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India Financing Highways

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CURRENCY EQUIVALENTS

Currency Unit	=	Indian Rupees (Rs.)
USD 1	=	Rs. 45
Rs.1	=	USD 0.0222
1 Lakh (Lk.)	=	100,000
1 Crore (Cr.)	=	10,000,000

ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
AP	Andhra Pradesh
APRDCL	Andhra Pradesh Road Development Corporation
BOLT	Built Own Lease and Transfer
BOOT	Build Own Operate Transfer
BOT	Build Operate Transfer
DBFO	Design Build Finance and Operate
EPC	Engineering Procurement & Construction
EU	European Union
FHWA	Federal Highway Administration
GDP	Gross Domestic Product
GOI	Government of India
GQ	Golden Quadrilateral
HDM-4	Highway Development and Management Model
IPO	Initial Public Offering
KRDCL	Karnataka Road Development Corporation Ltd.
MORTH	Ministry of Road Transport and Highways
MSRDC	Maharashtra State Road Development Corporation
NH	National Highways
NHAI	National Highways Authority of India
NHDP	National Highway Development Programme
O&M	Operations & Maintenance
PMGSY	Pradhan Mantri Gram Sadak Yojana
PSP	Private Sector Participation
PWD	Public Works Department
RBI	Reserve Bank of India
SH	State Highways
SPV	Special Purpose Vehicle
UNCITRAL	United Nations Commission on International Trade Law
UP	Uttar Pradesh

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This report is designed to provide information and advice to the Indian Union and States Governments on the principles and practicalities for establishing a sound and sustainable system of highway financing. The report also has an associated summary policy note, available separately.

Much of the data used to prepare the report was obtained through a baseline study conducted during 2003 by Consulting Engineering Services Ltd and Ernst and Young. This baseline survey obtained information from various national entities as well as from six states – Andhra Pradesh, Karnataka, Madhya Pradesh, Maharashtra, West Bengal and Uttar Pradesh. The baseline also benefited from a workshop held in Delhi where representatives of both the public and private sectors working in this field contributed their views on the preliminary findings. Specific material provided by others is gratefully acknowledged in footnotes wherever applicable.

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EXECUTIVE SUMMARY

Background

1. India has a very large network of low standard roads. The National Highways, totaling only 58,000 km¹, carry 45% of total traffic but are mostly two lane with high traffic, low service and slow speeds². There is no network of high quality, high capacity highways or expressways, and, despite 3.5 million km of roads, some 40% of India's villages have no all weather access. Government expenditure on roads is significant - representing 12% of capital and 3% of total expenditure - but road maintenance is grossly under-funded with only one third of needs being met, resulting in road deterioration, high transport costs and loss of accessibility.

2. Road transport is now the primary transport system in India and it is increasingly a major constraint to faster economic growth and social development. Union and State Governments recognize the deficiencies in the road network and plan: (i) over Rs.225,000 crore (US\$50 billion) on highway improvements in the period to 2011³; and (ii) substantial investment, through the Pradhan Mantri Gram Sadak Yojana (PMGSY), to connect villages. In addition, annual expenditure of Rs. 7,000 crore is essential to maintain the 170,000 km of National and State Highways and further funding is required to maintain the urban networks and district and rural roads. All these expenditures have to be financed within a current fiscal environment of high government deficits, amounting to 9.5% of GDP. There are major issues as to who will finance these expenditures and how the financing will be structured.

Approaches to Highway Financing

3. **Traditional.** In this approach, roads are treated as public goods and financed from general revenue with little connection between the costs of road provision and the taxes or charges paid by road users (though fuel is often heavily taxed for general revenue), and there is no attempt at direct road pricing.

4. **Commercial.** With a commercial approach, roads are treated as capital assets, commercial accounting is applied and users are charged, either directly or indirectly, for road use. Road transport remains a source of general revenue, but sector taxes are designed to minimize distortions to transport patterns or choices. Road finance is increasingly separated from general government expenditures and road users are increasingly involved in decision-making.

5. **Indian.** In India, the traditional approach largely persists, although a national and some state fuel cesses have been introduced, tolls are increasingly applied and substantial private sector financing is being sought. The approach has contributed to under-funding of road maintenance, a distorted vehicle fleet, perverse incentives for traffic allocation between road and rail, and substantial economic losses. A coherent structure for highway financing should have high priority; otherwise the distortions and costs to the economy will rise as overall expenditure on roads increases.

6. **Motivation for Private Sector Financing.** Private sector participation (PSP) in funding is increasingly perceived as the answer to highway finance and it has some very substantial potential benefits.

- **Bridging the funding gap.** Investment requirements are high but the public sector already faces a large fiscal deficit. Private finance could supplement public funding and postpone the cost of road investment to the taxpayer and/or road user.

¹ Recently another 7,000 km of lower category roads were reclassified as national highways.

² This report mainly addresses the National and State Highways, "the highway sector"

³ Vision 2021

- *Increased expenditure and revenue efficiency.* The private sector has stronger incentives to operate efficiently, minimize revenue leakage, adjust resources to changing situations, and adopt a comprehensive life cycle approach to road investment and maintenance.
- *Unbundling and reallocating risk.* Overall costs may be reduced by allocating individual risks to those parties best able to control them through some informational or other advantage.

7. PSP depends on a sound framework for overall sector funding as: (i) most PSP projects require some public funding; (ii) PSP highways are part of a network and demand for their use can be substantially reduced by inadequate connecting links; and, (iii) public acceptance of tolls may be partly determined by perceptions of the entire road charging regime. PSP cannot replace the role of the public sector nor reduce the importance of a rational, fair and transparent public financing system. Internationally, at most only 5-10% of highway networks have been financed by the private sector. Throughout the world, public funding prevails for the highway sector and this is very likely to be the case for India too.

Vehicle-Related Taxation and Road Expenditure in India

8. In FY2002, the road sector accounted for slightly less than 3% of total government expenditure and contributed about 15.5% of revenue. The total tax revenue from the road sector in the same year was Rs.500 billion while total expenditures were Rs.210 billion. Hence, there was a large revenue surplus from the sector.

9. However, aggregate numbers are not very useful for assessing the adequacy of highway financing, when: (i) taxation on fuel is a major source of general government revenue; (ii) road maintenance is under-funded and the road asset base is being eroded; and (iii) substantial investment is required to remedy neglect and add capacity. More important is the relationship between road user charges, explicit (e.g. the fuel cesses) and implicit, and the levels of road expenditure actually required to meet the needs of the sector.

Road User Charges in India

10. Vehicles, fuel and related inputs are subject to a wide range of Union and State taxes. Vehicles are taxed on initial purchase and are then subject to annual fees; fuel is taxed by both Union and States; tolls are becoming more widespread; and road freight and passengers may be taxed. Some taxes, like the cess, are clearly user charges; but the definition of other taxes is more ambiguous. Total annual road user charge revenue, in FY2002, was between Rs.15,000–20,000 crore⁴, rather less than total government road expenditure. In terms of identified expenditures, there were marked differences between the various segments of the road sector:

- *Highways.* Road user charges collected (Rs.10,000 crore) exceed expenditures (Rs.6,300 crore) but there would be a broad balance, if the highways were fully maintained;
- *District and rural roads.* Road user charges (Rs.3,400 crore) are substantially below expenditure (Rs.6,400 crore)⁵;
- *Urban roads.* Road user charges are substantially greater than urban road expenditure.

⁴ The low estimate includes only taxes/charges specific to road transport (like the cess); the high estimate also includes the sales/excise taxes in excess of the average rates for such taxes.

⁵ Rural roads generally carry few vehicles but are essential for access. They are almost public goods and could not be financed from economic road user charges alone.

11. While the Rs.10,000 crore collected in user charges from users of the National and State Highways was sufficient to fund highway expenditure in FY2002, the structure of charges is deficient in key respects.

- *The overall charges are too low.* Present revenue is sufficient because highways are being grossly under-maintained. The charges are also insufficient to fund the costs of road accidents, road safety measures, or environmental damage.
- *The structure is distorted and economically inefficient.* User charges on heavy trucks do not even cover short-run attributable costs, the absolute minimum for cost recovery; they need to be substantially increased.
- *The structure is inequitable.* Buses are the most heavily charged vehicles, paying over four times the charges on multi-axle trucks but responsible for 60% less costs. As buses are used by low income groups, the charges appear grossly inequitable, and should be reduced.
- *There is no charge for road space.* The present charges take no account of the occupancy of road space. This is important on highways (slow trucks delay all vehicles) and critical in urban areas. Congestion charges would be economically efficient in major urban areas, especially if the revenue were used to fund public transport.
- *State charges are inconsistent.* Different States have adopted different charges, based on revenue opportunities rather than road costs. There are no nationally consistent pricing method and incentives for vehicle owners.

12. The present structure results in: (i) too much road use, especially cars in urban areas; (ii) too little revenue for maintaining and improving the network; (iii) too many heavily damaging two axle trucks and little incentive for re-equipping with modern multi-axle truck/trailers; and (iv) an uneconomic distribution of traffic between road and rail with road user charges and rail cross-subsidies combining to promote too much road freight and too many rail passengers.

The Highway Financing Gap

13. India needs massive investment to provide a modern high capacity network; but first priority has to be given to maintenance of the existing highways. All the studies, in India and elsewhere, indicate that maintenance, effectively implemented, gives the highest economic returns: one Rupee spent well on maintenance can generate seven Rupees in net benefits. The highway network has an asset replacement value of roughly Rs.240,000 crore (US\$ 53 billion); India simply cannot afford to lose such assets.

14. Over the next ten years, about 32,000 km of National and 25,000 km of State Highways need to be widened, at a cost of some Rs.1,700 billion, and highway maintenance will require over Rs.950 billion. This is a conservative estimate and takes no account of the need to build an expressway system, at a cost of several million US dollars per km, along new alignments on the most heavily trafficked corridors. The present system of road user charges will only generate over the next ten years about Rs.1,600 billion⁶, leaving a total funding gap of some Rs.1,050 billion - or the annual equivalent of more than US\$2 billion.

⁶ Road user charge defined here as (i) Central level – cess on fuel and road tolls (ii) State level – registration fees, cess on fuel, tolls, permits and licenses, fines and penalties, taxes levied specifically on passenger and goods vehicles and the excess percentage over the average state sales tax rate for all commodities.

Private Highway Finance: Present Status

15. **Government of India (GOI).** Less than 20% of the National Highway Development Plan (NHDP) projects are being funded through private sector participation (PSP) which at present consists of the following.

- *Build Operate Transfer (BOT) concessions.* National Highways Authority of India (NHAI) has awarded tolled concessions totaling Rs.3,400 crore on highly trafficked road sections with relatively low traffic/financial risks.
- *Annuity concessions.* NHAI has awarded 467 km (about 8% percent of the NHDP) of annuity concessions amounting to Rs.3,000 crore for projects with generally higher traffic risks.
- *Special Purpose Vehicles (SPVs).* The Moradabad Bypass was constructed through a SPV and several other projects are now under implementation, including the Jaipur Bypass Phase II and some port connectivity road projects.

16. Based on its revenues (Central Road Fund and increasingly toll revenue) and an implied GOI guarantee, NHAI has itself raised substantial funds from the domestic bond market. To date, NHAI has raised Rs 656 Crore from two bond issues in 2000-01, Rs. 804 Crore through one issue in 2001-02 and Rs. 5,593 Crore in 2003. To date, NHAI has raised Rs 656 Crore from two bond issues in 2000-01, Rs. 804 Crore through one issue in 2001-02 and Rs. 5,593 Crore in 2003.

17. GOI has provided the following fiscal incentives for PSP: (i) full and partial tax holidays for ten years; (ii) tax exemptions to Infrastructure Capital Funds or Infrastructure Capital Companies providing long-term finance for infrastructure; (iii) reduced import/excise duty on construction inputs; (iv) reduced stamp duty on documents/agreements; and (v) reduced State sales tax on construction inputs.

18. **State Governments.** Some States are making real progress in attracting PSP in the highway sector. Madhya Pradesh, for example, has entered into a number of 'maintain and transfer' concessions. Andhra Pradesh, Gujarat, Maharashtra, Madhya Pradesh, Rajasthan and Tamil Nadu have all signed BOT concessions. But, the majority of States have little or no PSP experience and overall progress is very limited. No State has a defined policy for the selection and prioritization of PSP projects and, in general, there is no systematic procedure for project identification and procurement. Road Development Corporations (RDCs) have been created in Andhra Pradesh, Gujarat, Karnataka, Kerala, Maharashtra, and Tamil Nadu, and Uttar Pradesh is establishing a State Highways Authority. These agencies are expected to attract private funds through corporate borrowing or leveraging private project finance against public grants. The corporations have clearer objectives, more flexible staffing, and more streamlined decision making processes than the typical Public Works Department (PWD). This should improve the quality and timeliness of PSP planning and procurement. However, states need to guard against creating hidden contingent liabilities through these RDCs without consideration as to strengthening the revenue stream for repayment of their debts.

19. **Legislative and Regulatory Environment.** GOI and some States have already made legislative changes to facilitate PSP generally and for road sector PSP development. In particular: (i) GOI has amended the National Highways Act (1956) to permit BOT projects and allow tolls on both public and private funded roads and (ii) some States have amended the Indian Toll Act (1851) to allow the private sector to levy tolls on State roads and bridges.

Constraints to PSP Development

20. **Indicators of constraints.** While there has been progress in creating a better enabling environment, PSP financing remains limited, PSP projects have taken a long time to prepare and award, several projects have had to be restructured, and the "value for money" of Annuity PSPs (and the additional GOI off-balance sheet liabilities) has been questioned.

21. **Absence of Reliable Information.** In making PSP decisions, potential investors must forecast their cash-flows. In turn this requires reliable data on, inter alia, construction and maintenance costs, traffic flows, construction history of existing roads/structures in the proposed concessionaire. Yet, reliable information is generally not available and investors have to rely on their own investigations which, however exhaustive, provide only limited information. Therefore, investors probably have to include a very substantial risk premium in their bids.

22. **Low Willingness to Pay.** Indian road users' willingness to pay tolls appears low. Even though toll levels are among the lowest in the world and represent a fraction of the expected vehicle operating cost savings, their affordability is lower than in many other countries. Further, as the sector is heavily taxed, users may be reluctant to pay further charges in the absence of substantive differences in service quality and greater transparency in the overall use of taxes raised from the sector.

23. **Dispute Resolution.** While subordinate levels of dispute resolution are available, there remains a high probability that serious disputes will end in arbitration, a lengthy and costly process. A swifter, more certain dispute resolution mechanism could reduce the perceived risks for private investors.

24. **Additional Constraints at the State Level.** State governments face even greater constraints than GOI: typically lower creditworthiness and lower traffic on their highways. Many states have yet to put the basic building blocks in place, including not only the enabling framework but also procurement and contracting capacity and a more assured revenue stream to meet public sector contributions. Considering the current status of the institutional and regulatory framework for PSP, the States may need to be realistic in their expectations for PSP and probably focus on "rehabilitate, operate and maintain" concessions, bypasses and/or bridges as the most viable PSP projects for the moment.

Foundations for Sustainable Highway Financing

25. **Improving the Information Flow.** It is very difficult to see how rational decisions are made with the present level/quality of information on highways and highway finance. Comprehensive databases on traffic, tender rates, highway asset condition, etc. would result in better planning and more accurate tendering, giving benefits to all parties – the public agency, the private investor and the road user. Many countries, both developed and developing, have started to treat roads as a major business and moved to commercial accounting for road agencies⁷. Such accounting clarifies financial flows and demonstrates whether the asset base (the highways) is being increased, maintained or eroded. At the present time, road agency budgets seem more designed to obfuscate than reveal. High quality, timely information is essential for better decision-making and for creating financial transparency. If NHAI and/or state Road Development Corporations wish to reduce the cost of their borrowing, facilitate PSP and meet growing public demand for clearer accountability, adopting a modern accounting system that shows the economic reality of their business will be a critical building block.

26. **Establishing National Coordination.** There would be many advantages if the policies toward road user charges and highway finance in general could be coordinated between the State and Union governments and between the States governments. This would ensure that consistent pricing signals are given to the transport industry and an efficient fleet configuration developed. A Strategic Roads Authority might be the ultimate embodiment of such an approach; it could receive the cess and other designated road user charges and channel this funding in such a way as to develop a coordinated approach across all states. However, at this time, this may be too radical and a more acceptable approach may be the creation and maintenance of a Council of Transport Ministers. This would be similar in

⁷ The physical assets embodied in the highway network dwarf those in perhaps any commercial enterprise in India.

concept to the European Conference of Ministers of Transport which has demonstrated that there can be considerable benefit in joint action to resolve common problems without compromising sovereignty.

27. ***Generating User Acceptance for Increased Road User Charges.*** It is almost inevitable that road users, whether present or future, will pay for the costs of the highway network, irrespective of whether the investments are made by the public or private sectors. Road users already pay high taxes and many may feel that additional charges are simply exploiting an easy target that is already overtaxed. Other countries face the same issues, and many are turning to an approach which combines: (i) greater transparency in highway financing and governance; (ii) greater accountability to the road users who are financing the network; and (iii) a more business oriented approach to the planning and implementation of highway investment and maintenance.

28. Central to the approach is often a Road Fund managed by a Roads Board, outside the traditional government structure. The Board advises on the level of charges, receives the user charge revenues automatically and directly - without the revenue being routed through the Ministry of Finance and Consolidated Fund - and then buys road maintenance and construction from road agencies on the basis of approved work programs. Transparency is core to the approach; regular financial and technical audits of both the Roads Board and road agencies are statutorily required and all audits are published. Representatives of road users and other private stakeholders are represented, and increasingly these representatives provide not only a majority of the Board but also the chairperson. The Ministries of Finance and Works/Roads retain influence (changes in the fuel levy or other user charges have to be approved by the Ministry of Finance) but the process is strengthened by transparency and accountability introduced by bringing the effective consumers into the decision-making and monitoring process.

Reform to the User Charge Regime

29. Some of the funding gap may be met by borrowing or private sector finance but there is still a pressing need to restructure user charges to remove the economic distortions and raise revenue for full highway maintenance, while continuing (or perhaps increasing) highway investment. GOI may consider increasing the fuel cess to Rs.3/liter, the average level in other developing countries. States may consider dedicated fuel levies of perhaps Rs.0.5 – 1.0/liter. The additional revenue should be dedicated to highway maintenance. Adding Rs.2.0/liter in higher cesses would initially increase the variable costs of trucks by 5 – 6%, and their total costs by 3 – 4%. Over time, however, trucking costs would be reduced by the ensuing better highway maintenance. While the current high international oil price complicate this action, it does not rule it out.

30. More wide-reaching reforms should be based on a comprehensive study of road costs. The study should establish the most practical and economically efficient means to relate user charges to road costs. Such means might include: (i) imposing a higher cess on diesel; (ii) restructuring annual fees, especially for trucks; (iii) reducing user charges on buses; (iv) extending tolling at low rates but to more of the highway network; (v) piloting congestion charging; and (vi) assessing the utility of truck weight/distance charging. Road user cost and charge studies should be repeated periodically and made public.

Strengthening PSP for Highway Development

31. ***Justification for PSP.*** Many expect private finance to meet much of the future highway investment; but there has been little analysis of what modes of PSP would result in better-value highways. It is recommended that a special Comptroller and Auditor General efficiency/performance audit of the “value for money” from the various PSP models be undertaken, prior to the concessioning of the next 10,000 km of national highways. Individual projects need due diligence by the client as well as the investor, to ensure that value is obtained and that consumers are protected. Several governments have introduced

detailed Public Sector Comparator processes; without such process, a higher probability of unfavorable outcomes in PSP can be expected.

32. ***Project vs. Corporate Approach to PSP.*** The progress made under the PSP approach has been achieved at a relatively high risk and cost to the Government. With the exception of links having captive traffic, for which the project financing approach is suited, it is worth exploring whether corporate financing, based on the hypothecated cess and uniform tolls, would attract the required funds and minimize the high traffic risk premium normally charged under PSP.

33. With a securitized revenue stream from the cess and completed toll roads, NHAI could raise further debt or enter into non toll based Design Build Finance and Operate (DBFO) agreements without GOI guarantee⁸. Alternatively, the private sector could also be successfully utilized through maintenance concessions or long-term performance based maintenance contracts.

34. This corporate approach would: (i) diversify the traffic risk across the whole network; (ii) allow cross-subsidization between links; (iii) improve the understandability of the toll system for road users; (iv) give economies of scale; (v) ensure uniformity of service standards; (vi) allow for the incremental introduction of tolls; and (vii) give greater incentives to manage the whole network efficiently to minimize costs and maximize revenues. GOI could provide concessional funding for necessary but financially unviable projects. NHAI would have several financing options, including (i) issue non GOI guaranteed debt on the strength of its future anticipated revenues; (ii) enter into non toll based DBFO contracts, using annuity, lane availability or active management payments; or (iii) develop hybrid financing using a combination of annuity and incremental shadow toll payments where only some traffic risk is passed to the private sector.

35. ***The Regulatory Framework.*** If DBFO or toll based concessions are to be a major part of the highway sector, GOI should establish a regulator, similar to the Telecom, Insurance and Energy sectors. At the State level, unless the GOI regulator can be used, regulation through contract by a dispute resolution board may be appropriate.

36. ***Additional State Actions.*** GOI and a few states have established the broad institutional and legal frameworks for PSP; but most States continue within the PWD approach. They need to make substantial changes, including (i.) reform or the replacement of the traditional PWD, (ii) adoption of a corporate approach with Road Development Corporations/Highways Authorities and dedicated road funds with hypothecated revenues from road user charges; (ii) adoption of a PSP framework and enactment of accompanying laws.

⁸ BOTs could still be used for links with high traffic and limited traffic risk, such as major bridges

INTRODUCTION

The Importance of Roads and Road Transport

1. While the railways remain important for some bulk commodities and in some passenger markets, India is increasingly dependent upon road transport. Rail traffic continues to grow, but its share of freight and passengers has been falling for many years. The growth in road transport has been accelerating; during the 1990's, the national vehicle fleet grew from 21.3 million to 48.4 million. Faster economic growth, especially in non-traditional sectors, and higher personal incomes will undoubtedly continue the growth in demand on the road network. However, unless major reforms as well as investment are made, India's road infrastructure will be an impediment to economic growth and social development. The Indian Tenth National Plan (2002-2007), projects a GDP growth rate of 8% per annum and an industrial growth of 10% per annum and identified transport infrastructure as a major constraint on accelerated growth.

2 India has 3.5 million km of roads which, by international comparisons, provides a relatively dense network. The major issues in the sector are not primarily the length of the network but its low capacity and poor quality.

- During the 1990's, the national highway network expanded from 33,700 km to 58,100 km⁹ and, though it constitutes only 2% of the network, it carries about 45% of all road traffic. Most of the network is still two lane, providing low service standards and slow vehicle speeds. Many NH have simply be reclassified from lower category roads without any upgrading.
- At the other extreme, about 40% of villages are not connected by all-weather roads and have thus limited access to economic and social infrastructure and opportunities.
- Road maintenance throughout the network is dismal, contributing to both poor pavement condition and the loss of all-weather accessibility.

3. Therefore, India combines both the need to increase very substantially the maintenance of a very large network and the need to provide a high quality highway system, sufficient to support the development of a rapidly developing economy.

Highway Sector Financing Issues

4. Government expenditure on roads is significant, presuming 12% of capital and 3% of total expenditure; but road maintenance is grossly under-funded with only one third of needs being met. The Union Government (GOI) recognizes the deficiencies in the road network. The Tenth National Plan has assigned a high priority to the National Highway Development Plan (NHDP) for the construction of a Golden Quadrilateral of high capacity, high quality highways, linking the four major cities, as well as similar highways along North-South and East-West corridors. Very large investments are also envisaged on State highways. The capital funding needs are immense:

- over Rs.225,000 crore (US\$50 billion) on highway improvements in the period to 2011; and¹⁰
- substantial investment (about Rs. 70,000 crore or US\$15.6 billion), through the Pradhan Mantri Gram Sadak Yojana (PMGSY), to connect villages

5. In addition, annual expenditure of about Rs.7,000 crore is essential to maintain the 170,000 km of National and State Highways and further funding is required to maintain the urban networks and district and rural roads. All these expenditures have to be financed within

⁹ Recently a further 7,000 km have been reclassified.

¹⁰ Vision 2021

a constrained fiscal environment in which the combined GOI and State Government deficits total about 9.5% of GDP. There are major issues as to who will finance these expenditures and how the financing will be structured.

6. It is not only the level of highway funding which is important but also the means by which it is financed. The financing arrangements for the highway sector have significant implications for overall government expenditure, the role of private finance as well as having major impacts on the efficiency of the transport sector and thus indirectly for the efficiency of the entire economy.

Approaches to Highway Financing

7. The management and financing of roads is not a new issue for governments. The Roman Emperors invested heavily in road construction and maintenance throughout Europe and the Middle East. However, with the growing transport dominance of the motor vehicle, roads and highway finance has assumed major importance and a number of approaches have been adopted.

8. **Traditional.** In this approach roads are treated much like public goods and financed from general government revenue. There is little connection between the costs of road provision and the taxes or charges paid by road users (though fuel is often heavily taxed for general revenue purposes), and no attempt at direct road pricing.

9. **Commercial.** In the commercial approach, governments deal with roads as a business sector. Roads are treated as capital assets, commercial accounting is applied and users are charged, either directly or indirectly, for their use of the roads. Road transport remains a source of general revenue, but taxes are designed to minimize distortions to transport patterns or choices. In some countries, road finance is being separated from general government expenditures and road users are increasingly involved in decision-making.

10. **Indian.** The traditional approach largely persists in India, although a national and some state fuel cesses have been introduced, tolls are increasingly applied and substantial private sector financing is being sought. India may be early in a transitional stage between the traditional and commercial approaches. Yet, the present structure of financing contributes to the under-funding of road maintenance, a distorted vehicle fleet, perverse incentives for traffic allocation between road and rail, and substantial economic losses. A coherent structure for highway financing should have high priority; otherwise the distortions and costs to the economy will rise as overall expenditure on roads increases.

The Purpose of the Report

11. This report is designed to provide information and advice to the Indian Union and States Governments on the principles and practicalities for establishing a sound and sustainable system of highway financing.

- The report reviews the economic principles for establishing efficient and equitable road user charges (road pricing), and examines the potential mechanisms for charging road users. Present road taxation in India is assessed in the light of these considerations and the levels of highway funding required to meet government objectives.
- The report reviews the potential contribution of private sector finance to the sector and assesses the present use of private finance and the alternative possibilities for utilizing the private sector in the financing and management of the network.
- The report also examines the need for an agenda of sector reform which addresses both the financial and institutional frameworks needed to achieve network sustainability and public acceptance of higher user charges.

