

# EXECUTIVE REPORT

## A. STUDY BACKGROUND

1. 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 systems.<sup>1</sup> Intending to complete the construction of trunk road networks rapidly, many developing Asian countries have already introduced toll road systems. Arguably, however, many of these countries do not yet have clear or comprehensive visions and strategies for the future development and management of their toll road networks. It would therefore be valuable for the policymakers of these countries 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 their needs.

2. Recognizing this, the World Bank, in collaboration with Ministry of Construction of Japan (MOCJ), has launched an Asian Toll Road Development Program, of which a Review of Recent Toll Road Experience in Selected Countries is intended to be the first critical component. It is anticipated that this Study will provide opportunities for individuals and organizations involved in toll road development to discuss the future progress of their systems and obtain clear guidance from the experience of other countries. For this purpose, the Study reviewed worldwide experience with toll roads, focusing on 18 economies.<sup>2</sup>

3. A wealth of information on the experience with toll roads was compiled for each of the selected economies. Information collection was most intense in the six Asian countries visited.<sup>3</sup> During these visits, the Consultant team met with more than 100 individuals representing approximately 70 institutions including toll road related agencies, financial institutions, toll road operators, construction firms, law firms, credit rating organizations, and a variety of public sector agencies. Throughout the study, particular attention was paid to ascertaining toll road issues and lessons learned that may ultimately be installed on the Bank's "Knowledge Management System."<sup>4</sup> This Executive Report presents the major study findings that served as

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<sup>1</sup> In this report, the terms "toll road" and "toll highway" typically refer to highways for which tolls are charged, though in some cases other tolled facilities such as toll bridges, toll tunnels, and tolled roundabouts (the last-named in Malaysia only) are also investigated. While in general highways for which tolls are charged tend to be high-standard, high-speed, multi-lane, controlled-access roads (alternately referred to as expressways, motorways, or even freeways), in some instances the toll roads investigated in this report may be of significantly lesser design standards, and not entirely access controlled either.

<sup>2</sup> The 18 economies include: five East Asian countries with developing toll road systems (China, Indonesia, Malaysia, the Philippines, and Thailand); five countries with developed toll road systems (France, Italy, Japan, Spain, and the United States); and seven other countries and a region (Argentina, Brazil, Chile, Colombia, the Hong Kong Special Administrative Region [SAR], Hungary, Mexico, and the United Kingdom).

<sup>3</sup> The team visited Hong Kong SAR (China), Indonesia, Malaysia, the Philippines, Singapore, and Thailand.

<sup>4</sup> The World Bank's "Knowledge Management System" (KMS) is a computerized database that provides an efficient mechanism for storing and accessing information. The KMS is designed to facilitate access to a range of

a resource and provided discussion materials for the “Seminar on Asian Toll Road Development in an Era of Financial Crisis,” held in Tokyo, Japan from March 9 to 11, 1999.

## B. TOLL ROAD DEVELOPMENT TRENDS IN SELECTED COUNTRIES

4. Table 1 presents four indicators of toll road development in 18 selected economies, including the length of toll roads in service, gross domestic product per capita, auto ownership, and the extent of private sector involvement. While some countries have historically avoided charging tolls for public roads, in the present environment of fiscal restraint nearly all have turned to tolls as a preferred means for financing highway infrastructure investment. Except for a few countries such as Japan, the private sector is now playing a major role in toll road development. The following paragraphs give a brief overview of toll road development in the countries studied.

**Table 1: Indicators of Toll Road Development in 18 Selected Economies**

Economies	Total Length of Toll Roads in Operation (km) <sup>a</sup>	GDP per Capita <sup>b</sup> (US\$) 1997	Autos per 1,000 pop. <sup>c</sup> 1997	Extent of Private Sector Involvement <sup>d</sup>
Argentina	197 <sup>e</sup>	9,700	151	Moderate
Brazil	856 <sup>f</sup>	6,300	67	High
Chile	2.5 <sup>g</sup>	11,600	109	Moderate
China	4,735 <sup>h</sup>	3,460	8	High
Colombia	1,330 <sup>i</sup>	6,200	38	High
France	6,716 <sup>j</sup>	22,700	521	Moderate
Hong Kong	67.8 <sup>k</sup>	26,800	74	High
Hungary	254 <sup>l</sup>	7,400	272	Moderate
Indonesia	472 <sup>m</sup>	4,600	21	High
Italy	6,440 <sup>n</sup>	21,500	679	High
Japan	9,219 <sup>o</sup>	24,500	551	Low
Malaysia	1,127 <sup>p</sup>	11,100	152	High
Mexico	6,061 <sup>q</sup>	7,700	133	High
Philippines	168 <sup>r</sup>	3,200	12	High
Spain	2,255 <sup>s</sup>	16,400	457	High
Thailand	91 <sup>t</sup>	8,800	105	Moderate
United Kingdom	8 <sup>u</sup>	21,200	406	High
United States	7,363 <sup>v</sup>	30,200	760	Low

Sources:

<sup>a</sup> Figures in this column include toll bridge and tunnel roadways, although their contributions to the totals are generally minor.

<sup>b</sup> United States Central Intelligence Agency (CIA), *The World Factbook 1998*, <http://www.odci.gov/cia/publications/factbook/>

<sup>c</sup> Automobile Data: International Road Federation, *World Road Statistics 1998*, (Autos include passenger cars, buses, and trucks.) Population Data: CIA, *The World Factbook 1998*, <http://www.odci.gov/cia/publications/factbook/>

<sup>d</sup> This indicator is based on a qualitative assessment by the authors, taking into account the proportion of toll roads in each country or region that either are at present or are planned in the near future to be developed, financed, and/or operated by the private sector.

