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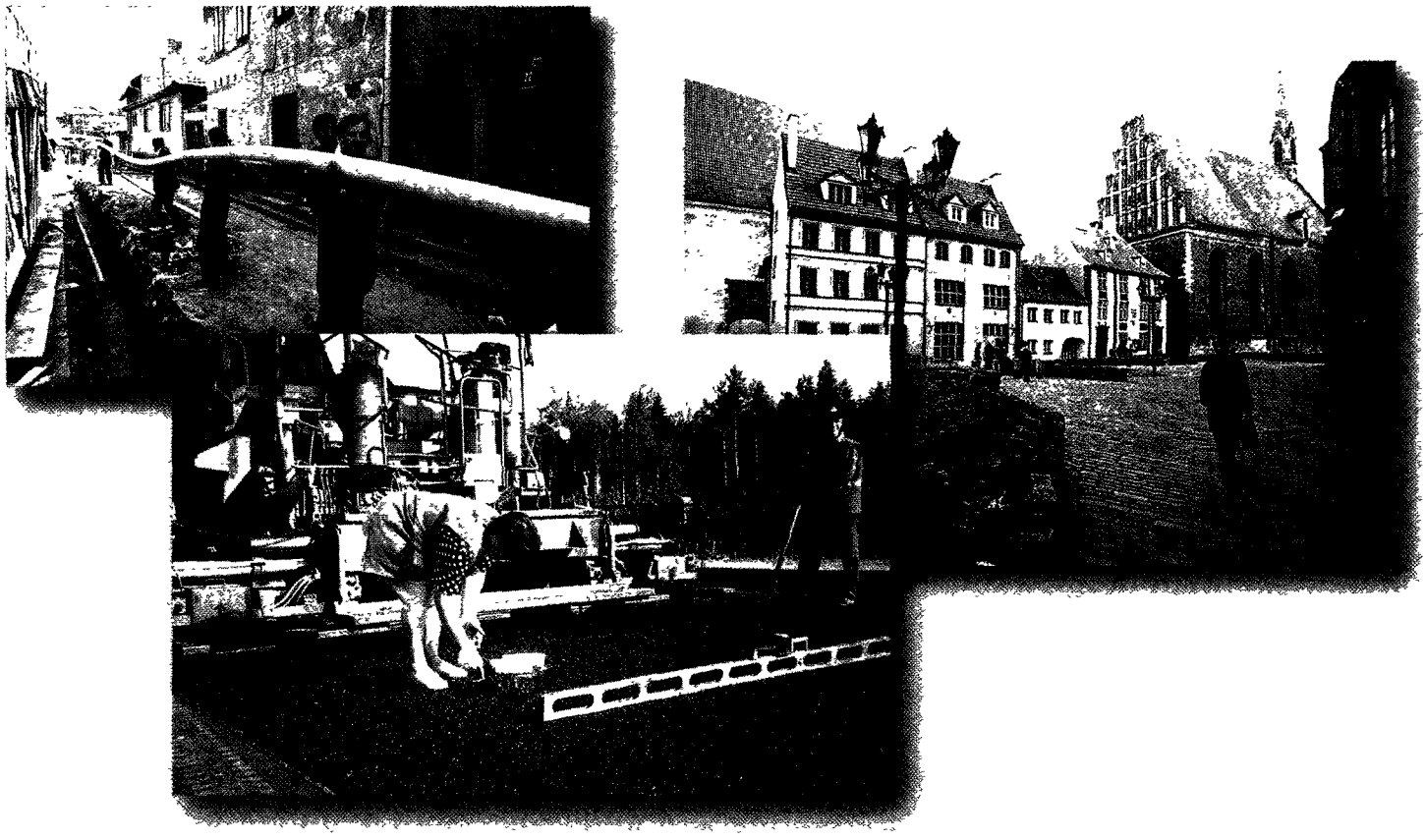
Overview of World Experience in Private Financing in the Road Sector

Ricardo Halperin and Patrick Malone



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Overview of World Experience in Private Financing in the Road Sector

This paper consists of (i) the slides for a keynote presentation by Ricardo Halperin at an International Conference on Road Financing that was organized by the Russian Federal Highway Administration, with the support of the ECA Infrastructure Department, in Moscow in November 1998; and (ii) a background paper, prepared by Patrick Malone, assembling underlying case material.

English versions of the slides prepared by other members of the Bank-organized delegation to the Conference are presented in ECSIN working Paper Nos. 3 and 4.

Overview of World Experience In Private Financing In Road Sector

by

Ricardo A. Halperin

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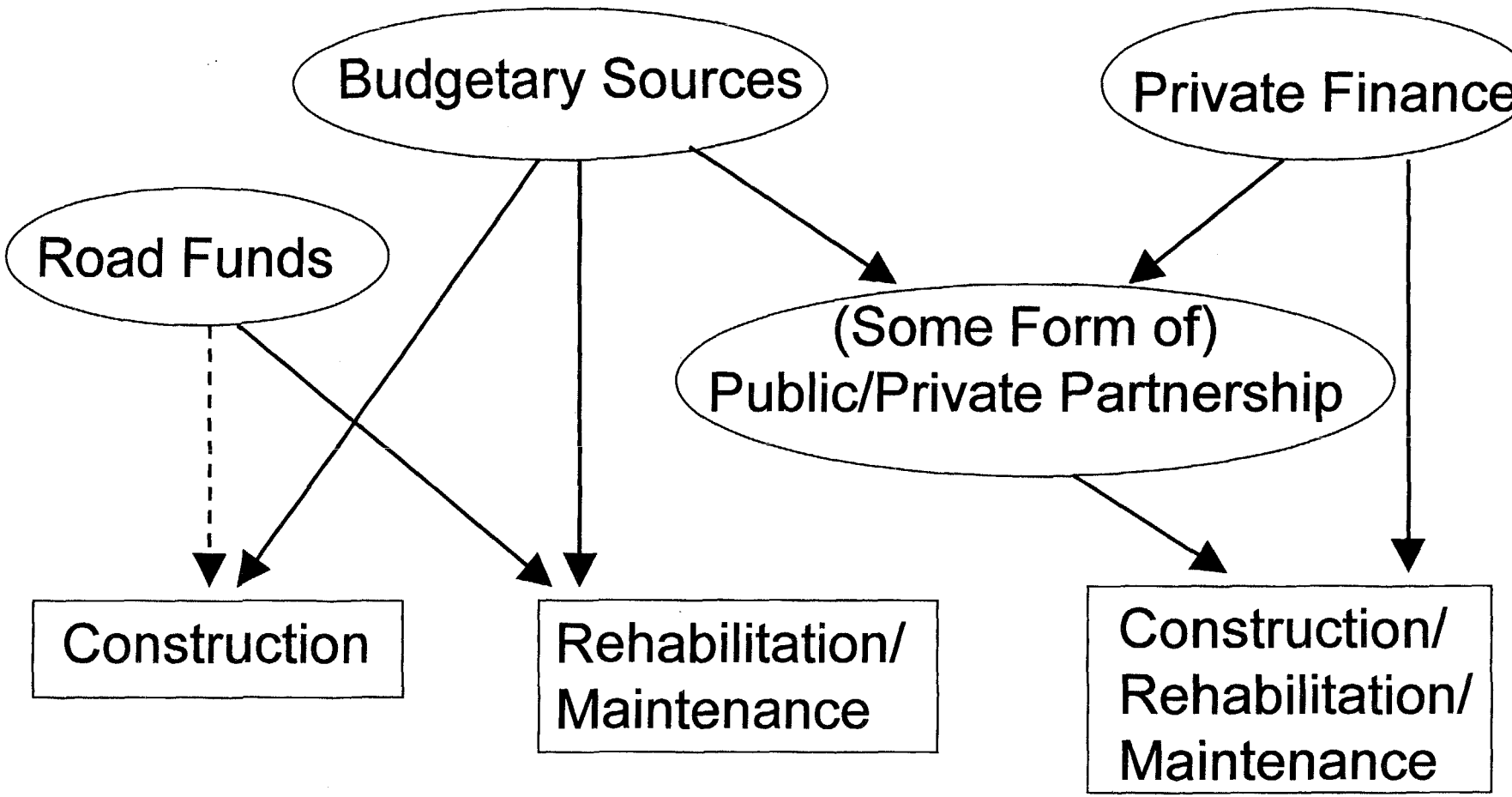
Alternative Methods for Financing the Roads Sector



