PUBLIC FINANCE OF THE HIGHWAY SECTOR
1. PRINCIPLES FOR ROAD USER CHARGES

Objectives for Road User Charging

1. Roads have often been treated as public goods, financed from general taxation rather than through cost-related charges. In this chapter, we consider the objectives of road user charges and their implications for the levels and structure of taxes which are generally used as proxies for direct road charges.

2. Efficient allocation of resources between sectors. Economic efficiency requires that the user of resources pays the marginal social costs associated with the use of those resources. If the user is charged less than these costs, then the cost of resources used will be greater than the benefits generated and the resources could be better used elsewhere. Conversely, if the user is charged more than the marginal costs, then demand will be less than optimum and overall benefits could be increased by increased resource use. The use of the resources should only be free in the case of pure public goods for which the use by one consumer has no impact on the availability of the resource for other consumers.

3. For roads and road transport, this means that no category of vehicle should pay less than the sum of the following:

   • The economic cost of the fuel and the other resources consumed in making the trip. These may be termed the private marginal costs of using the road network.
   • The marginal road maintenance cost: additional traffic, especially heavy commercial traffic, increase road deterioration, reduce the pavement life and increase the cost of road maintenance and renewal.
   • The marginal environmental cost: increased traffic raised the levels of vehicle emissions, noise pollution, etc. The costs are not borne by the road user but by society, mainly those people living and working close to the roads.
   • The marginal congestion cost imposed on other vehicles: as vehicle flows increase, vehicle speeds decline. The individual road user considers only his/her personal time and cost but their use of the road may well increase the travel time and costs of all users of that road.

4. There are recurrent costs associated with road provision and maintenance that are not related to use and on which the level of vehicle flow has no impact: weather and time related road maintenance, for example. Such costs should be financed by the means which causes the least economic and equity distortion.

5. Whether road users should also be charged the capital costs of network expansion/enhancement, in response to traffic growth and heavier vehicles, what might be termed the long-run marginal cost of the network, raises further issues and is discussed below.

6. Efficient use of resources within the road sector. Another important efficiency dimension in structuring a charging system is to avoid significant distortions within the sector. In the transport sector, it is important to avoid three distortions:

   • Distortion between vehicle classes and their users: charges on different categories of vehicle should appropriately reflect the differences in the costs that they impose on the system.
   • Distortion between modes: inappropriate charging structures on different transport modes, which compete closely for the same types of passenger and freight traffic, can

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1 For a more detailed exposition of this issue see Efficient Transport Taxes and Charges, ECMT, 2000, also available at [http://www.oecd.org/cem/](http://www.oecd.org/cem/)
have a marked negative impact on traffic allocation and economic efficiency. This is a significant distortion in India.

- **Distortion between locations:** this can occur, if the charging/financing structure in some states are significantly different to those in others. This may distort decisions on the location of economic activity or vehicle registration but its impact is probably lower than for the first two distortions.

7. **Equity** There are several dimension of equity that are or may be relevant to the structuring of a road user charging system:

- **Horizontal equity:** vehicles within the same category, imposing the same costs on society, should pay the same level of charges. Fuel tax is equitable, in this regard, as the payment is generally proportionate to road use. Different annual vehicle charges, depending upon the place of licensing as in India, may not be.

- **Vertical equity:** charges paid by different vehicle categories should vary in proportion to the costs that the categories impose. Fuel tax is not equitable; the increase in fuel consumed, as vehicle weight increases, is not proportional to the increase in road damage imposed. Insofar as heavier vehicles use diesel, a rough degree of vertical equity could be achieved by imposing heavier taxes on diesel than on gasoline.

- **Distributional equity:** this is normally interpreted as requiring charges/taxes to be progressive, with higher income users paying higher charges. This would suggest higher taxes on gasoline which, in low and medium income countries, is used in the cars owned by relatively rich. Equity considerations may be particularly important to finance those costs which are not directly attributable to individual vehicles. Distribution equity, however, can also be interpreted as requiring road users to fund all the cost associated with the provision of roads.

8. Hence, the implications for policy, when considering equity, are complex.

9. **Environment** Particularly in urban areas, road transport can be a significant source of air pollution. Absolute tax levels, and differential taxes on specific fuels, can be important instruments in supporting policies to reduce total traffic and encourage the use of less polluting modes of transport, transport technologies and/or fuels, such as CNG.

### The Costs To Be Covered by Road User Charges

10. There is a broad consensus regarding the costs that should be covered by road user charges with the exception of whether investment in new or improved roads should be financed exclusively by present road users.

11. **Full road maintenance costs** For efficiency reasons, as discussed above, all vehicles should be required to meet the full costs of road maintenance which are attributable to their use of the road network. Such maintenance includes not only the day-to-day routine maintenance (repairing potholes, for example) but also the more periodic resealing and strengthening of the pavements. Some maintenance costs are, however, not directly attributable to vehicle use. However, it is now generally agreed that vehicles, as a whole, should meet the full costs of road maintenance, assuming that all the roads make economic sense.

12. In principle, charges should be disaggregated by road type or even road section but, in practice, this is not possible. The road sections and types of primary road jointly provide a transport system and it is a reasonable approximation to make cost recovery at the level of the aggregate primary network. When considering the costs to be recovered, it is important to remember that it should be the costs which are imposed on the roads, and not the expenditures on road maintenance as these may be inadequate to remedy the level of wear and tear and the quality of the roads may thus be deteriorating.
13. There are some costs of road maintenance which are not variable with use and cannot be strictly attributed to specific vehicle categories, but costs nevertheless which need to be financed. Two broad approaches might be adopted to finance these non- attributable costs:

(a) **Equity distribution approach**: the higher income groups, primarily car owners, should finance the costs through higher charges (higher charges on gasoline) as they benefit from the road network and can afford to pay higher charges;

(b) **Economic pricing approach**: the fixed costs should be financed by charges which impose the least distortion on the use of the road network. Such charges could be set by:

- An annual vehicle license fee: once paid, there would be no impact on the individuals’ decisions as to whether to use the network, the cost of the marginal trip would not be changed.

- Charges established through Ramsey pricing principles: to minimize the impact on total use, the additional charges necessary to cover the fixed costs should be set in inverse proportion to the demand elasticity. Higher charges would thus be established for those vehicle categories with the lowest travel demand elasticity.