12. The report is specifically concerned with the main highway network (defined as the 170,000 km of National and State Highways) which carry the great majority of vehicle-km. There is also a very large network of rural roads which carry little motorized traffic but which provides basic access for the rural population and facilitates the administration of the country. These rural roads are crucial to the social infrastructure of the country but their financing raises issues outside the scope of this report. These roads generate major benefits but, in view of their low traffic levels, it would be inconceivable to finance their construction and maintenance from road users alone.

1. PRINCIPLES OF A USER CHARGE REGIME

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, the objectives of road user charges are considered and their implications for the levels and structure of taxes which are generally used as proxies for direct road charges¹¹.

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, increases road deterioration, reduces the pavement life and increases the cost of road maintenance and renewal.
- The marginal environmental cost: increased traffic raises the levels of vehicle emissions, noise pollution, etc. These 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

¹¹ For a more detailed exposition of this issue see Efficient Transport Taxes and Charges, ECMT, 2000, also available at <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 is 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 dimensions 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 may be achieved by imposing relatively 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 the relatively rich. Equity considerations may be particularly important to finance those costs which are not directly attributable to individual vehicles. Distributional 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 Compressed Natural gas (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 (e.g. repairing potholes) but also the periodic resealing and strengthening of pavements. Some maintenance costs are, however, not directly attributable to vehicle use but are caused by non traffic related degradation. 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: 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*: 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*: 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.¹²

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.¹³

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

¹² 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.

¹³ 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.

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.

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; i.e. 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, in accordance with normal commercial principles, the annual servicing charge on the capital employed 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 a zero marginal tax impact.

22. A recent European Conference of Ministers of Transport report analyzed this complex issue¹⁴. 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.

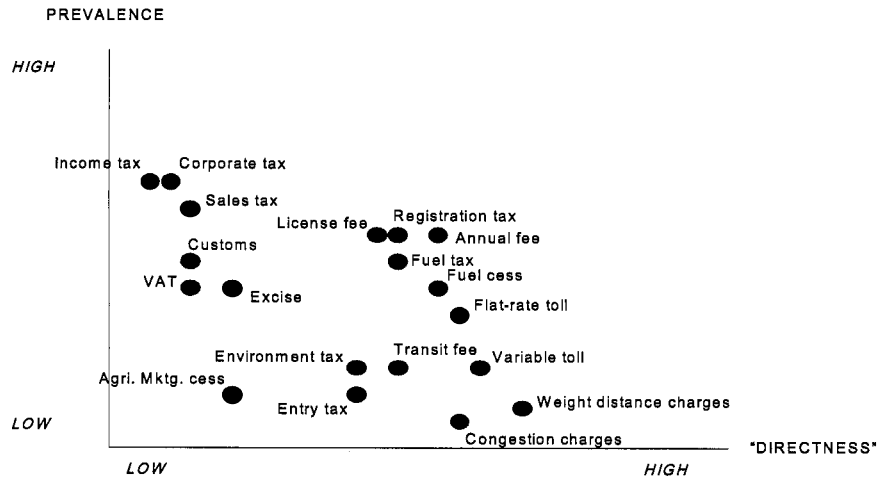
Suitable Tax and Charging Instruments

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

¹⁴ Efficient Transport Taxes and Charges, OECD, 2000

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 1.1. In general, for 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 road charges more directly with use.

Figure 1.1: 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 liter);
- iii. Countries with medium level of taxes of 10 - 30 US cents per liter (India and many other developing countries); and
- iv. High price countries with taxes ranging between 60 cents to 110 cents per liter (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 with low evasion). 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. However, 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 under-charged. This may adversely affect the choice of vehicles.
- There can be fuel substitution or adulteration¹⁵. 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% of the tax revenue. Much smaller dead weight losses are estimated for taxes on vehicles, spare parts and tires. Diesel and close substitutes have usually to be taxed at similar rates to avoid widespread fuel substitution or adulteration.
- About 46% of diesel in India is consumed outside the transport sector. Non-transport uses of diesel should normally not be charged for highway use 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 recover the fixed costs of the network as well as 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 damage¹⁶. 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

¹⁵ Newbery, Hughes, Peterson and Bennathan, Road Transport Taxation in Developing Countries. The Design of user charges and Taxes for Tunisia, World Bank Discussion Paper 26, 1988.

¹⁶ 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

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.

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.** There are two main economic constraints to implementing a toll system. First the costs of constructing and then operating a road toll system are quite high and roads with low traffic are not suitable for tolling. Generally, traffic flows of about 5,000 PCUs/day are required to make tolling financially viable, but most of the national highway network (54,000km) already meet this criterion. Second, tolls deter marginal users and/or encourage the use of non-tolled routes¹⁷. Normally, traffic diversion to non tolled alternate routes should not be more than about 15%. Any toll, above short-run marginal cost will generally result in some economic 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 has been set, how revenues will be used and what benefits will accrue.

¹⁷ *Shadow tolls*: concessions are awarded to the private sector (e.g. in the UK in the early 1990's) 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 transferring some traffic risk to the concessionaire while avoiding 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. They are only a contractual means of determining payments between an owner and concessionaire.

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. Another 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 to the operator.

37. *Weight/distance charges.* A serious deficiency in the road tax structure exists in relation to heavy commercial vehicles. The road damage costs rise 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 (see Box 1.1), is to be introduced in Austria in 2004 and the United Kingdom in 2006. Germany had hoped to have its GPS based weight/distance charge system operational in 2004¹⁸. 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.

Charging Structures – Effectiveness vs. Efficiency Trade-off

38. 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 collection¹⁹. Yet, 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.

¹⁸ Its introduction was initially delayed to 2004, by the failure of the system to meet its technical specifications. Notice of contract termination has recently been issued to the contractors. Germany still intends to proceed with some form of weight/distance charge system.

¹⁹ The Administration of Road User Taxes in Developing Countries, Bahl R, World Bank Working Paper, 1992

Box 1.1 Weight/Distance Charge Systems***New Zealand: the low technology route***

All vehicles with a gross laden weight in excess of 3.5 tones must pay the distance charge. Distance licenses are purchased in multiples of 1,000 km. Those vehicles paying the distance charge are classified according to: (i) whether the vehicle is powered or un-powered (trailer); (ii) the number of axles on the vehicle, and (iii) the number of tires per axle.

A license for a two axle truck (six wheels), with a permissible gross laden weight of 12 tones, is \$161.05/1000 km. Licenses must be carried on the vehicle and displayed on the passenger side windscreen. Vehicles with a gross laden weight in excess of 3.5 tones must be fitted with an approved hub odometer (≈\$35) to record the distance traveled. The revenue goes to the National Roads Fund. The system is administered by the Land Transport Safety Authority and enforced by the New Zealand Police. Revenue in FY2004 is expected to be \$634 million.

Switzerland: the high technology route

In 2001, Switzerland introduced a Heavy Vehicle Fee (HVF) system for all domestic and foreign vehicles. The HVF has many objectives, including to (i) internalize the external costs from freight transport (ii) finance large scale railway projects and (iii) encourage the transfer of goods from road to rail.

Fees are determined on a tone-km basis and also vary according to the emission category of the vehicle, with the average rate currently as 1.68 centimes (Rs 0.54) per tone-km. The fee collection is based on the principle of self-declaration and uses Dedicated Short Range Communication technology. For domestic vehicles, installation of an on-board unit (OBUs) is mandatory. For foreign vehicles, installation of OBUs is optional. Foreign vehicles can also pay using a ticket at self service stations at various entry and exit points to Switzerland. Currently the Swiss OBUs have inter-operability in Austria and future inter-operability is planned in France.

The total investments by the Swiss authorities amounts to 160 million euros. The operating costs for the system are around 16 million euros per annum. Total collection costs amount to 4-7% of revenues. Net revenues in 2002 were 500 million euros. This figure is expected to double to 1 billion euros from 2005, when increased tariffs come into force. High emission trucks are being replaced with those conforming to latest pollution norms. The long run trend of a constantly growing number of lorries on the roads has now been broken. The effect on consumer prices is negligible.

Source : <http://www.are.admin.ch/are/en/verkehr/lsva/>
<http://www.transfund.govt.nz>; <http://www.ltsa.govt.nz>

2. ROAD TAXES AND HIGHWAY EXPENDITURES

Introduction

1. This chapter reviews the current state of government finances relating to the highway sector in India and provides the necessary basis for assessing the need for restructuring the approach to the financing of the sector. The chapter considers:

- the direct and indirect taxes and charges applied to vehicles and road transport;
- the total level of government revenue generated from the road transport sector;
- the total level of government expenditure on roads and more specifically the National and State Highway networks; and
- the expenditure responsibilities of different vehicle categories.

2. The estimates of revenues and expenditures are based on national data and a sample of six states²⁰.

Road Related Taxes and Charges

3. India has a federal political and administrative framework under which the Central, States and local authorities have well defined powers for taxation and management of roads and road transport²¹. Except for the national highways, the responsibility for roads is vested in the State Governments. Both Central and State Governments impose taxes on vehicle purchase, vehicle ownership and vehicle use, as shown in Table 2.1

Table 2.1: Classification of Road Taxes/Charges in India

	Central Government	State Governments
Vehicle Purchase	Central customs Excise duty on motor vehicles Central sales tax on inter-state transactions and shipment of vehicles	Sales tax on vehicle/chassis and cab/body
Vehicle Ownership		Motor vehicle tax (annual or lifetime) Registration fee Certificate of fitness Taxes levied on passengers & goods vehicles Entry tax ⁽¹⁾
Vehicle Use	Excise duty on fuel Cess on fuel Excise duty on spares/ lubes/ accessories Road user tolls	Sales tax on spares/ lubes/ accessories Sales tax on fuel Cess on fuel Road user tolls Permits & licenses Fines & penalties

(1) Applicable to vehicles purchased/ registered in one state and brought into another state

4. With the exception of road tolls and road cesses, revenue from the various taxes/charges are not hypothecated to the road sector, but form part of general revenue. The levels of taxes and charges vary widely across the country.

5. **Central Government taxes.** The following taxes are imposed by Central Government.

²⁰ Andhra Pradesh, Karnataka, Maharashtra, Madhya Pradesh, Uttar Pradesh and West Bengal

²¹ See <http://parliamentofindia.nic.in/const/const.html>, especially Seventh Schedule and associated lists

Customs duty: Transport fuels carry 20% duty + Rs1.50 per liter. New vehicles attract 60% duty; used vehicles carry 105% custom duty.

Excise duty: Gasoline 30%, high speed diesel (HSD) 14%, other vehicle inputs 16 – 24% (see Annex 2). The general excise rate is 24%.

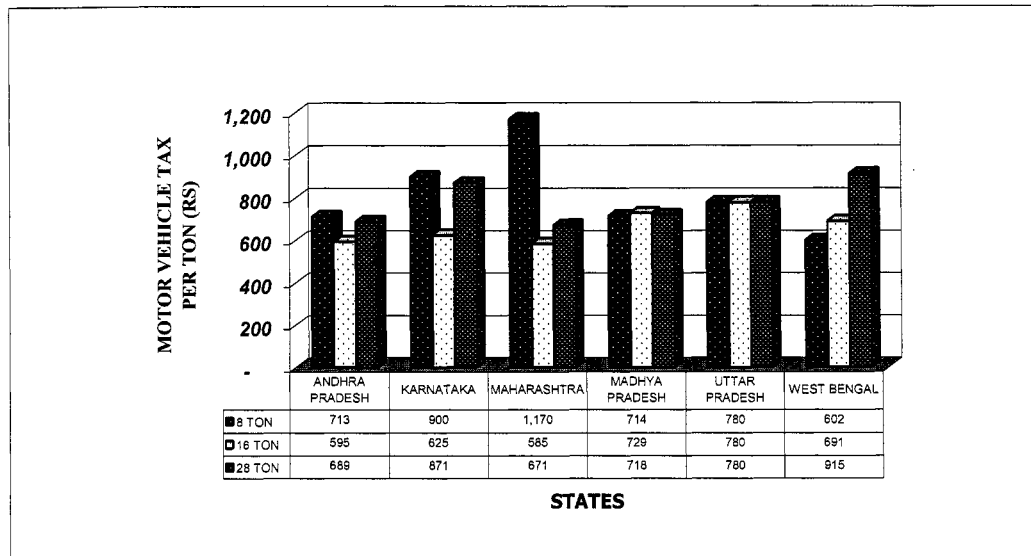
Fuel Cess: Under the Central Road Fund Act 2001, a special cess of Rs.1.50 per litre on HSD and motor spirit has been applied. The cess supports the development/maintenance of national and state highways and the development of rural roads.

Central sales tax: 4% on interstate transactions and transfer of vehicles by manufacturer/dealer from one state to another.

6. **State Government taxes.** The following taxes are imposed at the State level.

Motor vehicle (MV) tax / road tax: Small private vehicles (2-wheelers and cars) are generally charged a one time fee at the time of initial registration. Commercial vehicles are charged annually on the basis of the number of seats for buses and weight for trucks (see Annex 3). The MV tax for commercial vehicles is State specific and vehicles, operating in a number of states, have to pay additional MV taxes. There are wide variations in MV tax between States and between vehicle types. Buses and multi-axle vehicles (MAVs) often pay more than private vehicles and smaller goods vehicles. The implicit tax/ton for trucks shows little consistency. Figure 2.1 suggests there is no consistent approach to the setting of charges.

Figure 2.1: Per Ton Incidence Of Motor Vehicle Tax (In Rs)



Sales tax: There is wide variation in the sales tax rates between States (see Annex 4). Generally, fuel is charged at a higher rate than other vehicle related items: diesel 17.5% – 34%; gasoline: 20% - 30.5%; other vehicle-related inputs: 8 – 12%. The median state sales tax is approximately 12%.

Fuel Cess: Some States, such as Uttar Pradesh, levy an additional tax on transport fuel sales for the development and maintenance of roads

Entry tax: levied by some states on commodities and vehicles imported into the state. In Karnataka, an entry tax of 2% is levied on tyres and 5% on fuel and lubricants.

Misc. Fees: fees for vehicle registration, issuing/renewal of driver licenses and vehicle permits are collected, under the Central Motor Vehicle Rules 2001, to meet the cost of providing these services and are uniform throughout the country. Some States collect additional fees under powers conferred by their respective State Motor Vehicle Rules.

7. **Road tolls.** Road tolls are being collected by NHAI, some State governments and private sector concessionaires on specific road sections across the country. However, the total revenue from these tolls is still low, perhaps about Rs.1,500 Crore per year²², and have a marginal impact on the overall financing of highways. The willingness to pay tolls appears low, and traffic levels on tolled roads are generally below expectations.

8. **Local Authority taxes.** Local authorities levy octroi and terminal taxes on goods, animals and passengers entering a local area. Octroi is not specifically a road-use tax but the resulting delays have a significant negative impact on road transport.

Government Revenue from the Road Sector

9. **Total road-related revenue.** Estimates of the total Central and State revenue generated from the road sector were developed from a combination of primary and secondary sources²³ and then disaggregated between different vehicle categories as shown in Table 2.2. (Annex 5 provides the details of the assumptions made).

Table 2.2: Assessment of Total Tax Revenue by Vehicle Type: FY2002 (Rs. billion)

	Total	2-wheelers	Cars	Jeep/taxi	Bus	Commercial Freight Vehicles		
						Light	Heavy	Multi-axle
Central Government								
Excise on Fuel	150.9	32.8	52.2	4.4	10.1	15.8	34.3	1.3
Excise on Motor Vehicles	31.7	6.6	15.0	5.0	1.1	1.5	2.3	0.1
Excise on Tyres	11.2	1.5	1.6	0.4	1.0	1.8	4.2	0.2
Excise on Motor Parts	15.3	1.4	2.5	0.9	1.8	2.7	5.8	0.2
Cess on fuel	28.1	2.8	4.4	1.4	3.2	5.0	10.9	0.4
Total Central Government	237.3	45.1	75.6	12.3	17.5	26.8	57.5	2.3
State Governments								
Sales tax on Fuel	87.9	9.4	15.0	4.2	9.7	15.2	33.0	1.3
Sales tax on Motor Vehicles	39.0	11.2	14.5	4.8	1.9	2.5	4.0	0.2
Sales tax on Tyres	6.2	0.4	0.3	0.0	1.5	0.6	3.2	0.1
Sales tax on Motor Parts	4.9	2.3	0.9	0.1	0.5	0.3	0.8	0.0
Taxes on vehicles**	124.8	7.4	9.4	2.8	81.9	5.2	16.7	1.3
Total State Governments	262.8	30.7	40.2	11.9	95.5	23.8	57.8	2.9
Grand Revenue	500.1	75.8	115.8	24.2	113.1	50.6	115.3	5.2

* not including customs duties which are payable on import/export, a further Rs77 billion in 2001-02

** including fees, fines, penalties, passenger and goods taxes

10. Fuel taxes and cess generate about 55% of total sector revenue. Purchase and ownership fees/taxes account for about 40% of revenue, which is high by international standards and may encourage the intensive use of vehicles (high fixed and low marginal costs). Central and state revenues are approximately the same; but the overwhelming

²² World Bank assessment

²³ The main sources were the Directorate of Data Management, Central Excise & Customs for the central taxes and the RBI: States Finance, A Study of Budgets, 2002-03 for the state taxes. Data from six State Transport Departments and the Sales Tax Commissioners was used to supplement RBI data and extrapolated for the country as a whole.

majority of roads are the responsibility of state or local governments. As a result, significant inter-government transfers are required to match revenues with expenditures.

11. **Revenue generated by vehicle category.** The incidence of taxes on individual vehicles, and equivalent taxes per vehicle-km are shown in Table 2.3. Among passenger vehicles, buses pay the highest taxes on both a vehicle and km basis (though not on a seat-km basis). Buses are taxed substantially more than any category of freight vehicles, which is very unusual.

Table 2.3: Total Tax Revenue per Vehicle FY2002 (Rs.)

	2-wheeler	Cars	Jeep/Taxi	Bus	Freight Vehicles		
					Light	Heavy	Multi-axle
Average tax/vehicle:							
Purchase	680	8,087	9,087	8,863	4,428	7,488	10,818
Ownership	266	2,487	2,487	210,340	5,515	17,628	33,663
Road Use	1,778	19,947	10,026	71,228	43,460	96,499	91,071
Total annual tax/vehicle	2,725	30,521	21,600	290,431	53,403	121,615	135,551
Total tax/vehicle-km	0.44	2.39	1.03	5.69	1.48	2.03	2.51

12. **Revenue contribution by road type.** The levels of revenue generated on the main road network (National and State Highways) as well as on rural and urban roads were estimated, using the distribution of vehicle-km on the network. Traffic on the main road network is estimated to generate Rs. 254 billion, slightly more than half of total road-related revenue (Table 2.4). Revenue from freight vehicles accounts for 50% of the total revenue on the main road network, while light vehicles generate over 80% of the revenue on urban roads. The results are detailed in Annex 6.

Table 2.4: Road Network Distribution of Road Tax Revenues FY2002, Rs Billion

	Total Revenue		Light Vehicles		Buses		Freight Vehicles	
	Rs Billion	%	Rs Billion	%	Rs Billion	%	Rs Billion	%
National/State Highways	253.7	100%	52.4	21%	73.5	29%	127.8	50%
District and village roads	77.6	100%	21.8	28%	28.3	36%	27.5	35%
Urban roads	168.7	100%	141.5	84%	11.3	7%	15.9	9%
Total	500.1	100%	215.8	43%	113.1	23%	171.2	34%

Government Expenditure on the Road Sector

13. **Expenditure on the overall road network.** Total recurrent and capital expenditures on the road network are significant for both Central and State Governments, totaling almost 3% of the combined recurrent and capital expenditure. A broad breakdown of total government expenditure, for recent years, is provided in Table 2.5.

Table: 2.5 Government Recurrent and Capital Expenditure (Rs Billion)

	Central Government		State Governments		All Governments*	
	FY2002	FY2003	FY2002	FY2003	FY2002	FY2003
Total Recurrent Expenditure	3,016	3,405	3,314	3,552	6,330	6,957
Development	823	974	1861	1971	2684	2945
Social Services	185	193	1174	1207	1359	1400
Economic Services	638	781	687	704	1325	1485
(Roads/Bridges)	(68)	(68)	(48)	(48)	(116)	(116)
(Other Transport)	(20)	(17)	(17)	(18)	(37)	(35)
Non-Development	1,746	1,926	1,399	1,544	3,145	3,470
Total Capital Expenditure	444	521	383	437	827	958
Development	84	172	365	415	449	587
Social Services	-34	11	85	94	51	105
Economic Services	118	161	283	322	401	483
(Roads/Bridges)	(29)	(34)	(66)	(82)	(95)	(116)
(Other Transport)	(55)	(57)	(10)	(10)	(65)	(67)
Non-Development	178	232	18	22	196	254
Other capital/loans	182	118			182	118
Roads/Bridges as % of:						
Recurrent expenditure	2.3%	2.0%	1.4%	1.4%	1.8%	1.7%
Capital expenditure	6.5%	6.5%	17.2%	18.8%	11.5%	12.1%
Recurrent + capital	2.8%	2.6%	3.1%	3.3%	2.9%	2.9%

* Estimates are marginally higher than other sources

14. Roads account for a little less than 2% of total government recurrent expenditures and about 12% of total capital expenditures.

15. Capital expenditure on roads has been increasing and this is expected to continue, up from Rs. 85 billion in FY2000, reflecting the focus on connecting rural villages and improving the major National Highway system. Road maintenance, on the other hand, has shown little increase in recent years and may actually be falling in real terms. Between FY2000 and FY2002, expenditure on road maintenance only increased from Rs. 50 to Rs. 53 billion²⁴.

16. **Expenditure on the main highway network.** All road expenditures made by the Central Government can be attributed to the National Highways. For State expenditure, it was assumed that funds were allocated to State Highways, District Roads and Rural Roads pro rata to their total lengths and the unit costs of construction/maintenance for each category of road. This may understate total expenditure on highways which have been receiving priority in the allocation of available maintenance funds. The estimates of total expenditure on the main highway network are given in Table 2.6.

²⁴ Recurrent expenditure in Table 2.5 also includes administrative costs for the sector and are thus significantly greater than maintenance expenditure.

Table 2.6: Expenditure on National and State Highways FY2002 (Rs. billion)

Item	National Highways	State Highways	Total Network
Highway Construction/Improvement	26.17	14.01	40.18
Highway Maintenance:			
Routine	1.85	3.80	5.65
Periodic	5.55	11.39	16.94
Sub -total	7.41	15.18	22.60
Total Highway Expenditure	33.58	29.19	62.78

Source MORTH Directorate of Transport and Planning Commission, RBI State Finances

Comparison of Aggregate Revenue and Actual Expenditure

17. For FY2002, the total tax revenues derived from road users were very substantially higher than total expenditures on the road sector, (see Table 2.7).

Table 2.7: Total Revenues and Expenditure in the Road Sector FY2002 (Rs. billion)

	Tax/Charge Revenue	Road Expenditure	Expenditure as % of Revenue
National/State highways	254	63	25%
District and Rural Roads	77	64	83%
Urban Areas ⁽¹⁾	169		
Total	500	211⁽²⁾	42%

⁽¹⁾ Relatively small expenditures included with District roads

⁽²⁾ Including administrative costs

18. Overall, total tax revenues from road users are two and a half times total expenditure on the road network. Users of the primary road network are paying about four times the level of expenditure, and the revenue/expenditure difference is probably much greater in the urban areas. Only for district and rural roads (with low traffic flows) is there a broad balance between total revenue and expenditure.

19. This may suggest that, in terms of highway financing and user charges, little change is necessary. However, Table 7 presents a very incomplete representation of reality in the road sector.

- (a) Taxes on road use (vehicles, fuel, etc) are used almost universally to generate general government revenue as well as to finance the road sector. Taxes on road use are not necessarily equivalent to road user charges.
- (b) Actual expenditure on road maintenance may not be sufficient to maintain the network, which may be deteriorating, and thus does not reflect the real road damage costs imposed by vehicles.
- (c) Present expenditure on road construction and improvement may not reflect the needs of the sector nor provide a realistic reflection of likely future financing requirements.

3. THE ROAD USER CHARGE REGIME

Road User Charges in India

1. In some countries, there are specific and designated charges for road use (the road cess, for example). But most taxes on vehicles and operating inputs (fuel, tires, etc) are part of the general tax structure; they generate revenue for general expenditure as well as implicitly performing a road user charging role. A distinction needs to be made between these “normal taxation” and “road user charging” roles in order to try and ensure that both are set at appropriate levels. However, the road user charging function is rarely recognized explicitly in tax setting and thus it is necessary to determine an implicit separation between the two functions. There is a spectrum of possible approaches to making the separation.

- (a.) At one end of the spectrum: all taxes and charges paid by road users (i.e. total road user generated revenue), from their ownership and use of vehicles, could be considered as road user charges. This would imply that consumption of road services is exempt from the general application of indirect taxation; this is implausible.
- (b.) At the other end of the spectrum: only those specific charges which are dedicated to road financing (such as the road cess and road tolls), together with vehicle and driver registration fees might be defined as user charges, and all other revenues considered as general taxation. This would imply that very high rates of indirect taxes on road-use related items contained no implicit element of road use charge; this seems unlikely.

2. Often, it is assumed that all commodities carry the same rate of indirect tax for raising general revenue and that any excess over this general level can be considered as a road user charge. This approach can certainly be applied in India at the state level, where there is a general standard sales tax and higher rates on transport fuels. It is more difficult to apply to Central Government’s customs and excise duties, which vary widely. In these circumstances, the excess over the *average* rate can be used, , but it is less logical; a distinction can also be made between average taxes on consumer goods (and applied to light vehicles) and average taxes on production goods and raw materials (and applied to freight vehicles).

3. There are conceptual problems with using the “excess over average tax” to define road user charges. A general principle of indirect taxation is to minimize economic distortions. Efficient taxes should thus be structured in inverse proportion to the price elasticity of demand for the products. The demand for transport fuel is relatively price inelastic so, for macro-economic efficiency, the general revenue tax on fuel should be higher than the average general revenue tax. For economic equity or redistribution reasons, general taxes may be above average on those goods consumed disproportionately by the rich. Gasoline, used in private cars, may thus be more heavily taxed than the average.

4. Without an institutional separation of road user fees from general taxation, there will be ambiguity in the estimation of road user charges. It is useful, however, to have a baseline upon which to judge the adequacy of user charges, and to explore the implications for increasing road expenditures. Despite the methodological issues, the “excess over average indirect taxation” has been used as the basis for one estimate of implicit road user charges²⁵. A second estimate of road user charges has been made on a rather narrow definition, which excludes the “excess over average indirect taxation” element.