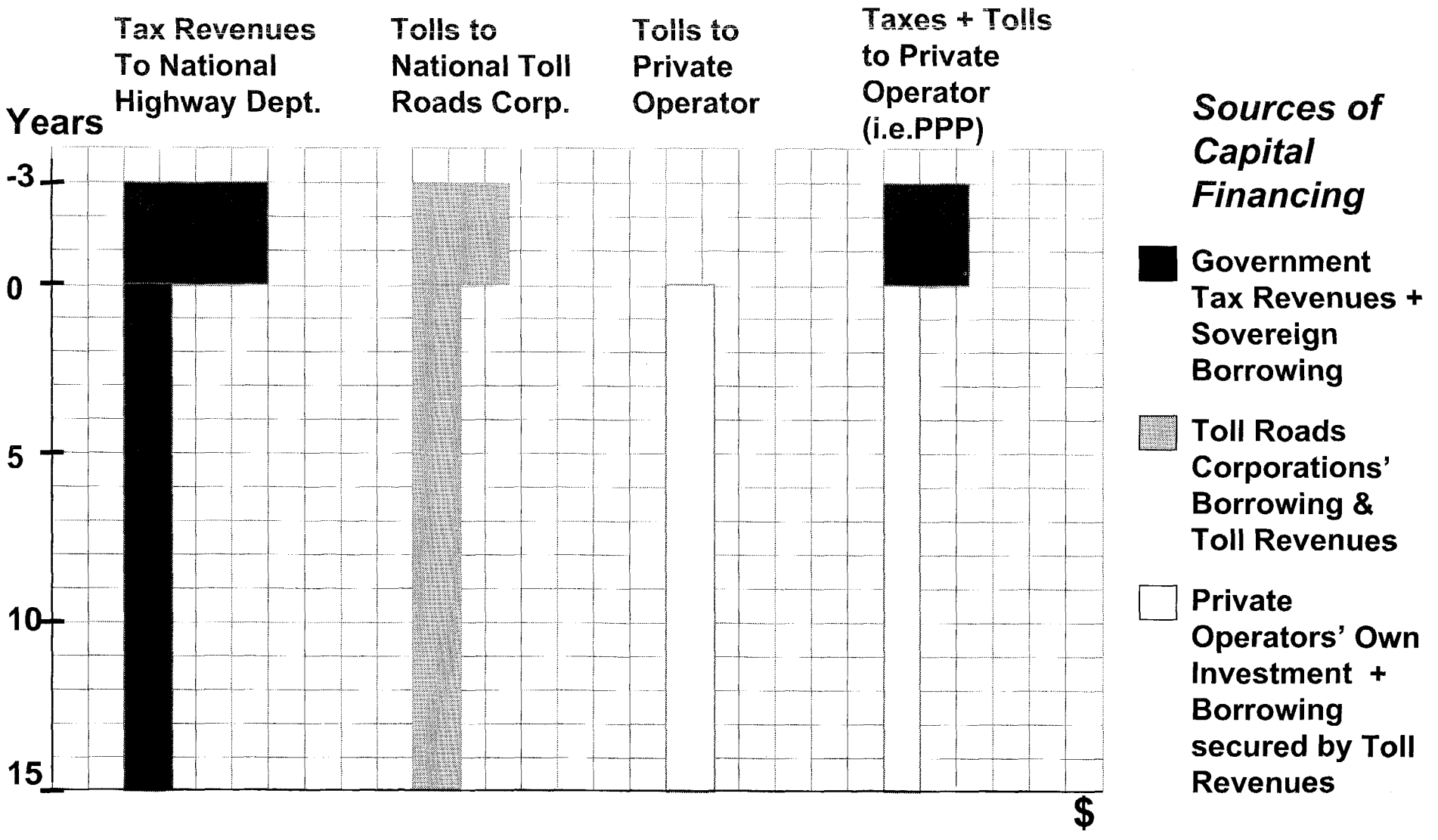
⇢ In some countries, road funds cannot finance construction

Why Concession Roads?

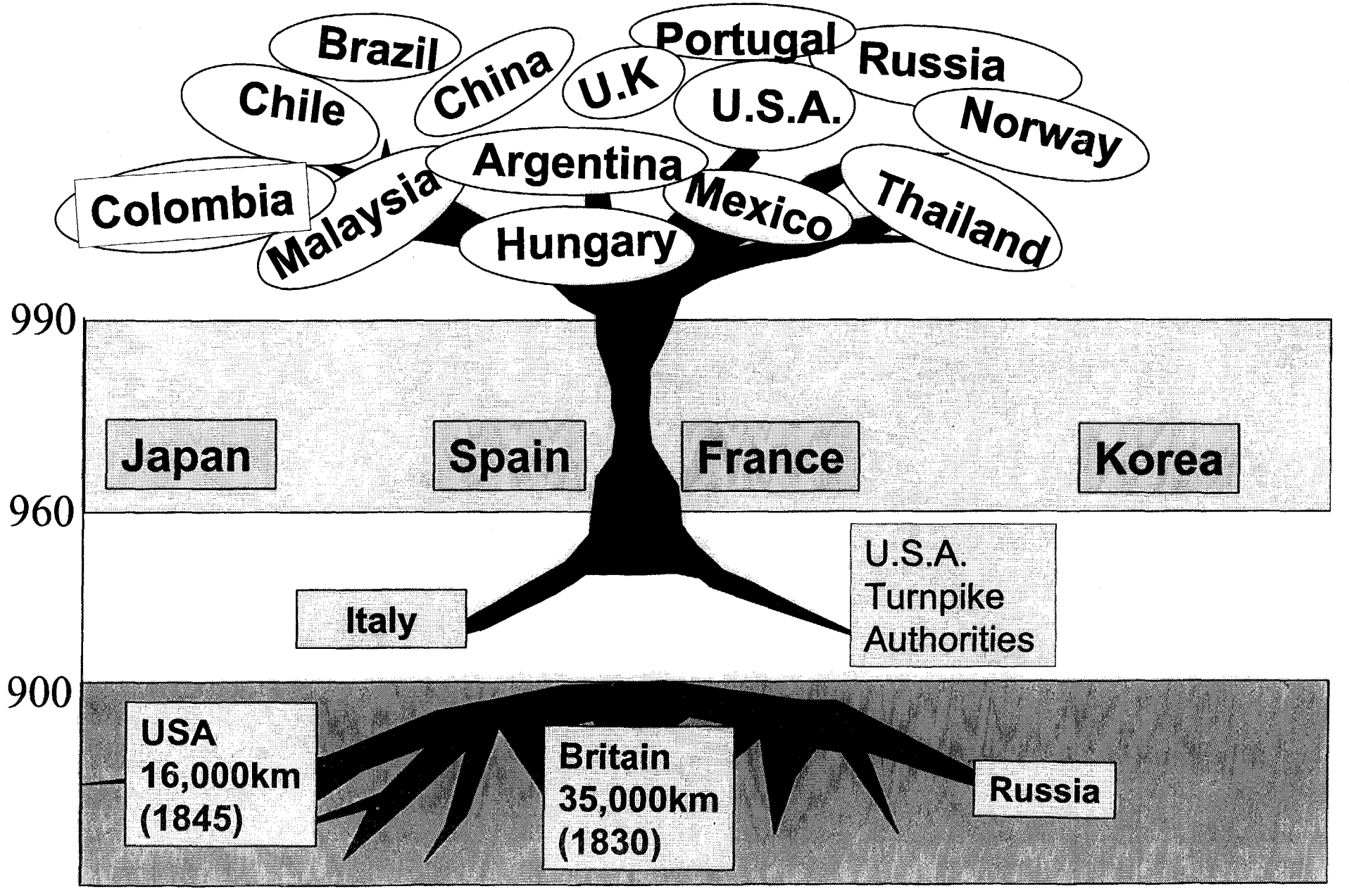
To Do More and To Do it Better:

- Raise more capital than Governments can provide.
- Improve network earlier than otherwise possible.
- Higher efficiency and better service demonstrated by private sector *under competition*.
- Increasing public acceptance of "user pay" principle of market economy: modern electronics enable it to be applied more cheaply and more accurately.

