is more an appreciation of how little they have known about the business of the monitoring toll road packages prepared by privatization teams.

The challenges to China who is working to expand the toll road industry will be to overcome those inhibiting factors, through such measures as:

Improving the legal and policy framework for toll roads by reducing barriers to toll road concessions and encouraging the government to concession roads with strong economics. The policymakers of the GOC should recognize that they would often be firefighters and that the only way to be effective in that role is to create a favorable environment and better prepare for the job while they can.

Developing standard and transparent concession models that simulate adequate competition, which is the best method of a market-oriented economy maximizing net social benefits; diversifying financing arrangement, since there is no such thing as “one-fit-all” modal and no single answer to all of China’s massive infrastructure needs, which are expected to run into the trillions of dollars over the next two decades.

Developing broader public acceptance of tolling as a standard method of road finance, similar to user fees for water, electricity, and other public services.

Utilizing assistance from multilateral institutions, which will most likely have to play a critical role in this early stage of private toll road development if it is to grow into a larger, self-sustaining industry.

Developing effective frameworks for private participation in China’s toll road can hardly be done overnight and would be largely built on the success of individual projects. But the sharing of information with other countries at all stages of development will speed this process. It may also enable China, late starter, to skip the learning-by-doing phase, jumping directly to deeper reforms and the gains they bring in efficiency, investment growth, finance, and public confidence. Hopefully with a little help from this paper, with comparative case studies, some fresh and critical thinking needed in “re-engineering government” in toll road development can be provoked and inspired for the China’s government.

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