14. **System administration costs.** The costs involved in managing road use (traffic police, traffic signaling, etc), in collecting the various user charges and in enforcing their payment, should also be met by users. Where administrative services (such as licensing, emissions testing, etc) impose costs, these costs at least should be recovered as a minimum directly from the users concerned through vehicle related fees.²

15. **Environmental and other externality costs.** In principle, the monetary cost of environmental impacts should also be included in the costs which should be recovered from users. These externalities include global and local air pollution, and road accidents. As far as environmental externalities are concerned, the health impact of local air pollution is usually considered to be the most significant. These can be roughly quantified, using dose/response relationships and then monetarized using stated preference evaluation methods for values of life, lost output and medical costs for morbidity.³

16. Where the fuel tax includes an element for environmental costs, the revenues which this generates should, in principle, be dedicated to compensating those who suffer from the impacts. In practice, because no direct compensation mechanisms are available the second best would be to devote the revenue to reductions in the level of environmental pollution.

17. As far as accidents are concerned, if there were a well functioning insurance and compensation system in existence, it would be reasonable to assume that accident costs were being fully covered. However, where medical costs are not paid for by the parties to accidents, and where those are costs borne by the state or by the injured parties, the excess of total accident costs over insurance payments should, in principle, also be recovered from road users. These revenues should be transferred to the parties bearing the costs. In practice, these calculations are very difficult to make, so it is more a matter of political judgment than scientific calculation as to what sums should be transferred.

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² These charges need not necessarily be restricted to covering merely the administrative costs if they happen to be an effective and efficient instrument for allocating the fixed costs between users in a non-distorting way, or to compensate for defects in the precision of charges for the costs that are variable with use. For example, in the absence of any better way of ensuring that heavy goods vehicles pay their proper share of road maintenance costs, the licensing duty structure may be set so that, on average, heavy goods vehicles do pay adequately.

³ Guidance on how to do this, and what information is available to assist it are to be found in the World Bank draft “Manual on Air Pollution from Mobile Sources” to be published later this year.
18. **Congestion costs** Road congestion pricing is now being given much wider consideration; Singapore has had congestion pricing for many years, and London introduced a central area congestion charge in 2003. In many countries, congestion pricing is only relevant to urban and suburban areas. However, congestion is also a phenomenon which can be experienced on inter-urban roads. In the UK and USA, for example, several motorways now experience congestion. More particularly, in India, the low capacity of the inter-urban highway network means that vehicle speeds are low, service standards poor, and additional vehicles will reduce these speeds/standards even further. Much of India’s main road network suffers from a level of congestion, and slow moving vehicles impose significant costs on other road users and should be charged for such costs.

19. **Capital investment costs.** The treatment of investment costs for new or improved roads is theoretically more difficult. It is agreed that road users should not be charged for the vast investment that has already been made in the road network, it is a more a question of whether road users should pay for the investment which is now being made in expanding and improving the network; whether road users should pay simply the short-run marginal costs or a longer run marginal costs including the capacity expansion cost.

20. A normal business, expanding too rapidly to finance capital expansion from revenues, resorts to borrowing. The annual capital charge may then be set to service the debt on the capital investment. Where the road system is well established, and its size is not growing rapidly, current year capital expenditure and the appropriate servicing charge for capital may be approximately equal. That is the presumption made in road cost accounting in some of the industrialized countries such as the United Kingdom.

21. In periods of very rapid growth of the capital in the network, as envisaged in the next decade in India, the annual investment costs are likely to exceed the “correct” capital charge. Trying to recoup these capital costs from current revenue is likely to inhibit the desired rate of investment as well as impose substantial costs on road users. Furthermore, while the efficiency objective requires that all categories of users pay at least the marginal social costs of their use of roads, it does not necessarily require that the full current year costs of investment expenditures be recovered from current users; this would put the burden of a long-term strategy excessively and unnecessarily on the current generation. Hence it is recommended that, in accordance with normal commercial principles, it should be the annual servicing charge on the capital employed that should be recovered from users, and not the current year’s capital expenditure. However, if the political decision is made to raise capital finance from vehicle related charges, then this revenue should, as far as possible be raised from vehicle related charges (based on attributable costs) with, as far as possible, a zero marginal tax impact.

22. A recent European Conference of Ministers of Transport report analyzed this complex issue⁴. Its conclusion was that 100% coverage of infrastructure expenditures by transport user charges alone is not an appropriate basis for ensuring efficiency. In the rail sector, increasing returns to scale mean that marginal social costs will be below average costs and transfers from general taxation will be required to cover total costs. In contrast, in the road sector, marginal social costs may vary greatly depending on the level of congestion and other externalities. Hence, marginal social cost pricing in the road sector may result in surplus revenues in some urban areas (of the order of 150%) but under recovery in rural areas.

**Suitable Tax and Charging Instruments**

23. A range of instruments has been used internationally to tax/charge users for road-related costs. An important defining characteristic of these charges is their proximity to the point of use – the “directness” of the tax. The range of instruments, their prevalence internationally, and a rough categorization by directness is shown in Figure 1. In general, for

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⁴ Efficient Transport Taxes and Charges, OECD, 2000
practical and political reasons, most countries still use relatively indirect tax instruments; however, this is changing as technology has developed and public pressure has grown to link charges more directly with use.

Figure 1: Tax/Charging Instruments Applied to the Road Sector

24. As fuel taxes, annual license fees, and tolls are likely to form the backbone of the revenue stream for the highway network, in the future, they are now explored in more detail. In addition, a brief description is also given of some new user charging initiatives that have been developed to overcome the disadvantages of previous charging instruments.

25. **Fuel taxes.** Both developed and developing countries rely on fuel taxation as the major source of taxation to finance road sector needs. Fuel taxation is also a major source of general government revenue. In India, gasoline, and less so diesel, are already subject to higher tax rates than other commodities.

26. The retail fuel prices for motor spirit and diesel, in different countries, are given in Annex 1. Countries can be broadly grouped into four categories with respect to fuel taxation:
   
   i. Oil producing countries with very low prices or price subsidies (Egypt, Indonesia, Iran, Nigeria);
   
   ii. Countries with low overall taxation rates (e.g. USA, an average tax of 10 US cents per litre);
   
   iii. Countries with medium level of taxes of 10 - 30 US cents per litre (India and many other developing countries); and
   
   iv. High price countries with taxes ranging between 60 cents to 110 cents per litre (mostly EU and Japan).

27. Fuel tax as an instrument in a well structured road tax regime has many attractions.
   
   - It is fiscally efficient (cheap to collect, low evasion, etc). It can be collected at the refinery and/or point of distribution and good records can be maintained to ensure transparency.
   
   - Limited impact on demand due to low price elasticity.
• Relatively progressive as travel demand is usually income elastic.

• Reasonably good measure for distance related costs as fuel consumption is highly correlated with the distance traveled; thus reasonably fair for allocating variable costs within vehicle categories.

• Correlated with environmental damage; global warming effects are fairly directly proportional to the amount of fuel consumed. Where different fuels have different environmental impacts, e.g. emissions of particulate matter, differential levels of taxation can be levied.