Four Ways The Public Can Pay For Major Road Construction



The Blossoming of Toll Roads, Especially Privately Financed



Share of Main Road Network Now Provided by Toll Roads (Publicly or Privately Managed)

1 - 10 %

Hungary
Indonesia
South Africa
Spain

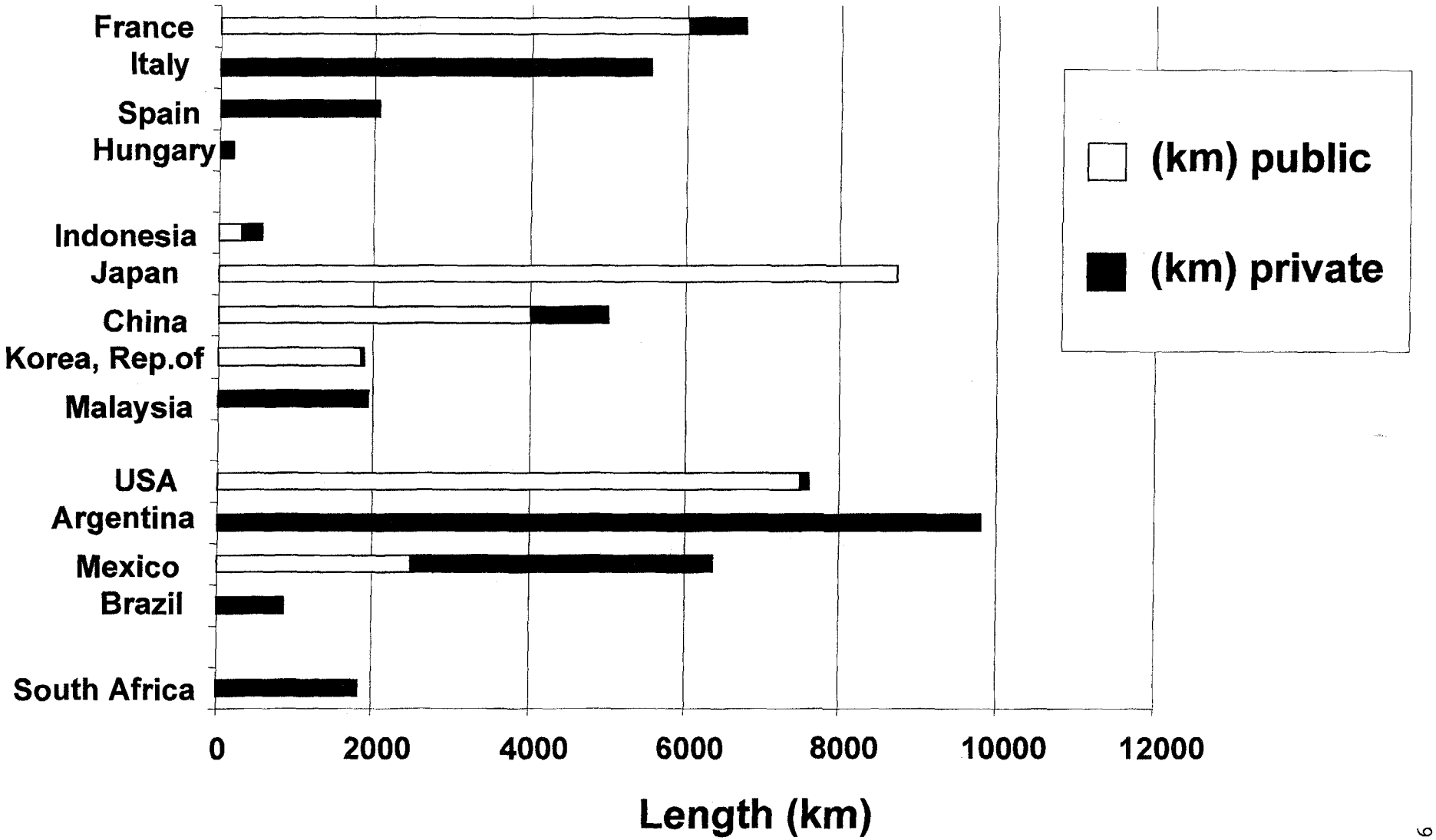
10 - 15%

Italy
Japan
Malaysia
Mexico

15 - 30%

Republic of Korea
France
Argentina

Length of Publicly and Privately Managed Toll Roads (km) in Various Countries



Toll Roads

ADVANTAGES

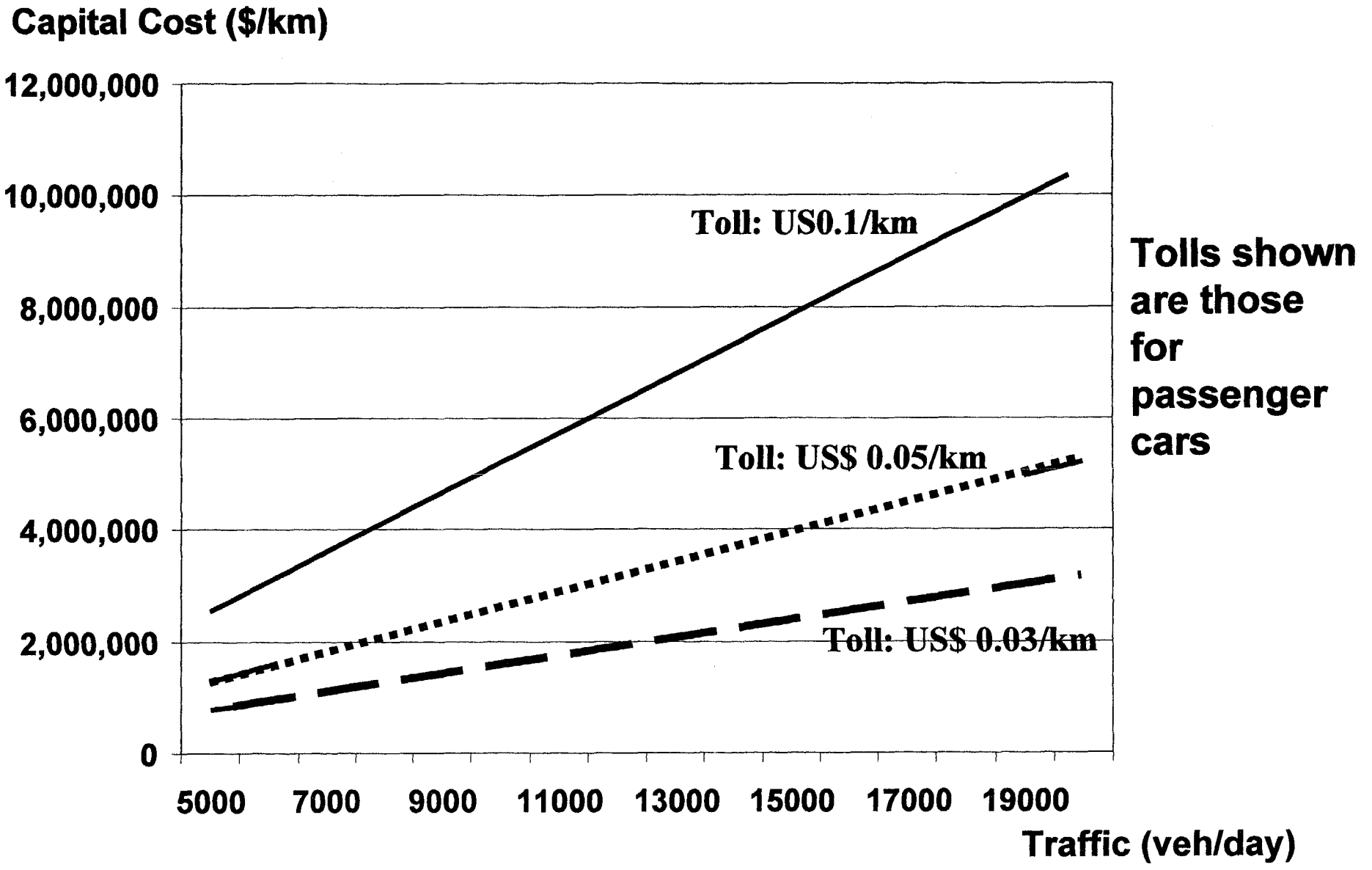
- Reduce budgetary obstacles to road improvement.
- Fuller use of the efficiencies of competitive private sector.
- Facilitate introduction of more efficient charging for road use.

