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ROAD TRANSPORT SERVICE EFFICIENCY STUDY

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CURRENCY EQUIVALENTS

Currency Unit = Indian Rupees (Rs.)
USD 1 = Rs.43
Rs. 1 = USD 0.0232
1 Crore (Cr.) = 10,000,000

ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
AITD	Asian Institute of Transport Development
ASRTU	Association of State Road Transport Undertakings
BOT	Build-Operate-Transfer
CES	Consulting Engineering Services (India) Pvt. Ltd.
GDP	Gross Domestic Product
GOI	Government of India
GVW	Gross Vehicle Weight
HDM	Highway Design and Maintenance System
HIV	Human Immunodeficiency Virus
IRDA	Insurance Regulatory and Development Authority
LCV	Light Commercial Vehicle
MAV	Multi-Axle Vehicle
MOC	Ministry of Communications
MOSRTH	Ministry of Shipping, Road Transport & Highways
MVA	Motor Vehicle Act
MVD	Motor Vehicles Department
NHA	National Highway Authority
NRTC	National Road Transport Commission
OD	Own Damage
Rs.	Indian Rupees
RTC	Road Transport Corporation
RTO	Road Transport Office
SOE	State Owned Enterprise
STU	State Transport Undertaking
TAC	Tariff Advisory Committee
TCI	Transport Corporation of India
TIR	Transport International Routier
TPL	Third Party Liability
UNECE	United Nations Economic Commission for Europe

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This study reviews the long-distance road transport industry in India in order to identify inefficiencies that could reduce the benefits to be derived from the large investments now being made by the Government in the nation's highway infrastructure. The findings of this study have been presented at recent seminars such as the "Global Infrastructure Summit" organized by the Federation of the Indian Chambers of Commerce and Industry (FICCI) in March 2005, and the "Convention on Reforms in the Road Transport Sector" organized by the All India Confederation of Goods Vehicle Owners Associations (ACOGOA) and the All India Bus Operators Confederation (AIPOC) in February 2005. It draws heavily on a number of studies that has been carried out by Clell Harral, Ian Jenkin, John Terry, Richard Sharp, Eugene Gurenko, the firm Consulting Engineering Services, Inc.(CES), and the Asian Institute of Transport Development (AITD). It also relies on two complementary studies carried out for China by Jianfei Zhang, currently Director General of the Ministry of Communications China and for Pakistan by Sardar M. Humayun Khan, for international comparisons.

All these studies were commissioned and managed by the Energy and Infrastructure Unit (SASEI) of the South Asia Region of the World Bank for the purpose of undertaking the subject sector work.

The final report has been prepared by a Bank team, including Alok Bansal, Isabel Chatterton, Eugene Gurenko, Simon Thomas, Zhi Liu (Task Leader for early part of the study) and George Tharakan (Task Leader). N. S. Srinivas and Rajesh Singh provided administrative assistance. The report has been prepared under the general guidance of Guang Z. Chen, Sector Manager for Transport, South Asia Region. Peer reviewers were Paul Amos, Asif Faiz and Graham Smith.

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EXECUTIVE SUMMARY, FINDINGS AND RECOMMENDATIONS

1. The World Bank has long been involved in financing road infrastructure in India, and presently the Bank's program exceeds USD 4 billion in the road sector alone. Government policies for the organization and functioning of the road transport industry will have major implications for the economic returns and societal impacts of these large investments in highway infrastructure now underway. This study has been undertaken to assess the present policy regime, and identify measures which may be considered to improve the functioning of road transport, in particular long-distance road transport, and enhance its already enormous contribution (3.9% of GDP) to the workings of the Indian economy. While the road transport sector encompasses a wide variety of activities, this study has focused on three aspects which were considered the most relevant to the investments in highway infrastructure — the trucking industry, inter-city buses, and in view of its very important but largely unfulfilled role in enhancing road safety, the motor insurance industry. The key findings and recommendations of the study are summarized below.