5. Based on the above assumptions, total road sector revenues have been divided into general taxation and road user charges in Table 3.1.

²⁵ For excise duties, the road user charge is the excess rate above the average excise rate of 24%, For state sales tax, the road user charge is the excess rate above the average rate of 12 percent.

Table 3.1: Total Road User Charges, Rs. Billion FY2002

Item	Rs billion	% of total revenue
Broad Definition of Road User Charges*		
General Taxation	300	60
Road User Charges	200	40
Total	500	100
Narrow Definition of Road User Charges		
General Taxation	347	69
Road User Charges	153	31
Total	500	100

* including excess over average taxes for excise and sales taxes on fuel

6. Depending on the assumptions adopted regarding indirect taxes, such as excise and sales tax, total road user charges (both explicit and implicit) in India are between 30-40% of the total revenues generated from the road sector.

7. The levels of implicit road user charges (RUC) paid by vehicle category are outlined in Table 3.2. The level of road user charges are very substantially lower than total tax revenues for all vehicle categories, with the partial exception of the bus category. The most marked impact is on two-wheelers and cars.

Table 3.2: Road User Charges per Vehicle FY2002 (Rs.)

Vehicle Type	2-wheelers	Cars	Jeep/taxi	Bus	Freight Vehicles		
					LCV	HCV	MAV
Total Tax Revenues							
Per vehicle	2,725	30,521	21,600	290,431	53,403	121,615	135,551
Per vehicle Km	0.44	2.39	1.03	5.69	1.48	2.03	2.51
Broad Definition of Road User Charges							
Per vehicle	747	8,098	4,902	226,424	15,866	40,055	54,910
Per vehicle Km	0.12	0.63	0.23	4.44	0.44	0.67	1.02
Narrow Definition of Road user Charges							
Per vehicle	365	3,642	3,723	218,574	10,814	29,109	44,548
Per vehicle Km	0.06	0.28	0.17	4.29	0.30	0.49	0.83

8. The distribution of total user charges between the different road categories is rather different to the distribution of total road-user related tax revenues, reflecting the very high proportion of light vehicles in the traffic flows on urban road networks (Table 3.3).

Table 3.3: Distribution of Road User Charges by Road Category, FY 2002

	Total Revenue		Total User Charges		Light Vehicles		Buses		Freight Vehicles	
	Rs. billion	Rs. billion	%	Rs. billion	%	Rs. billion	%	Rs. billion	%	
Broad Definition of RUC										
National/State Highways	257	112	56%	14	12%	57	51%	41	37%	
District and Village Roads	77	36	18%	6	15%	22	61%	9	24%	
Urban Roads	169	52	26%	38	73%	9	17%	5	10%	
Total	500	200	100%	57	28%	88	44%	55	28%	
Narrow Definition of RUC										
National/State Highways	257	92	60%	7	8%	55	60%	30	32%	
District and Village Roads	77	31	20%	3	10%	21	69%	6	20%	
Urban Roads	169	30	20%	18	60%	9	29%	3	11%	
Total	500	153	100%	28	18%	85	56%	40	26%	

9. The level of road user charge revenue generated in urban areas is much lower than its charge of total road-user related tax revenues. The proportion of total road user charges generated by buses on the non-urban roads is very substantial.

Road User Charges vs. Road Expenditures

10. In terms of the total Centre and State Government expenditure, reported in Table 5, there is a small shortfall when compared to the revenue raised using the broad definition of user charges, and a rather larger shortfall on the narrow definition, (see Table 3.4).

Table 3.4: Total Road Expenditures – Road User Charges FY2002 (Rs billion)

	Road Expenditure	Road User Charges	
		Broad Definition	Narrow Definition
National and state highways	63	112	92
District and rural roads	64	36	31
Urban	N/a	52	30
Total	211	200	153

11. At a network level, there is sufficient funding from highway users to cover identified actual expenditures on national and state highways. There is a significant road-user funding deficit for district and rural roads; this is perhaps not unexpected as a large part of this network carries little traffic but is required for basic access. However, as indicated previously, actual road expenditures may not reflect the level of road maintenance actually required to keep the network in a good condition and remedy the damage inflicted by road users.

Road User Charges vs. Full Road Costs

12. **Full road maintenance.** Actual expenditure on road maintenance is often not a good approximation to road damage costs. Like many countries, India under-maintains its roads and investment crowds out operations and maintenance. New roads are being constructed while the overall road network is deteriorating through lack of maintenance. The expenditure required to maintain fully the National and State Highways was estimated, using GOI's own

norms²⁶. The full maintenance requirement for the highway network is three times the level of actual maintenance expenditure, (see Table 3.5).

Table 3.5: National and State Highway Maintenance Needs FY2002*
(Rs. billion)

Item	Highway Maintenance Needs		
	National	State	Total
Maintenance Requirement	33.76	37.17	70.93
Routine	7.68	10.98	18.67
Periodic	26.07	26.18	52.26
Actual Expenditure	7.41	15.18	22.60
Actual/Requirement	22%	40%	32%

* Assumes the standard unit rates for Zone IV given in the norms for Road Maintenance in India published by MORTH

13. In aggregate, road user charges would meet the full maintenance costs on the main highways: Rs. 112 billion (Rs. 92 billion, using the narrow definition) compared with maintenance needs of Rs. 71 billion. However, not all vehicle categories may cover their road costs.

14. The road maintenance costs, both routine and periodic, incurred to maintain a road network in a good and stable condition can be broadly divided into two categories.

(a) *Vehicle attributable costs*: These are variable costs that increase with the level of traffic flow. The costs can be specifically related to individual vehicle categories, according to either the damage the vehicles cause or the road space that the vehicles occupy.

- Road Damage: road deterioration and the required strength of pavements is related primarily to the number and weight of axle-loads and is measured by total Equivalent Standard Axles (ESA). Light vehicles, such as cars, impose very little damage to paved roads, heavy commercial vehicles impose substantial damage, especially if they are heavily overloaded.
- Road Space: the use of road space, important in determining both congestion and the required width for new road construction, is a function of the size and speed of vehicles and is normally related to total equivalent Passenger Car Units (PCUs).

(b) *Fixed costs*: These costs cannot be directly attributable to any particular vehicle category and are usually caused by the passage of time or the effects of weather. The costs are sometimes disregarded for the purposes of determining appropriate road user charges and financed from general revenue, or are allocated on an 'equitable basis' to the different vehicle categories, normally on the basis of total PCUs.

15. The full road cost requirements for the highway network, both capital and maintenance, have been allocated to individual vehicle categories on the basis of their cost contributions. Estimates have been made for both full maintenance costs, with the fixed costs allocated according to their PCUs, and variable costs which can be specifically attributed to vehicle categories, (see Table 3.6 and Annex 7).

²⁶ An analysis of maintenance needs was also made using the World Bank's highway design model (HDM4). This analysis confirmed the magnitude of maintenance needs as determined by the norms, with estimated requirements within 20% for the National Highways and 10% for State Highways.

**Table 3.6: Road User Charges : Full Road Costs FY2002
National and State Highways (Rs. Per km)**

Item	Vehicle:-	2-wheeler	Cars	Jeep/taxi	Bus	Freight Vehicles		
						Light	Heavy	Multi-axle
Broad Definition of Road User Charges								
<i>User Charges/vehicle</i>		0.12	0.63	0.23	4.44	0.44	0.67	1.02
<i>Road Cost/vehicle</i>								
Total cost		0.17	0.33	0.33	1.14	0.55	2.03	2.81
Capital cost		0.13	0.25	0.25	0.84	0.41	1.34	1.88
Maintenance cost (total)		0.04	0.08	0.08	0.30	0.14	0.69	0.93
Maintenance cost (variable)		0.02	0.04	0.04	0.19	0.09	0.58	0.78
<i>User Charge : Cost Ratio</i>								
Total cost		0.7	1.9	0.7	3.9	0.8	0.3	0.4
Maintenance cost (total)		3.1	8.2	3.0	14.9	3.1	1.0	1.1
Maintenance cost (variable)		5.6	14.8	5.5	23.0	4.9	1.1	1.3
Narrow Definition of Road User Charges								
<i>User Charge/vehicle</i>		0.06	0.28	0.17	4.29	0.30	0.49	0.83
<i>User Charge : Cost Ratio</i>								
Total cost		0.4	0.8	0.5	3.8	0.5	0.2	0.3
Maintenance cost (total)		1.5	3.5	2.1	14.3	2.1	0.7	0.9
Maintenance cost (variable)		3.0	7.0	4.3	22.6	3.3	0.8	1.1

16. If full maintenance was to be undertaken on the network, few vehicle categories would fund their combined capital and maintenance costs; under the narrow definition of user charges, only buses cover their full share of road costs.

17. Much more seriously, the heavy commercial vehicle categories (Heavy and Multi-axle) only just cover their road maintenance costs, even under the broader definition of user charges. Under the narrow definition of user charges, the heavy commercial vehicle group (excluding multi-axle vehicles) fails even to cover their attributable road maintenance costs, which is the absolute minimum requirement for a road user charging strategy.

18. The user charges on buses, however, are greatly in excess of their share of road costs, irrespective of the definition of cost or the definition of road user charges. Quite clearly, buses, and consequently bus passengers, are subsidizing the system and implicitly the heavy commercial vehicles, in particular.

19. **Requirements for accident externalities and network operations.** In addition to under-maintenance, India allocates insufficient resources to ensure that roads are operated efficiently and safely. There are over 70,000 road deaths annually, including many pedestrians. A recent study estimated that road traffic accidents cost India Rs. 190 billion in FY2001, or about 1% of GNP. Improved engineering, education and enforcement could substantially lower these costs²⁷ but only Rs. 350 million is presently invested in road safety by central government, as well as an unknown but probably very small amount by state and city authorities. NHAI is now starting retroactively to provide adequate safety infrastructure on completed four lane highways, at a cost of Rs. 2 – 2.5 million lakh/km²⁸.

²⁷ Definition of Road Safety Policy and Action Plan for India, Span Consultants/DRD for MORTH, September 2003

²⁸ Detailed Project Reports for Minor Improvements Works, Third National Highway Project, NHAI, 2003

20. It has not been possible to estimate the funding provided for operating (excluding road safety) the highway network. However, as very few sections of highways have any traffic information, emergency facilities or other road services, the funding must be low.

21. **Congestion Costs.** Very heavily loaded trucks are driven at low speeds. These slow truck speeds, together with the limited road widths, road side development and non-motorized traffic result in low average speeds for all vehicles on most of India's highway network. Light vehicles, which could travel at much faster speeds, are delayed by the heavy trucks, i.e. even on the inter-urban highway network there is a level of congestion. Ideally, those responsible for the slower speeds should be charged for the delays that they cause to other road users. This would significantly increase the total road costs attributable to all freight vehicle categories.

Assessment of the Road User Charging Regime

22. Approximately Rs. 100 billion is collected, as explicit and implicit road user charges, from vehicles using the national and state highway networks. While this is sufficient to fund present public investment and maintenance on the network, the present charging regime is deficient in a number of major respects.

23. **The total level of road user charges is insufficient.** The present level of user charges is sufficient for present expenditures only because the highway network is being grossly under-maintained, poorly operated and with little attention to road safety. A sizeable proportion of the investment being made in the network is, in effect, capitalized maintenance, a very inefficient way of maintaining roads. Moreover, it is apparent that the present levels of user charges cannot include any significant element for the important externalities of congestion, road safety or environmental damage.

24. **The structure of road user charges is economically inefficient.** The present charges on heavy commercial vehicles cover only 80% of their attributable damage costs (variable road maintenance), which is the absolute minimum level for user charges. In addition, trucks impose substantial delays on other road users through their slow speeds, even on the highway network. Road user charges on heavy commercial (two, three and multi-axle) vehicles need to be substantially increased.

25. The present charging structure takes no account of the road space occupied by each vehicle. This is important for the highway network and critical on urban road networks, where charges related to congestion costs would be economically efficient and yield substantial revenues for the improvement of public transport services. The present congestion charge in Central London has substantially reduced congestion and increased service standards and has been accompanied by a significant shift of passengers to the bus service²⁹.

26. **The structure of road user charges appears inequitable.** Buses are the most heavily taxed/charged category of vehicles; they are very heavily taxed in most states through a heavy vehicle tax and in Maharashtra by a very heavy tax based on passengers carried. The implicit road user charges on buses are more than four times the charges on multi-axle freight vehicles, despite their much lower road damage costs. Buses are also charged much more heavily than cars, in relation to their road damage costs, even though they are far more efficient than cars in terms of road space. There is no economic reason for such high charges and, as buses are used by the lower income groups, they appear inequitable.

27. **The structure of road user charges promotes an uneconomic distribution of traffic.** Road freight vehicles are undercharged. Road freight rates are below their economic level encouraging the shift of freight from rail (rail freight generates profits for Indian Railways).

²⁹ See

<http://ecaweb.worldbank.org:8080/Transport.nsf/ECADocByUnid/D1B8523C31854F3685256D4700536A4E?OpenDocument>

Buses are overcharged, bus fares are much higher than their full economic cost and thus more people decide to travel by rail (Indian Railways lose money on most passenger services, especially those competitive with bus). Both the road and rail sectors, as well as the overall economy, lose as a consequence of the present level and structure of road user charges.

4. FUTURE FUNDING NEEDS

Highway Maintenance

1. Maintaining India's present highway network to full maintenance standards will require annual funding of about Rs. 70 billion, three times the current level of expenditure. Some may argue that India cannot afford to maintain fully its roads and priority should be given to expanding the network. All the evidence suggests that India cannot afford not to maintain its highway network – valued at roughly Rs.240,000 crore (US\$53 billion). A recent study analyzed the economic impact of inadequate road maintenance³⁰ and found that:

- The economic road user costs are 23% higher on roads in poor condition than on good roads, and 55% higher, if the roads are in very poor condition;
- The cost of surface dressing (for roads in good condition) is 66% lower than resurfacing or strengthening (for roads in fair condition); and only 25% of the reconstruction cost;
- The annual maintenance backlogs range from 2.5 – 4 times the required steady state expenditures; and
- In some states, for every one Rupee spent on maintaining the network, there are net benefits (NPV) in excess of Rs 7.

2. The study makes a strong case for substantial increases to the level of maintenance expenditure, if necessary by reallocating from capital expenditure. Extrapolating the results to India gives a maintenance backlog in the order of Rs. 130 billion. Cutting back on road maintenance neither makes economic sense nor long-term fiscal sense as the future costs for road reconstruction will be much higher.

Highway Investment

3. The Central and State Governments have realized the importance of improving India's road system, both in terms of providing wider accessibility to rural areas, and adding traffic capacity and improving service levels on the primary highway network. These improvements are essential if the Governments are to meet their objectives of achieving high economic growth rates and reducing poverty.

4. Plans have been prepared for road development by the MORTH and the Planning Commission. The GOI's *Vision 2021* assessed the demand for road transport, based on the desired future annual economic growth of the 6-8%, and estimated the need for road development in the country for the next 20 years. *Vision 2021* sets out physical and financial targets for highway development. In broad terms, the investment needs of the Expressways, National Highways, and State Highways, in the ten years 2001 – 2011, are estimated as Rs.300, Rs.1,200 and Rs.750 billion respectively (1999 prices), over Rs.2 trillion in all (the estimates are summarized in Annex 8). In addition, the PMGSY program will require substantial funding, of the order of Rs.70,000 crore over the period to 2010, to connect every village with all weather road access.

5. So far, significant progress has been made by central government in the implementation of the National Highway Development Program and PMGSY, and state governments have made improvements to about 20,000 km of the State Highway network.

The Funding Gap

6. This section estimates the overall financial resources needed, over the next 10 years, to develop and maintain the primary highway network, assesses the likely revenue from road

³⁰ Costs of Deferred Maintenance in India, World Bank, 2003. <http://www.worldbank.org> The study undertook a network strategic evaluation, using HDM-4, for the core highway networks in Tamil Nadu, Gujarat, and Karnataka.

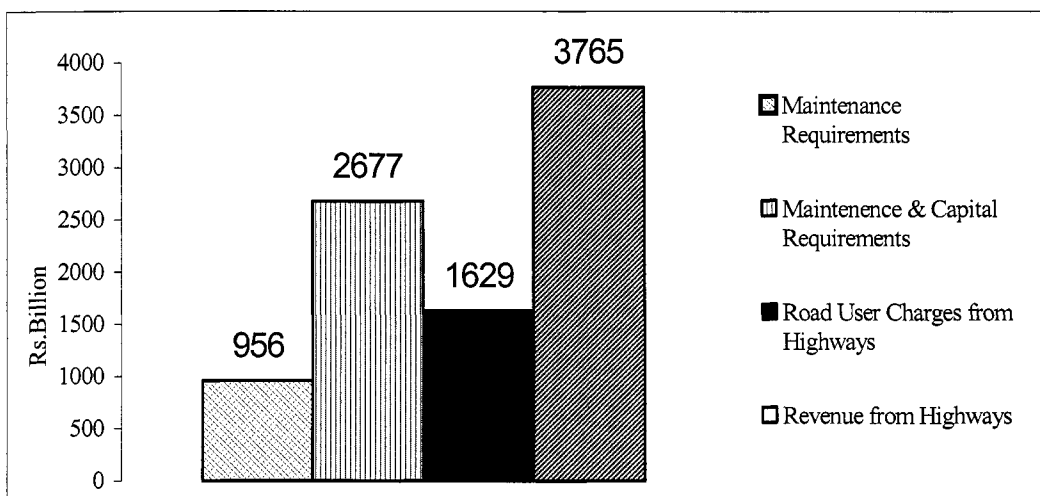
user charges, and compares the likely expenditures and road user charge revenues. The estimates are based on network wide analysis using the HDM4 model.

- Road user charge revenues are estimated on the traffic growth rates for different vehicles types, based on projected economic growth, and the present charges for each vehicle category. No allowance is made for the widespread imposition of tolls.
- The maintenance costs are based on the norms recommended in the 'Report of the Committee on Norms for Maintenance of Roads in India - 2000'.
- Capital investment (four/two laning existing two/intermediate) lane highways was assumed necessary when traffic levels reached category C as per IRC norms.

7. The analysis estimated the need to widen 15,000 km of national highways from two to four lane, and a further 16,500 km from intermediate to two lane. The total cost would be about Rs.1,098 billion (2003 prices), very close to the estimates in Vision 2021. The analysis suggested that about 25,000 km of state highways will need widening to two lanes, at a cost of about Rs.623 billion (2003 prices). This is a very conservative estimate. No allowance is made for addressing the maintenance backlog, which may be considerable. However, much of the backlog would be covered in the widening works, which would also include rehabilitation. Nor is any allowance made for establishing an expressway which at roughly Rs. 15-20 crore per km would add considerably to the financial requirement (Vision 2021 estimates a further Rs. 300 billion for expressways from 2001-2011).

8. Revenue from road user charges will more than cover highway maintenance, if the funding is dedicated to highways. However, even with this conservative estimate of needs, the required capital investment cannot be fully funded by road user charges, (Figure 4.1).

Figure 4.1 Revenue from Sector Taxes/RUCs vs. Highway Requirements, 2002-2011



9. With the revenue from the defined road user charges, the cumulative funding shortfall over the 10 year period is estimated at Rs. 1,048 billion, 39% of the total requirement. Highway maintenance represents about 35% of the total projected network cost, considerably above the actual 22% allocation in FY2002. The funding gap assumes that all the road user charges generated on the highways are returned to the highway sector. If the current proportion of road-user charge revenue is returned (56%), then available funding for highways would be only Rs.912 billion, less than the maintenance needs, and the funding gap would rise to Rs.1,760 billion.

5. MAJOR FINANCING ISSUES AND CAUSES

Major Financing Issues

1. The major issues, requiring urgent attention, include the following.

Highway Financing

- *Inadequate maintenance funding.* This applies to both national and state highways, and is partly due to the low political profile of road maintenance (particularly at the state level).
- *Investment financing gap.* This results from the very rapid increase in expected road investment, from NHDP and PMGSY, and the inadequacy of budget funds in the early years of the programs.

Road User Taxation

- *Proliferation and overlapping of taxes.* This arises from the allocation of expenditure responsibilities and taxing powers to the states, together with the lack of standardized approaches. Significant differences become entrenched and are very difficult to eradicate.
- *Regional disparities.* The states have the constitutional prerogative to levy charges on transport and there are neither national guidelines nor a consultative forum to help ensure consistency.

Road User Charges

- *Undercharging of heavy goods vehicles.* This may result from the desire to keep freight rates low but it is also a consequence of reliance on fuel taxes which are inadequate to reflect the costs imposed by heavy vehicles. The costs are not fully recovered by fixed annual fees which are a state responsibility.
- *Overcharging of buses.* Both vehicle and passenger taxation are state functions and bus transport is an easy revenue source. The levels of charges appear neither equitable nor efficient.
- *Urban congestion.* There is neither urban road charging nor extensive traffic management to control congestion. Costly additional infrastructure (e.g. the Mumbai overpasses) is constructed, with significant financial implications.
- *Lack of Direct Charging.* As most charges are not applied at the point of use, consumers have no incentive to manage their demand for road transport.

Inter-modal Transport Policy

- *Lack of coordinated inter-modal policies.* There is limited coordination between the policies of Indian Railways and the rest of the transport sector. Railway pricing and road user charges encourage too much road freight and too many rail passengers, resulting in an inefficient distribution of traffic.

2. The National Five-Year Plan has a clear vision of an improved/expanded highway network as an essential foundation for faster economic growth. This vision may be frustrated unless solutions are found to:

- the inadequate provision for road maintenance;
- the insufficient budgetary resources for the capital program; and
- the fragmented and inconsistent road tax and charging systems.

3. Solutions have to be found within a policy environment in which there is heavy reliance on road-user taxes for general revenue, a fragmented decision making structure and inadequate information.

Underlying Causes

4. **Road users as general tax revenue generators.** In India, only a third of road user taxes are returned to the road sector as investment or maintenance; this is comparable to Western Europe but much less than the USA (+90%, most road taxes are hypothecated)³¹ or Australia (50 – 60%)³². While road-related tax revenue in India, as a share of GDP, is similar to other countries, road-related tax revenue as a share of total tax revenue is much higher, (see Table 5.1).

Table 5.1: Road Sector Tax as Share of Total Tax and GDP

Country	Road Taxes as % of Total Taxes	Road Sector Tax Revenue as % of GDP
Australia	4.7	2.0
Germany	5.6	2.1
Italy	4.5	1.9
United Kingdom	6.7	2.4
Denmark	5.9	3.0
Finland	7.0	3.2
Greece	10.0	3.3
Ireland	10.2	3.2
Netherlands	6.8	2.7
USA	3.6	1.1
India	15.5	2.2

Note: Data for EU countries is for year 1999, and for India relates to year 2001-2002

Sources: Study on Vehicle Taxation in the Member States of the European Union, January, 2002 and Data for USA is for 1996-97, Source: International Road Federation, *World Road Statistics*, 1999

5. Total tax revenue in India is only about 18% of GDP, and both the Government of India and the State governments rely heavily on the road sector for general revenue; road related taxes are generally cheap and easy to collect. A broadening of India's tax base may be desirable but perhaps not achievable in the short term. Increasing expenditure in the road sector may thus require additional charges on road users. These additional charges may be more acceptable to road users if, in conjunction with the higher charges, there is greater earmarking of road user taxes/charges to the road sector. Some countries have accompanied higher road-related taxation with giving road users some control over how the funds are spent.

6. The high level of tax on the sector may have a profound effect on public acceptability of tolls. Tolls are being set generally at a small fraction of the operating cost savings expected for passenger vehicles and nominal toll rates in India are some of the lowest in the world, (Table 5.2). However, in relation to average incomes (the affordability index) the tolls may be considered as relatively high, although private car users have much higher incomes than the average. The Indian truck/car toll ratio also appears high but, on the other hand, two/three axle trucks are generally much more heavily loaded than elsewhere and thus impose much greater costs on the road network.

³¹ See <http://www.fhwa.dot.gov/ohim/hwytaxes/2001/>

³² Australian Bureau of Statistics and Dept of Transport

Table 5.2: International Road Toll Rates

Country	Road Toll US\$/km			Affordability Index*	
	Cars	Trucks		Car	2/3 axle truck
		2/3 axles	4+ axles		
Australia	6.0	15.3	15.3	0.284	0.621
Italy	5.3	6.7	12.1	0.285	0.273
Portugal	4.0	8.0	10.0	0.395	0.452
Spain	6.5	14.9	17.4	0.352	0.750
USA	2.6	5.6	9.0	0.204	0.163
Brazil	3.8	8.9	16.2	0.990	1.259
South Africa	3.2	8.7	13.0	0.642	0.797
Average toll	4.5	9.7	13.3		
Truck/Car Index	1.0	2.2	3.0		
India	1.0	3.5		2.482	1.241

* toll/per capita income at purchasing power parity

7. A study, commissioned by the Bank, concluded that the actual savings to trucks may be much lower than is often used in toll studies. The study estimated time costs at only about Rs.70-80/hour (perhaps slightly more than Rs. 2/km³³), and doubling speeds would only save truck owners about Rs.1/km. This limits the potential for high tolls on freight vehicles unless there are also appreciable distance savings, as generally the speed of the trucks establishes the speeds on the untolled network. Tolls for trucks are often higher than this, even in India. Overall, the survey suggested that the perceived user benefit of high quality toll roads is relatively low at present, especially for freight vehicles³⁴.

8. So while general tax levels are so high and benefits, to commercial user at least, from upgraded roads less certain, willingness to pay is low.

9. **Fragmented tax decision-making structure.** Highway financing is complicated by the levels and types of sector taxation and expenditure which are established by several different agencies and layers of government. The Constitution of India incorporates detailed provisions relating to the enactment of laws and the principles of devolution of taxation powers between the Central and the State Governments.

- (a) Central Government is responsible for customs duty, excise duty and central sales tax on inter-state trade.
- (b) Both the Central and the State Governments are empowered to legislate on mechanically propelled vehicles including the principles on which taxes on such vehicles are to be levied.
- (c) State Governments have the right to levy taxes on motor vehicles (road tax), on goods and passengers carried by road, tolls and octroi and entry tax. Regulatory control is exercised under State specific rules, within the broad framework of Motor Vehicles Act 1988³⁵.

³³ Highway Efficiency Study, World Bank, 2003

³⁴ Road freight services in India are primarily bulk, low cost and relatively low quality in which high speed delivery commands relatively little premium

³⁵ The Motor Vehicles Act 1988, a GOI Act, covers the regulation, control and operation of transport vehicles, including the licensing of drivers and conductors, registration of motor vehicles, control of traffic, insurance and other related matters. This Act, supplemented by the Central Motor Vehicle (CMV) Rules 1989, define the powers of the Central and State Governments with regard to the framing of rules, practices and procedures. It is the main instrument through which motor transport is regulated in the country by State Governments.