<sup>e</sup> (1996) International Bridge Tunnel and Turnpike Association (IBTTA), *1996 Toll Industry Statistics*

<sup>f</sup> (1998) Ministério dos Transportes, *Programa de Concessão de Rodovias Federais (Resumo)*, 1 June 1998

<sup>g</sup> (1998) *Public Works Financing*, November 1996, August 1997, and April 1998

<sup>h</sup> (1998) News Net Asia, 7 January 1998, <http://mna.asia.ne.jp/member/index.html>

<sup>i</sup> (1998) World Bank, *Project Appraisal Document ... for a Toll Road Concession Project [in Colombia]*, 11 June 1998, p. 3.

<sup>j</sup> (1998) The Association of French Motorway Companies, 1998, <http://www.autoroutes.fr/english/reseau.html>

<sup>k</sup> (1997) *Public Works Financing*, “1998 International Major Projects Survey”; and Highway Department of Hong Kong, *Privatization of*

standard categories of information such as examples of good practice, sample terms of reference, key readings, and who's who databases.

*Major Road Tunnels in Hong Kong Through BOT Arrangement, 1997*

<sup>1</sup> (1998) ELMKA, *ASECAP National Report, 1998 Motorway Network in Hungary*

<sup>m</sup> (1998) Express Highway Research Foundation of Japan (EHRF), *World Expressways (Sekai no Kosoku Doro)*, 1999

<sup>n</sup> (1997) Autostrade S.p.A., 1998, [http://www.autostrade.it/pagine\\_1/english/e-mappa.html](http://www.autostrade.it/pagine_1/english/e-mappa.html)

<sup>o</sup> (1998) Expressway Technology Center (EXTEC), *Case Study on Japan, 1999*

<sup>p</sup> (1998) Malaysian Highway Authority, 1998

<sup>q</sup> (1997) EHRF, *World Expressways (Sekai no Kosoku Doro)*, 1999

<sup>r</sup> (1998) Department of Public Works and Highways, 1998

<sup>s</sup> (1997) ASETA, *Red de Autopistas de Peaje Edicion 1998*

<sup>t</sup> (1998) Department of Highways, 1998

<sup>u</sup> (1997) World Bank Private Sector Department, 1997, *Toll Road Program in the United Kingdom A Policy and Financial Review*

<sup>v</sup> (1996) IBTTA, *1996 Toll Industry Statistics*

5. **Selected Countries in East Asia with Developing Toll Road Systems.** Over the last two decades the demand for high-standard highways in China, Indonesia, Malaysia, Philippines, and Thailand has increased substantially—a reflection of rapid economic growth and increasing levels of vehicle ownership and use.<sup>1</sup> Because of the limited resources available to the public sector for financing infrastructure development, many countries have turned to tolling as a promising method for funding highway development. Each of the five countries has adopted private sector concessions as their dominant mode for designing, building, financing, and operating toll roads.

6. *Malaysia* was the first country in the region to introduce toll roads (in 1966), while *China* now has about 4,735 km—the greatest total length in service. Although public sector highway authorities were the main actors in the early stages of toll road development, in the last ten years the private sector has become increasingly involved in each of these countries. At present, the majority of ongoing and planned toll roads in all of the countries involve the private sector.

7. The Asian financial crisis that began in mid-1997 has had a variety of consequences for toll road programs in these countries. The degree of impact on the toll road development programs has so far been the highest in *Indonesia*, relatively high in *Thailand* and *Malaysia*, and relatively low in the *Philippines* and *China*. Traffic volumes are down in *Indonesia*, *Thailand*, and *Malaysia*, but have not changed significantly in *China* and the *Philippines*. Most of the countries, except perhaps for *China*, are experiencing financial turmoil manifested by currency devaluation, rising interest rates, and a banking sector struggling with an increased volume of non-performing loans.<sup>2</sup> In *Indonesia*, all toll road construction work has been suspended, and the projects in the planning stages have been postponed indefinitely or canceled completely. In *Malaysia*, work is continuing but the basic terms and conditions of many projects are being renegotiated and project specifications are being redesigned (see Box 1). In many ways, the financial crisis has brought forward new issues in terms of the role of government in toll road development.

<sup>1</sup> Average annual growth of real (inflation-adjusted) GDP in these countries between 1990 and 1996 ranged from 2.8 percent in the Philippines to 10.1 percent in China (International Monetary Fund, *International Financial Statistics Annual Report, 1997*).

<sup>2</sup> However, in recent months, the Asian financial crisis has appeared to affect China as well. For example, in January 1999, the Guangdong International Trust & Investment Corporation (GITIC) was allowed to go bankrupt by the Government, leaving US\$4.3 billion in unpaid debts; GITIC had provided a cash-flow deficiency guarantee for repayment of loans to the Guangzhou-Shenzhen Super Highway Project.

8. **Selected Countries with Developed Toll Road Systems.** *France, Italy, and Spain* all feature advanced, well-developed toll expressway networks, and they each provide valuable lessons. *France* initially made a commitment to using tolls for financing motorway

**Box 1 Impact of the Asian Economic Crisis on  
Toll Road Development in Selected Countries**

**China.** Of the Asian case study countries, China appears to have been the least affected by the recent financial crisis; its annual GDP growth was 7.8 percent in 1998, just off its 8 percent target, but down from 8.8 percent in 1997. There has also been little indication of toll road project suspensions or postponements in China due to the economic crisis. There has thus far been no currency devaluation against the United States dollar as the Government has maintained its exchange rate controls. Also, the central government has ordered state banks to increase lending in order to achieve its growth targets. At least for the short term, these developments are expected to cater to the financing requirements of ongoing infrastructure projects across the country. Foreign financiers are, however, becoming extremely cautious about investing in new toll road projects in China.