28. Fuel tax, especially on diesel, has some major limitations as an efficient road user charge:

• Fuel consumption does not vary proportionally with vehicle weight. Fuel taxation does not accurately reflect road damage costs and heavy vehicles are relatively undercharged. This may adversely affect the choice of vehicles.

• There can be fuel substitution or adulteration. If kerosene prices are kept low, for social reasons, it may be added to diesel, with adverse environmental and fiscal consequences. One estimate of substitutability, between fuels, and between fuels and other inputs, suggests that the dead weight tax loss (i.e. what is lost in excess of what the Government receives) may amount to over 50 percent of the tax revenue. Much smaller dead weight losses are estimated for taxes on vehicles, spare parts and tyres. Diesel and close substitutes have usually to be taxed at similar rates to avoid widespread fuel substitution or adulteration.

• About 46 percent of diesel, in India, is consumed outside the transport sector. Non-transport uses of diesel should normally be untaxed but exemptions are difficult to monitor and enforce effectively.

29. There are clearly limits to the levels of tax that can be efficiently levied on diesel.

30. Annual vehicle licenses. Many countries use annual license fees as both a policing/control measure and as a means to supplement fuel taxes for road user charging. The great advantage of vehicle licenses is that they can discriminate within vehicle categories as well as between vehicle categories. They can, for example, discriminate within the car category by weight or power, and within the heavy commercial vehicle category by weight and/or axle configuration. Vehicle licenses are thus a very flexible instrument for road user charging.

31. License fees are often used to recovery the fixed costs of the network as well as to recover the costs of road damage that heavy vehicles inflict but are not adequately recovered by fuel and other charges. The fees can thus be set to encourage the use of larger, multi-axle commercial vehicles which normally cause less road damage. License fees are fixed charges which is an advantage for the recovery of fixed costs, as they do not influence the decision as to whether to make particular trips. On the other hand, the fixed nature of the charge makes annual license fees an imperfect charge for the recovery of variable costs. The fees discriminate against those vehicles which have low total utilization, often old vehicles making short trips, though this may have the benefit of promoting the renewal of the vehicle fleet with newer, more efficient and less damaging vehicles.

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5 Newbery, Hughes, Peterson and Bennathan, Road Transport Taxation in Developing Countries. The Design of user charges and Taxes for Tunisian, World Bank Discussion Paper 26, 1988.

6 The annual UK license fee for a 40 ton/5 axle vehicle is currently £3,950: the fee for a 44 ton/6 axle vehicle is £2,950
32. While not ideal, annual license fees are used very widely to recover road damage costs. They are more costly to collect but are already generally required for registration and vehicle inspection purposes. Very high license fees may, however, result in evasion and the use of counterfeit documentation.

33. **Road tolls** All tolls\(^7\) deter traffic and will discourage some trips of positive value if the toll levels are set at levels above social marginal cost. However, in aggregate, the imposition of higher toll levels may increase total economic welfare in three circumstances.

- Where the toll is necessary to finance, or accelerate, the provision of a facility which would not otherwise be provided. Benefits of this type are particularly important in India where demand is growing rapidly but general taxation/road user charges are insufficient to meet the desired level of investment.

- Where the tolled facility is itself congested and the toll secures a more optimal level of utilization (fewer users, moving more quickly). These benefits arise as a consequence of deterring some trips with a net marginal value (above private operating and time costs) less than the toll and hence improve the performance of the system for those trips with higher values.

- Where the whole system, including the tolled road and alternative untolled routes, is congested. The tolls “sort” the traffic so that the vehicles with the highest value of time savings use the faster tolled route, while those with a lower value of time, and hence a lower willingness to pay, use the untolled route. In such circumstances, often in urban areas, overall user charges might be increased to reflect the prevailing congestion.

34. Where a new toll financed route is provided, which would not have existed without tolling, both the traffic on the tolled route and those users remaining on the untolled route benefit, when compared with the situation of only the untolled facility. However, when an existing route is tolled, without any extra capacity or service quality, users with higher values of time will benefit and users with lower value of time will be worse off.

35. When tolls are imposed on existing facilities, in addition to existing levels of taxation, they will obviously increase the total revenue raised from road users. When the additional revenue is used to improve the network (additional capacity and/or better maintenance) road users may still be better off than without the tolls. This impact is often not recognized by road users and governments need to ensure that, when introducing a general toll regime on major links, sufficient attention is given to explaining to road users how the toll revenues will be used and what benefits will accrue.

36. “What level of toll is acceptable to users”? The answer is often given in terms of the proportion of the net benefits which are captured as tolls. A more scientific answer can be sought by considering the motivations for choice. The users of new tolled facilities demonstrate, by their choice of route, that they value their time and other savings more than the cost of the toll. Conversely, those who choose not to use the tolled road are demonstrating that they value the potential benefits less than the cost of the toll (though they may still benefit from lower traffic on the untolled road and thus increased speeds and higher service standards). Theoretically, social welfare will be maximized when the toll is set at the level which maximizes the total net benefits to both sets of users plus the profit (or loss) to the toll road operator.

\(^7\) Shadow tolls: concessions are awarded to the private sector (e.g. in the UK) to build and maintain roads with government payments to the concessionaire based on the traffic using the road. Such “shadow tolls” combine the advantages of the greater flexibility of private sector investment and system management, and avoid the deterrence to traffic and other practical and political difficulties and costs in imposing tolls. Shadow tolls should not be confused with real tolls; they generate no additional revenue and hence do not contribute to solving the financing issue.
37.  **Weight/distance charges** A serious deficiency in the road tax structure exists in relation to heavy commercial vehicles. The road damage costs more steeply with weight than fuel consumption and thus the tax/charges on the fuel used. Many countries compensate with annual vehicle fees, but these are imperfect charges for use-related costs. A more efficient solution is the introduction of a weight-distance charge for heavy goods vehicles. This type of instrument has been used effectively in Switzerland and New Zealand, is to be introduced in Austria in 2004 and the United Kingdom in 2006. The fact that a weight-distance charge applies only to heavy commercial vehicles makes it less vulnerable to fraud and corruption, especially if associated with very heavy penalties.

38. Advances in communication technology and the ready availability of GPS is leading to even more developments in road-user charges, especially in Western Europe, with commercial vehicle charges related to not just weight and distances but also the category of road used. There are now discussions in the UK to extend this type of approach to all vehicles and totally restructure vehicle taxation, substantially reducing fixed charges and fuel taxes and relying on direct pricing for road use.