10. There is no national road pricing/user charging policy nor any procedures to harmonize the type and level of road taxes. Consequently:

- there is multiplicity of taxes, duties and fees, levied at various administrative levels;
- motor vehicle taxes vary substantially between states without any apparent rationale for the levels and differentials between vehicle categories; and
- tax rates appear to be fixed in an ad hoc, arbitrary manner.

11. The overriding motivation for changing tax levels appears to be generally to increase tax revenue, with little regard to economic efficiency, equity or other public policy objectives.

12. ***Lack of information for policy formulation.*** There is a lack of reliable, complete and timely information on the current levels of road user taxes and charges, and their allocation to roads. There has been no study of road user charges/costs since 1988-89³⁶.

- In some cases, the primary sources are not held in a way that allows analysis without making far-reaching assumptions. For example, most road agencies do not record the division of expenditure between road categories; many states do not report sales tax on motor spirit and lubricants separately, only total sales tax revenue.
- In other cases, information is presented in such an opaque manner that interpretation is almost impossible. The state budget in Karnataka, for example, has dozens of budget heads/subheads covering expenditures by the Public Works Department on different road categories. Many of the budget head titles are not readily understood, outside a select few in Government, and relate to project activities no longer active.

13. This lack of reliable and/or coherent information affects both policy makers and the road user who pay the taxes and charges. It is difficult to see how policy makers can make coherent policies and expenditure decisions without accurate data on the level and distribution of taxation and expenditure. Even if a road user charging policy existed, a sound information base would be necessary to monitor its impact and provide the basis for corrective changes. The lack of information also makes it difficult for road users to hold anyone accountable for the more effective or efficient use of taxes collected from the road sector. The consumer of publicly provided water and sewer services receives regular detailed bills, and audited annual accounts are publicly available. With such information, there can be accountability for both service standards and the level of user charges. There is nothing comparable in the road sector and, while it may not be possible to provide the same level of detail as for a water utility, there should be accurate, comprehensible and timely information on the charges raised from and the expenditures made to the sector. Indeed, this level of disclosure is now mandated through the Right to Information Act.

³⁶ The World Bank commissioned a study on Vehicle Fleet Modernization and Road User Charges

6. PRINCIPLES OF PRIVATE FINANCE

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 – e.g. 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, adverse local reaction and availability of connecting roads. This section briefly describes why and how governments can facilitate private sector participation (PSP).

Rationale for Private Sector Participation in Indian Highways

2. **Bridging the funding gap.** Private funding first and foremost is often seen as an increasingly important means to bridge the funding gap between the requirements of the sector and public resources available. Like other public services, the sector faces a constrained fiscal environment - the general fiscal deficit has returned to the 9-10% of GDP range during the Ninth Plan period (1997/98-2001/02)³⁷. It has been shown elsewhere that the funding gap is about Rs.1,048 billion over the next ten years. Into this gap, private funds have already started – approximately Rs. 6,500 Crore on NHs and a further few thousand crore of Rupees for SHs. Furthermore, expectations are high that considerable additional private funds will come in the future. While the Tenth Plan indicates a further 10,000 km of NH to be four laned, GOI budget allocations are only providing for 40%; hence; roughly Rs. 24,000 Crore as balance is being expected to come from the private sector through toll based BOTs.

3. However, it is critical to remember that the flow of private capital only helps postpone the capital costs to the tax payer and/or road user until future years. Insofar as direct payment of tolls to a private operator detracts from the Government's capacity to charge, indirectly or directly, for road use, whether new construction is funded by the public or private sectors does not in of itself make any difference from an economic perspective.

4. **Achieving efficiency gains.** A second common argument in favor of private funding of roads is to achieve efficiency gains. This argument contends that gains can be attributed to the following.

- **A system of incentives and sanctions:** motivation at company level to earn a good return and fear of bankruptcy are passed on to individuals within the firm through wage increases and career development opportunities encouraging them to work harder and smarter.
- **Flexibility:** the private sector has greater flexibility in adjusting its resources (personnel, equipment and materials) to a constantly changing situation.
- **Comprehensive approach:** when entrusted with a long-term contract and a wider scope of work, private firms have an incentive to balance expenditure over a project's life and make effective trade-offs between investment, maintenance and operation costs subject to environmental, social and economic considerations.

³⁷ India. Why Fiscal Adjustment Now, World Bank, Forthcoming

- **Access to technology:** large firms have greater incentive to invest in research and development to improve the quality and efficiency of construction techniques, processes and equipment.
5. Note however, that these potential efficiency gains do *not* require the private sector to assume traffic risk through their revenues being dependent on real or shadow tolls.
6. ***Broadening the revenue base where there is direct tolling.*** Common sense suggests that private investors will have an incentive to maximize toll receipts when they rely on toll receipts in whole or in part for returns. There are several reasons why this may be the case. First, a normal profit maximizing firm will seek to reduce leakage and ensure efficient collection. Second, there is an incentive on an agency that relies on tolls for its revenue to set its prices at a level that maximizes revenue – i.e. to manage the demand and supply curves in a more rigorous way than the public sector that might have other objectives in mind. Third, given that neither users nor the government has *prima facie* any incentive to raise toll levels to financially sustainable levels, private financiers will be the only party clamoring for upward revision of tolls. Highways have in the past suffered from inadequate funding due to a free ride by users and politicians. Having an interested party argue for a sustainable approach is better than all parties colluding in an unsustainable system that postpones too much payment to future generations. Already, about 1,400 km and 500 km of national and state highways respectively are tolled raising about Rs. 1500 Crore per year³⁸.
7. ***Unbundling and Reallocating Risk.*** More generally, the potential benefits noted above can be described as unbundling and shifting the risk and rewards of a new investment from the public to the private sectors with the expectation that this will lower overall costs to society. Like any human activity, building a road is inherently risky not just because estimated construction costs may escalate but more significantly also due to the uncertainty of its use in the future. In a normal Engineering Procurement Construction (EPC) cash contract, road agencies share some of the construction risk with the private sector but retain all the risk associated with insufficient use or misuse in future (for example overloading leading to high maintenance costs). There is nothing inherently wrong in this traditional allocation of risk – after all, demand for a facility providing potential benefits far into the future is at least significantly dependent on factors well outside the control of the private sector; for example, country and regional economic growth, inter-modal competition and inflation. Even governments struggle to manage such factors. Moreover, on the one hand, if a road built at public expense exceeds the forecasts of traffic made prior to construction, then society in general is likely to be rewarded more by that risk having been assumed by the public sector than in the case of private funding where shareholders may corner the majority of the benefit. On the other hand, if the public sector does not assume a risk then society in general may not reap the full rewards.
8. However, road agencies may determine that they prefer to manage the overall risk of the investment by asking other parties to take on some risks, at a price of course, while keeping some risks under their own control. Other parties may be better placed to control risks due to the prevailing incentive system or some informational advantage. Overall costs of the investment to society may therefore be lowered. The choice to reallocate risks should, however, be based on a sound analysis of alternatives.
9. As will be argued below, the debate today on private funding of highways does not often go back to the first principles of whether it makes sense to use private funds to manage a particular risk for society's overall benefit on a highway investment. The decision is driven purely by the mistaken belief that only private funding can make up the funding gap.

³⁸ World Bank estimates

Enabling Environment for PSP

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

11. **Legislative Environment.** A fair and impartial legislative 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 helps allay 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 will 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 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.

12. **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 private finance program is planned, the establishment of a regulator 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.

13. **Institutional arrangements for facilitating PSP.** Fragmented jurisdiction, multiple authorities, complex procedural requirements and lack of capacity are sited as amongst 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

14. 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. For 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 6.1.

Table 6.1: Indicative Allocation of Risks in a Road Concession Project

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

Source: PIARC Committee on Financing and Economic Evaluation, Financing of Road Infrastructures – Guide for New Methods of Financing and Public/Private Partnerships, 1999.

15. **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 risks³⁹ 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.

16. ***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 road projects, due to the price-elasticity of demand (the higher the toll the fewer the users and vice versa) impacting traffic levels. 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 privately funded toll road 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.

Additional Support by the Public Sector

17. 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 9 for a 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, 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 provided by multilateral banks, 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.

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³⁹ 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.

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Additional Support by the Public Sector

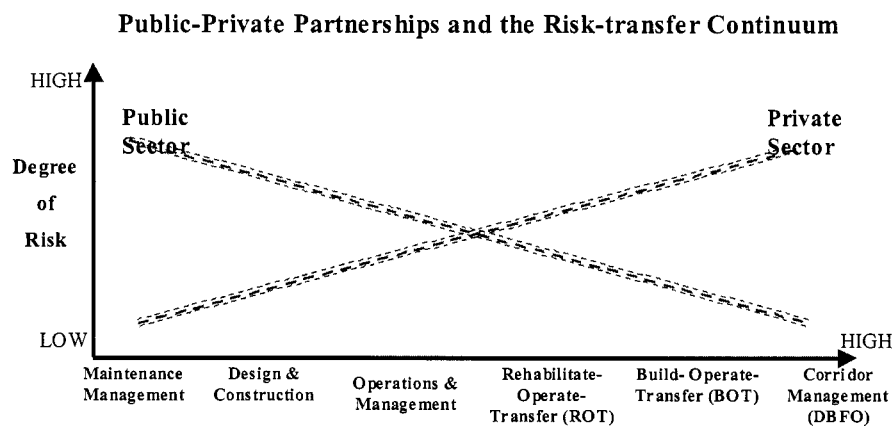
20. Road concessions often require varying forms of government support, if only as interim financing until the project's performance has been demonstrated to increase the possibility of raising long-term capital (see Annex 9 for a consolidated list of examples). This support contributes to the management 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, 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.

7. INTERNATIONAL EXPERIENCE WITH PRIVATE FINANCE

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 7.1). 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 chapter 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 elsewhere⁴¹.

Figure 7.1



Overview

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 network⁴². Except for Argentina and Chile, the countries with the most active PSP road programs, most countries have entrusted less than one-tenth of their main road network to the private sector⁴³. 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 2002⁴⁴. For example,

⁴¹ Far wider coverage of this issue is available at <http://rru.worldbank.org/Toolkits/highways/documents/start.HTM>
<http://www.worldbank.org/html/fpd/guarantees/assets/images/120.pdf>
 Asian Toll Road Development Program Assessment Report, Ministry of Construction Japan and World Bank, 2001

⁴² <http://rru.worldbank.org/ppi/>

⁴³ Toll Roads - Public Policy for the Private Sector, No 224, World Bank, 2000

⁴⁴ Source, *ibid*

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.

Favorable factors	Inhibiting factors
Firm political will and commitment to the PSP approach	Lack of an integrated institutional policy and framework for project identification, feasibility studies, project approval, etc.
Sound and growing economy, as well as a low and stable exchange rate	Lack of coordination between various government agencies involved with road sector projects
Developed/developing capital market, capable of handling project financing through innovative procedures.	Absence of a statutory, autonomous, regulatory authority (at arms' length from government) for dispute resolution, toll fixation/revision and for ensuring a level playing field for all participants
	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
	Absence of transparency and competition in procurement and award processes-competitive bidding procedures not followed in many cases.

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 7.1). 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. 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 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 concessionaires⁴⁵. In comparison, Box 7.2 overleaf shows an example of the key legal actions taken by Chile.

⁴⁵ "Asian Toll Road Development Program Assessment Report", Ministry of Construction Japan and World Bank, 2001

Box 7.1 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 includes:

- An estimation of the basic costing including capital and operating costs;
- The approach taken in relation to third party revenues;
- 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; and
- 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.

Source : http://www.ogc.gov.uk/sdtoolkit/reference/ogc_library/PFI/series_3/technote5/5tech_contents.html

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 matters⁴⁶. 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 process⁴⁷.

⁴⁶ Bidding for Private Concessions. RMC Discussion Paper 120, 2001, World Bank

⁴⁷ Designing Toll Road Concessions Lesson from Argentina, Public Policy for the Private Sector, World Bank, 1996

Box 7.2 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.
- Bi-lateral 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 project⁴⁸. 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.

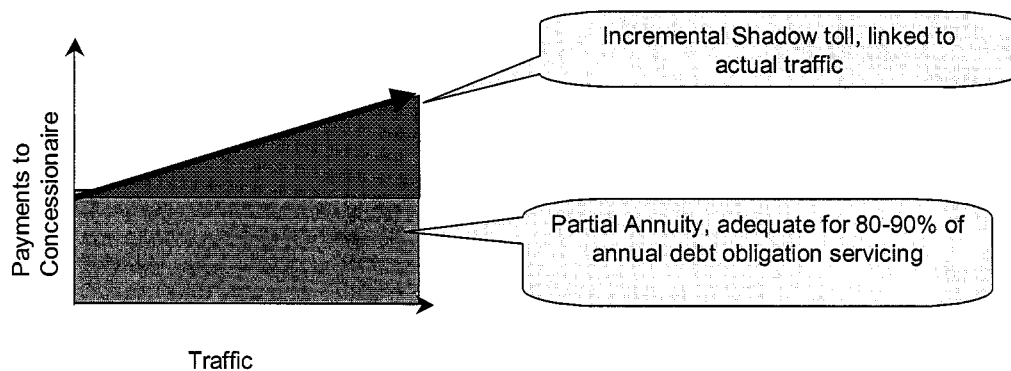
The Management of Risks

8. **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 7.3 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 accountable for their operational performance through the use of “shadow tolls”. In earlier UK DBFO projects and in countries such as Holland, Norway, Portugal, Poland and the Czech Republic, payments have been 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 may be 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 (one version with a fixed minimum payment is shown in Figure 7.2). This enables bidders to develop expectations of revenue which are more robust compared with real toll roads 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 at the point of use). Second, downside risk, where traffic volumes are low, is partially mitigated by banding of rates with higher rates at lower traffic levels. Thus, a shadow toll mechanism is more attractive to lenders as this reduces the volatility caused by real tolls.

⁴⁸ Source: Bidding for Private Concessions. RMC Discussion Paper 120, 2001, World Bank

Figure 7.2: Two Tier Shadow Toll Variations



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 globe⁴⁹. 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 debatable 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

⁴⁹ Infrastructure Projects – A Review of Cancelled Private Projects, Public Policy for the Private Sector, Note No 252, World Bank, January 2003

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. In more recent DBFO projects, the UK no longer uses shadow tolls 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 7.3). 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 then hypothecated towards highway improvements and maintenance. A Global Positioning System (GPS) based weight/distance toll system in Germany is also to be made operational next year. This is designed to raise dedicated revenue from truckers for six-laning the majority four-lane motorway network.

Box 7.3 Toll Pooling

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 tolls 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 investments⁵⁰. About 25% of its staff are devoted to toll collection. More recently, Korea has started to concession some more heavily trafficked existing and new highways.

Source:

Kengo Mizuno, "Lessons Learned: Public-Private Partnerships on Japan's Mega-projects," *PW Financing*, January 1996, pp. 1-7
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

⁵⁰ Of course, any revenues accruing to Government from indirect road user charges will add to the total burden on road users.

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 2003, 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 market⁵¹.

16. Because the useful lives of most road assets are quite long, the most appropriate long-term capital is provided by insurance companies, pension funds and similar institutional investors. 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.

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. 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 such instruments. Initially, the respective US state governments guaranteed toll road bonds. However, external credit enhancement measures are generally not required, as the credit worthiness of the issuing authorities is 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% of the national road network, and carry 40% of the road traffic. As of 1997, the toll road network in France was around 6,700 km, involving an investment of about \$28 billion. 72% of the total motorway network in France is tolled. In the initial stages, the Government extended concessional finance up to 70% of the 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 the 1960's, with construction advances (interest-free loans) being offered only for segments that the Government deemed unprofitable⁵².

19. Japan has one of the longest 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% 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

⁵¹ http://www.macquarie.com/uk/about_macquarie/media/20030113.htm

⁵² Source: a. Caisse Nationale des Autoroutes, *Annual Report of the Board of Directors*, 2001. b. http://www.unescap.org/tctd/pubs/files/econreg_ch11.pdf

of Japan. Debt has been underwritten by Government. There is no sign yet of 'pure' financial investors or of bond issues⁵³.

⁵³ Kengo Mizuno, "Lessons Learned: Public-Private Partnerships on Japan's Mega-projects," *PW Financing*, January 1996, pp. 1-7

8. INDIAN EXPERIENCE WITH PRIVATE FINANCE

Policy and Legal Environment

1. **Government Policy for PSP.** The overall objectives for the development of roads in India are laid down in the Tenth Plan (Box 8.1). This plan recognizes that to achieve the projected GDP growth, the industrial sector needs to grow at more than 10% per annum with a resultant increased demand for transport services. An increased role for the private sector in meeting this demand is explicitly sought.

Box 8.1. Transport Policy Goals in the 10th Plan

The following goals are made in the Tenth Plan:

- Meeting the transport demand generated by higher rate of GDP growth;
- Ensuring transport development is balanced, with special attention to remote regions such as the North-East;
- Capacity augmentation, quality and productivity improvements through technology upgradation;
- Higher maintenance standards to reduce the need for frequent reconstruction;
- Higher generation of internal resources and increased private sector participation in providing transport services;
- Increase efficiency by bringing competition in the provision and maintenance of infrastructure and services wherever possible;
- Higher emphasis on safety, energy efficiency, environmental conservation and social impacts; and
- Developing an optimal inter-modal mix where each mode operates efficiently, according to its comparative advantage, and complements services provided by other modes.

Source: Para 8.3.18 of Draft 10th FYP, Planning Commission

2. **National Legislative Changes.** The 1956 National Highways Act has been amended⁵⁴ to permit private entrepreneurs to undertake NH projects on a BOT basis and recover their investments through tolls. Under this Act, a simplified procedure was prescribed for acquisition of land for the building, maintenance, management or operation of a National Highway, and separate provisions were made for the levy and collection of fees in respect of both public and private funded projects. The GOI has framed a supporting policy (Box 8.2).

3. **State Legal Framework for PSP.** The 1851 Indian Toll Act makes it possible for State Governments (SG) to levy and collect tolls on any road or bridge which has been made or repaired at the expense of the central government or any SG. However, the Act needs to be amended by respective SGs to allow the private sector to levy and collect tolls on State roads and bridges. Some SGs have indeed amended the Act – for example Uttar Pradesh and Madhya Pradesh - or otherwise taken legal steps in order to promote PSP (see Table 8.1 below).

⁵⁴ Amended in 1977, 1992, 1995 and 1997.

Box 8.2 Main Features of GOI Policy for PSP in the Roads Sector	
•	Foreign Direct Investments up to 100% is permitted.
•	NHAI can participate with up to 30% of the total equity of a company floated to develop a road project.
•	NHAI can provide capital grants to the developers of a road project on a case by case basis.
•	Suitable traffic support/guarantee is provided on a case to case basis.
•	Real estate development can be made an integral part of BOT projects to enhance their financial viability.
•	Entrepreneurs to be protected against force majeure situations including political, non-political and legislative changes.
•	Dispute resolution of arbitration would be under the 1996 Indian Arbitration and Conciliation Act, incorporating United Nations Commission on International Trade Law (UNCITRAL) provisions.
•	The ownership of the land for highway construction and roadside facilities continues to vest in Government. Mortgaging of such land is not allowed. However, land can be leased to entrepreneurs.
•	Unified check barriers at the inter-state borders to be provided. Such barriers would be located outside the right-of-way with proper entry/exist layout.
Source: Road Development Report Vision 2021, MORTH, Government of India (as amended)	

Table 8.1: Legal Provisions to Encourage PSP in Six Selected States

State	Legal Provisions
Andhra Pradesh	The SG's publication 'Private Investment in Road projects in Andhra Pradesh', proposes to amend the AP State Motor Vehicles Act along lines similar to the National Highways Act to enable private parties to levy tolls and regulate traffic on the facility constructed by them. ⁵⁵ Issued a policy framework for private participation in Roads Sector through a Government Order in September 1997.
Karnataka	Not defined
Madhya Pradesh	1992 Amendment to Indian Toll Act allows the SG to lease the levy tolls on roads or bridges, at prescribed rates, by public auction or private contract for up to 15 years.
Maharashtra	Amended Section 20 of the 1958 State Motor Vehicle Tax Act to enable private parties to levy tolls on any motor vehicle on bridges and tunnels through a BOT agreement. Section 17(4) of the 1975 MMRDA Act provides for charging tolls for the use of amenities provided by MMRDA.
Uttar Pradesh	1974 Indian Toll Amendment Act transfers State responsibilities to the U.P. State Bridge Corporation Ltd., a State Government Company under the Companies Act with the right to manage and collect the tolls levied on roads and bridges. Section 2 of the same Act permits the SG and the U.P. State Bridge Corporation Ltd. to lease the right to collect tolls to any third party.
West Bengal	Legal provisions relating to levy of tolls: (i) on heavy trucks and buses under the 1993 West Bengal Municipal Act, as amended in 1997; (ii) on roads and vehicles under the 1980 Calcutta Municipal Corporation Act; (iii) on the Howrah Bridge under the 1926 Howrah Bridge Act; and (iv) on all types of vehicles and animals passing over or through any bridge constructed under the 1969 Hooghly River Bridge Act.

4. In addition to amending the Indian Toll Act, another avenue being followed by some States is to enact a *uniform law for infrastructure development*. Enacted laws include the 2001 Andhra Pradesh Infrastructure Development Enabling Act (IDEA) and the 1999 Gujarat

⁵⁵ See <http://www.aproads.com/html/salient.htm> for more details

Infrastructure Development Act (GIDA)⁵⁶. The latter is a good example of how SGs are seeking to circumscribe risks for private parties. The Act is very detailed and provides for several private sector participation options. The Act also provides for the use of an open competitive bidding process based on pre-qualification, a technical evaluation, and a financial evaluation, and lays down the criteria for financial evaluation. It allows: (i) the project developer to charge fees as specified in the concession agreement which can be revised, based on criteria specified in the agreement; and (ii) inflation and variation in foreign exchange rates to be taken into account for such revision of fees. The Act identifies several ways for the State Government to provide assistance for a project as well as a framework for termination of a concession.

5. **Securitization.** Infrastructure financing, being highly capital intensive, does not often permit the possibility of a security structure that allows lenders full recourse to the assets of the promoters. Hence, a 'non-recourse' or 'limited recourse' arrangement is more likely to be adopted, involving the creation of a legally independent project company financed with debt that is secured by the assets of that company (e.g. land, industrial assets, licenses, and contractual rights). In India, the immovable assets (e.g. land, machinery, buildings) of the project company are usually secured in favor of the lender by way of a mortgage while the movable assets are 'hypothecated'. The creation of security by leasing out land for road projects is not possible as its ownership rests with the Government. In cases of default by borrowers, the 2002 Securitization Act⁵⁷ enables a bank or a financial institution which is a secured creditor under a security agreement with a borrower to enforce any secured interest created in its favor without the intervention of any court or tribunal. This represents an important step forward which allows lenders to avoid lengthy and time consuming litigation thereby reducing credit risk for lenders. Similarly, a provision incorporated into the standard Concession Agreement used in India allows the lender, in the event of a default, to continue the implementation of a project.

6. **Environmental Clearances.** Actions have also been taken to reduce the risk of delay from environmental clearances. Under the 1986 Environment (Protection) Rules, the Ministry of Environment and Forestry (MOEF), via Notification from January 1994, states that highway projects shall not be undertaken anywhere in India unless environmental clearance has been granted by the Central Government. In view of the pronouncements by the Supreme Court in certain public interest litigation cases involving environmental issues, the National Environment Appellate Authority was set up under the 1997 National Environment Appellate Authority Act. This serves as an independent body to deal with petitions, complaints, representations and appeals against the decisions of competent authorities granting environmental clearances to development projects under the provisions of the 1986 Environment (Protection) Act. By providing for a focus of independent decision making on the issue, the creation of the Authority represents an important step forward in facilitating private participation in road development.

7. **Arbitration and Conciliation.** The 1996 Arbitration and Conciliation Act brought about major changes in Indian Arbitration law by increasing investor confidence in the system of commercial dispute resolution and enforcement of foreign awards in India. This was done by removing obstacles to commercial dispute resolution outside of a court and creating an environment with minimum court interference.

8. **Fiscal Incentives.** The Government of India announced various tax exemptions and fiscal incentives to facilitate PSP in several sectors including roads and highways (Box 8.3).

⁵⁶ See <http://www.gsrc.com/htmls/index3.htm> for an extract of the full Act

⁵⁷ 2002 Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act (previously Ordinance).

Box 8.3 Summary of Fiscal Incentives for Private Sector Participation in Roads

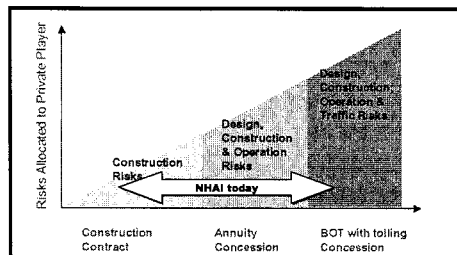
- Exemption is given from import duty on identified high quality construction plant and equipment.
- A ten year tax holiday is available and this concession can be accessed in any 10 consecutive years during the first 20 years of operation (Section 80 IA (12) (ca) of the 1961 Income Tax Act).
- A maximum of 40% of the income derived by financial institutions from the finance they provide for infrastructure projects may be excluded from Income Tax.
- Exemption from Income Tax on the income from dividend and interest on long term capital gain derived from investment in the form of shares or long term finance to any enterprise set up to develop, maintain and operate an infrastructure facility.
- Subscriptions to equity shares and debentures are eligible for deduction under Section 99 of the Income Tax Act.

Source: Road Development Report Vision 2021, MORTH, Government of India (as amended)

Progress with Private Sector Participation at the National Level

9. Nearly 80% of all the projects executed under the NHDP are still EPC cash contracts whereby the contractor builds the road and hands it over to NHAI. The remainder are being funded through a mixture of PSP models. The different models demonstrate a sliding scale of risk management by the NHAI as shown in Figure 8.1 below. In general terms, high-density stretches with more assured returns are normally awarded under toll concessions, while SPVs and annuity concessions are used for projects that have higher traffic risks. Approximately 8% of the length⁵⁸ of the NHDP may be implemented through annuity concessions. In tandem, NHAI has awarded around Rs. 3,400 Crore worth of projects under tolled concessions.

Figure 8.1: Risk Allocation in Different NHAI Models



10. **BOT Toll Road Concessions.** BOT Toll Road Concessions awarded by NHAI are based on a model concession agreement with modifications for each specific case⁵⁹. The broad risk allocation framework is, therefore, common for NHAI toll road concessions, with some slight differences reflecting increased and more equitable risk sharing between NHAI and the private investors (see Annex 10). Generally, there has been an increasing amount of risk and responsibility sharing with the Concessionaire (see Table 8.2 below).