**Indonesia.** The private sector participation-based approach to toll road development was considered to have a promising future in Indonesia until the onset of the financial crisis. But the collapse of the domestic commercial banking sector brought all ongoing Indonesian toll road projects to a halt. Both construction work and land acquisition has stopped on all sections. Without revenue from completed facilities, many concession companies are either facing bankruptcy or suspension of funding support, or are close to default on their concession agreements with Jasa Marga, the state toll road corporation. The collapse of the banking sector has also forced a number of concession companies to consider re-capitalizing their toll roads that are under construction.

**Malaysia.** As of January 1, 1999, concession agreements had been signed for 24 toll bridge and expressway projects in Malaysia. Of these, 13 projects are open to traffic, four are under construction, and the remaining have yet to begin construction. The current financial crisis has affected many of these projects, and the Government has so far been amenable to adjusting the terms and conditions of concession contract in response. In December 1997, for instance, the Government invited all project proponents that were negotiating concessions to submit alternative proposals for restructuring their projects in view of the financial crisis. In addition, the Malaysian central bank has recently increased restrictions to the country's exchange control regulatory regime, with the intent of limiting speculation in the ringgit.

**Philippines.** The Philippine economy is perhaps stronger than many of the other developing countries affected by the Asian crisis in the sense that it had already reformed its financial markets and "graduated" from International Monetary Fund reforms. In 1993 the Philippine central bank was made independent, the financial system was liberalized, foreign exchange controls were removed, and new foreign banks were allowed for the first time since 1949. There have been no major bank closures (only 1 or 2 percent), nor a collapse in the real estate sector (which has been attributed to a low rate of speculative construction). However, the currency was devalued, and the real GDP for 1998 declined by 0.5 percent from 1997. Ongoing toll road projects have seen no construction suspensions or slowdowns as a result of the economic crisis.

**Thailand.** The banking sector crisis in Thailand has had some impact on toll road projects, but to a much lesser extent than in Indonesia. At about 12 percent per annum, commercial interest rates are presently only 1 to 2 percent higher than they were before the crisis. However, banks are in general less willing to lend at present due to continuing problems with non-performing loans. The consensus view is that Thai banks intend to address their internal problems first, before taking on additional complex project finance commitments. Reduced traffic and an inability to win governmental approval for toll increases has also led to a growing cash flow problem for the primary toll road operator—portending difficulties with debt repayment, which has not been an issue before now.

construction by semi-public companies, but later moved towards a policy of more extensive private sector involvement. However, the French motorway system was confronted with a serious cash deficit problem in the 1970s and 1980s, partly as a consequence of the energy crises, and in response the government nationalized the private toll road companies in the early 1990s. France is also known for pioneering the technique of toll road development through cross-subsidization. Over time, the concession companies have been expected to subsidize new and more costly routes with operating surpluses derived from older, more heavily traveled segments that had been built at lower cost. In return for developing new motorways, the operators have been granted extensions in the periods of their older and more profitable concessions. *Italy* has undertaken toll motorway development through the granting of most concessions to companies controlled at least in part by public bodies. The toll road program in *Spain* has changed over time from the development of a private sector concession-based system of tolled intercity highways, *autopistas*, to a system of government-funded toll-free roads, *autovias*.<sup>3</sup> However, in response to recent budgetary stringency, the Spanish government has again become more amenable to private involvement in toll road development.

9. Unlike the history of private sector toll road development in France, Italy, and Spain, *Japan* has followed a consistent policy of toll expressway development through public corporations. A system of “toll revenue pooling” (internal cross-subsidization) for the entire rural expressway network has made it possible for Japan to develop more than 9,000 km of toll roads throughout the country, 6,420 km of which are expressways.<sup>4</sup>

10. In the *United States*, toll roads played an important role in the early development of the country, but particularly in latter half of this century most interstate highways and urban expressways have been developed as untolled facilities. Since the 1980s, however, there has been a renewed interest in toll financing for highways. Recent innovative financing initiatives in the United States have involved public-private partnerships between state governments and private sector highway development consortia.

11. **Selected Other Countries.** All of the Latin American countries reviewed in this study 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. The latest program, however, calls for the development of a new 10,000 km national highway network using public sector funding. In *Brazil*, a 15,000 km toll road concession program is being implemented at both the Federal and State levels, although the January 1999 currency devaluation, combined with the increasingly depressed Brazilian economy, is likely to delay the ambitious development schedule. *Chile* has also been actively engaged in concessioning road improvement projects to the private sector, and it 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. After completing 5,120 km of new highways in only five years,

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<sup>3</sup> The total length of *autopistas* and *autovias* are 2,255 km (1997) and 4,474 km (1994) respectively.

<sup>4</sup> As of November 1998.

financial instability due to unexpectedly high construction costs and low traffic, coupled with the December 1994 devaluation of the peso, brought the concession program to a standstill in 1995. A comprehensive restructuring of the program in 1997 cost the Mexican Government US\$8 billion; current plans call for a re-privatization beginning in 1999.

12. In the early 1990s, with an urgent need to both reduce public spending and improve its road infrastructure, *Hungary* called upon a BOT approach to develop a toll motorway network.<sup>5</sup> However, Hungary's pioneering experience with BOT has not been without difficulty, and the current plan is more along the lines of a public-private partnership approach. Some have also questioned the need for development of a full-scale motorway network in the country at this stage.

13. The *Hong Kong Special Administrative Region* adopted a plan for the private development of public infrastructure at an earlier date than many of its neighbors; its first privately built and operated toll tunnel opened in 1972. While the government utilized lease-type structures in their initial projects, they have lately been adopting a more standard BOT-style approach with increasingly sophisticated mechanisms for toll adjustment.