**Simple Charging Structures**

39. The tradeoffs to be considered in relation to the use of weight/distance charges represent an example of a broader problem: striking a balance between the practical and the theoretically efficient. This is very important when designing a robust road user charge system; simple structures ease administration, reduce administrative costs, reduce tax evasion, and lower the costs of compliance. Complexity encourages evasion, lowers the probability of detection and reduces transport revenue collection. There are also substantial benefits to charging close to the point of use; this allows pricing signals to be perceived more easily and more directly by road users and enhances the incentives for rational choice in travel demand. There is thus a tradeoff between imposing charges that closely reflect the social marginal cost of use (and are perceived by users as reflecting the costs they impose) and using instruments that are cost effective to collect and administer.

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8 The Administration of Road User Taxes in Developing Countries, Bahl R, World Bank Working Paper, 1992
PRIVATE FINANCE OF THE HIGHWAY SECTOR
7. PRINCIPLES OF PSP IN ROADS

Introduction

1. There is an ongoing public policy debate in India on how to fund the necessary new investment as well as operations and maintenance on the growing national and state highway network. The GOI and many state governments are interested in broadening the role of the private sector in highway development with a view to strengthening and expanding private financing of highways. There are several key determinants of the viability of privately financed road programs including, the country regulatory and legal environment and the resulting nature of the public/private risk regime. Compared with other infrastructure projects, there are several financing difficulties inherent in road projects such as the acquisition of long-segments of right of way and associated resettlement issues as well as unforeseen geological and weather conditions. In addition, there are substantive risks associated with the unpredictability of revenues and toll receipts due to competing routes, unexpected revision in toll rates and availability of connecting roads. This section briefly describes how governments can facilitate PSP. The next section summarizes how this theory has been applied in practice internationally. Further sections set out a framework for PSP for Indian Roads, Indian experience with private sector participation and financing of roads, summarises the main remaining constraints and then provides some recommendations.

Enabling Environment for PSP

2. International best practice shows that a sound legal, institutional and procurement framework are the necessary foundations to enable and encourage private investment in the sector. Indeed, providing an enabling environment and improving the existing framework within which PSP/PPP can be implemented is a key factor in mobilizing private participation and leveraging public funds to meet the financing needs of the road sector.

3. **Legislative Environment.** A fair and impartial legislative and regulatory regime is an essential prerequisite for sustainable development of highways projects with private sector participation. Existing laws and regulations can impose constraints for execution of such projects. A fair, impartial, and non-discriminatory legal regime allays investors’ apprehensions about discriminatory treatment under law. Investors wish to be reassured that the legal provisions in force and applicable in relevant spheres like land, contract, property, corporate functions, taxation, labor relations etc. would be applied in a fair, equitable and objective manner and would allow, inter-alia:

- Grant of concession i.e. transfer by Government of the right of construction and maintenance of roads to a private party;
- Levy and collection of tolls for use of roads and facilities by the private investors;
- Statutory backing for the Concession Agreement specifying the rights, duties and obligations of the parties involved;
- Repatriation of investment and net profits after expiry of the Concession period; and
- Safeguarding of investors’ interests in case of change of Government/Government policy.

4. **Regulatory Environment** Coupled with a sound legal environment is the need for fair and independent regulation. This plays a significant role in dispute resolution, fixation and revision of tolls and monitoring of construction and maintenance contracts. Broadly, a regulator needs to strike a fine balance between investors’ legitimate concerns in getting a reasonable return, the genuine needs and requirements of users and governmental concerns of getting value for money. Regulation can be achieved either through “regulation by contract” where each contract specifies the roles and obligations of the parties involved, and/or by
setting up a regulator to regulate sector wide activities. Where a large PPP program is planned the establishment of a regulator eventually would be a preferable option to maintain a consistent regulatory regime and ensure a level playing field for all stakeholders. An autonomous and independent regulatory authority is the preferred option where a Government is serious about facilitating PSP. To be effective, such a Regulatory Authority would ideally be a statutory, autonomous and impartial body with appropriate powers and functions.

5. **Institutional arrangements for facilitating PSP**

   Fragmented jurisdiction, multiple authorities, complex procedural requirements and lack of capacity are sited as one of the key deterrents for facilitating PSP in infrastructure. Cumbersome approval processes leave many important and routine decisions to administrative authorities. Responsibilities should be clearly delegated between central and local approval authorities and rules and regulations for approval process should be made transparent. Standardized processes such as inquiry and submission forms, concession contracts and O&M contracts facilitate PSP by introducing efficiency and transparency in procedures. “One-stop-shops” are usually successful if there is support from the highest levels of governments. Providing all relevant approvals under a single statute is one way to simplify the approval process.

**The Public/Private Risk Regime**

6. Efficient private participation and successful private-public funding of a project depend upon an appropriate identification, measurement, distribution and management of all risks associated with a project. Theoretically, risk should be properly quantified and allocated to the party that is best able to either control or bear that risk. However, the difficulty in predicting and subsequent management of risks makes negotiation and contracting of privately funded highways complicated, intense, and challenging. To both the private investor and the Government, this represents a balancing act of risks and rewards. A typical broad allocation of risk is indicated in Table 1 below.

7. **The Risk-Return Relationship**

   A government can reduce overall project costs by directly assuming the risks than cannot be assumed by the private sector at a lower premium. This may still result in residual contingent liabilities for the Government. A Government should be clear about the types and quantum of risks it wishes to transfer to the private sector. To the extent possible, it is in the hands of the government to: (i) use financial engineering techniques to reduce project financing costs; (ii) reduce systematic risks with a view to minimizing associated contingent liabilities; and (iii) manage all the non-systematic risks that cannot be avoided through fair allocation of these risks between the public and the private sector. This exercise should be done with a view to minimizing the per capita cost to society. Many non-systematic risks can be controlled in theory by the private sector and systematic risks can be partially managed by the government. In theory, only those risks where the private sector has an informational or other advantage over the public sector should be transferred – otherwise society may end up paying more. From an investor's perspective, non-systematic risk must be adequately rewarded and systematic risk in its investment must be reasonably circumscribed.

8. **Managing Highways’ Main Risk - Traffic Risk**. One risk bears special mention and will be returned to in later sections – volatility in toll sales, where they form a significant portion of total concessionaire revenue. This is frequently the most significant risk for tolled

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30 Systemic risks are exogenous factors outside the control of the investor that reflect the sensitivity of the expected return of the project in relation to the market and overall economy. These risks are measured by Beta factors (covariance between the return of the project and the overall market, divided by the variance of the overall market). Non-systematic risks are endogenous and specific factors to the project.
road projects, due to the price-elasticity of demand (the higher the toll the fewer the users and vice versa). Unfortunately, forecasts of current and future demand are seldom exact and are often incorrect by orders of magnitude. Natural biases and a principal/agent problem arise in forecasting whereby the host government could be more optimistic than private operators; and with the protection of limited liability, investors could be more optimistic than lenders in their expectations. Moreover, the availability of alternative roads and potential construction of competing routes by other parties, as well as deterioration of connecting roads, are also major risks affecting revenue forecast for toll road PPP projects. Although toll road projects frequently assume that one or both parties to the contract can significantly control this risk, this assumption may prove a fatal flaw in the logic of many projects unless there is a captive market such as for a bypass, tunnel or bridge.