11. On a pilot basis, NHAI has also proposed to let a concession agreement which combines the construction of a greenfield project with the rehabilitation and upgrading of an existing stretch⁶⁰. This would address the problem that the new stretches have low traffic volumes making them commercially unviable. Existing stretches could generate enough toll revenue based on existing traffic patterns to improve the cashflows of the concessionaire,

⁵⁸ The actual stretch of NHDP Phase I & II commissioned under annuity scheme is 8%.

⁵⁹ See <http://www.nhai.org/concessionagreement.htm> for copy of the standard form

⁶⁰ The proposed project is part of the Porbander-Deesa segment of the East-West Corridor. New construction refers to the Jetpur-Gondal section (26 Km of four lane highway) and the Rajkot Bypass section (10 km), and the rehabilitation component refers to a four-laned stretch of the 32 Km Gondal-Rajkot section.

especially during the construction stage. In addition, overall risks would be mitigated to some extent because of pooling of projects at various stages of risk profile.

Table 8.2: Progression in Risk Sharing Arrangements in NHAI Toll Road Concessions over Time

Construction Related Delay Risk	Progressively has been made the entire responsibility of Concessionaire. Concessionaire has choice of re-allocation to EPC contractor, but remains primarily responsible to NHAI through liquidated damages. Liquidated damages have replaced earlier corporate guarantee of promoters for timely completion, making the model more “non-recourse” in nature.
Compulsory surveys and tests	In latest models, left to the discretion of Concessionaire
Independent Consultant	Concept introduced in later concession arrangements, with selection process becoming more participative (i.e. involving Concessionaire as well)
Traffic Risks	Compulsory routing of traffic through project road not observed in latest concession, with traffic retaining full choice. At the same time, protection against development of alternative projects is provided, with assurance of levying higher tolls on alternative competing facilities.
Promoter lock-in	Greater flexibility over time, with latest model allowing higher levels of promoter divestment.
Lender Protection	Slight reduction in amount of debt protection in case of concessionaire events of default, probably with the steady increasing lender comfort and appetite related to these projects.
Change in Law	In later models, compensation for change in law to be triggered only in case of adverse effect exceeding a certain floor amount; this is an incremental improvement which avoids complicated adjustment procedures for minor impacts, although it implies that Concessionaire has to bear change in law risk for small amounts.
Termination Payments for Force Majeure	Increasingly refined formula which takes into account effects of inflation and passage of time.
NHAI support in case of poor project performance	Originally, revenue shortfall loan envisaged to enable project subsistence in case of revenue shortfall for any reason, however, in subsequent models, such loan is provided only in case of severe shortfalls due to political force majeure.

12. The typical grant-based BOT model used in India on National and State highways involves: partial funding of project cost through a non-refundable grant disbursed by the government/ road agency to the Concessionaire during construction; a fixed concession period and toll rate structure; “grant” required by bidders constitutes the bid variable; grant contribution by the government normally does not exceed the amount of equity contribution by the private investor; and the remainder of project cost is typically met through non-recourse debt.

13. NHAI is currently in the process of concessioning the four-laning of a further 10,000 km of national highways outside of the GQ and NS/EW networks. Initially these roads had been under the charge of the MORTH but were transferred during late 2003 to NHAI. The program is still under preparation and the details of how this will work are not yet known. However, current thinking is that the majority of approximately 48 projects would be procured through a toll based BOT mechanism with less viable routes being procured through conventional cash contracts or annuities. The process of empanelment of suitable concessionaires has begun. Public support will be capped at 40% of project cost, 25% during construction and 15% during the O&M period of approximately 15 years.

14. **Annuity Concessions.** The Annuity scheme is a variant of a BOT Toll Concession scheme whereby the concessionaire is not left to recover its costs through collection of tolls but is assured a fixed periodic payment by the NHAI. The Annuity scheme offers the advantage as a means of “borrowing” from the private sector for road development through bundling together construction and long term O&M responsibilities onto a single party. To date, NHAI has awarded a total of 467 km of annuity concessions amounting to about Rs.3,000 Crore - five stretches (with a total length of 373 km) in the Golden Quadrilateral and three other stretches (81 Km), with payments partly related to shadow tolling (Durg Bypass, Nandigama-Vijayawada Phase II and Delhi-Gurgaon Expressway) – see Table 8.3.

Table 8.3: Annuity Concessions Structured by NHAI

Road	Annuity Amount, Rs. Million
Golden Quadrilateral	
Panagarh – Palsit	5,550
Palsit - Dankuni (Durgapur Expressway)	3,998
Maharashtra Border-Belgaum	5,050
Ankapalli - Tuni	2,948
Tuni – Dharmavaram	2,791
Dharmavaram – Rajamundry	2,962
Nellore Bypass	1,296
Other Projects	
Tambaram - Tindivanam	4,186
Total	28,781

15. As almost all projects structured as annuity concessions have reached financial closure, this would suggest that this method is popular with private investors in India.

16. **Private Investment Premium for Annuity Contract.** The effective cost of annuity borrowing for NHAI is high (effective rate of 17-18% p.a., compared to NHAI’s cost of funds which are around 11% p.a.⁶¹). Individual factors leading to higher costs are discussed below.

- **Risk Premia for Risks passed on to Private Investor.** Under the annuity scheme, the private investor is required to assume various risks that would normally remain with NHAI, many of which can significantly affect the investor’s cashflows vis-à-vis original projections. Hence, investors usually factor in premia to price these risks in their financial proposals. These risks include: (i) risks related to price and quantity variations; (ii) changes in financing rates; (iii) long-term inflation; and (iv) construction delays.
- **Cost of Debt.** This is higher for non-recourse lending to project companies than the cost of a loan to NHAI, due to its current creditworthiness. In addition, the prevailing practice of financial intermediaries in India is to insist upon the creation of a “Debt Service Reserve” (DSR) for additional comfort during the tenure of their non-recourse loans. Adding the DSR to total project cost increases the capital servicing requirements thereby adding considerably to the annuity pricing. In essence, the borrowing company is required to build up an investment reserve, usually equivalent to the next six months’ worth of lender’s dues, in an account on which the lender has a lien. In case of default on debt obligations for any period, the lender would be entitled to recover dues for that period from the debt service reserve. DSR acts as a

⁶¹ The weighted average cost of debt for NHAI is estimated as 11.35%, using NHAI’s debt structure for 2002-03 (55,930 million in market borrowings at an average cost of 8.5%; Rs. 78,620 million as external assistance of which 20% was at the cost of 13%; the rest 80% as a grant; and Rs. 23,540 million of Annuity Projects at a cost of 17%).

buffer to ensure smooth payments of interest and principal even during brief periods of cash shortfall within the project company. DSR can be created: (i) out of total project cost, in which case it is funded through a combination of debt and equity, raising the total project cost; or (ii) through a guarantee provided by the bankers to the project promoters, increasing the sponsor's overall exposure to the project⁶².

- *Cost of private equity investment* in the project is naturally higher than the NHAI's cost of capital estimated at around 11%.

17. ***Regulatory Inefficiencies in Annuity Contracts.*** Although a project may show healthy cash-flows, net return in the hands of equity holders of the project company is often much lower than the profitability of the company may suggest, owing to a combination of statutory reserves, deferred tax liability and taxation inefficiencies.

- *Statutory Reserves.* According to Company law, corporate entities are required to set aside a sum of up to 10% of book profits every year, into a statutory reserve which is not accessible for distribution to share or equity holders. This results in considerable cash sitting idle for a long time.
- *Taxation Inefficiencies.* From the Government's point of view, income taxes and taxes on dividends distributed raise the effective cost of the annuity concession, because it has the effect of increasing the effective cost of annuity "borrowing" vis-à-vis a conventional loan. This is due to: (i) a limited period of tax holiday for infrastructure companies under Section 80 IA of the Income Tax Act (10 years during operations); (ii) distribution tax on dividends paid by project companies with effect from April 2003; and (iii) minimum Alternate Tax which forces companies to pay tax even during the tax holiday periods. Taxes paid by the project company represent monies that are sourced from the Central and State Governments and paid back to the Central Government.

18. ***Impact of Annuity Concessions on Risk and Project Costs.*** For the private operator annuity concessions reduce the uncertainty and risk associated with BOTs in relation to revenue generation, but the associated regulatory requirements noted above raise the effective cost of an annuity for NHAI. As all annuity concessions are still under operation, it is not possible to infer the actual cost of these concessions. Nevertheless, using a financial model of a typical annuity concession, it was concluded that the likely cost of the annuity "borrowing" from the government's perspective due to the factors noted above would be around 17% per annum.

19. ***Special Purpose Vehicles (SPV).*** The SPV route essentially involves setting up a joint venture company between two or more promoters to execute the project. These are generally toll roads implemented in independent corporate entities owned by NHAI itself and are commonly used for port connectivity where other user entities can contribute to project funding. Appropriate long-term capital is usually provided by insurance companies, pension funds and similar institutional investors. These investors usually require the investment to have an investment grade rating from at least one credit rating agency. Participation by state governments is also significant in these projects. Moradabad expressway was developed through this route. Other projects under implementation are Jaipur Bypass Phase II, Ahmedabad-Vadodara expressway and 10 port connectivity road projects.

20. ***NHAI Debt.*** Based on its revenues from the Central Road Fund and increasingly from tolls as well as on an implied GOI guarantee, NHAI has itself raised substantial amounts of funds from the domestic debt markets with a nominal interest rate between 7-9%. The credit rating of NHAI is AAA and stable but is susceptible to the following factors – fungibility of cess inflows and their continuation, prioritization of debt servicing, retention of

⁶² The sponsor's total exposure would be a combination of equity invested and contingent liability to the amount of guarantee issued.

tolls and support from GOI⁶³. The credit rating states its assumption of stable revenues from the Central Road Fund to NHAI.

21. To date, NHAI has raised Rs 656 Crore from two bond issues in 2000-01, Rs. 804 Crore through one issue in 2001-02 and Rs. 5,593 Crore in 2003. Investments in NHAI bonds have been exempted from capital gains tax under the Income Tax Act Section 54EC and have been oversubscribed. In addition, NHAI has applied for a Rs. 6,000 Crore line of credit from the Life Insurance Corporation. The agreement envisages securitization of cess on petrol and diesel, put aside in the non-lapsable Central Road Fund. The interest on the Life Insurance Corporation (LIC) loan has been proposed at a premium of 1% on 18 year Government Securities (currently at 7.35%) for a loan duration of 25 years with repayments starting after 5 years. This is the only NHAI debt instrument that is proposed to be explicitly backed by the GOI at a fee of 0.25% per annum.

Progress with Private Sector Participation at the State level

22. There is a wide and growing divide between some States that are making real progress in attracting PSP to the sector, while the majority of States have little or no experience and seem unlikely to do so for the foreseeable future (see Table 8.4).

23. Madhya Pradesh, for example, has made good progress concerning PSP in roads having entered into a number of 'Maintain and Transfer' concessions with the private sector. The States of Andhra Pradesh, Gujarat, Maharashtra, Madhya Pradesh, Rajasthan and Tamil Nadu have already entered into BOT concession arrangements, each using a fairly standardized model for BOT projects (see Annex 11 for the risk allocation framework for small road projects in Andhra Pradesh). As a typical example of how these work at the state level take Madhya Pradesh. The MP Bridge Corporation uses a grant-based BOT model in which up to 50% of a BOT project's cost is provided by the Corporation in the form of a grant to enhance commercial viability. The grant amounts required for implementation of 14 key state highway stretches on this basis have been raised through borrowings largely from HUDCO. The amounts thus raised are accordingly leveraged through individual project companies.

24. **Project Development.** Some States have set up Project Development Funds, such as the Andhra Pradesh Infrastructure Initiative Fund to finance the preparation of road projects for private involvement. While the concept is good and should help facilitate PSP, such funds have not yet played a significant role.

⁶³ Source - <http://www.crisil.com>

Table 8.4: Overview of Achievements in PSP at State Level

State	Extent of Private Participation	Agency and PSP Mechanism	Approx Length SH Constructed Km ⁶⁴	Value of Private Funding Rs Cr
Andhra Pradesh	Some, but in very small size projects	Andhra Pradesh Road Development Corporation (APRDCL) Debt to APRDC and BOTs	Bridges and ROBs plus 36 km	188
Gujarat	Limited although many are under preparation.	Gujarat Road Development Corporation SPVs and BOT	110	
Karnataka	Limited in new construction but maintenance of most of core network outsourced on term basis	Karnataka Road Development Corporation Ltd. (KRDCL) Debt to KRDCL	Nil	Nil
Madhya Pradesh	Significant, but only a few of the projects envisaged have progressed to financial closure & construction	MP Bridge Corporation Debt to MPBC and BOTs	2000 (Rehabilitation only)	
Maharashtra	Many toll based projects being implemented but limited private investment	Maharashtra State Road Development Corporation (MSRDC) Debt to MSRDC and BOT		
Tamil Nadu	Significant but few projects have reached financial closure	Tamil Nadu Road Development Corporation TNRDCL	180	300
West Bengal	None	Under discussion	Nil	Nil

25. **Identification and Award of Potential PSP Projects at the State Level.** Some states identify road projects for development and maintenance through Strategic Options Studies commissioned by the respective road agencies. However, states are yet to have a policy setting the basis for selection and prioritization of projects for implementation through PSP and in general, states have not yet adopted a systematic procedure for project identification and investment facilitation. In practice, routes with higher traffic density and of general strategic importance are the ones prioritized for development by private investors. States that have attracted BOTs have adopted a two-part bidding procedure, involving invitation of technical and financial proposals from bidders. After evaluation of bidders' technical proposals, parties meeting the minimum technical requirements are "pre-qualified". The project is eventually awarded purely on the basis of the most attractive financial proposal, as is the norm for contracting by the Central and State Governments in India. Depending on the PSP model being adopted by the State Government, the most attractive financial proposal may imply the lowest grant requirement (such as in Madhya Pradesh), or the shortest concession period (such as for small projects in Andhra Pradesh). As the tolls for each State are pre-determined, there is no case for financial proposals being expressed in terms of the required toll structure.

26. **Implementing Vehicles at the State Level** At the state level, Road Development Corporations have been created in AP, Gujarat, Karnataka, Kerala, Maharashtra, and Tamil Nadu. Part of the objective of these new agencies is to bring private sector funds to the sector

⁶⁴ World Bank estimates

either through corporate borrowing (AP, Karnataka MP, Maharashtra,) or through leveraging public subsidies against private project finance (Tamil Nadu, Gujarat). Road Development Corporations generally enjoy more flexible human resource management arrangements, clearer objectives as well as more streamlined decision making structures than typical Indian road agencies. These characteristics are potentially important in terms of improving the quality and timeliness of the PSP project planning and procurement, thereby reducing some risks to potential sponsors.

Table 8.5: Comparison of State Fundamentals/Enabling Environment for PSP in Highways⁶⁵

Fundamental Factor	Andhra Pradesh	Kerala	Karnataka	Gujarat	Tamil Nadu	Madhya Pradesh	Maharashtra	NHAI
Legal Framework	✓	✓	X	✓	X	✓	✓	✓
Regulatory Framework	✓	X	X	✓	X	X	X	✓
PPP Policy	✓	✓	X	✓	✓	✓	✓	✓
Contracting Transparency	✓	✓	✓	✓	✓	✓	✓	✓
Implementation Capacity	X	X	X	✓	✓	✓	✓	✓
Semi autonomous road agency	✓	✓	✓	✓	✓	✓	✓	✓
History of tolling	✓	X	X	✓	✓	✓	✓	✓
Assured revenue stream for public contribution	X	X	X	X	X	X	X	✓
Relative level of private finance	Low	Nil	Nil	High	Medium	Medium	Low	High

27. **Aggregate Status of States' Enabling Environment for PSP.** Many states have yet to establish the basic enabling environment (see Table 8.5 above). Considering the current status of the institutional and regulatory framework for PSP, States may need to be realistic in their expectations for PSP and probably focus on "rehabilitate, operate and maintain" concessions, bypasses and/or bridges as the most viable PSP projects for the moment.

Financial Engineering on NHAI and State Projects

28. **Grant Supported BOTs.** To date, typically grants have been provided during construction only. There is now some debate as to whether moving towards partially disbursing grants during operations may not make sense. However, ignoring any tax effects, there is less difference between the two approaches than may first appear. The size of the payment made by the government will merely adjust for the time value of money. The main difference would be on who carries the risk of default on the concession contract terms. If the grant is all disbursed up front, the government risks having no remaining financial mechanism to enforce proper O&M – i.e. default on behalf of concessionaire in relation to his service obligations. If the grant is disbursed over time, then the concessionaire risks the government not being willing or able to pay the promised amount in the future – i.e. default on behalf of the government.

29. **Least Present Value of Revenue (LPVR) based Bidding.** The three road concessions being implemented by Infrastructure Leasing & Financial Services Ltd. (IL&FS) in India are

⁶⁵ World Bank assessment

examples of “Fixed IRR” or “Assured Return” models. These models provide a guaranteed level of net return on equity, taking the time value of money into account. The concession period lasts until the concessionaire recovers its investment, thus a concession is terminated only upon the Concessionaire achieving a predetermined level of IRR. However, since the Fixed IRR model takes into account the returns over and above the costs of the toll road operator, there is no incentive for cost efficiencies. All cost overruns, construction or operational, are compensated for by the regulatory authority.

30. In the ‘Least Present Value of Revenue’ auction (LPVR), the bidding variable is the present value of revenue throughout the life of the concession that firms are willing to accept to undertake the project. The private operator that bids the lowest present value of revenue wins. The duration of the concession is then flexible and depends on the effective traffic levels encountered. Both fixed IRR or LPVR models offer some advantages over alternative BOT schemes including the fact that: (i) tolls can be adjusted without negotiation with the concessionaire, as long as the expected investor return is maintained - this flexibility is important in urban road concessions where it is difficult to determine the optimal tariff *ex-ante*, especially during congestion periods; (ii) these methods reduce the uncertainty of demand, as they transfer political and demand-related risks to the user in the form of an endogenous concession period; and (iii) calculation of compensation payments on concession termination is straightforward at any point in time during the concession period. In addition to these advantages, the LPVR method of BOT project implementation manages certain risks better than the IRR fixed return model. These are summarized in Table 8.6.

Table 8.6: Advantages of LPVR over Fixed Return Model

Item	Conventional “Fixed IRR” Model	LPVR Model
Return Assurance	Investment on private equity pre-determined and assured	Investment on private equity pre-determined and assured
Capital Cost Efficiencies	Does not encourage concessionaire to optimize project capital cost, as benefits do not accrue to him, even though the financial risk is still borne by the sponsors	Encourages optimization of capital costs as concessionaire retains the benefits of capital cost efficiencies
Operating Cost Efficiencies	Does not encourage operating cost efficiencies, as costs are essentially “passed on” to government agency/ users	Encourages operating cost efficiencies as higher costs reduce concessionaire’s returns and lower costs increase its returns
Monitoring Requirements for assessment of return at any point in time	More difficult, as it requires the employer to know both actual revenues and costs of the concessionaire	More straightforward as the employer needs to know only actual concessionaire’s revenues

31. National highway PSP projects in India are typically funded through a mix of conventional non-recourse debt⁶⁶ and equity. Bankers normally accept a maximum debt-equity ratio of 70:30 for toll-based projects. The annuity BOT projects awarded by NHAI have been funded with debt-equity ratios of 75:25 owing to the much higher perceived certainty of project cashflows. Typical loan duration varies from 7 to 13 years, although only a few projects are able to secure debt of more than 10 years. Normally, there is no obligation for repayments during the construction period and these only commence immediately after project commissioning. Loan repayment is typically on a quarterly basis with equal amortized repayments of principal and interest.

⁶⁶ Debt for which the borrower is not personally liable.

32. The client/demand side is driving PSP, and so is the supply side, with market forces encouraging the development of a number of new financial instruments to help bring in private financing for roads. For example, the Infrastructure Leasing and Financing Services Ltd (IL&FS) created a *deep discount bond* instrument (redeemable at the end of 17 years) for use in its two BOT projects in Gujarat, combined with a takeout arrangement. IL&FS also pioneered the use of *subordinated debt* in financing two BOT projects in Gujarat State (Vadodara-Halol and Ahmedabad- Mehasana highways). Bankers in India accept a partial investment in subordinated debt by the project promoters as “equity” for the purposes of computing debt equity ratios. The use of subordinated debt improves the effective debt coverage available to senior lenders, and helps in overcoming statutory limitations on dividend payment, improving sponsor returns. Similarly, the GMR Group is implementing two NHAI annuity BOT projects in Southern India through *pinpoint equity*. The group has made its equity investments in the project companies through a mix of over 90% preference equity, with the balance investment as ordinary equity. Preference equity is easily redeemable under existing company law in India, while extinguishing of ordinary equity investment through a capital write down requires approval from the High Court. The promoters of the Second Vivekananda Bridge Project on an NH in West Bengal are proposing to place a convertible instrument with financial investors which is originally raised as subordinated debt and is eventually convertible into equity. The instrument creates a convenient mechanism to offer lower risk with upside potential for financial investors.

33. Overall, there appears to be a reasonable amount of interest among potential lenders in taking debt exposure in BOT road projects being undertaken by a creditworthy sponsor. This may partly be due to the general high availability of funds in the banking system and a relative shortage of attractive lending opportunities. In particular, lenders are: (i) willing to consider attractive repayment terms, including stepped up repayments and post-construction moratoria for projects perceived as generally bankable; and (ii) offering attractive interest rates for such projects, on a non-recourse basis. This opens up further opportunities for the government to lower risks and overall project costs and it is in line with the current trend to adopt more innovative financing instruments in India.

Indicators of Remaining Constraints to PSP

34. **Limited Private Funds Raised.** One indicator of weakness in the system is that the level of private investment is still relatively low in comparison with other countries that are actively pursuing private funding of roads. While a number of states are using Road Development Corporations to access private funding, given the implicit Government guarantees provided, this amounts to little more than off budget borrowing. The number of States that have actually seen BOT or other models where more risks are transferred to the private sector are very few – in fact just seven states⁶⁷. More substantive programs have not materialized, for example, in Rajasthan⁶⁸. Moreover, the majority of these are short sections of bypasses or bridges amounting to just a few 100 km. NHAI has been rather more successful – about 450 km worth Rs.3,400 Crore under BOT and a further 470 km worth Rs.3,000 Crore through Annuity schemes. However, in comparison with some other countries this is low – in Chile, \$3.3 billion was raised from the private market over the 1990’s to upgrade the 2,000 km highway network⁶⁹.

35. **Long gestation of PSP Projects.** A second indication that there are constraints in the system is that PSP projects are generally take a long time to prepare and procure – typically at least 24 months. A good example of this is the Bangalore Mysore Infrastructure Corridor

⁶⁷ AP, Gujarat, MP, Maharashtra, Rajasthan, UP, Tamil Nadu

⁶⁸ “Rajasthan government’s ambitious Rs 747-crore project for development of road network in the state under build operate and transfer basis has run aground with investors having slapped a “not feasible, no interest” notice in the first tranche of bids for such projects” Reuters, 6 June 2002.

⁶⁹ Toll Road Concessions – the Chilean Experience, PFG Discussion Paper No 124, World Bank, 2003. See also the PSP database for global information at <http://rru.worldbank.org/ppi/>

Project. While the Government of Karnataka and the proposed concessionaire signed a Memorandum of Understanding in 1995, the project has still to come to financial closure. The Delhi Noida took nearly nine years between the signing of the MOU and commencement of operations⁷⁰. However, given more recent events and additional reforms, it is not expected that these lengths of delays will be repeated in the future. The concessioning of a further 10,000 km of NH is ongoing and the actual timeframe of this process will provide an indicator of whether things are improving.

36. **High Rate of Restructuring.** Another indicator is that quite a few PSP projects have had to be restructured or renegotiated. For example, the Durg bypass on the NH6 in Madhya Pradesh now requires renegotiation. This 18km long bypass has suffered from a double blow of escalated costs due to a change in the scope of work imposed after contract award by NHAI, for which compensation has not been paid yet, together with traffic volume being about 40% below projections. Competing routes that had not been adequately factored by either party had a role to play in reducing the traffic. The Delhi Noida BOT has also had to be restructured due to lower than expected commercial traffic, itself partly the result of the failure of the government to provide adequate connecting routes⁷¹. The restructuring of the Hubli Dharwad, Vadodara Halol BOT projects are also understood to be currently under negotiation.

37. **Questionable Value for Money.** A final indicator that there are improvements to be achieved is that there is skepticism over the value for money that has been obtained in some PSP models in India. In particular, the Annuity model has come under scrutiny as to whether the eight agreements (474km) reached was a good use of taxpayers' money. This model provides for a concessionaire to design, build, finance and operate a project road for a predetermined time. After commissioning NHAI makes semi annual payments until the end of the concession period as the only revenue for the concessionaire. NHAI retains the right to charge tolls on the road. In an analysis done for this study, the cashflow profile of the eight concluded annuity projects have been shown to be equivalent to NHAI borrowing at between 17-18% (derived as the IRR of the cashflow stream from NHAI's perspective). This compares with a weighted average cost of capital for NHAI of about 11.3%. Although some design/survey change, operation and maintenance risks have indeed been transferred to the private sector, and there are some regulatory inefficiencies (statutory reserve requirements and taxes) this may not explain the spread between the two rates or whether the premium being paid is appropriate for the risks transferred. It is not clear what level of due diligence was undertaken prior to entering these contracts – however, with hindsight the annuity model as implemented appear to provide questionable value for money.

Systemic Constraints To PSP In India

38. **Absence of Reliable Information.** In making a decision to buy or sell, lend or borrow any asset, people use information to determine the relative price of the asset and how this compares with the expected future cashflows from the transaction. The cashflows can either be inferred by comparison with current market prices if there is a market for that asset or they can be estimated through projecting forward historical data of relevant factors. In the case of highway projects that have their own individual characteristics, potential investors must use a forecasting method to determine the cashflows – data on construction unit costs, traffic, and the history of construction of any existing road or structure that is to be incorporated in the concessionaire's highway. The problem highway investors and creditors face in India is that such information generally is not available even within the road agencies, let alone in a usable format or on a public basis. Where there is data available, there are concerns over the accuracy of the data, especially in relation to traffic counts (see Annex 12 on private sector concerns). Hence, investors rely on their own limited investigations which

⁷⁰ Presentation by CEO of Noida Toll Bridge Co, November 2002

⁷¹ <http://www.thehindubusinessline.com/bline/2003/01/28/stories/2003012800960600.htm>

are unlikely to capture a long history or wide breadth of experience. Without this, no probability distribution of costs and benefits can be constructed on which sensitivity or scenario analysis rely. The resulting analysis is more likely to be inadequate, subject to bias and ultimately the conclusions may not hold. The perception within the private sector is that the estimates of construction costs indicated to bidders at the time of bidding may not entirely reflect costs of construction in practice, as certain allowances for price escalations may need to be made (the time gap between construction cost estimates and the time of actual bidding has been 1-2 years).