14. In the *United Kingdom*, due to legal restrictions and strong public resistance, direct assessment of tolls has thus far only been used for very short road links, such as bridges and tunnels. All British motorways currently in operation have been funded from Central Government sources, but the Government is now promoting use of the Design-Build-Finance-Operate (DBFO) mechanism to encourage increased private financing of roads. Similar to a BOT arrangement, this strategy calls for the development and maintenance of a road segment to be transferred to the private sector for a specified period of time. The difference is that under a DBFO arrangement, the concessionaire typically provides the facility and the services to the Government in return for "shadow tolls" that are based on highway usage and the availability of the facility.

### C. KEY ISSUES AND LESSONS LEARNED

15. **Overview.** Each of the selected economies has its own unique institutional and regulatory frameworks reflecting the social, economic, and political environment, which in turn influences the form of toll road investment decisions by the public and private sectors. In this study, both successful and unsuccessful experiences have been interpreted in this context, with the authors attempting to draw lessons that can be adopted in other countries. Throughout the report, the term "best practice" has been used to denote the goal of delivering economic efficiency (cost-effectiveness and the best use of resources), optimal achievement of parties' objectives, transparency, and adherence to the highest principles and ideals.

16. This study identified the following nine key issue areas: (i) planning and institutional; (ii) legal and regulatory framework; (iii) concession contracts; (iv) government support; (v) traffic forecasting; (vi) setting and adjusting toll rates; (vii) financing structure and sources;

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<sup>5</sup> Construction of an untolled motorway network in Hungary began in early 1960s and had reached 420 km in length by 1996.

(viii) public acceptance; and (ix) the role of donor agencies. The following paragraphs present a summary of the analysis undertaken.

17. **Planning and Institutional Issues.** *Strategic network planning.* The countries with successful toll road network development usually have a well-established strategic planning framework whereas less successful countries exhibit weakness in this area. *France, Italy, Japan, and Spain*, for example, regularly update national toll road network development plans that are supported by appropriate legislation. In *Indonesia* and *Mexico*, on the other hand, various sections of the current toll road program were conceived in isolation and not derived from a long-term strategic interregional network development plan, and accordingly they were not well coordinated with plans for capacity expansion of non-toll highways. A strategic planning framework incorporating network analysis is important to optimize the benefits and minimize costs of toll road development. Components of such planning should include: (i) refining the strategic road network and the most appropriate alignments of the key links; (ii) firming up the appropriate timing of construction of individual links based on corridor studies; and (iii) establishing clear economic and financial viability.

18. *Cross-subsidies for network expansion.* The *Japanese* experience demonstrates that pooling toll revenues can contribute greatly to network expansion by cross-subsidizing unprofitable routes or segments while maintaining relatively consistent toll levels over the network. The Government of Japan set a goal to build a nationwide expressway network that included routes running through rural areas and/or areas with terrain upon which road construction would be costly. To pursue this goal, toll revenues pooling was required given the requirement for full recovery of capital investment costs with toll revenues. *France* constructed an extensive motorway system connecting all of its primary cities and many of its secondary urban centers, with a system of cross-subsidies within companies in the 1970s and among companies in the 1980s.<sup>1</sup> This strategy resulted in expansion of the toll road network and toll harmonization. The critical issue raised by cross-subsidies is whether the social and economic advantages of having an extensive network of high-performance highways rather than a smaller network in which each individual segment is self-supporting justifies the loss of financial discipline and the possible misallocation of scarce resources through the use of such subsidies.

19. *Alternative forms of operating entities.* Toll roads may be developed and operated by (i) a government agency, (ii) a public corporation, (iii) a private sector concession, and (iv) a public-private (also known as private-public) partnership (PPP).<sup>2</sup> The existing arrangement of operating entities in each case study stems from particular political and historical backgrounds, and each approach presents certain advantages and disadvantages (see Table 2). The challenge here is how to offset the disadvantages inherent in each form of operating entity. For instance, an independent advisory committee in *Japan* recommended that public toll road corporations,

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<sup>1</sup> In 1982, a new Government agency, *Autoroutes de France (ADF)*, was established as a clearinghouse for the issuance of new advances (government loans) to and the receipt of repayment of previous advances from the toll road companies. The creation of ADF allowed the Government to engage in cross-subsidies between and among companies.

<sup>2</sup> The PPP approach refers to a commercial company in which both the private and public sectors hold stakes, with managerial control in the hands of the private sector. A PPP may be distinguished from a private sector concession in that (i) both private and public interests typically hold equity in a PPP, and (ii) it is more flexible regarding project implementation.

among many other things, specify targets to reduce construction and operation/maintenance costs.

**Table 2: Advantages and Disadvantages of Alternative Forms of Toll Road Operating Entities**

<b>Form of Entity</b> <i>Countries where Practiced</i>	<b>Advantages</b>	<b>Disadvantages</b>
<b>Government Agency</b> <i>Indonesia, Malaysia, Philippines, Thailand, and United States</i>	Facilitation of planning for network expansion.	Competing demands for government funds and difficulty in providing incentives to improve cost effectiveness and operational efficiency.
<b>Public Corporation</b> <i>Japan, Indonesia, Thailand, France, and the Philippines*</i>	Greater effectiveness relative to private companies in pursuing goals set by the government, and their ease of accepting cross subsidies among routes in a network.	Lack of incentives for cost reduction, and tendency to be less efficient than their private counterparts. Due to tight governmental control, less effective in responding to market conditions, which change over time and differ across regions due to tight control by the government.
<b>Private Concessions</b> <i>Argentina, Brazil, Chile, Colombia, France, Hungary, Mexico, Spain, Hong Kong SAR (China), and the United States, among others</i>	Often favored over Government agencies because of their efficiency and market responsiveness.	Network development can be more difficult compared with public agencies. Private firms may not be able to assume all the risks associated with toll road development, which entails a long-term and large-scale investment.
<b>Private-Public Partnership (PPP) Approach</b> <i>Hungary, Colombia, China, Indonesia, and Philippines</i>	Brings additional resources to the project and complete it in a shorter time. Increases the efficiency in construction and project operation, through market discipline, assuring that the project is completed on schedule and within the budget.	Requires clear and justifiable definition of responsibilities between the public and private sectors.