Summary of Key Findings

The Trucking Industry

2. Despite many remaining impediments, mainly concerning the existing infrastructure, India has achieved a highly competitive, low-cost road freight transport industry for basic services, with highway freight rates among the lowest in the world. The industry is deregulated and, as in many countries, highly fragmented with many small operators. The industry's structure, comprising transporters, broker agents and small operators, is market driven and appears to be serving the market reasonably well. Given the very low freight rates, one has to conclude it is an effective industry structure.

3. It is the constant pressure of a highly competitive market that delivers to India's shippers some of the world's lowest freight rates. In such a competitive market, one would expect freight rates to vary little from costs, and our estimates of costs confirm that expectation. In fact, trucking freight rates are so low that the industry is suffering an intense period of low profits or even losses. In this context, actions by government that increase costs or reduce the efficiency of operators, will soon find their way into higher freight rates.

4. While the industry delivers very low freight rates, service quality is poor, with low reliability and transit times nearly double that of developed countries. This low quality of service may be adequate for much of the present traffic comprising low-value bulk products — much of which would normally be served more economically by railway or coastal shipping. However, it is not adequate for higher-value manufactures or the time-sensitive export trade which comprise a growing share of the Indian economy.

5. Equipment utilization rates for the Indian trucking fleet, which average 60,000 km to 100,000 km per truck-year, are less than a quarter of those in developed economies. These low utilization rates are caused by long delays at checkpoints enroute, excess trucking capacity which results in idle trucks, slow speeds on most roads, especially in congested areas, and lack of tractor trailer units that enable the tractor to keep operating while loading and unloading are carried out on the trailers.

6. Truck delays at checkpoints have been estimated to cost the economy anywhere between Rs.9 billion and Rs.23 billion a year in lost truck operating hours. Given the present surplus capacity in the trucking fleet, the opportunity cost of the lost time would be less, but this estimate does indicate the magnitude of the problem of truck delays. The estimate does not include “Facilitation Payments” made at the checkpoints to circumvent various regulations, and these have been estimated to range between Rs.9 and Rs.72 billion. While these unofficial payments, being transfers, are not directly a loss to the economy, they probably result in revenue and other losses, to the Government and the economy, far in excess of the monies actually paid.

7. The trucking industry today uses mainly 2- and 3-axle rigid trucks with a small sleeper cab and an open top freight box of 30 to 40 cubic meters. Given the competitive market conditions, it can be inferred that the existing fleet mix is overall the most economical given the array of vehicles currently available to the Indian trucking industry. However, that is likely to change as the road network is improved, the mix of traffic changes, and the array of available vehicles is widened. Because of their low cubic capacity, current Indian vehicles are not so low cost when moving light-loading freight for which the freight rate is almost doubled per ton-km due to the smaller weight of cargo that can be accommodated.

8. An increase of 10 percent in the market share of tractor-trailer units has been estimated to result in a reduction in transport costs on the order of Rs.5 billion per year. With improved fleet management enabling more intensive use of the tractor units, these potential savings could increase to Rs.8 billion. These units also have the advantage of more modern technologies which enhance driver comfort and the safety of operations. Introduction of tractor-trailer multi-axle vehicles would reduce not only transport costs but also road damage caused by the higher axle-loadings of 2- and 3-axle rigid trucks.

9. Government needs to develop incentives to expand the multi-axle truck fleet as these trucks cause less pavement damage and are of more modern design resulting in lower per unit costs, higher fuel efficiency and reduced emissions of pollutants. The incentives proposed for introduction of multi-axle trucks include reduced tax and highway toll rates in recognition of the lower costs these trucks impose on public infrastructure.