39. **High Price Elasticity of Demand for Tolled Services.** In many countries, private funding for roads depends heavily on toll collection to provide for revenue. In India, both Central and State Governments are seeking to increase toll collection both for publicly and privately funded roads. Yet, the systemic problem faced across the country is that, largely due to high levels of existing taxation on road users, willingness to pay for tolls is rather low, despite the fact that Indian toll levels are on average some of the cheapest in the World – roughly 15-25% of the savings in vehicle operating costs for cars and 50-70% for commercial vehicles. Where tolls are being imposed, expected traffic is not materializing due to diversion undermining the viability of existing projects and deterring private investment in future projects. This risk is genuine and can threaten the financial sustainability of a project. The Mumbai-Pune expressway, for example, is not able to attract the estimated traffic levels due the presence of alternate routes and the user's reluctance to pay the existing toll charges (see Box 8.4). The trucking industry has already raised its objection to the so called "double dipping" of increased cess and toll⁷².

Box 8.4 The Experience with the Mumbai-Pune Expressway in Maharashtra

The first phase of the project between Khandala and Lonavala was opened to traffic in May 2001 and the entire expressway was ready by mid-February 2002. The expressway reduces travel time from Kalamboli to Delhi Road to about one and a quarter hours as against 5 hours on existing NH-4. Despite its inherent appeal, the road has failed to attract the estimated traffic levels, and hence raise the expected revenues, due to the presence of alternate routes and the users' reluctance to pay the existing toll charges. After a year of operation, revenues fell short of its first year toll collection target of Rs. 1.2 billion. Currently Maharashtra State Road Development Corporation (MSRDC) is collecting an average of about Rs. 37 million a month as toll charges from an average of 12,000 vehicles per day plying on the expressway. This, coupled with higher than expected construction costs due to delays in execution (over Rs. 16 billion versus Rs. 14 billion budgeted), is threatening the sustainability of the agreement. MSRDC is optimistic that there will be an upswing in revenues once the entire stretch is complete and properly operational as two underpasses and a 10 km long Panvel Bypass were completed recently.

To get out of this debt trap, MSRDC has recently handed over the expressway along with the parallel Mumbai – Pune section of the NH-4, on a 15 year lease. The concessionaire has been granted the sole rights to collect tolls on both these roads in lieu of an upfront payment. Under the deal, the concessionaire is required to (i) upgrade the NH4 to 4 lanes by March 2006, after which it can start collecting tolls on the NH4 and (ii) maintain the expressway, (however structural repairs on the expressway will continue to be the responsibility of MSRDC). Opposition to this move has already begun with local residents demanding that at least one road should be toll free.

40. A revealed preference survey undertaken for this study looked at user attitudes and preferences on the tolled Mumbai Pune Expressway and the parallel existing un-tolled route along the NH4. The survey was taken from 600 private and commercial users each on both routes. The survey also collected traffic data from the two routes - the free route has three to four times as much traffic as the tolled route. The survey sought user's views on five main factors – travel time, riding comfort, cost, reliability and traffic interference. While the tolled

⁷² "There should not be any imposition of tolls on existing roads after their conversion from single lane to two-lanes and from two-lanes to four-lanes. If the Government wants tolls, then it should stop collecting cess on diesel", the All India Motor Transport General Secretary, Mr. J.M. Saxena, as reported in The Hindu, September 23, 2002

route is preferred by cars, taxis, buses and vans due to time savings, heavy freight users prefer the NH4, overwhelmingly due to cost savings. 50% of respondents using the NH4 stated that they were not using the expressway due to the toll, despite the rate being set at about 25% of VOCs savings for cars and 60% for trucks – i.e. every user is better off using the expressway. Overall, the survey suggests that the perception of the value of benefits to higher class but directly tolled roads is relatively low at present.

41. Furthermore, private sector perceptions are that total traffic estimates in the bidding documents do not necessarily reflect the total “tollable” traffic on these roads, which is somewhat lower than total traffic. In general, road projects have often shown low tollable traffic, warranting, in some cases, grants as high as 60-70% of construction cost in order to entice private investors. The case for adopting a BOT at such high levels of subsidy becomes very hard to make.

42. **Dispute Resolution.** At present, the standard concession agreement in use by NHAI, provides for the following levels of dispute resolution (i) mediation by independent consultant appointed by NHAI from panel of three firms identified by concessionaire which are to come from panel of five firms chosen by NHAI (ii) Chairman of NHAI and Chairman of concessionaire and (iii) arbitration under Rules of the Arbitration Act. Those BOTs that have been let at state level have generally followed this same mechanism as they have based the concession document on the NHAI’s. While this mechanism is a step in the right direction, for more serious disputes the probability of ending up in arbitration is still high. The time and costs of arbitration are, however, often high and a more certain and swift dispute resolution mechanism may reduce perceived risks for private investors.

43. **Indebtedness Levels.** It is an accepted practice in India to leverage infrastructure projects with a large debt component. Private sector participation and innovative financial structures have sometimes been implemented by increasing the indebtedness of the public sector to levels beyond those recommended for India. These high gearing levels, when compounded with the need to access long term debt of a maturity and repayment profile suitable to the project’s cashflows, subject the project to significant financial risk. For example, the Mumbai-Pune Expressway project costing Rs. 12,55 billion is highly leveraged with a debt equity ratio of 4.5:1. The entire debt amount of Rs. 10,30 billion was raised in the domestic capital market through bonds issued by the Maharashtra State Road Development Corporation (MSRDC). Even the equity investment of Rs. 2,25 billion was received from the Mumbai Metropolitan Regional Development Authority (MMRDA) in the form of subordinated debt. As the Indian capital markets are still underdeveloped, a debt to equity ratio in the range of 2.2:1 and 1.5:1 are usually accepted by financial institutions and banks for road infrastructure projects, significantly below that for the Mumbai-Pune Expressway. Guidelines to assure gearing levels are kept at reasonable levels are required.

44. **Additional Weaknesses at State Level.** State governments face a more difficult task than the central government in securing PSP, although some States have proved it can be done on certain projects⁷³. The former not only have lower creditworthiness when concessionaires are considering the timeliness and completeness of any public subsidies, but also networks generally with lower traffic. This puts a premium on state governments improving the enabling environment and their own capacity to implement PSP projects. Many states have yet to put the basic building blocks in place, including not only the enabling framework but also procurement and contracting capacity and certainty of revenue stream from public sector.

45. **Summary.** While it has been argued above that international experience has demonstrated that private funding is not likely to prove a panacea for the sector, and that there

⁷³ Take the example of the East-Coast Highway (100km), the Government of Tamil Nadu’s contribution of Rs.10 crore leveraged an investment of Rs.51 Cr from the private sector. It is expected to save the Government in excess of Rs.100 Cr by way of savings on future maintenance expenses and ensure sustained O&M for the entire concession period of 30 years.

are still many constraints in India to facilitating more private investment, actions should still be taken. The private sector can bring funds and new techniques to improve the network, especially its busiest links. The GOI is clearly banking on substantial PSP in the next phase of National Highway development with 10,000 km of roads being expected to be funded substantially through BOT. Moreover, there is also opportunity at the state level. An analysis that was carried out for this study sought to determine the likely scope of PSP by way of toll based BOT projects in six states (see Annex 13) ⁷⁴. This concluded that of the 37,000 km state highway network in these states, roughly 13,000 km or 36% was potentially viable as a BOT project, either as a rehabilitation or upgrading project depending on traffic levels. The key threshold for viability was around 5,000 PCU, below which more than 70% public support would be required and a BOT was therefore deemed unsuitable. The range of public support required for these 13,000 km of BOT, assumed at 40% disbursed over the construction period, was estimated as being from Rs.6 to Rs.72 Crore per annum, sums that are quite feasible even for fiscally constrained states.

⁷⁴ AP, Karnataka, MP, Maharashtra, UP and West Bengal

9. RECOMMENDATIONS

The Foundations for Financial Sustainability in the Sector

1. Previous chapters of this report have outlined the large financing gap in the highway sector, and the likelihood that increased funding will have to be financed from the highway users themselves, irrespective of whether investment is financed from public or private sources. It is clear that the institutional arrangements of the sector need to change in order to improve the quality of decision making, enhance the transparency of financing arrangements and obtain the acceptance and support of the road user community for the proposed changes in the level and structure of road charging. The reforms suggested are designed to help tackle the underlying problems of inadequate information, fragmented decision making, and lack of transparency.

2. The reliance on the road sector for general tax revenue is a systemic problem which affects many developing countries. A broadening of India's tax base may be very desirable but may not be achievable in the short-term. Consequently, road users are likely to have to pay more for better roads⁷⁵. Several countries have found that, in order to make additional user charges acceptable to road users, rather different institutional governance structures are desirable; structures in which representatives of road users and other stakeholders are brought into the decision-making process and given some influence on how their user charges are spent.

3. ***Create and Disseminate Better Information.*** The first step in strengthening the decision-making process is improved information and information dissemination. Many governments regularly re-assess the structure/level of road user charges through Road Cost Allocation and Road Cost Recovery Studies⁷⁶. Such studies may cover:

- the road costs imposed by different vehicles on each road category in the network;
- the total of taxes and fees paid by each vehicle type and for different categories of roads; and
- the level of road user charges paid by each vehicle type on each road category.

4. In India, a road user charge study was undertaken in 1988-89, but its recommendations were given little consideration and the study has not been repeated. When road users are expected to fund the road network, such studies are essential. The allocation of costs between vehicles needs to be kept under continuous review to ensure that no vehicle group is paying less than its road damage costs. Road cost allocation reviews should be undertaken biannually and, as taxes and charges are raised by both GOI and the States, they should be commissioned by a central agency with the States providing whatever data on costs and taxes are necessary. These cost allocation studies should be made public and form the basis for determining user charges.

5. Furthermore, the nature and quality of the financial information collected and reported by road agencies should be greatly improved, especially if the road agencies are hoping to raise funding from the private sector. Globally, road agencies are adopting a business oriented approach to managing the road network and shifting from traditional government accounting to quasi-commercial accounts in which:

⁷⁵ Of course, the benefits of the better roads to road users should more than offset the additional charges, but may not be immediately perceived.

⁷⁶ See for example the results of such a studies in the USA at <http://www.fhwa.dot.gov/ohim/hwytaxes/2001/>

- accrual rather than cash accounting is employed⁷⁷;
- road/bridge assets are capitalized and depreciated; and
- the cost of maintenance is reported as an expense⁷⁸.

6. This follows the accounting conventions used by the private sector firm, showing fixed assets on its balance sheet and accounting for depreciation through the income statement. Road agencies are thus demonstrating more coherent and transparent accounting for the very considerable assets they manage: NHAI, itself, would be high in any ranking of Indian companies by balance sheet size if road assets were properly valued⁷⁹. In the USA for example, the Government Accounting Standards Board promulgated Statement 34 in 1999 requiring all government bodies to calculate, audit and disclose the cost of infrastructure and the associated annual depreciation/maintenance expense. The introduction of the requirement being phased in by 2006 is likely to have profound effects on the bond market which road authorities rely on for a considerable portion of their financing⁸⁰.

7. Audited financial statements (balance sheet and income and cash-flow statements), that reflect the reality of the sector, would send a clear message to taxpayers, bond holders and underwriters of the road agencies' stewardship of the road network and their financial capacities to repay future liabilities. If NHAI and/or the state Road Development Corporations want to reduce the cost of their borrowing; facilitate private funding of the sector; and meet the growing public demand for clearer accountability, adopting a modern commercial accounting system will be a critical building block.

8. If public and private finance is to be used cost-effectively in the improvement of India's highway network, there is also a pressing need for improved road and traffic data. Potential investors in the network must forecast their cash flows and need data on construction unit costs, traffic, and the engineering history of those roads/structures. Unfortunately, such information is generally not available even within the road agencies, let alone in a usable format or on a public basis. The likely consequence is that investors incorporate much higher risk premiums into their bids than might be justified. Contracting out, using more automated methods and independently auditing data collection may help inspire greater confidence in the quality of the data. By having a longer and wider history of traffic, tendered rates for BOQ items, asset condition and traffic, clients can expect private parties to be more accurate in their tendering with benefits accruing to all sides.

9. ***Create a Coordinating Mechanism to Harmonize User Charges.*** While the constitutional responsibilities for setting and collecting taxes and charges need not be modified, there would be major advantages in a more coordinated approach to setting road user charges. At present, there is little coherence in either the methods or levels of charges and, in some instances, conflicting incentives are being given. There are two broad options for establishing a harmonized road user charge regime: a strategic road authority or a looser affiliation of the center and state governments.

10. A Strategic Roads Authority (SRA) would be responsible for the planning, coordinating and financing of the overall highways program. The Central Road Fund already offers a source of finance for national and state highways, as well as local roads; but it cannot influence the allocation of funds between activities (set by statute), and has no powers over the road-user taxation policies adopted by the individual states. The SRA could receive the cess, and all other designated national road user charges and then channel this funding to develop a coordinated approach to highway funding across all the states. It would be charged

⁷⁷ See "Transition to the Accrual Basis of Accounting: Guidance for Government and Government Entities (2nd Edn.);" IFAC, December 2003, available from <http://ifac.org>

⁷⁸ See Asset Management for the Road Sector, OECD, 2001

⁷⁹ Australia, UK, USA and Canada are all moving in this direction

⁸⁰ Primer GASB 34, US Federal Highway Administration, 2000

with undertaking studies of road costs and revenues and developing, with the relevant state agencies, an integrated approach to effective road user charging.

11. The SRA should be given the responsibility for designing an approach to the financing of capital investment, consistent with budget limitations and the capacity to raise new sources of revenues, over the next two Five Year Plan periods. It is perhaps inevitable that the present heavy financial burden of developing a modern highway network will be spread more evenly over time. The SRA would, therefore, need powers to raise medium term (5-10 years) debt, to be held on its balance sheet, to be repaid by a secure revenue flow from the fuel cess and highway tolls.

12. If the SRA is to facilitate co-ordination between central and state functions, there would need to be a governing council comprising representatives from the central and state governments. In addition, to help generate support for increased charges, the governing council should also include representatives from road users and other road sector stakeholders. The SRA would need to be staffed by engineers and, more particularly, by experts in economics and finance.

13. A powerful SRA may be too radical. In the short term, it may be more feasible to develop a council of transport ministers or some similar body whose mandate would be to encourage dialogue between the states to help harmonize policies toward the road sector, including road user charging and expenditure allocations. Such a body could perhaps be created as a sub-committee of the Council of Chief Ministers. It might well be the appropriate body to commission the proposed studies on Road Costs and Cost Allocation; there would then be common ownership of the resulting product by all the relevant governments.

14. Internationally, two similar institutions already exist: the European Conference of Ministers of Transport (ECMT), and the International Fuel Tax Association in the USA and Canada. (see Annex 14). The ECMT has a much broader mandate than the International Fuel Tax Association which is designed purely to reduce and improve administration of fuel taxation. Both examples demonstrate that there can be considerable benefit in joint action on common issues, without compromising sovereignty. To establish a similar organization for India, with substantial potential benefit, only requires political will and some limited secretariat support.

15. ***Create and Maintain National and State Road Funds.*** Differentiating implicit road user charges from general taxes always requires assumptions and consequently the conclusions are speculative; there are no unambiguous criteria for what constitutes a “normal” tax. However, if responsibility for setting road user charges were separated from general revenue taxes, and the user charge revenue accrued to a commercially managed Road Fund, then there would be clearer lines of responsibility and accountability. Several such road funds have now been established and are working satisfactorily. The main characteristics of such a road fund include the following⁸¹.

- A separate, quasi-autonomous Road Fund, should be managed by a Roads Board.
- The Roads Board includes representatives from private road-users and other stakeholders as well as the Government. Preferably, there should be a majority of private sector members with a private sector chairperson.
- Road user charges are specific and separated from general taxation.
- Revenues are paid automatically and directly to the Road Fund, rather than through the Consolidated Fund.

⁸¹ See Commercial Management and Financing of Roads, World Bank, 1998
<http://www.worldbank.org/afr/ssatp/techpaper/tp409.pdf>

- Strict procedures are established for the allocation of funds between activities and the approval of work programs submitted by the various road agencies.
- Independent financial and technical audits are undertaken and all reports are published.

16. India already has a national Road Fund, financed by the road cess. The allocations of the receipts are statutorily predetermined (national, state, rural, and urban), with 50% allocated to rural road development. A few states have also established their own dedicated road funds to increase road sector funding. The Indian Central Road Fund differs from the recommended “second-generation” road funds⁸² in two principal aspects:

- the emphasis on road development rather than road maintenance with the revenue from the fuel cess is largely used for new road investment; and
- the complete dominance of the public sector in the management/governance of the Fund⁸³.

17. Rational management of the road sector requires a coordinated and integrated approach to investment and maintenance. Unfortunately, politicians often take a very shortsighted view of road maintenance, when faced by resource constraints, and give priority to investment. In India, this is a major problem and there is a huge shortfall on road maintenance. This could be addressed by legislating that the Central Road Fund, or a successor Strategic Roads Authority, and State Road Funds must adequately maintain the core national and state highway networks, and that maintenance should be the first charge on resources.

18. The continued involvement by the Ministry of Finance and Roads has not undermined the effectiveness of road funds elsewhere. In India, it is perhaps inevitable that road funds will have mixed public/private boards, and considerable influence will be retained by the Ministries/departments of Finance. Such involvement would probably include MoF agreement to the level of any cess or other specific road user charge. This, however, should not be an impediment to the development of a business oriented and user responsive process for the raising of revenues, and allocation and implementation of road expenditure.

Options in Financing the Highway Program

19. Assuming that the highway network is fully maintained and improved to meet the needs of a rapidly growing economy, there is likely to be a cumulative funding gap, during the next ten years, in excess of Rs 1,000 billion, or more than US\$2 billion per year. Indeed, the funding gap would be much greater (Rs 1,760 billion) if the present proportion of highway user charges continues to be used in other sectors. The Government of India and the State Governments have a number of possible options to fill, bridge, or reduce the financing gap:

- i) Increase the proportion of road related revenues returned to the sector, i.e. reduce the importance of road users as a source of general tax revenue;
- ii) Raise the levels of existing taxes and user charges;
- iii) Introduce more direct road pricing, such as road tolls or weight-distance charges;
- iv) Reduce public sector commitments by concessioning highways to the private sector for construction and/or maintenance *and* then require concessionaires to recover some/all of their costs through tolls;

⁸² “First generation” road funds were simply revenue raising from dedicated taxes. In many countries, such funds developed a very poor reputation with high levels of corruption and the diversion of the funds to other uses.

⁸³ The public sector dominance of the governance of road funds is also found at the state level, except in UP.

- v) Bridge the immediate financing gap by increased borrowing, thus spreading the financing burden; and
- vi) Reduce investment expenditure by greater prioritization of works and lowering unit costs by systematic value analysis at every stage of the project cycle.

20. Reducing the role of the road sector as a sources of general revenue (option i), may simply not be feasible where there are high demands for public finance and limited opportunities for efficiently increasing tax revenues. Concessioning highways, with the private sector assuming the traffic/revenue risks, (option iv), may have some role but a network wide approach, with a public road agency assuming the traffic risks and setting uniform tolls, may provide greater overall benefits.

21. Resolving the financing issue thus appears to revolve around either borrowing (option v) or increasing road user charges, raising existing charges and/or introducing new charges (options ii and iii). Prioritization of works and obtaining better value from expenditure (option vi) should apply to all public investment, as it does in the private sector. A combination of borrowing and increased charges seems almost inevitable, the balance between them is essentially a policy decision for the central and State Governments.

22. The very high financing needs in the road sector reflects not only growing traffic levels but also the relative neglect of the sector over an extended period. It can argued that the present road investment needs are much higher than the longer term equilibrium level, once the back-log of rehabilitation and capacity expansion has been rectified. To fund the proposed expenditure from present users alone, will either require a very substantial increase in user charges or the allocation of more general tax revenue to the road sector which may be difficult to achieve.

23. The benefits of the proposed investment will extend to future road users and thus it would be appropriate to recognize that this is essentially a long term investment issue and spread the capital financing burden of the highway network expansion/improvement to future road users, through borrowing. Such borrowing could be through the public sector or through various forms of private sector financing. The extent of generational cost sharing is essentially a political decision, and one which needs to be made in order to define the funding required from existing road users.

Recommended Changes to Charging Instruments

24. The levels and structure of road taxes have evolved without any underlying economic rationale and/or specific objectives other than revenue generation. The present tax structure provides neither economic efficiency nor equity. Any efficiency or equity achieved has been incidental and not the result of deliberate policy decisions. The absence of a well defined, rational and coherent road user charge policy at the National and the State levels has contributed to the multiplicity of taxes and the pricing distortions.

25. Therefore, it is strongly recommended that a national taxation policy be developed, for the entire land transport sector, that would:

- promote efficient competition between alternative modes;
- encourage market oriented solutions that reduce subsidies;
- help develop optimal pricing policies for different land transport modes;
- acknowledge the desire to shift towards more direct charging for road use; and
- differentiate road user charges from general taxes and define the shares for road construction and road maintenance.

26. Road transport and road infrastructure are vital for accelerating the rate of economic growth in India, and a well-defined and coherent financing structure for the road network should have very high priority.

27. **Increasing the general fuel cess.** The use of highways differs from the purchase of most other services as there is rarely a direct price. There is, however, a strong case for using a “proxy charge” for the use of the road network. Such a charge is often levied on automotive fuels⁸⁴. Many countries, facing the same funding constraints as India, have imposed a fuel levy/cess, with the revenue dedicated to the road sector (often specifically road maintenance). While dedicated taxes are generally anathema to finance ministries and the IMF, there is growing acceptance of the benefits of a reliable source of road maintenance funding, within a well structured and accountable road fund.

28. In 1998, the GOI introduced a new fuel cess, dedicated to expenditures in the road sector, which was subsequently formalized through the Central Road Fund Act, 2001. The cess was initially set at Rs.1/liter, for both gasoline and diesel, and then increased to Rs.1.50/liter (≈US\$3/liter) in 2003. This has substantially increased the resources for the highway sector: Rs 20 billion/year for national highways and about Rs 11 billion for state highways. Some states have introduced additional fuel cesses; Uttar Pradesh, for example, imposed an additional sales tax of 4% on diesel, and 6% on gasoline, raising about Rs. 2.5 billion/year for the road sector.

29. Financing the funding gap from the fuel cess would require a cess rate of about Rs. 7.5/liter; such a massive increase is unlikely to be politically acceptable. The fuel cess levy in India is relatively low in comparison with similar levies in other countries (they range from US\$4.5 – 10/liter but most are US\$ 6 – 7/liter) and some increase would probably be acceptable, especially if accompanied by institutional reforms to the management of the Central Road Fund. It is recommended that the GOI considers doubling the fuel cess to Rs 3/liter, and dedicating the additional revenue entirely to road maintenance. It is also recommended that the State governments establish dedicated cesses to fund the maintenance of the state highways; this might require fuel cesses of Rs. 0.5-1.0/litre on both diesel and petrol. The current high international oil prices complicate this course of action somewhat but do not make it impossible.

30. **Higher diesel cess** There is a strong economic case for a higher cess on diesel as the variable costs imposed by heavy commercial vehicles are about 7-10 times higher than those by passenger cars⁸⁵. Heavy trucks are undercharged for their road damage costs and raising the cess on diesel would be one way of recovering these costs. The danger of a higher cess on diesel is that it would increase the price differential with kerosene and encourage fuel adulteration.

31. Increasing the diesel cess could have negative impacts on non-road users of diesel, who consume about 46% of diesel⁸⁶. It is relatively easy to exempt large individual users (railways and power), but much more difficult to give exemptions to small users in agriculture and industry. The measures that governments have used to address this issue are outlined in Annex 15, but some governments have simply accepted the inequity and provided no exceptions. It is recommended that GOI commission a detailed study to review the case for higher diesel cess and the likely impacts on other sectors.

32. **Purchase and ownership taxes.** Purchase and ownership taxes on vehicles (fixed taxes and charges) can and often are used as part of a road user charge strategy. While it is generally preferable to relate charges to the use of the vehicles, this is not always practicable.

⁸⁴ Charges on vehicle tires might perhaps give a greater correlation to road costs but high charges on tires could have serious road safety issues.

⁸⁵ Where differential fuel levies are used, it is often gasoline which is a higher rate

⁸⁶ Agriculture: 20%; power generation: 7%; industry: 8%; railways: 4%; and other: 7%. Source: Ministry of Petroleum and Natural Gas, 2000-01

There are also good arguments for having a fixed charge to cover the fixed costs of providing and maintaining the network. The annual fixed charge should be structured to reflect not only the non-attributable costs of the network but also those attributable costs which are not adequately recovered by use related charges. For freight vehicles, this would suggest annual license fees based on a combination of gross vehicle weight and the number of axles. The annual license fee can thus provide incentives to road users to employ less damaging vehicles.

33. Most states already charge annual fees on motor vehicles but it is clear that there is no standard approach to the level or structure of these fees. It is recommended that, following a study of road user costs, all state governments should be encouraged to adopt a uniform approach to the establishment of annual fees for freight vehicles in order to ensure that the road transport industry is provided with consistent incentives to adopt the most economically efficient vehicle fleet configuration.

34. **Tolling the National and State Highways.** Road tolls generate a small fraction of the total revenue from road users, possibly around one percent. However, both in India and internationally, there is growing interest in directly pricing for road use both to raise revenue and to relate user charges more directly to user costs (including congestion).

35. In the light of the present low willingness to pay tolls and the limited value of time savings for freight vehicles, the appropriate policy is to keep tolls low but apply them more widely. This is NHAI's intention, once the Golden Quadrilateral and North/South East/West corridors are completed. The NHAI draft Corporate Plan indicates that tolls on this network will generate Rs. 20 billion annually, by 2007, sufficient for corridor management and maintenance plus $\approx 50\%$ of interest on outstanding debt, excluding annuity schemes and SPVs/BOTs.