\* Strictly speaking both SEMCAs in *France* and PNCC in the *Philippines* are “semi-public” bodies, but with a majority of shares held by the public sector.

20. **Legal and Regulatory Frameworks.** *General need for well-drafted laws and regulations.* Irrespective of institutional option, well-drafted laws and regulations have proven necessary for successful toll road development, as demonstrated, for example, in *France, Japan,* and the *United States*. In *Japan* public corporations have been established under well-drafted laws, and strategic nationwide toll road plans are clearly defined every five years and issued as ministerial regulations.

21. 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 infrastructure 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. The enabling legislation may be general and enable different types of concessions to be granted (e.g., the Philippines’ somewhat misleadingly nicknamed, yet comprehensive, “BOT Law”), or alternatively it may be specific and provide for a particular concession; either approach should be acceptable provided that, among other things, the right agency is designated as concession grantor and the permitted term of the concession is sufficiently long so that the concessionaire will be able to build and operate the toll road in accordance with its business requirements.

22. In *Argentina*, detailed laws and regulations covering bidding documents, administration and enforcement of concession contracts, and pricing mechanisms already existed in other sectors (e.g., power, telecommunications, water), but were lacking in transport until they were developed in the mid-1990s. This case demonstrates the importance of having a legal and regulatory regime in place, one that is well drafted and covers basic concerns.<sup>3</sup>

23. *Bidding and selection procedures.* Formalized, 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. The experience in *Argentina* 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. *Chile* also 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.

24. *Dispute resolution.* Although no one hopes for disputes on a BOT project, the regulatory framework must provide for adequate dispute resolution procedures in the event that disputes emerge. A number of toll road projects in *Thailand* have suffered due to a failure to follow established international dispute settlement procedures, which would provide the best approach.

25. **Concession Contracts.** Except perhaps in the Philippines, in the East Asian countries studied concession contracts have been relatively loosely negotiated and depended too much on “amicable solutions” between the parties involved. Concession contracts between a grantor and a concessionaire, however, should be unambiguous with respect to the risks involved. Preferably, a model concession contract should be prepared to enhance fairness and the clarity of negotiations between the parties involved. Essential elements of a concession contract are explained in Table 3.

26. **Government Support.** There is a variety of government support measures that can be provided to public corporation or private toll road concessionaires. Each has advantages and disadvantages as shown in Table 4, and countries that have been successful in toll road development have usually provided an appropriate combination of these measures. The extent of support to be provided to particular toll road operators, however, depends on the political and economic situations of countries considered. It is also important for a government to assess critically the possibility of large contingent liability in the case of guarantees such as foreign exchange guarantees, loan/bond guarantees, or equity guarantees.

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<sup>3</sup> If these criteria are met, a law of general application may be preferred, to ensure equal treatment of concession holders in various sectors, to allow for learning from the related experience of other sectors, and to conserve scarce legislative energy. John D. Crothers [Gide Loyrette Nouel], “Project Financing of Toll Motorways in Central and Eastern Europe: A Signpost for Transition,” *Law in Transition* [an EBRD newsletter on legal cooperation and training], p. 7.

**Table 3: Essential Elements of a Toll Road Concession Contract**

<b>Element</b>	<b>Description</b>
<b>Grant of concession</b>	The concessionaire should be granted exclusive rights to the use of the toll road right-of-way.
<b>Credit enhancement of concession grantor</b>	When financial support measures (e.g., revenue shortfall compensation, payment of shadow tolls) are involved in a concession contract, the credibility and capability of the concession grantor to make such payments on a timely basis is important.
<b>Toll rate setting and adjustment</b>	The concession contract must provide a clear framework for toll setting and adjustment covering topics such as operating cost fluctuations, currency devaluation, and minimum debt service ratios. Such matters are particularly important when revenue guarantees are not in place and the concessionaire bears construction, traffic, and toll collection risks.
<b>Conditions to terminate contract</b>	In the event that concession is terminated, whether as a consequence of a default by the concessionaire or the grantor, or as a result of the occurrence of a force majeure event, then the grantor or a new entity appointed by the grantor would take over all ownership rights to the toll road, including the right to collect tolls.
<b>Step-in right of lenders/concession grantor</b>	Project lenders will invariably seek to take an assignment from the concessionaire of its rights and interests under the concession contract, including its rights to the revenues from the tolls or fares. In addition, when the concessionaire is in breach of its obligations under the concession contract or there has occurred a default event under the financing documents, the project lenders will wish the right to “step-in” to cure the breach and, in some cases, transfer the shares in the concessionaire to a new sponsor, or transfer the concession to a new concessionaire.
<b>Changes in law</b>	One of the most difficult concession contract negotiation issues relates to changes in law, the occurrence of acts of government interference, force majeure, and other events or circumstances outside the control of the concessionaire that reduce returns for the sponsors or results in the concessionaire’s inability to pay the project lenders. In most concession contracts, unless a deficiency guarantee or subsidy is provided, such events or circumstances will expressly exclude insufficient traffic or downturn in usage.
<b>Exclusivity</b>	The concession contract should ideally provide that no other concession that would compete with the project has been or would be granted, at least for an acceptable period. Unless such an assurance is provided, a competing concession may be granted and reduce traffic flow.
<b>Dispute resolution</b>	The approach may be to require dispute resolution under local law, with proceedings in the local language and/or English, or to provide for offshore arbitration under internationally tested rules.
<b>Mitigation of risks</b>	Various risks associated with the projects are assumed among the participants who are best able to manage such particular risks. Major risks for a private financed toll road project include: (i) political risks, (ii) construction completion risks, (iii) market and revenue risks, (iv) operation risks, (v) finance risks, and (vi) legal risks.
<b>Post-concession issues</b>	There has not yet been a toll road concession project in which the concession has expired and the facility transferred. These post-concession issues must be discussed and determined as a part of the integrated transport policy of each country before the granting of concessions.