Table 1: Indicative Allocation of Risks in a Road Concession Project

<table>
<thead>
<tr>
<th>Type of Risk</th>
<th>Government</th>
<th>Private Sector</th>
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<tbody>
<tr>
<td><strong>Political Risks</strong></td>
<td></td>
<td></td>
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<tr>
<td>Expropriation of the company</td>
<td>✓</td>
<td></td>
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<tr>
<td>General modifications of the law and tax system</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Specific modifications of the laws and tax system</td>
<td>✓</td>
<td></td>
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<tr>
<td>Political events</td>
<td>✓</td>
<td></td>
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<tr>
<td>Termination of the contract by the government</td>
<td>✓</td>
<td></td>
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<tr>
<td>Limitation of currency convertibility</td>
<td>✓</td>
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<tr>
<td>Materially adverse foreign action</td>
<td>✓</td>
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<tr>
<td><strong>Construction Risks</strong></td>
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<td></td>
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<tr>
<td>Land acquisition</td>
<td>✓</td>
<td></td>
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<tr>
<td>Cost overrun (excluding change of project)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Cost overrun (change of project)</td>
<td>✓</td>
<td></td>
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<tr>
<td>Increase of financial costs</td>
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<td></td>
</tr>
<tr>
<td>Risk on schedule and quality of works</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Risk on administrative procedures delay time</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Damages incurred by the works</td>
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<td></td>
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<tr>
<td>Bankruptcy of the private company</td>
<td>✓</td>
<td></td>
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<tr>
<td><strong>Operation Risks</strong></td>
<td></td>
<td></td>
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<tr>
<td>Impact on the environment</td>
<td>✓</td>
<td></td>
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<tr>
<td>Force majeure</td>
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<tr>
<td>Technology risk</td>
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<tr>
<td>Cost overrun</td>
<td>✓</td>
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<tr>
<td>Change in specifications</td>
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<tr>
<td><strong>Commercial Risks</strong></td>
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<tr>
<td>Traffic shortfall (to reference case)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Price control policy (tolls)</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Other revenues</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction of competing facilities</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Financial Risks</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inflation</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Interest rate</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Exchange rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Legal Risks</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permits and licenses</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Litigation</td>
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</tr>
</tbody>
</table>

Additional Support by the Public Sector

9. Road concessions often require varying forms of government support, if only as interim financing until the project’s performance has been demonstrated to increase the possibility of raising long-term capital (see Annex 11 for a consolidated list of examples). This support contributes to the management of risks. One tool that is available to Governments to adjust and fine tune the distribution of risks between the parties is the payment mechanism. This may take many forms of revenue support, revenue sharing, shadow tolling, subsidies/grants, and subordinated loans. Further public support to the financing of PSP programs could include risk identification and allocation in a project. This could include risk mitigation instruments such as sovereign risk guarantees. Partial Risk Guarantees, for example, could facilitate private project financing, by covering debt service default due to non-performance of contractual obligations undertaken by the government or their agencies in road projects. These guarantees would catalyze further private finance by assisting in allocating the risks of a project to the parties best able to bear those risks.
8. INTERNATIONAL EXPERIENCE WITH PSP IN ROADS

Introduction

1. Internationally, there is a spectrum of risk transfer to the private sector with construction contracts transferring the least risk, and toll based Design-Build-Finance-Operate (DBFO) transferring the most risk (see Figure 1). Although the overall rationale for choosing a particular arrangement is to promote efficiency (including reducing the overall costs to society of management of the inherent risk in road construction), fairness and accountability, different arrangements address different needs. A project’s specific objectives may determine to a large extent the type of arrangement to use. Specific objectives can include, for example: (i) to reduce public sector maintenance responsibility; (ii) to reduce costs to the public sector through use of innovative construction or design techniques and tighter risk control; and (iii) to improve incentives for revenue collection and reduce revenue leakage. This section seeks briefly to identify how some governments have applied the theory noted above, most especially in those areas where it is believed that India can most benefit from such experience. It is not intended as a full account of this experience which can be accessed elsewhere. The section also touches on one particular method employed by capital markets to raise private funding which may be suitable in the Indian setting.

Figure 1:

Public-Private Partnerships and the Risk-transfer Continuum

Overview of International Experience

2. Privately funded road projects typically form only a small percentage of the total highway network of a country and overall private funding flows have been modest in comparison with total flows to the sector. From 1992 to 2003, globally private investment in highways had a median value of $4.2 billion/year representing a small fraction of total expenditure on the World’s highway network. Except for Argentina and Chile, the countries with the most active PSP road programs, most countries have transferred less than one-tenth

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Asian Toll Road Development Program Assessment Report, Ministry of Construction Japan and World Bank, 2001

of their main road network to the private sector\textsuperscript{33}. Indeed, Latin American countries have had the highest share of their national roadway funded and operated by the private sector – the region accounted for 53\% of private highway investment from 1992 to 2002\textsuperscript{34}. For example, two-fifths of the main roads in Chile, and about a third in Argentina are toll roads with private participation. China, Indonesia, Mexico and Malaysia are other developing economies where there has been significant private investment in highways. Elsewhere, private investment has been more modest. Nevertheless a large number of countries have experimented with contracts that allow different degrees of private participation in the road sector, transferring different risks and to different degrees, particularly for maintenance.

3. A review of recent experience in some of the Asian countries e.g. Indonesia, Thailand, Philippines, Hong Kong, and India is helpful in understanding how a government can promote PSP in the road sector and identifying some of the favorable/inhibiting factors. These factors are explored below.