Toll Roads

DISADVANTAGES

- Uneconomic traffic diversion and underuse of sunk investment.
- Costs of limited-access design and toll collection.
- Applicability limited to major roads.

What is Financially Feasible?



Motorway Development by State-Owned Toll Road Corporations

- Government raises funds through bond issues
- Motorways built, maintained and operated by private contractors
- Debt service paid from toll revenues
- Surplus revenues retained to finance other motorways
- Examples : USA (Turnpikes), Japan, Korea, Slovenia

Some Main Recent Examples of Efforts to Attract Private Financing

- Mexico - widespread construction program - had to be bailed out by government at very high cost
- Hungary - several motorway sections - traffic shortfalls and successful legal challenge to tolls
- China - Guangzhou - Shenzhen - cost overruns and traffic shortfalls
- USA - Large traffic shortfalls on Dulles Greenway (Virginia) but very successful SR-91 (California)
- Thailand - Bangkok Expressway - concessionaire forced to reduce tolls
- Poland - ambitious construction program unable to attract financing

Argentina's Experience

- Initial concessions in 1990 for rehabilitation and maintenance of 9,000 km at time of financial crisis
- Concession contracts had to be renegotiated several times to reduce toll escalation and increase government contribution
- Results showed that users are prepared to pay for improved service and better maintained highways
- Generally favorable experience with maintenance concessions encouraged extension to construction
- One US$ 500 million improvement to Buenos Aires access roads already completed, others underway

Main Problems in Private Toll Road Projects to Date

- Traffic forecasts overoptimistic, especially for share of traffic which would choose tolled route
- Tolls set at unacceptably high levels (partly because of short term of loans available) and had to be reduced
- Political sensitivity of tolls, causing contract renegotiations or even suspension
- Unrealistic government expectations, placing excessive risks/costs on private sector
- Effect of Exchange Rate devaluations on debt-service

Key Requirements for Success

- Government should have substantial stake in the partnership
- Appropriate legal and regulatory framework in place
- Support from independent legal and financial advisory services, starting early in the negotiating process
- Simple and transparent bidding criteria
- Rules for renegotiation of contracts to be spelt out clearly
- Fair apportionment of risk between government and concessionaire
- Carefully researched traffic forecasts
- The concept of tolling, and the specific tolls, to be discussed beforehand with the prospective road users

IFC- Supported Highway Concessions 1996-98

Country	Ecuador	Brazil	Colombia	Panama	Ivory Coast
Type	Rehabilitation	Upgrade	Widen	Urban New	Urban Bridge
Length (km)	284	407	56	19.5	6.6
First-Year Traffic (ADT)	5-10,000	43,500	8-11,000	30,650	48,000
Toll (US$/km)	0.02	0.03	0.05	0.09	0.15
Capital Cost (US$ mln.)	50.5	525.5	100.0	209.2	163.4
Financing (%)					
Equity	23 a)	20	31	20 a)	26 a)
Government	-	20 b)	17 b)	47	5
Senior Debt	77	20	20	26	62
Subord. Debt	-	40	32	7	7
	100	100	100	100	100

a) Principal shareholders foreign (respectively Spanish, Mexican, French)
b) Cash generation from assets transferred to concessionaire

Most Promising Variants of Private-Sector Involvement

- Maintenance and Operation Concessions
- Construction of Bridges and Tunnels
- Urban Bypasses financed on the Security of Town Access Charges
- Addition of Tolled Lanes providing Higher Service (less Congestion) on Existing Major Highways (or parallel to them)
- Staged Construction of Inter-Urban Motorways

Key Steps for Government

- Better records, analysis of expenditures and traffic on each section of network, and use of independent studies/audits.
- Future network context for roads to be concessioned.
- Convincing public opinion: quality costs; risks and costs fairly divided between public and private sector.
- Development of reliable legal, fiscal, administrative framework.
- Transparency and reliability of procurement process: fair competition.
- Well-defined toll-rate adjustment criteria, mechanisms.

OVERVIEW OF WORLD EXPERIENCE IN PRIVATE FINANCING IN THE ROAD SECTOR: SOME PRINCIPAL CASES

Patrick Malone

1. Road work, worldwide, has traditionally been financed directly by government. Thus the question naturally arises 'why then *private* financing'? One answer of course -- possibly the most obvious and simplistic-- is that governments no longer have the financial resources to carry out all that is needed on a highway system. This applies not only to construction but also to operation and maintenance of the system, which may themselves require substantial amounts of funding. In the USA, 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.

2. 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 shippers, the road users, and all those along the margins of the roads whose operations and livelihood are affected by the road system. It is important therefore to address the totality of the road system, not just the roads themselves. For example,

- there is the obvious option of financing *new construction* -- expressways, major tunnels and major bridges; and

- but there are also the opportunities for financing activities relating to *an existing network,* such as maintenance and rehabilitation, and there are possibilities of concessioning activities along the margins of the network.

3. Concessions to build and operate roads today receive great attention, but the idea is not new. In the 18th and 19th centuries there were more than 2,000 private corporations operating 'turnpikes' in the United States; in more recent times these turnpikes were operated either as state turnpikes, or within the jurisdiction of a specially created 'turnpike authority', the New Jersey and the Pennsylvania Turnpike Authorities being the best known. In the United Kingdom there are still a few small bridges on which the right to collect tolls dates back to the 17th century. In Hungary, the Chain Bridge over the Danube at Budapest was opened in 1848; a toll was charged and (a symbol of social change) all users had to pay, including the nobility. And Russia also had some of the earliest toll roads; the first toll road was introduced by the Emperors Ordinance in November 1834, for the Moscow Highway; it is interesting to note that the tolls varied between summer and winter. Then in 1847 an ordinance was issued requiring tolls to be collected on the newly-built highway between Tula and Orel.

4. In more recent times -- in the 1950s and 60s -- the concept was revived when motorways were constructed in France and Italy by concessions awarded to government-owned motorway companies. Spain followed a few years later with its own motorway program; the

level of public funding for roads was considered inadequate to meet the needs of a growing tourist industry, and the country adopted the strategy of developing tolled motorways through concession companies, but, contrary to the policies adopted by France and Italy, concessions in Spain were awarded to private entities.

5. The energy crises of the 1970s impacted this development of motorways by concession in a number of ways. Construction costs rose dramatically, and such loan finance as was available was for shorter periods and at a higher interest rate than previously obtained; coupled with this, traffic growth slowed, and hence traffic (and revenues) fell short of projections. In France the private companies were forced to re-finance with loans on unfavorable terms; two of the four companies were forced to call on state guarantees in 1982, followed by a third in 1985. Similar developments in Spain led to the collapse, in 1983, of three companies, representing about 15% of the motorway sector.

6. By the late 1980s however, the fortunes of these motorway concessions had revived, a result principally of improved economic conditions and of high traffic growth. Simultaneously there was renewed interest in concessioning of construction, and this interest continues today because the factors that led to the earlier involvement of the private sector are still present, possibly more compelling than before. And so, Governments in all continents have turned to the private sector to assist in financing the highways sub-sector; in France, for example, in 1997 there were nearly 9,000 km of motorways, of which 6,500 km were concessioned. There are now therefore numerous examples of private sector participation in the highway sub-sector, some successful and some less so, from which to draw lessons. An indication of concessioned highways, as a proportion of the principal network, is given in Table 1.