27. **Traffic Forecasting.** Traffic forecasting is far from an exact science; it involves a great deal of uncertainty and is highly susceptible to poor quality input data and erroneous or incomplete assumptions. Factors such as land use and population growth along the route, public acceptance and use of the highway, and various economic indicators used in traffic models all have inherent uncertainties that affect the traffic forecast. Since project viability (vis-à-vis anticipated toll revenues) is directly related to expected traffic volume, toll road operators, grantors, concessionaires, financiers, and investors must all be concerned with such estimates. There are many cases where analysts have used parameters calibrated elsewhere without evaluating their transferability to the countries in which they were to be applied. In other instances, grantors have used traffic volumes that were estimated by the project proponents without re-examining the figures during negotiations. These situations have been partly attributable to a lack of technical expertise and budgetary constraints, reflecting further institutional shortcomings.

**Table 4: Advantages and Disadvantages of Common Government Support Measures for Toll Road Development**

Support Measures <i>Countries where practiced</i>	Contents	Advantages	Disadvantages
<b>Comfort Letter</b> <i>China</i>	A legally non-binding letter issued by government to give support to certain actions not clearly stated in contractual agreement such as performance of a public corporation as a grantor of concession	Can provide financiers and sponsors a minimum level of assurance when no implicit government support is attainable.	Not legally binding.
<b>Land Acquisition</b> <i>China, Thailand, and United States, and others</i>	Expropriation of right of way for toll road construction. Cost of land acquired maybe borne either by the government or the concessionaire.	Helpful for the concessionaire because the right of expropriation usually resides with the government. This support usually improves "project economics" to a great extent when implemented at no cost to the sponsors.	Delays.
<b>Extension of Concession Period</b> <i>Indonesia and others</i>	Measure to provide compensation for the loss of profit due to circumstances caused by the government	Improves project economics.	Effect on current cash flow is small.
<b>Construction of Related Facilities</b> <i>United Kingdom, Thailand, and others</i>	Construction of connecting roads, access ramp, etc.	Contributes significantly to the project since connecting roads and other facilities are critical elements for commencement of operation.	Construction delays may critically impair the commencement of operation.
<b>Revenue Support</b> <i>Malaysia and China (including Hong Kong SAR)</i>	Revenue support is usually done with a minimum threshold for compensation paid by the government.	Facilitation of the finance closing and the project.	Weak design may impose a large contingent liability on the government.
<b>Revenue Sharing with Existing Facilities</b> <i>Malaysia, Thailand, United Kingdom, and others</i>	Deriving revenue from an existing toll road facility; can take the form of taking over the complete facility including employees and assets as well as debts.	Possible mitigation of revenue shortfall risk in the startup years.	Revenue sharing formula requires careful design. Possible burden when all assets, debts, and employees are to be transferred.
<b>Shadow Toll</b> <i>United Kingdom and Argentina</i>	Toll is paid by government according to the vehicle-km of the traffic counted automatically.	Facilitation of private financing without stimulating resistance to tolling.	Possible financial burden/ fiscal inflexibility in the later years; may hinder transition to real tolling.
<b>Provision of Development Rights and Third-Party Revenue</b> <i>Malaysia and China (including Hong Kong SAR)</i>	Right of commercial development along the toll road to supplement project economics.	Enhancement of project economics.	Excessive dependence on this measure may impair project economics.
<b>Subsidies/Grants</b> <i>Chile, Colombia, and Spain</i>	Government support both in cash and in kind such as land and facility.	Enhancement of project economics.	Arrangement may be time consuming and implementation may be delayed; possible risk of undue governmental intervention, "moral hazard," etc.
<b>Subordinated Loan</b> <i>Malaysia and others</i>	A type of loan for which repayment is subordinated to the senior loan (ordinary loan). Government, parent company and, in some cases, institutional investors are providers of the loan. The interest rate is higher than for a senior debt.	Facilitation of finance closing because it is treated as equity; could be used as stand-by facility to mitigate risks such as cost overrun and revenue shortfall.	Possible deterioration of project economics due to higher interest cost.
<b>Foreign Exchange Guarantees</b> <i>Indonesia, Philippines, and Spain</i>	Compensation for impact caused by devaluation of local currency. It could be built into the tariff formula	Facilitation of finance closing in foreign currency when country risk in this respect is high.	Possible large contingent liability for the government in the event of large currency devaluation.
<b>Loan (Bond) Guarantees</b> <i>China and others</i>	Guarantee on repayment of loan and on redemption of bond	Facilitation of finance closing.	Possible large contingent liability for the government; moral hazard for concessionaire and lenders.
<b>Equity Guarantees</b>	Guarantee of equity investment	Facilitation of project proposals and implementation.	Possible large contingent liability for the government; moral hazard for concessionaire and other investors.

28. The importance of sensitivity analyses in traffic forecast cannot be overstated—with respect to traffic and traffic diversion as well as other key variables (e.g., toll rates, project costs, implementation period, and a combination of these factors). In the Dulles Greenway Project in the *United States*, the traffic forecasts upon which financing decisions were made did not accurately address the issue of toll sensitivity, and motorists appeared to be discouraged by the initial toll charge, which was more than double the rate of the connecting Dulles Toll Road. In a more successful example, JHPC, the state toll road corporation in *Japan*, has refined toll diversion equations over many years, to improve the accuracy of traffic forecasting by adjusting toll elasticities.

29. Not surprisingly, traffic forecasts are typically more accurate for improved existing highway routes than for new toll road projects in “greenfield” corridors. Although accuracy can also be improved in the long term by refining methodologies and using empirically based equations for estimated traffic diversion (as has been done in *Japan*), it is still important that traffic forecasting be cross-evaluated by more than one independent consultant or institution.