<table>
<thead>
<tr>
<th>Favorable factors</th>
<th>Inhibiting factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm political will and commitment to the PSP approach</td>
<td>Lack of an integrated institutional policy and framework for project identification, feasibility studies, project approval, etc.</td>
</tr>
<tr>
<td>Sound and growing economy, as well as a low and stable exchange rate</td>
<td>Lack of coordination between various Government agencies involved with road sector projects</td>
</tr>
<tr>
<td>Developed/developing capital market, capable of handling project financing through innovative procedures.</td>
<td>Absence of a statutory, autonomous, regulatory authority (at arms’ length with Government) for dispute resolution, toll fixation/revision and for ensuring a level playing field for all participants</td>
</tr>
<tr>
<td>Developed/developing capital market, capable of handling project financing through innovative procedures.</td>
<td>Delays in decisions regarding Government support-both in kind (land for example) and/or investment – delay in land acquisition is a bottleneck in many countries</td>
</tr>
<tr>
<td>Developed/developing capital market, capable of handling project financing through innovative procedures.</td>
<td>Absence of transparency and competition in procurement and award processes-competitive bidding procedures not followed in many cases.</td>
</tr>
<tr>
<td>Developed/developing capital market, capable of handling project financing through innovative procedures.</td>
<td>Uncertainty about fixation of toll levels/revision-related to lack of a regulatory mechanism</td>
</tr>
</tbody>
</table>

4. In the context of significant inhibiting factors, as described above, the Governments need to be sure that the motivation for using private finance is properly considered and justified. PSP projects require considerable due diligence on the client’s side as well as the investor’s side – both in order to establish whether value for money is being obtained when providing public support and to protect consumers from monopolistic pricing over what is generally a very long time horizon. Some governments, such as Canada, the State of Victoria in Australia and the UK, have prescribed a detailed process to undertake this due diligence (see Box 2). In the absence of such a process, governments can expect a higher probability of failure in PSP.

The Enabling Environment

5. **Legislative and Regulatory Environment.** Where governments have been serious about facilitating PSP in the sector, they have been willing to provide a new enabling legal framework as necessary. Box 3 overleaf shows an example of the key legal actions taken by Chile. In comparison, where the legal framework has been weak, PSP programs have often faltered. For example, in Mexico the 6,000 km long privately financed toll road program has come unstuck. Part of the reason for this is the lack of a clear legal and regulatory

\textsuperscript{33} Toll Roads - Public Policy for the Private Sector, No 224, World Bank, 2000
\textsuperscript{34} Source, ibid
institutional arrangement which discouraged lenders and investors from respecting agreements. The independent regulatory authority also lacked sufficient capacity so disputes were resolved in local courts which discouraged foreign investors wary of local biases. The conflicting dual role of Secretariat for Communications and Transport as part regulator part concession partner sent conflicting signals to concessionaires.  

**Box 2 The Public Sector Comparator**

In early 1990’s, the UK government enacted legislation to guide, facilitate and finance the development of Compulsory Competitive Tendering, Private Finance Initiatives (PFIs) and Public-Private Partnerships (PPP). Under this legislation, the UK Treasury ensures that any initiative contemplating a PFI or a PPP develops a Public Sector Comparator (PSC) based on a highly prescribed process. The motivation for enforcing the use of a PSC was poor performance in earlier PFI/PPP projects, union pressure and a strong Treasury commitment to accountability and transparency in public spending.

The PSC is a method used to calculate the “in-house” cost of delivering a project and/ or service and comparing this with a private finance option. It serves the following purposes: to determine if the project is affordable to government by ensuring full life cycle costing at an early stage; to test whether a PPP is viable and demonstrates value for money; to communicate with partners on such key aspects as output specifications and risk allocation; and to encourage broader competition by creating greater confidence in the bidding process.

A typical PSC would include:

- An estimation of the basic costing including capital and operating costs
- A report on the approach taken in relation to third party revenues
- A section dealing with the approach taken on asset values on transfer, disposal and termination of the contract
- A risk matrix, showing the various sources of risk, their costs, the likelihood of their occurrence, and the consequences for the project
- A discounted cash flow forecast
- Sensitivity analyses, showing the consequences of varying key assumptions

The PSC commences as a high level document to gauge internal acceptance and then evolves into a detailed assessment. The responsibility of designing and implementing the PSC remains with the public sector agency involved in the particular project, although private sector advisors can provide support. The signing authority for a PPP has to satisfy him/herself that the PSC has been properly conducted and the PPP option found preferable.


6. **Public Sector Planning and Implementing Capacity** One critical success factor identified in a review of a number of concession projects in seven countries was the establishment of a dedicated project team on the client side made up of experienced professionals in the areas of engineering, financing, market analysis, revenue forecasting and legal matters. The team would need to have the skills and autonomy to prepare and supervise PSP projects and should not rely heavily on external technical assistance. This approach is used in some Australian states and was used in some early transport projects in the UK. The Philippines established a One –Stop- Action Center to help investors understand the process of obtaining consents and permits. One analysis of the mixed success in Argentina stated that a key lesson learned was that institution building must be taken seriously if poor and slow decision making was not to plague the process.

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36 Bidding for Private Concessions. RMC Discussion Paper 120, 2001, World Bank
37 Designing Toll Road Concessions Lesson from Argentina, Public Policy for the Private Sector, World Bank, 1996
**Box 3 Legal and Regulatory Provisions: Chile**

- Key legal provisions put in place through Decree in 1991 and then laws of 1993 and 1996, together with associated regulations in 1991 and 1997
- Legislation created system of competitive bidding based on flexible arrangements for awarding concessions, establishing mutual rights and setting up conflict resolution mechanism
- Bilateral sole source agreements not permitted though unsolicited bids acceptable provided there is competition in actual procurement
- Criteria for awarding bids explicitly stated in law and regulations. Bid documents to specify evaluation criteria
- Three person conciliation commission to settle all disputes originating from the interpretation and implementation of the concession contract consisting of one government nominee, one concessionaire nominee and one agreeable to both parties who acts as chairman. The commission can also act as an arbitration tribunal in the event that conciliation is not successful within 30 days

Source: Toll Road Concessions, the Chilean Experience, PFG Discussion Paper 124, World Bank, 2003

7. **Project Procurement.** Experience has shown that to maximize interest from qualified bidders, governments need to adopt a strategy designed to reduce the costs of tendering and restrict the number of bidders in the final round to only three or four. The tender procedure also needs to be undertaken openly and swiftly and bidders should have to respond to a clear set of requirements and specifications covering the commercial, financial and technical aspects of the project. A number of different criteria have been used to evaluate proposals including lowest toll rates, shortest concession period, lowest subsidy to be provided by the state, highest payment to be made by the concessionaire and least present value of revenue levels. Experience demonstrates that evaluation of bids should ideally be on the basis of a single criterion to provide transparency and prevent subjective tradeoffs during evaluation.

**The Management of Risks**

8. **The Issue: Volatility of Toll Sales** In formulating the procurement system and associated preferred risk allocation, the risk associated with traffic demand is the most difficult to deal with. Some countries introduced tolls for publicly financed roads first, paving the way for a toll paying culture amongst users, in order to facilitate the later development of private sector funded toll roads with full transfer of traffic risk (see Box 4 on Korea). Revenue risks could be mitigated for private financiers of tolled projects by the host government through the use of minimum revenue guarantees (which may be coupled with upside revenue sharing).