THE BROAD POLICY ISSUES

7. Under what circumstances should government concession roads to the private sector? What factors contribute to the decision? Before proceeding with a private toll road program, the advantages and disadvantages of private sector tolling compared with public funding or with public toll roads should be carefully evaluated. Assessing the appropriateness of private toll roads is a complex, project-specific process involving numerous economic and political considerations. The primary economic advantages of tolling, public or private, are the generation of user-based funds to support road development, and the ability to influence road user and traffic patterns through road pricing. The primary economic disadvantages of tolling are the time and cost required to implement a toll system, the traffic diversions associated with toll collection, and the potential delays, although these latter may now be reduced by using devices such as electronic tolling.

8. In addition to these economic considerations, policymakers must consider many non-economic factors; these include public perception of tolling, the equity of charging tolls for road use, and the impact on governments flexibility in future road development as a result, say, of guarantees given to the concessionaires. Specifically, experience has shown that the

public reaction is one of the overriding factors, and may prove to be the greatest impediment to tolling.

9. Then there is the issue of how the concession should be structured. The process of concessioning can be divided into two phases: (i) definition of the policy and legal framework, and then (ii) program implementation. A successful concession requires a supportive policy and legal framework, it should be integrated with national, regional and local transportation policies and programs, and it should be 'enabled' by a concession law. Then there are the questions:

- what types of road should be targeted for tolling?
- would a specific toll road concession law be necessary, or could the concession be implemented under existing contract and investment law?
- what government entity should be authorized to implement the program?

10. Once the policy and legal framework are in place, a well-defined and controlled process for program implementation can accelerate the schedule, improve the quality of bids and ensure that government objectives are met. This in itself generates additional issues:

- who should be responsible for funding preliminary design, environmental, and traffic and revenue studies?
- what should be the bidding criteria?
- how should the facilities be financially regulated?
- how flexible or defined should the project design be?
- should the concession contract be negotiated, competitively negotiated, or fully defined prior to bidding?

11. Finally there is the issue of the financial support from government -- how much and of what type? Governments seek to minimize the need for public financial support for toll road concessions in order to maximize the benefits of concessioning relative to its cost. Public financial support may be appropriate, however, if it helps to mobilize large amounts of private capital. But governments involved in toll road projects should seek to limit their contingent liabilities, such as guarantees of minimum traffic and of revenue, as well as their direct financial contributions. If public financial support is indeed appropriate, then there is a range of mechanisms that may be used:

- equity guarantees
- debt guarantees
- exchange rate guarantees
- grants and subordinated loans
- minimum traffic or revenue guarantees
- concession extensions and revenue enhancements

There is also the mechanism of shadow tolls, under which government itself pays to the concessionaire an agreed fee per vehicle.

12. These financial instruments range from the simple to the complex. But underlying all is the issue of risk, and more specifically the apportionment of risk, between the two parties, the government and the concessionaire; each of course would seek to minimize the risk that it may bear.

13. So, concessioning is a complex business. It is understandable therefore that it may take a matter of years, literally, to arrive at 'closure' of the contract; so many 'actors' are involved, compared with a contract entered into by government directly with a contractor, and so many interests -- often conflicting interests -- are at stake.

14. It is therefore worth reviewing some examples of private financing for development of a highway system, to see how the concessions operated in practice, and to draw some lessons from the experience to date.

CONSTRUCTION CONCESSIONS

Mexico

15. In Mexico a massive program of private toll roads was launched in 1989. It was to become the largest program of its kind world -- wide. 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 a program to build 4,000 km of toll highways was launched in 1989. This program was perceived as essential to help revive the economy. Given the constraints on public sector borrowing, private financing secured by tolls was the only source of financing for such a large program.

16. The mechanism was as follows. Government would select the roads to be concessioned, specify the maximum toll rates (which would be indexed for inflation), provide the preliminary designs, cost estimates and traffic forecasts, and provide, at no cost, the right-of-way. Contractors were to contribute 25% to 30% of the cost largely by discounting their construction bills (this was attractive to the construction industry because it was largely idle), the remaining costs being financed by debt from banks and other sources. Concessions were to be awarded by competitive bidding, to the bidder offering the shortest concession period; the legal limit for the concession period at that time was 15 years (although this was soon increased to 20 years and finally, in 1993, to 30 years). The government would guarantee, in part, the construction cost and traffic projections to the extent that if traffic (and therefore revenues) were to be less than forecast, or if construction costs were to be more than 15% above estimate (or caused by delays or design changes for which government was responsible) the concession period would be appropriately extended.

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

- financial feasibility and government contribution: the concessions with the highest profit potential were generally awarded first, but as the program extended to roads with less traffic potential or more costly construction, or both, government had to offer concessions in which it contributed 25% of cost. By 1992, as a result of cost overruns and low traffic, only 4 out of the 12 concessions for which a financial rate of return could meaningfully be calculated had returns exceeding 6%, while 6 had negative rates of return;

- concession period: concessions awarded on the basis of duration encouraged bidding for very short concessions and to charge the maximum toll allowed; the average duration of the first 22 concessions was just under 12 years, and 2 were for 5 years only. The high tolls resulted in some of the toll roads being almost empty while the parallel toll-free roads were congested;

- the quality of the preparation work: The sheer size of the program meant that the government departments concerned did not have the resources adequately to prepare the designs, or to study how the road users would react to the tolls. In fact, even in the early part of the program the concessionaires were charging an average of US 17 cents/veh.-km, whereas prior to the program, a typical toll (on the limited state-financed network) was US 2 cents/veh.-km; and

- underbidding by contractors: The design of the program encouraged unrealistically low bids because concession extensions were possible in the case of cost overruns. Despite a clause in the concession law requiring scrutiny of construction bills, contractors tended to overvalue their contribution to the costs because their partners, mainly nationalized banks that were pressed by the government to lend to the concessions, were not accustomed to monitoring construction documentation.

18. Despite these emerging problems, the government went ahead and increased the program from 4,000 km to 6,000 km; the economy was growing at a healthy 6% to 7% annually, and the perception was that such growth would require more and more motorways. Moreover there seems to have been pressure from the individual states to add roads in areas in which there was no real need to do so. But expansion of the program did nothing to solve the problems referred to above, and these persistent problems forced government to restructure the program several times during the 1990s. The first restructuring allowed concessions that had traffic shortfalls or cost overruns to petition the government for relief. The second restructuring started late in 1994 when devaluation of the peso and the ensuing economic slump, combined with high toll rates, further reduced traffic levels, and worsened the financial position of the concessionaires and of the banks involved. By the end of 1995 government agreed to grant truckers and bus operators income tax relief on tolls paid, and at the same time some of the concessionaires reduced tolls. In the third restructuring, in late 1997, government assumed all bank liabilities -- and temporary ownership -- of 23 toll roads, these latter to be re-auctioned to private operators within two years.

19. This restructuring was particularly difficult to conclude in that it followed the controversial and much publicized international banking rescue operation of Mexico. The

government estimates that the cost of this restructuring could reach as much as US$ 7 billion over the next 30 years.

20. In retrospect what were the principal problems of the Mexico Toll Road concept, and hence what might be learnt from that experience?

- the bidding process and concession design were inadequate; the pre-qualification process was not sufficiently rigorous, and the criteria for selection limited the potential concessionaires to a small number of local construction companies that were more interested in the construction itself than in long-term financial viability of the projects;

- there was inadequate financial discipline in government-owned banks; it was not uncommon for lenders to waive important conditions (insurance and bonding requirements, review of traffic studies, securing of right-of-way) that were necessary prior to lending, in the belief that if the projects eventually proved commercially disastrous, the government would come to the rescue;

- the program was initiated at a time when the local financial markets were not developed; this, combined with the macro-economic crises in the country, inhibited local sources from providing long-term, fixed-rate financing; and

- the institutional capacity -- both public and private -- to execute such a massive program was insufficient for the task, specifically (i) the technical and administrative capacity of the local construction industry, (ii) the project financing experience of most financial intermediaries involved, and (iii) the institutional capabilities of the regulatory officials.