36. It seems probable that India will rely increasingly on tolls for highway finance and the real issue is the speed of their introduction. The NHDP is an ideal opportunity to implement a systematic toll policy for major interstate highways. Except on high cost bridges, where higher tolls may be both necessary and feasible, it would seem sensible to have a national toll schedule, designed to finance construction and maintenance over a 20 - 25 year period. This could be introduced over 3 - 7 years. It is recommended that the GOI designates the new routes on the Golden Quadrilateral and on the North-South and East-West corridors as a national toll network. The toll network would be controlled by, and the toll receipts would accrue to, NHAI as general income rather than specifically to individual links, except where existing toll based concessions have already been let. The actual operation of the links could be outsourced to private operators. This initial toll network could grow as the remaining 44,000 km of national highways are upgraded.

37. It is also recommended that State governments implement a uniform tolling system on their core highway networks, once individual links are improved to a reasonable two lane standard with traffic levels sufficient to justify the cost of tolling. The tolls should be set to recover, at least, the cost of operating and maintaining the roads and should be commensurate with the national system. In the longer term, the levels of tolls may be increased to cover the costs of strengthening or rehabilitating further links on the core highway network.

38. A study, undertaken in preparing this report, assessed the potential for toll based BOTs on state highways in six states with a total state highway network of 37,000km; such schemes may be feasible on about 35% of the network, assuming relatively low levels of investment. Moreover, new technologies are reducing tolling costs and the levels of evasion and revenue leakage. Even adopting a cautious approach, it may be feasible to toll about one quarter of the state highway network.

39. **Weight/distance charges.** One of the most serious deficiencies of the road user charging regime in India is the under-charging of heavy commercial vehicles for their road damage costs. This undercharging can be partly compensated by annual charges but these are a rather blunt instrument and do not discriminate between vehicles with different levels of

utilization. Moreover, a simple charge, based solely on gross vehicle weight, can give distorted signals with respect to vehicle choice.

40. In India, a weight/distance charge could be introduced for national/state highways through the methods used elsewhere, or by stopping vehicles at toll plazas for manual collection of tolls related to the vehicle weight/axle category. An Expert Group should be established to elicit the views of the trucking industry and then consider the proposal in detail.

41. **Urban congestion charges.** It is recommended that urban road pricing should be considered to address the increasing congestion problems in major urban centers. However, this should be viewed as a separate exercise to general road user charging and should be initiated and managed by the cities as part of integrated urban transport strategies. This will require a definition of urban boundaries for the purposes of inter-urban toll and charging purposes; it is suggested that these are established early in the development of the national and state highway programs.

42. **Enhancing Equity.** Moving towards greater reliance on differentiated fuel cesses and road tolls will, in the longer term, help to allocate more directly the costs of different vehicle categories and make the charging structure more equitable between users. In the short term, it would be prudent also to rationalize the current tax regime. In a country of sub-continental size like India, efforts should be made to harmonize the methods of calculating levels of user charges so that the current wide variation between states and between different users can be reduced. This type of exercise is currently being undertaken by the 25 countries of the EU.

43. The existing tax structure should be simplified first, by minimizing the ambiguities in vehicle classification and the basis of charges. Certain taxes, which are difficult to administer, like passenger tax and goods tax might be merged with road tax (the principal tax levied by the State Governments) and a single consolidated charge levied. Rajasthan and Andhra Pradesh have already amalgamated various taxes without loss of revenue. Another form of simplification, now in use, is an one-time tax on private personal transport, i.e. private cars and 2-wheelers. This would reduce administrative as well as compliance costs. However, some form of annual registration may still be desirable for vehicle control purposes, such as for vehicle road-worthiness.

44. States also need to review whether the current charging of buses and commercial trucks is equitable or whether it should be revised. The overcharging of buses and undercharging of freight vehicles has negative implications for both transport efficiency (leading to inter-modal traffic distortions) and equity. It appears to be the result of the heavy financial dependence of states on bus and passenger taxation. The solution to this may need to be partly institutional with some compensation, possibly through a re-allocation of fuel tax and other central funding, if the states forgo the excessive taxation on buses.

Additional Reforms to Help Spur Private Finance

45. **Establishment of a Highway Regulatory Authority.** While this aspect is already fairly well developed at the national level, the GOI can consider the following options (i) do nothing; (ii) incrementally strengthen the standard concession document as is already being done; or (iii) establish an independent regulatory authority under law. The third option may be sensible in the longer run to help standardize process thereby providing greater predictability to investors and allow for shorter concession contracts that easier to develop and conclude. Authorities have become functional in the Telecom, Insurance and Energy sectors in India and are playing an important role in opening up these sectors to competition. Establishment of a Highway Regulatory Authority on similar lines for the road sector would certainly provide an impetus to private sector participation in various modalities in road projects, thus quickening the pace of growth by removing/mitigating infrastructural hurdles. Typically, such an Authority should consist of not less than three members having a minimum of 20 years' experience each drawn from the:

- Engineering profession – preferably with expertise in road construction/traffic engineering;
- Legal profession – one who has been or is eligible for being a High Court Judge; and
- Industry and/or financial analyst cum economist – familiar with the sector and road freight industry.

46. From amongst the members, the Government could nominate one as the Chairman and another as the Vice chairman. The tenure of a Member would be three years, renewable for one more term of three years, but not beyond the age of say sixty five. They should be empowered to act in an autonomous, independent manner through a legislative enactment which would also provide for its composition, qualification of members, powers and functions and other relevant details.

47. At the State level, putting in place a full time regulator may not make sense until a sufficiently large program of PSP is in place in which case regulation through the contract by a dispute resolution board may be appropriate. However, such a mechanism would need to have sufficient powers to ensure that any ruling was implemented quickly.

48. ***Institutional Framework.*** Reform of sector institutions from old fashioned PWD systems to a more effective and efficient system is a key building block. Alternatively, establishing a State Road Development Corporation with improved governance and more nimble procedures may be given responsibility to act as a nodal agency for induction of private investment in the sector by commissioning project preparation and procurement activities on behalf of states.

49. ***Adoption a PSP framework and enactment of accompanying laws.*** Formulating a comprehensive road development policy and articulating an associated PSP framework for the state, defining public contribution/participation, risk sharing, and regulation of contracts. The existence of a legal framework or specific guidelines for inducting private investment help provide comfort to investors and lay down processes for adoption by the PWD/Road Development Corporation. The existence of an established policy and guidelines assumes specific importance in ensuring consistency and transparency.

50. ***Increase Incentives for PSP through Reduction of Existing Inefficiencies.*** Despite the incentives in place for PSP, more remains to be done concerning whether: (i) the provisions regarding income deductions for tax purposes in the 1961 Income Tax Act could be applied to all bank financing, not just specialized financial institutions; (ii) the provisions regarding the deduction of 20%, for tax purposes, of equity shares subscribed or debentures issued, could be extended to all financing parties to a PSP project and not just the infrastructure company; (iii) Company Law's statutory reserve requirements of 10% could be reduced in line with international experience applicable in India; (iv) the depreciation method to estimate deferred tax liabilities could be left unspecified; and (v) other taxation inefficiencies could be addressed. These include, for example: (i) the limited period of tax holiday for infrastructure companies under Section 80 IA of the Income Tax Act (10 years during operations); (ii) the distribution tax on dividends paid by project companies with effect from April 2003; and (iii) the minimum Alternate Tax which forces companies to pay tax even during the tax holiday periods.

51. ***Improve Project Planning, Prioritization and Justification.*** By strengthening the process of planning, prioritizing and procuring PSP projects, all road agencies can help promote more private funding to the sector. This requires the preparation and implementation of clear guidelines to identify the range of PSP models to be applied and the circumstances under which each would be used. Further projects should be prioritized using well defined selection criteria such as type of vehicular traffic, traffic volumes, connectivity with major roads, present road conditions, and decide on the form of private sector engagement. Finally, all PSP projects involving the outlay of public funds or the granting of rights to collect tolls in

a monopolistic manner for an extended period should be subject to detailed value for money assessment by the road agency. The onus should be on that agency to demonstrate objectively the advantages to be achieved from the proposed PSP. This assessment should be reviewed and approved by a suitable Government body unconnected with the promoting agency – the Public Investment Board in the case of NHs and the relevant unit with the Department of Finance for SHs. The Public Sector Comparator system used in the UK and Australia as described in Chapter 7 may provide a suitable model for adaptation to the Indian environment. Applying a more rigorous project planning and preparation procedure will also entail building skills within road agencies and approving bodies to undertake such analysis.

52. **Network Finance and Project Finance Approach.** While putting in place a stronger regulatory framework, improving the level of information and strengthening the planning and procurement process will facilitate PSP, this paper also explores whether for the NH network, taking a project by project approach as well as trying to shift a significant portion of the traffic risk to the private sector brings the best results. This may result in concentrating traffic risk resulting in the need to restructure projects, increasing costs to society as a whole and leaving more remote sections of the network behind. In addition, the progress made under the PSP approach, to bridge the financing gap for the development and maintenance of roads, has been achieved at a relatively high risk and cost to the Government.

53. With the exception of links having captive traffic, for which the project financing approach is suited, it is worth exploring whether corporate financing, based on statutory hypothecated cess and uniform tolls (established for each category of vehicle on a per kilometer basis), would attract the required funds and minimize the high traffic risk premium normally charged under PSP. Corporate financing could provide funds for less trafficked sections that are not attractive to the private sector. With a securitized revenue stream from the cess and completed toll roads, NHAI could raise further debt or enter into non toll based Design Build Finance and Operate (DBFO) agreements without GOI guarantee⁸⁷. The total revenues accruing through fuel cess and tolls and the relative weighting between the two can be subject to periodic review by the NHAI Board, subject to the obligation to justify proposed changes in front of an independent review panel of interested parties established by the GOI. The justification would clearly demonstrate the operational and financial impact of failure to adopt the proposed revised rates. The panel would have the right to veto proposed changes in the charging regime. Alternatively, the private sector could also be successfully utilized through maintenance concessions or long-term performance based maintenance contracts.

54. The advantages of this approach as opposed to a project by project concession approach are as follows: (i) diversification of traffic risk to whole of network; (ii) capacity to cross subsidize between links on the network; (iii) greater transparency for road users on road charges, revenues and expenditure and therefore increased likelihood of user acceptance of system; (iv) economies of scale in establishing national highway tolling system; (v) greater uniformity of service standards; (vi) allow for more incremental introduction of tolling; and (vii) greater incentive on NHAI to manage efficiently all items of work on the whole of the network so as to minimize total costs and maximize total revenues⁸⁸. GOI may still be free to provide concessional or grant funding for specific projects that are clearly demonstrated not to be financially viable but which the GOI wish to see completed to meet other public policy objectives such as regional integration or strategic requirements. Moreover, for specific links where traffic can be more accurately forecast - bridges and bypasses – BOTs may still be employed on standalone basis using real tolls.

55. In this structure, where current cess/toll revenues fall short of funding for O&M, debt servicing and desired new investment, NHAI would have two options. First, it could issue

⁸⁷ BOTs could still be used for links with high traffic and limited traffic risk, such as major bridges

⁸⁸ Later assumes that NHAI was to have more financial autonomy and concomitant financial accountability.

non GOI guaranteed debt on the strength of its future anticipated revenues alone. Such debt would be expected to be raised at a significant but not large premium to GOI debt of equivalent maturity⁸⁹, reflecting investor perceptions of the operational risks of cost overruns and revenue shortfalls. NHAI can manage its financial risks through further developing its Treasury function and using the derivatives market to hedge unwanted risks. Second, NHAI could also enter into non toll based DBFO contracts, using either straight annuity, lane availability or active management payments. If NHAI still considered that a concessionaire has some but limited control of the levels of traffic, a hybrid option of using both annuity and incremental shadow toll can be adopted - a base payment which is assured regardless of actual traffic combined with an additional payment per vehicle that actually uses the road. Implementing either financing option would be subject to the approval of the Finance Ministry. Further strengthening the O&M implementation system, accounting and the corporate governance arrangements would all be expected to have positive impacts on reducing the cost of NHAI borrowing, either through debt or concessions, by reducing creditor perceptions of the likelihood and severity of operational risks.

56. In fact the choice between using corporate debt on NHAI's balance sheet or procuring long term DBFO contracts to elicit private funding may not be so relevant as it first appears. In a world without tax, without transaction costs and with equal skills in the private and public sectors, the economic reality of the two options is substantially the same - i.e. a liability requiring a periodic entry in the income statement either as an interest payment to a creditor and/or depreciation of an asset. In accounting terms also, the two may also be equivalent when the DBFO contract is viewed as a lease by NHAI from the DBFO partner. International Accounting Standards 17 stipulates that a lease should be classified as a capital lease and held/amortized as a liability on the lessee's balance sheet if any one of the following conditions prevail: (i) when the term of the lease is the major portion of the asset's life; (ii) the present value of the lease payments is equal or greater than the fair value of the asset; (iii) where the asset ownership reverts to the lessee at the expiry of the lease; or (iv) where the lease contains a bargain purchase option⁹⁰. These conditions would likely prevail in a DBFO contract in India, as has been the case with Annuity contracts. NHAI is required to operate and account along commercial lines and is incrementally adopting ICAI/IAS standards.

57. With these observations in mind, it is recommended that a broad public debate be undertaken - to be informed by a special Comptroller and Auditor General efficiency/performance appraisal of the value for money that has been obtained through the various PSP models in use by NHAI - prior to finalizing the ongoing procurement process for the concessioning of 10,000 km of national highways. Of special interest in this review, should be the impact that NHAI and the states' current creditworthiness has had on the cost of private sector financing and overall on the success of PSP projects and the suitability of the institutional, legal and regulatory framework of the Central Road Fund for securitization.

58. A corporate approach to PSP could also be explored at the state level. Corporate financing could be implemented through the establishment of semi autonomous Road Development Corporations. These would be coupled with dedicated road funds using road user charges, largely fuel cess, and publicly imposed uniform tolls to assure funding streams into the future against which private capital markets can provide debt or debt/equity through DBFO contracts. States should nevertheless guard against creating new contingent liabilities without due regard to strengthening associated revenue capacity to fund new debts (see box 9.1).

⁸⁹ Recent line of credit that was proposed but yet to reach closure from Life Insurance Corporation offered at 100bp over 18 year treasury bond rate

⁹⁰ The Analysis and Use of Financial Statements, White et al 1997. The same definition is used by the Accounting Standard 19 of Council of Chartered Accountants of India

Box 9.1 Managing Fiscal Risks of Off Budget Liabilities

The following voluntary standards have been recommended for governments to better manage off budget liabilities.

- Before it accepts a new contingent liability, a government should assess the risk to its fiscal condition, including the probability of future payouts. The assessment should be conducted by an independent entity.
- The government should periodically compile an inventory of outstanding contingent liabilities and report on the volume of these liabilities, their legal basis, and the probability of losses.
- Government fiscal analysis published in the annual budget or other documents should discuss the major risk factors affecting revenues and expenditures for the next fiscal year or beyond.
- The government should establish a risk management strategy to guide public organizations when they take actions that expose them to financial liability.
- The government should promote cost-and risk-sharing to discourage moral hazard, ensure the economic viability of guarantees, and reduce the probability and amount of loss.
- The budget should set aside funds , within an overall fiscal constraint, for expected losses during the year
- The budget should limit the amount of guarantee and other contingent liabilities to be tendered during the year, as well as the total amount that each institution authorized to issue guarantees may have outstanding.

Source: Government at Risk - Contingent Liabilities and Fiscal Risk, H. Polackova Brixi and A. Schick, World Bank, 2002

59. ***Incorporating road users into road capital structures.*** Certain national and state highway stretches directly serve individual project beneficiaries in urban agglomerations. The involvement of direct project beneficiaries as part financiers of the capital structure of such BOT projects may benefit such projects through: (i) facilitation of greater public acceptability of such projects, with possible benefits of increased acceptance of the “user pays” principle; (ii) creation of a more direct linkage between the costs and benefits of such projects; and (iii) creation of an additional source of strategic road equity for such projects. For example, road users may be included into the capital structure of a project through sale (during project construction period) of long term passes⁹¹ entitling the user to an unlimited number of trips on the project road for a limited period of time. As opposed to the existing practice of issuing monthly passes to frequent users (after commissioning of the project), the alternative measure would sell larger value passes to such users during the construction period, thereby raising part of the capital required for project implementation. The effective cost of this instrument would be the total value of toll unpaid during the operations period by a portion of frequent users holding such passes. The choice and responsibility for issue of such road users “equity” lies with the private sponsors of BOT projects. However, NHAI or state governments could play a promotional role in realizing such objectives by: (i) stipulating that a certain portion of specific projects should attempt to tap this potential market on a “pilot” basis; and (ii) educating road users on the attractiveness and rationale of such schemes.

60. ***Corporatization/Securitization.*** Securitization techniques can be used to structure securities designed to maximize their investor appeal and the benefits of portfolio diversification and secondary liquidity. This entails corporatization and public offerings of road packages. In India, significant portions of roads to be tolled are being implemented through contracts on a cash payment basis. The responsibility for operating and maintaining

⁹¹ It may be noted that various BOT roads already offer a “monthly” pass system with discounted pricing for frequent users

these stretches lies with the government. As an alternative, government agencies can consider transfer of long-term operation, maintenance, capacity augmentation and user toll levying rights on these roads to newly created and wholly owned corporate entities (SPV's).

61. Indian government agencies have accessed the retail equity market to a limited extent. The development of a vibrant market in road equities could result in two key benefits for the sector in India: (i) possibility of accessing additional funding sources for the sector; and (ii) creation of investment exit possibilities for the existing investors, who are primarily construction contractors, thereby enabling such strategic investors to channel existing "locked" investments into new projects.

ANNEXES

Annex 1 Pump Prices For Super Gasoline And Diesel

(In US Cents Per Liter) 1991-2000

Country	Super Gasoline					Diesel				
	1993	1995	1998	2000*	2002	1991	1993	1995	1998	2000
Australia			46	57	50				45	57
Bangladesh		36	47	46	52			31	26	29
Belgium		118	112	96	104			82	85	78
China		27	28	40	42			24	25	45
France		117	111	99	105			78	77	82
India *		48	56	60	66			19	21	39
Italy		118	119	97	105			86	93	83
New Zealand		61	64	48	55			32	39	34
Pakistan		47	46	53	52			20	19	27
Singapore			72	84	85				36	38
Sri Lanka		75	84	66	54			23	30	27
Uganda	79	98	86	86	83	55	71	85	68	75
United Kingdom		92	111	117	118			84	111	122
Zambia		72	60	53		24	66	57	49	
South Africa	52	51	43	50	43		52	46	39	50
Brazil	53	63	80	92	55		38	39	34	34
Canada	47	45	41	58	51		39	36	39	47
United St. (average)	32	34	32	47	40		28	33	27	48
México	39	32	36	61	62		28	25	28	45
Argentina	79	60	94	107	30		29	28	42	52

* 2000 Price for Regular Gasoline

Source: Fuel Prices and Vehicle Taxation with comparative tables for more than 160 countries; Pricing Policies for Diesel Fuel, Gasoline, and Vehicle Taxation in Developing Countries by Gerhard P. Metschies

Annex 2 Excise Duty Rates, 2003

Item	Excise Duty (%)
Motor Spirit	30%
High Speed Diesel (HSD) Oil	14%
Motor Vehicles*	
- 2-wheelers	16%
- Cars	24% (including 8 percent special excise duty)
- Bus & Freight Vehicles	16%
Tyres & Tubes	24%
Parts and accessories	16%

* In addition, motor vehicles attract a cess of 0.125%

Annex 3 Motor Vehicle Tax in Selected States

Vehicle Type	Basis of Tax and Periodicity of Payment					
	Andhra Pradesh	Karnataka	Madhya Pradesh	Maharashtra	West Bengal	Uttar Pradesh
Two-Wheeler	For different CC categories fixed or % of cost whichever is higher – life time	Fixed or % of cost whichever is higher-life time	% of cost of vehicle – life time	% of cost of vehicle – life time	For different CC categories, fixed - life time	Fixed – life time
Car	Related to weight, fixed or % of cost whichever is higher	Fixed or % of cost whichever is higher –life time	% of cost of vehicle – life time	% of cost of vehicle – life time	For different weights, fixed-life,time for 5 years	% of cost - life time
Bus	Seating capacity and distance covered in a day– quarterly	Seating capacity – quarterly	Seating capacity for different route km ranges – monthly	Seating capacity – annual	Seating capacity – annual	Seating capacity and Route Category – quarterly
Goods Vehicles	Laden weight- quarterly	Laden weight- quarterly	RLW – quarterly	RLW – annual or 7 times annual rate for one time tax	GVW – annual	GVW – quarterly

Note: In Uttar Pradesh, additional tax on passenger vehicles is charged quarterly on the basis of km run and additional tax on goods vehicles is charged quarterly based on GVW

RLW = Registered Laden Weight; GVW = Gross Vehicle Weight

Annual Incidence of Motor Vehicle Tax

(in Rs per annum)

Vehicle	Andhra Pradesh	Karnataka	Madhya Pradesh	Maharashtra	Uttar Pradesh	West Bengal*
Two-wheeler (100 CC)	210	208	150	210	125	80
Car (Santro)	2042	2625	1458	1167	729	1172
Mini Bus (35 Seater)	101500	70000	48300	2485	68580*	72555
Bus (55 Seater)	159500	110000	75900	3905	132360*	113355
LCV (4.5 ton GVW)	2796	4800	3728	2190	3510*	3365
HCV (16.2 tonne GVW)	9675	10240	12100	9360	12636*	11160
MAV (28 Tonne GVW)	19304	18800	20108	18790	21840*	25610

* including additional motor vehicle tax.

- Note:
- In case of life-time tax, annual tax is worked out assuming a life of 12 years. In case of West Bengal, life-time tax is collected for 5 years.
 - In case of Maharashtra in addition to motor vehicle tax, stage carriages are charged passenger tax

Annex 4 Rates of Sales Tax

Item	Andhra Pradesh	Karnataka	Madhya Pradesh	Maharashtra	West Bengal	Uttar Pradesh
Motor Vehicles	12%	12%	12% + 15% surcharge = 13.8%	12%	12%	12%
Spare parts	12%	12%	12% + 15% surcharge = 13.8%	12% = 10% sales tax + 1% turnover tax + 1% surcharge	8%	8%
Tyres & Tubes	10%	8%	8% + 15% surcharge = 9.2%	12% = 10% sales tax + 1% turnover tax + 1% surcharge	8%	8%
Petrol	30.55%	28%	25% + 15% surcharge = 28.75%	30% plus cess @ Re 1 per litre	20.00% plus cess @ Re. 1 per litre	20%*
Diesel	19.33%	17.50%	25% + 15% surcharge = 28.75%	34.9% plus cess @ Re 1 per litre	12.55% plus cess @ Re 1 per litre	20%*
Lubricants	16%	15%	12% + 15% surcharge = 13.8%	13%	15%	20%

* including additional sales tax of 4% on diesel and 6% on petrol, the proceeds of which are credited to State Road Fund

**Annex 5 Assumptions behind the Assessment of Road Sector Revenue
by Vehicle type (2001-2002)**

Category	Method of estimation
Central Government	
Excise on motor spirit Excise on diesel	An assessment of vehicle wise consumption of fuel is made by using fuel consumption norms (km/litre), annual vehicle utilization (in km) and number of vehicles on road. The number of vehicles on road is estimated by adjusting registered vehicle fleet in light of the vehicle-wise production figures over a period of time. Source: Indian Petroleum and Natural Gas Statistics published by the Ministry of Petroleum and Natural Gas
Excise on motor vehicles	Distributed amongst vehicle type on the basis of its assessed share in excise collection related to vehicle production in the year 2001-02
Excise on tyres – vehicle purchase	Distributed amongst vehicle type in proportion to the vehicle wise production data
Excise on tyres – use	“Use related” excise is distributed on the basis of fuel consumption shares
Excise on motor parts – vehicle purchase Excise on motor parts – vehicle use	10 % of total excise collections is assigned for vehicle purchase and balance 90% for use The vehicle purchase related component of excise collection is distributed amongst vehicle types on the basis on assessed share in excise related to motor vehicle purchase The use related component is distributed amongst different vehicles using share in fuel consumption
Cess on fuel	Distributed amongst vehicle types using the share in fuel consumption. (Diesel is adjusted for road sector consumption)
State Government	
Sales tax on motor spirit Sales tax on diesel	Sales tax was estimated using fuel consumption by vehicle type and average sales tax rate. An average all-India sales tax rate was calculated using the sales tax rates in the different states and union territories. Similar procedure was followed for the fuel consumption.
Sales tax on motor vehicles	Distributed amongst vehicle types on the basis on production figures of each vehicle type
Sales tax on tyres	Estimated using sales tax amount per tyre and the number of tyres being used.
Sales tax on motor parts	Estimated by applying the ratio of spare parts cost and tyre cost in vehicle operation cost of each vehicle type to the sales tax collection of tyres
Taxes on vehicles (incl. fees, fines, penalties, passenger and goods taxes)	Total revenues under these head for all the states is obtained from the RBI Study on State Finances. As vehicles in Union territories amount to 9.7 % of motor vehicles in States, an additional 9.7% of revenue on motor vehicle tax revenue is added for union territories. This total figure is distributed amongst different vehicles based on the assessed share of revenue resulting from vehicles on road and average charge per vehicle type obtained from six study states.