9. Private financiers can be more effectively shielded from public resistance to tolling yet made to be accountable for their operational performance through the use of “shadow tolls”. In earlier UK DBFO projects and increasingly in countries such as Holland, Norway, Portugal, Poland and the Czech Republic, payments are made by the state to concessionaires based on traffic levels (shadow tolls) or availability of the road. These payment mechanisms reduce the demand risk that otherwise exists on real toll roads. Shadow tolls are set in “bands” so that at low traffic levels the toll (government payment) per vehicle is higher, and the average toll (government payment) decreases as the number of vehicles increase. This enables bidders to develop expectations of revenue which are more robust compared with real toll assets for a number of reasons. First revenues are not subject directly to elasticity of demand. As the government is making the payment per vehicle rather than the user, there is no overt disincentive for the user not to use the facility (they are not paying a toll to do so). Second, downside risk, where traffic volumes are low, are partially mitigated by banding of rates with higher per vehicle rates at lower traffic levels. Thus, shadow toll mechanisms are more attractive to lenders as they reduce the volatility caused by real tolls.

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10. Protection from competing facilities and inadequate connecting roads varies between countries and road programs, but it is considered equitable for this risk to be principally borne by the state and only incidentally by the private sector. The contracting authority may not have direct responsibility for the competing route or connecting road (often a local authority asset), but clearly it has more influence over the local authority than the concessionaire and therefore is best placed to manage this risk. The outcome of transferring this risk to the private sector is, at best, higher financing costs and/or lower concession fees receivable by the government, and, at worst, a deal that is not bankable.

11. For real tolled facilities, financiers need to anticipate the revenue volatility and uncertainty caused by real tolls and base their financial projections on some of the worst downside characteristics. Experience shows financiers are not always adept at managing the demand risk, as evidenced by the conclusions of a recent review of cancelled private infrastructure projects between 1990 and 2001 from around the globe\(^9\). About 6% of toll roads (mostly in Mexico and Hungary) were cancelled during this period representing about 16% by value of the private investment in the sector. The one factor that contributed most significantly to these cancellations of toll road projects was that roads could not attract enough users to meet optimistic traffic forecasts. Further, the authors conjectured that where governments were willing to assume some or all traffic risks, investors due diligence on demand forecasts may have been less thorough.

12. Overall, it is very much open to debate whether it makes sense to transfer traffic risk substantially to the private sector apart from in cases such as bridges, tunnels and bypasses where traffic demand can be better assessed and managed. The Public Accounts Committee that scrutinizes all public expenditure in the UK had this to say about four DBFO projects procured during the early 1990’s where shadow tolls were the payment mechanism.

> Departments should consider carefully the implications of basing payments to operators on volumes of activity over which neither the public sector nor the operators have any effective control. In the case of these four contracts, payments to operators are based primarily on traffic volumes which are, however, notoriously difficult to forecast. In other words, the Agency have created a risk which is borne by the operators and which can be expected to have increased their costs. PFI can deliver better value than traditional methods of procurement if risks are transferred to the parties best able to handle them. But it is a mistake to confuse risk transfer with risk creation, which is simply likely to increase costs to the taxpayer.”

13. The UK no longer uses shadow tolls in more recent DBFO projects as the payment mechanism, but rather pays according to lane availability and active congestion/safety management.

14. **A Possible Solution - Toll Pooling** One option that has been practiced in a number of countries with some success is the establishment of a uniform publicly managed toll system (see Box 4). The pooling of toll revenues allows for cross-subsidization of lower trafficked routes, efficiencies in toll collection, a more gradual increase in the level of tolls to build user acceptance and diversification of traffic risks. It also removes a large portion of the political risk of interference in a toll rate that had earlier been agreed between a Government and a concessionaire. The Government is then free to choose between a more or less direct user charging regime to meet public policy objectives at the same time as manage public opinion. Many European countries seem to moving towards this concept. For example, Switzerland and Austria have recently implemented additional network wide weight distance toll systems recovering new funds from the trucking industry. The toll receipts are pooled and the hypothecated towards highway improvements and maintenance. A GPS based weight/distance toll system in Germany is also to be made operational next year. This is

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designed to raise dedicated revenue from truckers for six-laning the majority four-lane motorway network.

<table>
<thead>
<tr>
<th>Box 4 Toll Pooling</th>
</tr>
</thead>
</table>
| **Japan**: Since 1972, tolls from expressways and other regional highways have been pooled through the Japan Highway Construction Corporation. The tolls are set according to the following principles: (i) redemption - toll roads must pay off their debts; (ii) benefit - toll rates must not exceed the benefit the users receive; and (iii) just-and-fair principle - toll rates charged must be set at ‘just and fair’ levels.  

**Korea**: The Korea Highway Corporation, 82% Government owned, was established in 1969 and is responsible for the development, maintenance and operation, including tolling, of about 2,100 km of the Korean highway network. The roads constructed by the Corporation were funded initially by government support and debt on the Corporation’s balance sheet. Tolls were earlier set to cover the anticipated O&M costs. Now toll rates are determined on the basis of the benefit to user principle. In 2000, the Corporation raised $1.43 billion in tolls. Over the period from 1995 to 2006, it is expected that toll revenue will raise about 31% of total agency revenues, loans/bonds about 42%, Government support 22% and other revenues 5%. Of this 36%, 22% and 42% will go towards debt repayment, maintenance and new construction respectively. This means that toll receipts are covering not only O&M but also construction, either by way of repayment of existing debt or in actual new investments. About 25% of its staff are devoted to toll collection. More recently, Korea has started to concession some existing and new highways.  

http://www.sra.co.za  
http://www.freeway.co.kr/eng/html/Corporation/sub01_01.html

15. **A Portfolio Approach for Risk Diversification** Similar to the publicly managed toll pooling approach mentioned above, the private sector can also diversify risks through adoption of a portfolio investment approach adopted. An example of this approach is Road King Infrastructure Limited (RKI) of Hong Kong (RKI). As of 2002, RKI had a portfolio of 22 toll road projects in mainland China covering about 1,000 km, mainly operating with joint venture partners for specific projects. RKI leverages the creditworthiness and the track record of its portfolio of highway projects in China, thereby diversifying its investment portfolio into various regions (high growth centers) and risk profiles. A similar approach is being applied by Australia’s Macquarie Bank and the Korean lender Shinhan Financial Group, joint managers of the Korean Road Infrastructure Fund (KRIF). KRIF was set up as a 10-year closed fund by Macquarie and Shinhan in January 2003, raising 247 billion won (about $200 million) from Korean institutional investors. It has since raised a further 120 billion won. It made its first purchase in March, spending 177.8 billion won on a toll road in the southern city of Kwangju and is planning to invest in another six toll roads in Korea. In future, the intention is to list the KRIF and thereby tap the retail investor market.