China

21. In China, interest has been both in major bridges and in roads, the most interesting being the Guangzhou-Shenzhen Superhighway; this, the first major toll road so far completed in China, has improved transport between Chinas Pearl River in Guangdong Province and Hong Kong. The first phase, a 123-km dual three-lane facility, which opened in 1994, was developed by a Hong Kong property development company, through a joint venture with the Guangdong provincial government. The project was built on a BOT basis with a 30-year concession period; the developer took on substantial pre-construction risk, including land acquisition for the project, and in addition to tolls, acquired the right to develop commercial property at the highways 15 interchanges.

22. The project cost US$ 1.9 billion, a 60% overrun on the initial estimate. Approximately 60% of the revenues were denominated in local currency and the developer carried the risk of currency devaluation. Alternative toll-free roads were already operating at near-maximum capacity, thus the developer did not consider these as a major threat to the revenues from the tolled traffic.

23. In fact this judgment was in error; the tolls had been set relatively high (equivalent of 10 US cents/km) and even though the alternative routes were congested, truckers continued to use them selectively. Reports are that the operators of the heavy traffic (particularly of container traffic on which much of the optimism on revenue had been based) with two-way radios in their cabs, try and balance the cost of congestion on the toll-free roads with the cost of the tolls on the Superhighway, by switching on and off the latter using the many intersections. Thus the residual traffic on the Superhighway tends to be luxury automobiles, for the drivers of which 'time really is money', and long-distance coaches, but minimal heavy goods traffic. Revenues are thus appreciably lower than forecast, and the planned development at the intersections -- part of the concession -- has not materialized.

Hungary

The M1/M15 Toll Motorway Project

24. The government of Hungary, in 1991, approved a long-term motorway development program, aiming to triple the length of motorways from the then 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. 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. A subsequent feasibility study recommended that the program be commenced with the proposed M1/M15 project, estimated cost about US$300 million, and the government accepted the recommendation. The M1 section (43 km), a critical element in the Transport European Network, was in fact the 'missing link' in the Budapest-Vienna motorway, the other sections of which had already been completed as non-tolled motorways. The M15 motorway (14 km) was to connect the M1 Motorway with the Slovak border, and was conceived as a staged operation -- the first stage comprising only one of the two-lane carriageways. The original schedule called for the M1 section to be completed by the end of 1995, in time for the 1996 World Fair in Budapest, and the M15 by the end of 1997.

25. Bidding was a two stage (prequalification + bidding), transparent process; the invitation to bid requested prequalified consortia to finance, design, build, maintain and operate the M1/M15 project without the use of state funds or sovereign guarantees. The successful consortium (French/Austrian/Hungarian) was awarded the concession, for 35 years, in April 1993, and after 22 months of construction the first privately-financed motorway in the region, the M1 toll motorway, was opened substantially on time (January 1996) and within budget -- a testimony to the efficiency of the private sector. Construction of the first phase of the M15 motorway was completed in December 1997. The initial traffic on the M1/M15, however, remains 35-40% below forecast.

26. The principal government obligations, agreed upon during negotiations, remained limited to:

- preliminary design;

- environmental clearance of the design (this was not a trivial operation given Hungarys stringent and costly environmental requirements to safeguard the habitat of the native fauna);

- land acquisition and site delivery to the concessionaire;

- an undertaking that no toll would be levied, for the first ten years of the concession, on the remaining 126 km of the M1 operated by the government, thus permitting a toll higher than the internationally recognized average toll rates per km on the newly built section.

All commercial, operational and financial risks were borne by the concessionaire and the debt providers; there was no state guarantee as to traffic levels or revenues.

27. The first two years of operation of the tolled section of the M1 produced mixed results. The initial toll rates applied for the main vehicle categories -- equivalent to US 15 cents/km for automobiles and US 45 cents/km for heavy goods vehicles -- were at the top of the range of the EC formula for harmonizing tolls across the Community, to which Hungary had acceded. 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 the users to accept. A legal challenge to the level of the tolls was sustained in the courts, and in the general uncertainty that followed the lenders suspended disbursement of the loans; as a result construction of the M15 was temporarily halted in late 1996, and resumed only when the government provided shareholders with appropriate guarantees.

28. The successful development, bidding, negotiations, financing, construction and operation of this motorway demonstrated that such complex transactions can be completed successfully provided that the appropriate regulatory and legal framework is in place. From the government viewpoint, and in retrospect, it was appropriate to attempt to attract private finance, 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 the users, the allocation of all traffic-linked commercial risks to the private sector proved impossible to maintain. The principal lesson to be learnt is that under the current conditions in Central and Eastern Europe, stand-alone' financing will not be successful, and that substantial public contribution, possibly up to 40/50% of total cost, is necessary to make toll motorway concessions 'bankable'. Negotiations are now underway for restructuring the project.

The M5 Toll Motorway Project

29. The M5 motorway runs south from Budapest, some 140 km, to the border with Serbia, and forms part of the main international transport corridor linking Western Europe with the Balkan region. Following completion of the last (and tolled) section of the M1 Motorway, the government issued an invitation to pre-qualify for the financing, design, construction, maintenance and operation of sections of the M5; the whole operation was to be without use of public funds or sovereign guarantees, other than the in-kind contribution of 30 km of half-finished (one carriageway only) length of the M5, and the land acquisition for the new sections. Only three requests for pre-qualification were received -- probably a commentary on, among other things, the 'tough' requirements for the financing -- and only two bids were eventually received. Evaluation and parallel commercial negotiations followed, leading to downsizing and phasing of the project, and increasing government support to enhance the 'bankability'; a preferred bidder was finally selected in early 1994.

30. At the request of the potential lenders, led by EBRD, a new traffic study was carried out by an independent consultant; the findings were disturbing to the lenders, and further negotiations followed in early 1995 with the aim of amending the concession contract. As a result, government decided to increase substantially, and guarantee, the standby operational subsidy provided by the Road Fund, link its value to the ECU, and include some innovative financing instruments devised by EBRD. Aggregating these changes, government contribution was estimated at about one-third of total cost. Construction of the motorway is in progress and within budget; specifically, of the two phases of the construction, the first phase is complete and in operation, and negotiations have started for the second phase.

31. As with the M1, the M5 tolled highway has generated opposition form the local populace. In the case of the M1, the opposition was chiefly against the 'user-pay' principle; with the M5 the complaints are from villages that are being impacted adversely by traffic diverting from the toll road.

32. The experience of the M5 Toll Motorway has demonstrated that:

- under prevailing conditions in Eastern and Central Europe -- relatively low traffic volumes and weak purchasing power of road users -- considerable government contribution is needed if a public/private partnership for motorway development is to be successful; the amount and type of this contribution should be developed and agreed during the commercial negotiations with the preferred bidder;

- from the public viewpoint, the economic opportunity cost of such a contribution should be carefully evaluated to verify that it is the best use of scarce resources;

- to reduce risk as perceived by potential private investors, a partial traffic (or revenue) guarantee may be necessary from government to help to make a proposed project 'bankable';

- an appropriate traffic/revenue study should be carried out by an independent consultant, selected in conjunction with potential lenders, the results of the study being used to prepare credible financial plans, and to define the appropriate support that would be needed from government; and

- as with the other concessions, a possible negative reaction of the populace should never be discounted.

Poland

33. Poland envisioned a program far greater than that in Hungary. In the mid 1990s Poland announced a concessioning program comprising 2,570 km of tolled motorways, estimated to cost nearly US$8 billion, to be built over a period of 15 years; this was equivalent to about US$3 million/km excluding the cost of financing. One of the governments main objectives in pursuing the concession approach was to minimize the states financial contribution; specifically, governments contribution was to be limited to:

- provision of land;
- possible provision of loan guarantee (in any case not to exceed 50% of the expected investment); and

- introduction of appropriate legislation and administrative procedures for implementation of the program.