Annex 6 Revenue Contribution by Road Network, 2001-2002

(Rs million)

Road Category	Total	2-wheelers	Cars	Jeep/taxi	Bus	LCV	HCV	MAV
National Highways & State Highways	253680	11369	28951	12113	73494	30377	92236	5140
All other state roads (District and Village roads)	77641	7580	5790	8479	28267	10126	17294	105
Urban Roads	168740	56847	81062	3634	11307	10126	5765	0
Total	500061	75796	115803	24226	113068	50628	115295	5245

Road User Charges Contribution by Road Network, 2001-2002

(Rs million)

Road Category	Total	2-wheelers	Cars	Jeep/taxi	Bus	LCV	HCV	MAV
National Highways & State Highways	112332	3119	7681	2749	57297	9025	30379	2082
All other state roads (MDR, ODR & VR)	36324	2079	1536	1924	22037	3008	5696	42
Urban roads	51648	15594	21507	825	8815	3008	1899	0
Total	200303	20792	30724	5498	88149	15041	37974	2125

Annex 7 Revenue - Cost Comparison at Vehicle Level

Item	2- wheelers	Cars	Jeep/taxi	Bus	LCV	HCV	MAV
All Roads excluding Urban Roads							
a) Revenue and cost in Rs. per vehicle-km							
Revenue	0.44	2.39	1.03	5.69	1.48	2.03	2.51
Capital Cost	0.13	0.25	0.25	0.84	0.41	1.34	1.88
Maintenance Cost (total)	0.04	0.08	0.08	0.30	0.14	0.69	0.93
Maintenance Cost (variable)	0.02	0.04	0.04	0.19	0.09	0.58	0.78
b) Revenue-Cost Ratio							
With total cost	2.7	7.2	3.1	5.0	2.7	1.0	0.9
With maintenance cost	11.3	30.8	13.3	19.2	10.4	3.0	2.7
With variable maintenance cost	20.5	55.8	24.0	29.5	16.5	3.5	3.2
c) Revenue-Cost ratio with revenue contribution and cost share							
With total cost	1.4	3.7	1.6	2.6	1.4	0.5	0.5
With maintenance cost	1.8	4.9	2.1	3.0	1.7	0.5	0.4
With variable maintenance cost	2.6	7.0	3.0	3.7	2.1	0.4	0.4
NH & SH Network							
a) Revenue and cost in Rs. per vehicle-km							
Revenue	0.44	2.39	1.03	5.69	1.48	2.03	2.51
Capital Cost	0.06	0.11	0.11	0.36	0.18	0.57	0.80
Maintenance Cost (total)	0.02	0.04	0.04	0.16	0.08	0.36	0.48
Maintenance Cost (variable)	0.01	0.02	0.02	0.10	0.05	0.30	0.40
b) Revenue-Cost Ratio							
With total cost	5.7	15.5	6.7	10.9	5.7	2.2	2.0
With maintenance cost	20.6	56.1	24.2	36.3	19.2	5.6	5.2
With variable maintenance cost	37.3	101.5	43.7	57.1	30.5	6.7	6.3
c) Revenue-Cost ratio with revenue contribution and cost share							
With total cost	1.4	3.8	1.7	2.7	1.4	0.5	0.5
With maintenance cost	1.8	5.0	2.2	3.2	1.7	0.5	0.5
With variable maintenance cost	2.6	7.1	3.1	4.0	2.1	0.5	0.4

**Annex 8 Vision 2021 Capital Investment
on Expressway, National and State Highway Network, 2001-2021 (at 1999 prices)**

Scheme	Period 2001-2011		Period 2011-2021	
	Length (km)	Amount (Rs. million)	Length (km)	Amount (Rs. million)
<u>A. Expressways</u>	3000	300,000	7000	700,000
<u>B. National Highways</u>				
i) Four Laning/Six Laning	16,000	640,000	19,000	760,000
ii) Two-Laning with hard shoulders	15,000	187,500	7,000	87,500
iii) Strengthening Weak Pavements	20,000	150,000	24,000	180,000
iv) Bypasses, bridges, over bridges, safety and drainage measures	Lump sum	72,500	Lump sum	92,500
v) Expansion of NH System	10,000	150,000	12,000	180,000
Total for National Highways		1,200,000		1,300,000
<u>C. State Highways</u>				
i) Four Laning/Six Laning	3,000	100,000	7,000	250,000
ii) Two-Laning with hard shoulders	35,000	280,000	60,000	500,000
iii) Strengthening Weak Pavements	30,000	220,000	40,000	300,000
iv) Bypasses, bridges, over bridges, safety and drainage measures	Lump sum	100,000	Lump sum	100,000
v) Expansion of SH System	10,000	50,000	20,000	100,000
Total of State Highways		750,000		1,250,000

Annex 9 Forms of Government Support for Road Concessions

Support Measures	Description
Comfort Letter	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.
Land Acquisition	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.
Extension of Concession Period	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.
Construction of Related Facilities	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.
Revenue Support	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.
Revenue Sharing with Existing Facilities	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.
Shadow Toll	The Dutch 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.
Provision of Development Rights and Third-Party Revenue	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.
Subordinated Loan	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

Support Measures	Description
	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.
Foreign Exchange Guarantees	<p>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:</p> <ul style="list-style-type: none"> • Possible large contingent liability on the government; • Moral hazard for concessionaire and the lenders.
Loan (Bond) Guarantees	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.
Equity Guarantees	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.

Annex 10 Risk Framework of NHAI BOT Models

MORADABAD BYPASS	DELHI GURGAON EXPRESSWAY
Project Completion Risk	
Liquidated Damages are a part of the Concession Agreement, which stipulates that in case the delay is on account of the Construction Contractor, the LDs shall be equal to the amount received from the Construction Contractor, else the damages will be paid by the Concessionaire at the rate of Rs. 1 lakh per day up to a delay of 90 days and Rs. 2 lakhs per day for a delay beyond 90 days, subject to maximum of 5percent of the Capital Cost.	Liquidated Damages are a part of the Concession Agreement and the responsibility for timely completion rests entirely on the Concessionaire. Damages are linked to achieving each Project Milestone (as against Completing entire Project). The damages will be paid by the Concessionaire at the rate of Rs. 1 lakh per day for each project milestone and an amount calculated at the rate of 0.01percent of the total Project Cost per week for the entire Project.
No form of Corporate Guarantee provided.	No form of Corporate Guarantee provided.
Concessionaire has access to carry out the tests and surveys required.	Concessionaire has the right to commence construction at its own risk.
Independent Consultant to be appointed by NHAI from a shortlist of consultants.	Independent Consultant to be appointed in consultation with the Concessionaire.
Market Risk	
Issue of a notification restricting the plying of Commercial Traffic/Heavy Vehicles on the existing stretch of NH-24 (through Moradabad City) during the entire life of CA.	No such notification to be issued.
Development of any alternate road to the Bypass restricted	- do -
Operating Risk	
Main Promoter (NHAI) to maintain minimum 51percent equity stake in the SPV during entire concession period.	Consortium Members to maintain minimum 26percent equity stake in the SPV during the entire concession period.
In case of Concessionaire event of default 90percent of outstanding dues of the lenders would be met by NHAI.	In case of Concessionaire event of default 90percent of outstanding dues of the lenders would be met by NHAI.
Legal Risk (Change in Law)	
Terms of CA would be modified by NHAI to bring the Concessionaire in substantially the same commercial and financial position as it was prior to the change in law in case the effect of the said change in law is greater than Rs. 10 million. In case NHAI does not do so it would be termed as NHAI event of default and in terms of the CA, all lenders outstanding dues would be paid by NHAI.	Terms of CA would be modified by NHAI to bring the Concessionaire in substantially the same commercial and financial position as it was prior to the change in law in case the effect of the said change in law is greater than Rs. 10 million. In case NHAI does not do so it would be termed as NHAI event of default and in terms of the CA, all lenders outstanding dues would be paid by NHAI.
Force Majeure Risks	
All insurable Force Majeure Events would be covered through suitable insurance policies.	All insurable Force Majeure Events would be covered through suitable insurance policies.
In case of other FM events, the compensation provides for lenders dues and equity. Equity compensation essentially aims to protect nominal value of 1.5 times equity. But the actual return depends on inflation.	In case of other FM events, the compensation provides for a) senior lenders dues b) 1.2 times dues of subordinated lenders c) Equity compensation to protect nominal value of 1.5 times equity (but the

	actual return depends on inflation) d) negative grant amount paid by the Concessionaire.
NHAI to provide Revenue Shortfall Loan to the Concessionaire in case the shortfall is due to an Indirect/Direct Political Event of Force Majeure.	NHAI to provide Revenue Shortfall Loan to the Concessionaire in case the shortfall is due to an Indirect/Direct Political Event of Force Majeure.
Commercial Risk	
In case of termination due to Concessionaire's default, all his rights and obligations will automatically stand assigned to NHAI (who may assign this to another Concessionaire).	- do -
For the purpose of financing, the concessionaire has the right to transfer and assign its rights and interest in the Project and to create security interest in the CA for the benefit of the lenders.	- do -
No form of Revenue shortfall loan provided.	- do -
NHAI has given an undertaking to provide subordinated loan to the extent of Rs. 5 crores to meet the shortfall in debt servicing to build debt service of 6 months principal and interest.	Information not yet available.
Political Risks	
If CA is terminated due to NHAI event of default or due to Force Majeure Event the lender shall have the first charge on such sums payable by NHAI to the Project.	- do -

Annex 11 Risk Allocation Framework
in “Model” Concession Agreement for Small Road Projects in Andhra Pradesh State

Key Risks	Treatment
Delays related to Land Acquisition	<ul style="list-style-type: none"> • Concession Period is reckoned from the “commencement date”, which is the date on which physical possession of project site is delivered to the Concessionaire; all milestones and obligations of Concessionaire are reckoned from this date (including, for example, financial close deadline), thereby avoiding placing this risk on the concessionaire
Delays in Construction	<ul style="list-style-type: none"> • Allocated to Concessionaire, with liquidated damages imposed for each day of delay • Delays beyond 180 days from scheduled completion day liable to result in concession termination
Delays in Financial Close	<ul style="list-style-type: none"> • Period for financial close is subsumed within the concession period and as such financial close is not a milestone or trigger event for any other event under the concession • Delays in financial close do not affect concessionaires obligations under the agreement, and concessionaire would therefore in any case be required to complete the project utilizing any other funding at its disposal
Delays in Approval of Designs & Drawings	<ul style="list-style-type: none"> • Independent Engineer who is appointed for review of drawings & design is selected through a fair transparent process, with the Concessionaire having some element of choice in the appointment process • Independent Engineer is required to submit comments or objections to submissions by the Concessionaire within a stipulated time period, failing which the Concessionaire can proceed with its design proposals, thereby eliminating risk of delays in such approvals beyond the control of the Concessionaire
Risks Related to Permits	<ul style="list-style-type: none"> • Responsibility for arrangement of clearances and approvals from the Ministry of Railways lies with the Concessionaire, although GoAP commits to providing “necessary assistance” to the concessionaire in this matter • GOAP commits to awarding, on a timely basis, such approvals or permits within its own jurisdiction
Changes in Scope	<ul style="list-style-type: none"> • Concessionaire required to bear risks of change in project scope up to a predefined limit (typically 5 percent of estimated project cost”) at the behest of GoAP • Changes in scope having higher impact to be compensated through appropriate extensions in concession agreement (calculated in such a manner as to maintain the same project internal rate of return)
Force Majeure	<ul style="list-style-type: none"> • Distinctions made between “Non-political”, “Indirect-political” & “Direct-political” FM events, as is NHAI’s practice • Delays caused by FM events during construction result in extension of all milestones by the period of delay • Cost sharing (as is standard NHAI practice): <ol style="list-style-type: none"> 1. Each party bears its own costs in case of non-political FM 2. Costs are shared 50:50 in case of indirect political FM 3. Costs borne by GoAP in case of direct political FM
Termination in case of FM events	<ul style="list-style-type: none"> • FM subsistence for 120+ days can result in termination of concession at either party’s option • Compensation payments by GoAP in case of Termination as follows: <ol style="list-style-type: none"> 1. Non-political FM event: compensation limited to 90 percent of debt due 2. Indirect political FM event: total debt due plus 110 percent of equity subscribed in cash with adjustments for inflation and passage of time 3. Direct political FM event: total debt due plus 150 percent of equity subscribed in cash with adjustments for inflation and passage of time • In all above, computations, compensation is reduced to the extent of pending insurance claims; however 80 percent of claims not admitted will be payable as compensation by GoAP

Termination owing to Concessionaire Events of Default	<ul style="list-style-type: none"> • Various events of default defined • Concessionaire given 60 day “cure period” to rectify defaults, failing which concession may be terminated by GoAP • Termination payment by GoAP to Concessionaire: 90 percent of debt less insurance claims pending (80 percent of claims not admitted will be payable as compensation by GoAP)
Termination owing to GoAP Events of Default	<ul style="list-style-type: none"> • Various events of default defined • Concessionaire given 60 day “cure period” to rectify defaults, failing which concession may be terminated by GoAP • Termination payment by GoAP to Concessionaire: entire debt due plus 150 percent of equity subscribed in cash with adjustments for inflation and passage of time less insurance claims pending (80 percent of claims not admitted will be payable as compensation by GoAP)
Traffic & Revenue Risks	<ul style="list-style-type: none"> • Allocated entirely to Concessionaire • No support by GoAP even in case of chronic revenue shortfalls
Competing Facility Risk	<ul style="list-style-type: none"> • GoAP commits that any competing facility developed during the tenure of the Concession period will necessarily be a tolled facility with vehicle users on the competing facility being charged user tolls of at least 133 percent the toll levels on the Project
Change in Law	<ul style="list-style-type: none"> • Changes in Law resulting in “aggregate financial effect” exceeding a predetermined amount shall result in adjustments to the Concession provisions to as to put the Concessionaire in the same financial position as before the Change in Law • Such adjustments to take the form of extension of Concession Period
Lender Protection	<ul style="list-style-type: none"> • Lenders protected through a Substitution Agreement (Direct Agreement) with GOAP & the Concessionaire, whereby events of default by Concessionaire under the Financing Documents are recognized as also constituting events of default under the main concession agreement, and Lenders have rights to substitute the Concessionaire with another concessionaire of their choice in such cases

Annex 12 Private Sector Concerns with BOT Projects in India

No	Issue	Key Concerns	Observations
1.	Country Risk Perception	<ul style="list-style-type: none"> • Negative perception of risks associated with investments in India; perception of excessive risk levels largely centers around: <ul style="list-style-type: none"> ○ Perceived risk of state/ central governments defaulting on obligations ○ Concerns on fundamental viability of toll roads, based on actual performance of projects over the last few years ○ Perceived lack of creditworthiness of the road agencies and government 	<ul style="list-style-type: none"> • Potential investors in developed western nations are essentially not aware of developments and investment potential in India • At present, the toll road market in European countries is perceived to offer ample investment opportunities for investors
2.	Perceived inadequacy of project preparation	<ul style="list-style-type: none"> • Investor issues in relation to BOT project preparation include: <ul style="list-style-type: none"> ○ Perceived inaccuracies in technical studies, with consequent impact on project costs ○ Concerns over accuracy of historical traffic counts ○ Relative lack of flexibility on the part of road agencies with respect to key project parameters e.g. DPRs are based on frozen project specifications and costs are calculated thereon; however, in practice actual project specifications are likely to differ 	<ul style="list-style-type: none"> • In practice, investors perceive that they cannot rely much largely on project studies commissioned by road agencies, and require undertaking detailed evaluation of their own before making investment decisions. • However, it is not feasible for an investor to make a thorough project evaluation to the precise degree of accuracy required within the typical timeframe available during the project proposal process. Therefore, investors perform need to rely at least in part on the road agency's technical studies. Accordingly, investors routinely make generous allowances for quantity variations and unforeseen circumstances in their project cost estimates • It is common to find in practice that DPR estimates of project cost are lower than bidder's estimates or actual project costs. The DPR estimate of project cost is normally incorporated in the concession agreement, and termination compensation payments are limited by this cost estimate • There does not appear to be a formalized process for approval of changes in project configuration (within reasonable boundaries) after

No	Issue	Key Concerns	Observations
3.	Regulatory Issues/ Risk related to performance of Government Obligations	<ul style="list-style-type: none"> • At all times during the project life, the Concessionaire requires action or intervention by Government agencies in various aspects, including: <ul style="list-style-type: none"> ○ Timely Toll notifications – in practice notifications related to toll escalation are often delayed and there is no compensation to a concessionaire for loss in profit during notification delay period ○ Tax notification–notifications from CBDT related to exemptions under 10 23 G may be delayed in practice ○ Practical implementation of State Support – In practice, concessionaires have faced problems related either to timely signing of state support agreements with respective state governments, or actual receipt of all necessary support as envisaged in these agreements, particularly at the local level 	<ul style="list-style-type: none"> • It is observed that investors perceive different projects being offered by the same institution (NHAI) as considerably different in terms of risk profile. This is in spite of the fact that traffic origination for national highways is not solely dependent on the particular State through which the highway passes. The difference in risk perception is attributed partly to perceived differences in support likely to be received from different State Governments
4.	Financing Market Depth	<ul style="list-style-type: none"> • Generally, Credible Investors do not appear to perceive a significant lack of debt financing options in the country • However, there is a clear lack of financial investors for bridging equity gaps in such projects 	<ul style="list-style-type: none"> • The Primary Investors in BOT road projects are invariably contracting companies or subsidiaries of groups with specific focus on road contracting. Such investors have limited investible surpluses for BOT projects; therefore the presence of financial investors would effectively extend the ability of the contracting community in India to fund more BOT projects

award of a project to a preferred bidder

No	Issue	Key Concerns	Observations
5.	Investor Exit	<ul style="list-style-type: none"> • There are no real exit options for investors in road projects today. No project has attempted a public offering of equity, nor are there any secondary deals in road securities 	<ul style="list-style-type: none"> • The lack of financial investors in such projects is largely attributable to the lack of exit options after a reasonable investment tenor. Financial investors look for investment maturities of not more than ten years, while most toll road concessions are much longer than this in duration, and equity returns within the first ten years are very low • Financial investors, therefore, need to partially “unlock” their investments in project shortly after construction in order to be able to make investments in fresh projects. • The lack of exit options is largely attributed to the nascent state of the sector in India. The oldest BOT road project awarded thus far has barely recorded 2-3 years of operations, which, based on global experience, is too early for a project to stabilize in terms of cash flows, and attract secondary investors

Annex 13 Practical Limits to Extent of Private Involvement

Table 1 provides a breakup of state highway length within the States under consideration, classified on the basis of lanes and traffic density. This breakup does not include minor and village roads which are not under the jurisdiction of the respective State Public Works Departments.

Table 1: Length of State Highways

(in km)

State	Traffic in PCUs				
	<5000	5000-10000	10000-15000	15000-20000	>20000
Lane Type: 1.5					
Andhra Pradesh	70.0	32.6	137.0	0.0	0.0
Karnataka	4028.5	2658.6	1211.2	6.5	0.0
Madhya Pradesh	1987.6	21.0	0.0	0.0	0.0
Maharashtra	9967.6	2742.1	1193.7	130.8	26.3
Uttar Pradesh	4222.7	216.0	109.5	0.0	0.0
West Bengal	1415.7	431.7	51.7	0.0	0.0
Lane Type: 2.0					
Andhra Pradesh	234.2	1347.6	184.6	38.0	0.0
Karnataka	60.3	20.2	0.0	0.0	0.0
Madhya Pradesh	217.0	39.0	0.0	0.0	0.0
Maharashtra	1105.7	1507.9	370.1	43.1	32.8
Uttar Pradesh	215.5	693.5	138.7	0.0	0.0
West Bengal	0.0	0.0	105.4	0.0	0.0

- Roads with vehicular traffic of 15,000 PCUs and above will need capacity augmentation to four lanes, whereas, the rest can be rehabilitated and strengthened.
- An analysis has been conducted to broadly assess the extent of private sector participation potential in these States, using the following assumptions:
 - The States adopt a PSP model based on fee recovery through user tolls, with a partial grant disbursed by the state to the concessionaire during the construction period to enhance returns on equity and increase investment viability
 - Projects with a traffic of 15,000+ PCU are taken up for capacity augmentation (4-laning) while projects with traffic lower than 15,000 PCU are rehabilitated.
 - In both cases, the concessionaire takes up long term O&M responsibility for the duration of the concession period. For 4-laning projects, the total concession period is taken as 25 years and the concession period for other projects is taken as 17 years (the rehabilitation model assumed is similar to the model used in Madhya Pradesh)
 - Construction period in both these cases is taken as 2 years; concession period includes the time required for construction
 - Capital costs for 4-laning/ rehabilitation are assumed as follows:
 - Cost for 4 laning: Rs.35 mn per Km
 - Cost of rehabilitation: Rs. 7.5 mn per Km
 - Cap on Grant of 40 percent of the Construction Cost

o Other Assumptions:

Traffic Growth	5 percent	per annum
Toll rate per PCU	0.50	Rs. per PCU (for 4 laned roads)
Toll rate per PCU	0.25	Rs. per PCU (for 2 & 1.5 lane roads)
Escalation	3 percent	per annum
Interest Rate	14 percent	per annum
Routine O&M	1 percent	of original capex per annum
Periodic O&M	5 percent	of original capex every five years
Inflation	3 percent	p.a.
Tax rate	35 percent	

For the purpose of this analysis, the threshold return requirement for a project to be taken up by a private investor has been assumed as 20 percent Equity IRR.

The main observations are as follows:

- Under the model assumptions indicated above, the grant requirement from government to enable the private investor to achieve the required returns on equity investment in roads with traffic density below 5,000 PCU is well in excess of 70 percent of the project construction cost. This leaves little room for fund leveraging from commercial lenders. It is suggested that for this reason, this category of roads may not be considered for PSP under a BOT model
- The grant requirement for development of the remaining road network under a PSP framework is indicated in the **Table 2** (grants are expressed in terms of Rs. mn per annum; disbursement is required at this level per year for two years i.e. over the construction period of the projects)

Table 2: Grant per Annum for Rehabilitation of State Highways (Rs. million)

		Traffic in PCUs			
State		5000-10000	10000-15000	15000-20000	>20000
Lane Type:1.5					
Andhra Pradesh	Grant per annum	4.3	2.6	0.0	0.0
Karnataka	Grant per annum	348.9	22.7	4.6	0.0
Madhya Pradesh	Grant per annum	2.8	0.0	0.0	0.0
Maharashtra	Grant per annum	359.9	22.4	91.6	8.3
Uttar Pradesh	Grant per annum	28.4	2.1	0.0	0.0
West Bengal	Grant per annum	56.7	1.0	0.0	0.0
Lane Type: 2					
Andhra Pradesh	Grant per annum	176.9	3.5	26.6	0.0
Karnataka	Grant per annum	2.7	0.0	0.0	0.0
Madhya Pradesh	Grant per annum	5.1	0.0	0.0	0.0
Maharashtra	Grant per annum	197.9	6.9	30.2	11.3
Uttar Pradesh	Grant per annum	91.0	2.6	0.0	0.0
West Bengal	Grant per annum	0.0	2.0	0.0	0.0

The success of the PSP model considered here is contingent in part upon the confidence of private investors as well as bankers/lenders in receiving the required grant disbursements over the construction period from the State Government. In order to mitigate such concerns, the State Governments may consider ring-fencing an identified revenue stream and disbursing the required grant amounts from this identified stream.

Annex 14 Examples of Inter-State Cooperation on Tax Instruments

EUROPEAN CONFERENCE OF MINISTERS OF TRANSPORT (ECMT)⁹²

History: The European Conference of Ministers of Transport (ECMT) is an intergovernmental organization established by a protocol signed in Brussels on 17 October 1953 by fifteen European countries. It is a forum in which Ministers responsible for transport, and more specifically inland transport, can co-operate on policy. Within this forum, Ministers can openly discuss current problems and agree upon joint approaches to improve the utilization and rational development of European transport systems of international importance. Today the ECMT comprises of 43 full member countries, 7 associate countries and 1 observer country.

Mission: the ECMT's role primarily consists of:

- Helping to create an integrated transport system throughout the enlarged Europe that is economically and technically efficient, meets the highest possible safety and environmental standards and takes full account of the social dimension.
- Helping to build a bridge between the European Union and the rest of the continent at a political level.
- Providing a forum for analysis and discussion on forward looking transport policy issues.

Structure: The Council of the Conference comprises the Ministers of Transport, the main body of the Conference. A Chairman is appointed annually from the Council and is assisted by two Vice-Chairmen. An annual Ministerial Session of the Conference is hosted by the country holding the chairmanship. The main formal decisions of Ministers are contained in Resolutions, Recommendations and other acts agreed by the Council. A Committee of Deputies, composed of senior civil servants, prepares proposals for consideration by the Council of Ministers. The Committee is assisted by working groups, each of which has a specific mandate. The Secretary General heads the Secretariat in its role of assisting the statutory bodies. The Secretariat consists of three units: Transport Policy, Economic Research and Statistics, and Communications and Administration.

Recent Initiatives:

At present, the ECMT has working groups for the following areas: Access and Inclusion; Combating crime and terrorism in transport; combined transport; economic research; fiscal and financial aspects of transport; integration of new member states; railways; road safety; road transport; statistics; sustainable urban travel; transport and environment; trends in traffic; and infrastructure investment.

INTERNATIONAL FUEL TAX AGREEMENT (IFTA)⁹³

The International Fuel Tax Agreement (IFTA) is a uniform system across all US states (except Alaska & Hawaii) and Canadian provinces (except the Northwest Territories, Nunavut and Yukon) for administering and collecting fuel consumption taxes from inter-jurisdictional motor carriers (IJs)

History: In 1982 representatives of the States of Arizona, Iowa and Washington expanded the discussions of uniformity for motor carrier fuel use tax reporting to an experimental agreement known as the International Fuel Tax Agreement (IFTA). In 1986, 1987, and the early part of 1988 the states of

⁹² <http://www1.oecd.org/cem/>

⁹³ <http://www.iftach.org/index4.htm>

Oklahoma, Minnesota, Idaho, and South Dakota joined IFTA. During this period of time there was a subcommittee of the working group developing a recommended "Model Base State Fuel Use Tax Reporting Agreement." In 1990 it was decided that IFTA should become an independent organization having legal status. In 1991 the corporation was created as the International Fuel Tax Association, Inc. (Association). Congress passed the ISTEA, mandating membership in IFTA not later than September 30, 1996. Today all 48 continental states and 10 Canadian provinces are members of IFTA.

Benefits: The purpose of this agreement is to establish and maintain the concept of one fuel license and administering base jurisdiction for each licensee and to provide that a licensee's base jurisdiction will have the primary responsibility for administering the International Fuel Tax Agreement and executing all its provisions with respect to such a licensee.

IFTA reporting significantly reduces the paperwork and compliance burdens for fuel tax reporting. Carriers file a single quarterly return with a single payment to their base jurisdiction that covers all their travel in other IFTA member jurisdictions. The base jurisdiction processes the IFTA tax return and forwards funds to, or requests funds from, each jurisdiction for net fuel taxes.

Annex 15 Measures to Compensate Non-road Users for Levies on Diesel

Measures	Countries Accepted	Ways Adopted	Remarks
Weight-Distance charges	New Zealand, Iceland	Licenses issued for a certain distance to be traveled and graduated according to the axle configuration and gross vehicle weight	For diesel vehicles only
Diesel exemption certificate	Central African Republic, Chad, Sierra Leone, US	Users to file an exemption certificate, certifying that diesel will not be used to power road vehicles	Evasion & leakage unavoidable
Colouring untaxed diesel	Finland France, Pakistan, US, UK	Vehicles prohibited from having dyed diesel in their fuel tanks	Penalties imposed in case of non-compliance
Reimbursement of taxes paid to non road users	New Zealand, US	A tax exemption card or complete documentation with request for refund	Costly
Compensating Non Road users Ex-post	Latvia, Mozambique	Non road user groups compensated based on their outputs and average diesel consumption per unit of output	In Mozambique, 20 percent of diesel levy goes into a special fund for supporting farmers
Special arrangements for farmers	Zambia	Concerns of farmers looked into – farmers as active decision makers in fixing the level of fuel levy and how proceeds are to be spent	No exemption as such