16. Because the useful lives of most road assets are quite long (40 or 50 years is not uncommon), the most appropriate long-term capital is provided by insurance companies, pension funds and similar institutional investors. Generally, the risk appetite of such investors is quite small, (limited, if any at all, to interest rate and other “controllable” commercial risks), given the long-term tenor of their financing. Listed companies that invest in a portfolio of Highways with proven traffic trends can provide the required interim financing for highway projects until the operating performance of these highways have been sufficiently demonstrated for the project to receive an investment grade rating and to obtain long-term capital.

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40 Of course, any revenues accruing to Government from indirect road user charges will add to the total burden on road users.

41 http://www.macquarie.com/uk/about_macquarie/media/20030113.htm
Additional Public Support

17. Loans are the most common form of public funding. Generally, these are low-cost funds, raised by the issuance of government-guaranteed bonds or long-term, low interest or interest-free loans supplied from general or earmarked accounts. These loans tend to be repayable over a period of 15-30 years. In the US, public toll road authorities issue debt instruments known as ‘revenue bonds’, which are serviced entirely by the toll revenues collected by the issuing authority. The tax-exempt status of these instruments has been a key consideration for enhancing investor interest in these instruments. Initially, the respective US state governments guaranteed toll road bonds. However, at present such external credit enhancement measures are generally not required, as the credit worthiness of the issuing authorities are now established.

18. In France, limited access, grade-separated inter-urban expressways, known as ‘Autoroutes’, have been developed over the last 30 years. Such expressways account for only 4 percent of the national road network, and carry 40 percent of the road traffic. As of 1997, the toll road network in France was around 6,700 kms, involving an investment of about $28 billion. 72 percent of total motorway network in France is tolled. In the initial stages, the Government extended concessional finance up to 70 percent of the total project costs to private concessionaires; 52% from the Central Government and 18% from local governments. The balance was met through equity contribution of private concessionaires. In the second phase of development, government assistance was less than what it was in the 1960’s, with construction advances (interest-free loans) being offered only for segments that the Government deemed unprofitable⁴².

19. Japan has one of the largest toll-road networks in the world (9,200 km). Nearly two-thirds of the 12,700 km of trunk roads and expressways (of the total road network of more than 1 million km) are tolled. Roads were initially funded through public means dependent on a Road Improvement Special Account. This drew resources from tolls, central and local taxes on fuel and freight transport. Later, highway projects were promoted by large construction companies with subsidized debt. Such companies inject the equity, usually about 10 per cent of the funding requirement. Senior debt has been provided by Japanese commercial banks, regional banks, or trust companies, with some participation by the Development Bank of Japan. Debt has been underwritten by Government. There is no sign yet of ‘pure’ financial investors or of bond issues⁴³.


Annex 11 Forms of government support for road concessions

<table>
<thead>
<tr>
<th>Support Measures</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Comfort Letter</td>
<td>The Chinese government commonly issues a legally non-binding letter to give support to certain actions not clearly stated in contractual agreement such as performance of a public corporation as a grantor of concession. These letters can provide financiers and sponsors a minimum level of assurance when no implicit government support is attainable. However, the disadvantage is that the letter is not legally binding.</td>
</tr>
<tr>
<td>Land Acquisition</td>
<td>Expropriation of right of way for toll road construction. Cost of land acquired maybe borne either by the government or the concessionaire. This is common in China, Thailand and United States and is helpful to 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 as land acquisition measures tend to cause delays in the projects.</td>
</tr>
<tr>
<td>Extension of Concession Period</td>
<td>The Indonesian government takes measures to provide compensation for the loss of profit due to circumstances caused by the government. Although this results in improved project economics, its effect on current cash flow is negligible.</td>
</tr>
<tr>
<td>Construction of Related Facilities</td>
<td>The British and the Thai governments commonly provide for the construction of connecting roads, access ramp, etc. This contributes significantly to the project since connecting roads and other facilities are critical elements for commencement of operation. However, construction delays may critically impair the commencement of operation.</td>
</tr>
<tr>
<td>Revenue Support</td>
<td>Revenue support is usually done with a minimum threshold for compensation paid by the governments in Malaysia and China (including Hong Kong SAR). This provides facilitation for the financial closing and project completion. Weak design may impose a large contingent liability on the government.</td>
</tr>
<tr>
<td>Revenue Sharing with Existing Facilities</td>
<td>In Malaysia, Thailand and the United Kingdom, 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. Hence, there is a possibility of mitigation of revenue shortfall risk in the startup years. On the other hand, the revenue sharing formula requires careful design.</td>
</tr>
<tr>
<td>Shadow Toll</td>
<td>The British and Argentine government pay toll to the concessionaires according to the vehicle-kilometers of the traffic counted automatically. This provides for a means of introducing private financing without stimulating resistance to tolling. Possible financial burden/fiscal inflexibility in later years may hinder transition to real tolling.</td>
</tr>
<tr>
<td>Provision of Development Rights and Third-Party Revenue</td>
<td>This measure involves the transfer of right of commercial development along the toll road to supplement project economics. The advantage is that this enhances project economics but excessive dependence on this measure may have just the reverse effect.</td>
</tr>
<tr>
<td>Subordinated Loan</td>
<td>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 that for a senior debt. This is a common measure in Malaysia for facilitation of financial closing because it is treated as equity. It could also</td>
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<tr>
<td>Support Measures</td>
<td>Description</td>
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<td>be used as a stand-by facility to mitigate risks such as cost overrun and revenue shortfall. The disadvantage associated with this form of government support is possible deterioration of project economics due to higher interest cost.</td>
</tr>
<tr>
<td><strong>Foreign Exchange Guarantees</strong></td>
<td>In Indonesia, the Philippines, and Spain, government provides compensation for the impact of the devaluation of local currency. Such a provision is built into the tariff formula, and is instrumental in facilitating financial closure. The disadvantages are:</td>
</tr>
<tr>
<td></td>
<td>- Possible large contingent liability on the government;</td>
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<tr>
<td></td>
<td>- Moral hazard for concessionaire and the lenders.</td>
</tr>
<tr>
<td><strong>Loan (Bond) Guarantees</strong></td>
<td>The Chinese government gives a guarantee on repayment of loan and on redemption of bond for the facilitation of project proposals and implementation. This results in a large contingent liability for the government.</td>
</tr>
<tr>
<td><strong>Equity Guarantees</strong></td>
<td>Guarantee of equity investment may be given for facilitation of financial closing in foreign currency when country risk in this respect is high. Large contingent liability for the government in the event of large currency devaluation is possible.</td>
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</tbody>
</table>