The immediate program concentrated on two axes, and envisioned a BOT-type concession with 20 to 30 year concession periods:

- north-south, the Al motorway, 500 km linking the major southern industrial cities of Krakow/Katowice/Gliwice with the central city of Lodz, and the major Baltic seaport of Gdansk, and

- east-west, the A2 motorway (part of the Moscow-Berlin route) form Lodz westwards, close to Poznan and on to the border with Germany; and the A4 motorway, in the south, from Krakow to the border with Ukraine (part of the route from Central Germany to Kiev and beyond).

34. When the first bids were received, it was obvious that 'free-standing' financing would not be viable, certainly in the short-term, and that considerable government support would be needed. Currently the question then is how the problem of inadequate cash flow will be financed, at least in the early years. It is pertinent to note that only recently (August 1998) the Minister of Transport was proposing an amendment to the motorway legislation providing for augmenting the financial participation of the state in motorway concessioning.

Thailand

35. The issue of the level of the tolls, and what would be acceptable politically and to road users, as noted earlier in connection with the legal challenge to the proposed tolls in Hungary, was repeated in Thailand. To help relieve massive congestion in Bangkok, a Japanese-led consortium was granted a 30-year concession to build and operate an 18 km toll road within the city. Just as part of the road was about to be opened, the Expressway Authority had second thoughts on the toll (US$ 1.25 equivalent) that had been specified in the concession agreement, and insisted that it be reduced by one-third. The consortium was not prepared to accept the reduced revenue that this would imply, delayed opening the completed work, and halted further construction. The Authority, fearing rioting by frustrated road users, obtained a court order to force the road to be opened, and insisted on re-starting negotiations to settle this and other outstanding issues. There were attempts thereafter to resolve the dispute by local companies taking over the majority stake of the Japanese partner in the original consortium. This experience underlines the point that throughout the initial negotiating process, the reaction of the road users, and their likely perception and reaction to tolls, should be well researched and fully taken into account.

The United States

36. Interest in the area of private sector involvement in road construction revived in the United States in 1980s. Two noteworthy examples are:

- the SR-91 in California; 16 km of new 4-lane construction within the median of an existing highway, a successful 'congestion-reliever', and

- the 'Dulles Greenway', 22 km, completed only a few years ago and serving the Virginia suburbs of Washington DC. The original traffic projection was 34,000 vehicles/day within a year of opening and with a $2 toll, but in fact the Greenway had attracted only a daily average of 11,500 at the end of the first six months. The toll was reduced, therefore, to $1.75 and then to $ 1.00. Usage increased, but only to a daily average of 23,000, a striking example of the elasticity of the demand, yet traffic was still only two-thirds of that predicted. And in Summer 1998 the concessionaire was granted yet another deferral of loan payment because of lack of revenue. So even the most sophisticated methods of traffic prediction may sometimes be deficient.

The United Kingdom

37. In the United Kingdom there is the example of Dartford Bridge, completed a few years ago as part of the ring road (M25) round London; this is illustrative of the characteristics of large bridges and tunnels in the context of concessioning. Bridges and tunnels are often considered in a separate category because of their unique characteristics; they are typically very short, very expensive to build (per km) relative to roads, but serve high volumes of 'captive' traffic. Some bridges and tunnels, particularly major ones, can be thought of as extreme examples of congestion relievers, and like congestion relievers they tend to be

attractive for 'project finance' as a result of the heavy traffic served. Dartford Bridge was built to relieve congestion in the two existing tunnels that carried the M25 under the Thames. Construction of the bridge used about $32 million in toll revenues from the existing tunnels during construction; it was also one of the more expensive privately financed projects -- a cost of US$ 247 million for 2.8 kilometers of route length, or US$88 million/km.

38. But in addition to financing of new construction, there has also been experimentation with concessioning of maintenance (with possibly only minor upgrading) and operations, notably in Latin America.

MAINTENANCE & OPERATION CONCESSIONS

Chile

39. Chile has experienced economic growth at an average rate of 6% per year over the past 12 years, but investment in the road system did not keep pace. Despite increased investment in the last few years, the back-log in construction and rehabilitation has persisted. The government, realizing that public funding would not be sufficient, adopted a concession program to meet the shortfall in the funding necessary for the road network; it hoped, at the same time, that inclusion of the private sector would bring with it efficiencies in design, construction, operation and maintenance of the network, through adoption of modem management techniques and innovative solutions to meet the complexities of road development and long-term operation and maintenance.

40. At the outset the government was careful to set out the crucial parameters of the program -- maximum permissible levels for the tolls, terms of the concessions, and principal design parameters, the aim being to create a business environment that would be attractive to the private sector, while still protecting the public interest. The benefits to the users were also taken into account right from the start, since a basic principle was that the users of the program should feel that they were receiving a satisfactory and safe service that was worth the additional payment (in tolls) and reflected actual savings in their operating costs. In this connection, it is interesting to record that government adopted a system of 'peak tolling', one section, for example, with traffic of about 7,000 vehicles/day being tolled at the equivalent of US$ 2.20 in off-peak periods, rising to US$ 3. 10 in the peaks.

41. The government had always kept in mind the basic 'finance' of the road sections selected for the program, specifically the connection between traffic levels and toll revenue; on the main north-south highway (3,200 km) only about half was selected for the earliest phases of the program -- the remaining sections were deferred because traffic levels were not considered adequate to support a concession program.

Argentina

42. In Argentina, concessioning on the major road network started in 1990. The country had an established, well-connected but poorly-maintained network, maintenance had received low priority because of shortage of public funding and of the high cost of public sector construction and maintenance. Argentinas main objectives were therefore reconstruction and maintenance of existing roads, rather than new construction, and simultaneously a reduction of the public support required by the sector. Involving the private sector in exchange for the right to charge user tolls was seen as a way to shift the financial burden to the users, and at the same time to maintain roads more efficiently than previously. Most of the road traffic is concentrated around the national capital, Buenos Aires, and a few provincial capitals, and on the inter-city links serving them.

43. The concessioning program was carried out in two steps. First the government, in 1990, concessioned about one-third of the inter-city highway system, by awarding twelve 12-year concessions. The roads involved had traffic of the order of 2,000 - 2,500 vehicles/day, and in return for the right to collect tolls, the concessionaires were required to undertake a program of maintenance, rehabilitation and capacity improvements. The bidding was competitive, with a total of 147 bids submitted for the 12 sections. Then, in 1992, the government launched the second stage, for the maintenance, operation and improvement of three of the strategic arteries radiating from Buenos Aires. For this latter stage, the government benefited from its experience of the bidding on the inter-city links, and designed simple, straightforward concession terms and bidding criteria. Tolls vary by road and by type of vehicle, from 1.6 US cents/km for automobiles to 13.6 US cents/km for heavy vehicles.

44. What can be learnt from the Argentine experience?

- the importance of having simple and transparent criteria for the bidding. In the initial round for the inter-city concessions, bidders had to contend with a long list of technical and financial criteria, all with different weightings; in contrast, the bidding for the Buenos Aires access roads used a single criterion, and investment obligations were discussed with potential investors before the bidding documents were finalized;

- the rules for re-negotiating contracts, if that should become necessary or desirable, should be defined as early and as clearly as possible in the negotiating process; and

- institution building must be taken seriously, particularly when central and provincial responsibilities are involved, as they were in Argentina. Before the program was initiated, responsibility for the main technical functions relating to the national highway system (planning, design, construction and maintenance) was vested in the center, those for the provincial systems with the provinces. Reform transferred management and control of all roads to the provinces, the central agencies' responsibility being confined to national planning and coordination, allocation of resources and auditing of their use on national highways, also regulation of the national system. At the start of the concessioning program, the central body did not perform any of these functions

satisfactorily; it did not adequately supervise the concessionaires, nor did it require meaningful reporting by them. For example, concessionaires were allowed to collect the tolls before they had invested in the required improvements; this led to a political revolt by the truckers and other road users who were required to pay tolls, but saw little benefit from so doing.