30. **Setting and Adjusting Toll Rates.** The profitability of a toll road project, especially in inflationary environments, will depend much on the toll level, or increases achievable by the operators. Accumulated world experience suggests a number of general guidelines for setting and adjusting toll rates. Sensible, general principles suggested by one World Bank report (for Vietnam) indicate that (i) tolling is feasible only when there is a minimum of 4,000-5,000 vehicles per day; (ii) toll rate levels should not result in excessive traffic diversion, with an upper limit of acceptability considered to be in the range of 10-15 percent; and (iii) under certain conditions, toll rates can be set higher where there is no viable alternative.

31. *Toll adjustment procedures.* Another issue is whether toll rate adjustments should be left to a governmental authority’s discretion or based on a formula, usually linked to inflation. In either case, there is a need to follow specified toll adjustment procedures once they have been set; uncertainty creates problems for toll road operators (see Table 5).

32. **Financing Structure and Sources.** *Advantages and disadvantages of toll financing.* An important threshold issue is the relative advantages and disadvantages of toll financing of highways as compared to financing from fuel taxes or other revenues sources—with the latter the predominant approach in *Northern Europe, North America, and Australia*. The decision of whether to toll a particular road or not is important where traffic levels are relatively low, but it has not been adequately considered in many of the case study countries. The decision should be justified by economic analysis since the perceived objectives (e.g., raising additional revenue, fairness in terms of the user pays principle, optimal pricing and resource allocation) are seldom achieved. Also, the costs of establishing a toll system, the collection costs, and the diversion of tolls by collectors (leakage) can be high. For example, the case studies and other evidence indicate that additional construction costs can range between two and eight percent of initial costs and that operating expenses can range between five and twenty percent of toll revenue, depending on whether an open or closed tolling system is employed.

Table 5: Selected Examples of Toll Adjustment Procedures

Location	Example	Description
<i>France</i>	Governmental discretion	Toll rate adjustments are at the discretion of the Ministry of Finance, which tends to approve larger increases for less profitable companies. The French approach avoids unnecessarily high returns to investors, but at the risk of sacrificing efficiency by undermining incentives to make exceptional efforts to control costs or improve productivity.
<i>Japan</i>	Use of an advisory committee to the Prime Minister	The Japanese toll revenue pooling system requires a reexamination of total cost redemption every time there is an expansion of the expressway network (i.e. when the Minister of Construction issues a construction order for a network addition). When the cost of constructing a network expansion or other significant improvement requires a toll rate adjustment and/or an extension of the toll collecting period, the proposal goes through official government procedures involving a review and examination by a “Toll Committee,” and approval by MOC and MOTC reflecting public hearings.
<i>Spain</i>	Use of a formula linked to inflation	Spain’s approach to regulating the toll rates of concessionaires is based on a formula linked to price inflation. The Spanish approach has the merit of promoting new investment and efficiency, and it has only limited risks of unnecessarily high returns to investors, since “excess” profits are moved to a Special Reserve.
<i>Hong Kong SAR</i>	A sophisticated yet straightforward toll adjustment mechanism (TAM)	If traffic and therefore revenue falls below a forecast volume, the TAM will allow the operator to advance the prespecified date of a toll increase. Conversely, if the amount of revenue received by the operator is above the forecast, resulting in a rate of return that exceeds a specified range, a toll increase will be deferred.
<i>Philippines</i>	An advanced toll adjustment formula – attractive to investors	Mandated by Presidential Decree No. 1894, it is based upon a parametric formula that takes into account prevailing local and foreign interest rates, the consumer price index, currency values, and a construction materials price index. However, if toll road investors happen to receive a windfall, there is no profit-sharing clause—the investors keep all of the reward.
<i>Indonesia</i>	Uncertainty in adjustment procedures	Under Law No. 13/1980, the designation of a road section as a toll road and the determination of initial toll tariffs require Presidential approval of proposals made by Minister of Public Works. The concession company proposes tariff adjustments every two or three years based on a formula incorporating the consumer price index, but approval cannot be guaranteed by the government. Uncertainty over the toll adjustment procedure may discourage private investors.
<i>Mexico</i>	Uncertainty in adjustment procedures	Both toll increases and decreases typically require approval of the Secretariat of Communications and Transport, which restricts most concessionaires’ abilities to responsively adjust pricing to optimize revenues once the roads were open to traffic.
<i>Malaysia</i>	An approach for addressing uncertainty—similar to that of <i>Hong Kong SAR</i>	The proposed new method is to annex the forecast traffic volume to the concession agreement. If the actual traffic level is more than the forecast level at a specified time, the Government could request either the deferral of a toll rate increase or lowering of the level of toll rate increase; but if the actual traffic is less than forecast, the concessionaire could request to bring forward the timing of toll rate increases.

33. *Equity financing.* It is relatively easy to attract domestic capital of both debt and equity for smaller projects, say when the capital cost is less than US\$100 million. Moreover, it is very beneficial for a toll road project to obtain domestic financing to avoid the exchange rate risk between local currency toll revenues and foreign currency debt. However, in many countries, local capital markets are not sufficiently developed to provide the long-term capital required for toll road projects. The current financial crisis in Asia has worsened the situation.

34. *Subordinated loans.* There are two important roles for subordinated loans: (i) to fill the gap between the equity and the senior loans in the original finance structure, and (ii) to provide stand-by financial support in case of revenue shortfall and cost overruns. They may address the difficulty of procuring equity (due to equity's slowness in recouping the investment through dividend payments) by providing a stable cash payment stream with a higher interest rate than senior debts from the beginning years of the project. Because of the subordinate nature of repayment to senior debts, second to the equity injection, government support and sponsors' support in the form of subordinated loans should be more acceptable to the senior debt providers than ordinary loans. This approach, while common, should be applied carefully since an excessive use of subordinated loans may considerably increase the capital costs and impair the sponsor's commitment to the project.

35. *Senior commercial bank loans and debt securities.* Procurement of long-term bank loans for privately financed toll road projects is a critical issue in developing countries. The longest tenure that a toll road project company can obtain in a commercial bank loan in the East Asian countries studied is about five years, which is far too short to recoup the investment, whereas in many developed countries such as the United States and United Kingdom, the tenure of commercial bank loans may extend 15-30 years, i.e., matching the concession period. For developing countries, it may be recommendable to either establish a financing institution or a similar mechanism to provide long-term loans for privately financed infrastructure projects.

36. *Institutional investors/infrastructure investment funds.* Institutional investors can be a good source of financing for toll road projects since the long-term maturity of their funds matches the duration of a toll road concession. However, institutional investors in developing countries are not active in infrastructure sector in general.

37. *Initial public offerings (IPOs).* An IPO of a single asset company with a BOT arrangement can be difficult as the duration of future cash flow is limited by the fixed concession period and the enterprise is affected to a great extent by general stock market sentiment at the time of IPO. On the other hand, an IPO based on multiple assets with a portfolio of stable cash-generating toll road projects may become an appropriate solution to fundraising issues in developing countries. Example practices are found in *China*. Jasa Marga, the public toll road company of *Indonesia*, planned an IPO that has been delayed due to the Asian financial crisis.

38. *Asset securitization.* One innovative approach is the leveraging of existing highway assets to raise new funds in capital markets. This approach can be attractive to private investors, since they may assume only limited construction/completion risks, and the transactions offer the prospect of high returns. The approach is also attractive to governments, since it permits them to obtain additional financing with relative ease, including for financially less attractive but still economically desirable projects. For example, by the securitization of existing highway assets, including roads financed with World Bank assistance, *China* has been able to raise large sums of additional capital from foreign investors.

39. However, there are some concerns with the asset securitization approach, e.g., the possibility of over-leveraging the asset at the expense of the obligation to repay the original loan. Another problem with using the capital markets is that the timing and the volume of fundraising is inherently dominated to a great extent by prevailing market sentiment; investors

are very sensitive to political risk (as seen recently in East Asia and the Russian Federation recently) as well as the features of alternative investment opportunities such as coupon rate for various bonds, profitability of stock markets, and ups and downs of real estate markets. Therefore, financing through the capital markets should not be counted on as a perpetual and stable source of funds.

40. *Pinpoint equity with indexed infrastructure bond issue.* Pinpoint equity (high debt-to-equity ratios) coupled with inflation-indexed bond issues may be used to relieve investors of the problem of slow returns on their investment through dividends. The issues here are (i) the need for the investor to flexibly recoup its investment without hindering the opportunity of private financing, (ii) lowering the capital cost to achieve a more affordable toll rate, (iii) the need to provide the investor with incentives that lead to higher returns, and (iv) the need of the investor for liquid investments.

41. **Public Acceptance.** An important issue on public acceptance of toll road development relates to land acquisition and resettlement. Certain countries such as *China* and *Thailand* could benefit from upgraded institutional capacity and compensation schemes to address resettlement planning issues. Also worth noting here, risks related to land acquisition are best borne by the Government, not the developer, as was the case with the Guangzhou-Shenzhen Superhighway Project in China.

42. In addition, mitigation of adverse environmental impacts (e.g., air quality, noise) of toll roads must be an integral part of the planning process. In the case of the M3 toll road in *Hungary*, public hearings were not held to discuss alternatives, in contravention of European Union directives. The Environmental Impact Assessment for the M3 project has also been criticized, for not considering (i) the impact of the road on increased automobile traffic inside Budapest, (ii) increased automobile traffic in residential areas along alternative routes, and (iii) impacts on animal habitats.

43. Effective public relations campaigns can foster public acceptance of well-conceived toll road projects. Public acceptance—of both the highway and its tolls—has been a major issue for all of the toll road operators and investors in the *Philippines*. Since toll rates on the original toll expressways there had been extremely low for a longtime, motorists did not have any familiarity with paying market-rate tolls. Consequently, a major concessionaire has initiated public awareness campaigns in their various highway corridors using print, broadcast, and outdoor media.

44. **The Role of Aid Agencies.** Aid agencies can address a variety of financing, institutional, and regulatory issues as shown in the examples below:

- *Long-term loans.* One way in which donor agencies can provide assistance for toll road development is in providing long-term financing. In many developing countries, even ones that have large capital markets, it is difficult for domestic capital to cover infrastructure projects mainly because of the lack of long-term financing tools; for example, this issue has been addressed in *Brazil* and *Colombia* by the Inter-American Development Bank (IDB).

- *Interim financing.* Donor agencies can also provide interim financing (e.g., as provided in *Hungary* by the European Bank for Reconstruction and Development, EBRD).
- *Credit enhancement with respect to political risk.* Donor agencies provide various measures of credit enhancement with respect to political risks, including political risk insurance, Export Credit Agency (ECA) cofinancing and guarantees, and Partial Credit and Risk Guarantees (e.g., as provided in *Colombia* by the World Bank).
- *Arranger of finance.* A donor agency can play the role of financial arranger (e.g., as done in *Hungary* by EBRD).
- *Provision of guarantees.* Another role of donor agencies can be to guarantee loans (e.g., *Hungary* by EBRD).
- *Technical assistance and human resource development.* Donor agencies, particularly the World Bank, can add value by providing expertise and contributing to training in various areas related to toll road development (e.g., as achieved in *China* and *Chile* by the World Bank; in *Hungary* by EBRD; and in *Malaysia*, the *Philippines*, and *Thailand* by the Japan International Cooperation Agency).