Colombia

45. The main problem of Colombias road system has been the poor operating condition of the highways that serve the largest consumption and production centers. Years of chronic deficit in public funding have resulted in an untimely implementation of investments, and a poor quality of maintenance, particularly of the primary highways. The national planning department estimated that the low levels of funding of the roads sub-sector had resulted in an additional economic cost of about 2.7% of the Gross Domestic Product. Government strategy now is to address these constraints by *inter alia* seeking to expand the role of the private sector through contracting out of all operations that are the responsibility of the National Institute of Highways, and bringing in private sources to finance and manage road projects under long-term concessions.

46. The Government has developed in the 1990s a steadily expanding program of concessions comprising: (i) operation and maintenance of existing highways; (ii) rehabilitation, operation and maintenance of existing highways; and (iii) construction, operation and maintenance of new highways. Particular attention has been paid to funding the problems of tunnel construction on the new highways, where in areas of unstable and unpredictable geological conditions, substantial additional work may arise that could not be foreseen at the design stage. These project components have been concessioned for a period of 24 years, including a construction period of four years. The design and structure of the concessions, as offered at the bidding stage, have sought to strike a balance in the distribution of the projects risks between sponsors, lenders and the National Institute of Highways.

47. Historically, toll rates on earlier tolled sections of national highways kept pace with inflation. This policy of indexing toll rates will continue under this new program, with initial charges being set at levels deemed to be within the users' willingness to pay. Even so, the risk of user resistance to the tolls is considered significant.

SHADOW TOLLS

48. In the United Kingdom the motorway network has been built by the state, and there are no direct user charges, but as in many other countries government does not have sufficient funds to finance new roads, improve existing roads, or even to maintain the roads to the required standard. So government has set out a program to encourage private sector involvement, called DBFO -- Design, Build, Finance and Operate -- and most of the projects now being bid under this concept are a mixture of improvement and maintenance, but mainly the latter. Tolls will not be charged on DBFO projects, but instead the government will pay

to the concessionaire, from public funds, an agreed amount for each vehicle that uses the road throughout the concession period. The potential concessionaires estimate the traffic flows over the concession period (not a simple task) and then bid a shadow toll' for each type of vehicle. With the motorway constructed and in operation, the concessionaire is paid the shadow tolls relevant to the actual traffic.

49. In Portugal, plans to collect tolls directly from users have generated problems for motorway concessions, and so government is turning to shadow tolls. Specifically, it seeks to accelerate improvement of its highway network to toll road standards with the introduction of a US$ 1.5 billion construction program remunerated out of shadow tolls under 50-year franchises. In Spain, the government of the Madrid region is initiating the country's first shadow toll program, covering 36 km of the Madrid Ring Road; the cost estimate is US$ 268 million equivalent, and the design-build-finance-operate franchise will be for 25 years. Traffic is estimated at 100,000 vehicles/day in the opening year (2000). Obviously shadow tolling is becoming increasingly popular, particularly where there may be strong public opposition to, and lack of political enthusiasm for, direct tolling and the 'user pay' principle.

CONCLUSIONS

50. The main lessons about private-sector financing in the roads sector can be summarized as follows:

- Involvement of the private sector is sound in theory, but in practice it is difficult to recollect a completely satisfactory example of private sector financing of road construction; private financing of major bridges and tunnels appears to be more practicable doubtless because the traffic is largely 'captive', and hence there can be more confidence in the traffic projections. Involvement of the private sector in concessions for road maintenance and operations has generally been more successful, compared with construction.

- A feature of private sector financing is the large number of 'actors' involved, each with their own, and often conflicting objectives and agenda. Principally because of this, private sector financing for a proposed project takes considerably more time to develop and is more complex than would be the same project financed entirely from budgetary sources.

- Particularly in the early stages of a program of private sector financing, Highway Authorities benefit considerably from independent legal and financial advisory services.

- Although the preparatory stages of a proposed private financing take longer than 'direct' financing from public sources, once under way, implementation is often shorter and more efficient; the work on the M1 (Hungary) exemplifies this point.

- Where the private concessionaire is providing a service that impacts directly on the road user, the level of the tariffs and the quality of the service provided can become particularly sensitive in political terms -- the recourse to the courts in connection with the tolls on the tolled section of the M 1 (Hungary), and the fear of riots in Bangkok, amply demonstrate this point.

- When a concession or BOT contract is to be awarded, open competition generally yields better results than direct negotiation with just one party.

TABLE 1

Publicly and privately managed toll roads in selected countries

(kilometers)

Country	*Publicly managed toll roads (km)*	*Privately managed toll roads (km)*	*Main road network (km)*	*Privately managed toll roads as % of main road network*
Argentina	0	9,800	37,137	26.4
France	6,025	743	28,000	2.7
Hungary	0	173	29,653	0.6
Indonesia	280	277.5	31,000	0.9
Italy	0	5,550	46,900	11.8
Japan	8,723	0	59,000	0.0
Korea, Rep.of	1,840	40	12,100	0.3
Malaysia	0	1940	15,900	12.2
Mexico	2,507	3,872	45,600	8.5
South Africa	0	1838	59,900	3.1
Spain	0	2,063	23,131	8.9

Sources:
1. "Commercial Management and Financing of Roads," Ian Heggie and Peter Vickers, World Bank, 1998.
2. World Bank Data.

TABLE 2

Toll Rates in Selected Countries
(dollar/km)

Country	*Minimum*	*Maximum*	*Average*
A. ROADS			
Argentina			
Passenger Cars	0.01	0.03	0.02
Trucks	0.02	0.13	0.07
Australia			
Passenger Cars	0.03	0.08	0.06
Trucks	0.09	0.20	0.14
Brazil			
Passenger Cars	0.02	0.05	0.03
Trucks	0.14	0.24	0.18
France			
Passenger Cars	0.06	0.08	0.07
Trucks	0.13	0.18	0.15
Italy			
Passenger Cars	n/a	n/a	0.05
Trucks	n/a	n/a	0.12
Japan			
Passenger Cars	0.07	1.04	0.29
Trucks	0.23	3.73	0.70
Malaysia			
Passenger Cars	n/a	n/a	0.01
Trucks	n/a	n/a	0.03
Mexico			
Passenger Cars	n/a	n/a	0.07
Trucks	n/a	n/a	0.29
Norway			
Passenger Cars	n/a	n/a	0.08
Trucks	n/a	n/a	0.08
Portugal			
Passenger Cars	n/a	n/a	0.04
Trucks	n/a	n/a	0.09
South Africa			
Passenger Cars	0.01	0.09	0.03
Trucks	0.03	0.64	0.14
Spain			
Passenger Cars	n/a	n/a	0.08
Trucks	n/a	n/a	0.16

TABLE 2

Toll Rates in Selected Countries (*continued*)

Country	*Minimum*	*Maximum*	*Average*
Unites States			
Passenger Cars	0.02	0.08	0.04
Trucks	0.06	0.37	0.18
B. BRIDGES			
Brazil			
Passenger Cars	0.09	0.25	0.11
Trucks	0.52	0.80	0.66
Canada			
Passenger Cars	0.45	1.20	0.81
Trucks	1.71	5.44	2.98
Denmark			
Passenger Cars	n/a	n/a	1.63
Trucks	n/a	n/a	5.31
England			
Passenger Cars	0.56	0.64	0.37
Trucks	1.45	4.16	1.74
Ireland			
Passenger Cars	0.36	0.54	0.28
Trucks	1.17	1.62	0.87
Japan			
Passenger Cars	0.50	1.04	0.75
Trucks	1.08	3.73	2.49
Scotland			
Passenger Cars	n/a	n/a	0.54
Trucks	n/a	n/a	1.35
C. TUNNELS			
Japan			
Passenger Cars	0.24	2.06	0.7
Trucks	0.65	5.66	2.0

Sources:
1. "Toll Rates Survey", International Bridge, Tunnel and Turnpike Association, February 1998.
2. World Bank Data.

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