10. India’s legal single axle load limit is now 10.2 tons, however, most Indian highways, both national and state, were constructed for axle loads of 8.16 tons, the previous legal limit. It has been estimated that strengthening this older network for the increased load limit would require investments of Rs.200 to Rs.300 billion. Controlling axle loads is critical to protecting these investments once they are made. To protect the investments in the Golden Quadrilateral and its diagonals, it is estimated that the physical infrastructure (weigh bridges, etc.) for axle load controls would cost around Rs.2.5 billion, which is well worth the expense considering the size of investment protected.

11. The present single axle load limit of 10.2 tons appears to be slightly lower than the optimal, which was assessed to be in the range of 11 to 13 tons. However, since a small degree of overloading, say 5 percent, would be treated leniently, operators could approach the optimal when carrying high density loads without excessive repercussions. Hence the current axle-load limit maybe considered to be sufficiently close to optimality.

12. Road Safety is a major concern for India, with fatality rates about ten times those in the developed economies, and trucks are responsible for a disproportionate share of these accidents.

The annual economic loss from road accidents has been estimated to exceed Rs.550 billion, with a majority attributable to the truck fleet. To improve the safety record, driver training, licensing, the working conditions of drivers, and enforcement of safety regulations must become a priority for the Government.

Inter-City Bus Services

13. The Road Transport Corporations Act of 1950, initiated the creation of State Transport Undertakings (STUs) with monopoly franchises for many inter-city bus services. At their zenith in the early 1980s, the STUs controlled 45 percent of India's bus fleet. While they incurred losses on most urban services, their rural and inter-city services generally covered operating costs. The Motor Vehicle Act of 1988 reversed the policy, and encouraged greater reliance on the private sector, which led to increased competition for the STUs and mounting losses. By the year 2000, STU losses exceeded Rs.22 billion; the Government then halted financial support to the STUs and encouraged State Governments to do the same. The role of STUs in inter-city bus services is receding in most of India, and several states now rely exclusively on private sector provision.

14. Despite restrictive granting of permits and unfavorable/discriminatory tax treatment for private operations, the private sector has won back a rapidly increasing share of the inter-city road passenger market, and now about 80 percent of the bus fleet is privately operated. A study of private inter-city bus operations in three states has confirmed that there is a significant amount of clandestine operations by private operators who provide stage carriage services while holding contract carriage permits. However, the services appear to be generally satisfactory, with between 60 and 70 percent of users surveyed rating the services either satisfactory or good.

15. Unit costs of STU operations have escalated due to excessive staffing, and on average STU costs per passenger-kilometer are more than 40 percent higher than that of private operators. STU staff costs are now about three times that of the private sector; they employ on average 7 staff per bus at an average salary of Rs.7,700 per month, whereas for private operators those numbers are 4.3 and Rs.3,500 respectively. Reducing STU staffing and salaries to levels comparable with the private sector would result in an annual savings of around Rs.40 billion. Not all of this would accrue to the economy, since some of it is a transfer from STU staff to bus passengers or tax payers. Redeployment of surplus STU staff, however, would be a true saving.

16. The Association of State Road Transport Undertakings (ASRTU) has made a proposal for reform, the thrust of which generally supports corporatization of STUs, subsidies, compensation for social mandates imposed by Government, cross-subsidies among routes, and an expanded role for STUs in the regulation of inter-city services. This report's recommendations, however, differ from the ASRTU proposals in some important respects : it is doubtful that the social obligations imposed on STUs, which the ASRTU would like to see paid as a subsidy to the STUs, could not be delivered more efficiently by the private sector; the case for the capital and route operating subsidies advocated by the ASRTU in the inter-city bus markets is at best weak; their proposed bundling of unprofitable routes with more profitable ones in order to provide a cross-subsidy to the former has generally been found unworkable; and the proposal that STUs act as both operator and regulator presents serious issues of conflict of interest and moral hazard.

17. If the primary objective is the best quality service at the lowest possible cost, the long-run strategy for inter-city bus services must be to move the STUs to majority private ownership in competitive markets as early as possible. Arguably, competition is more important than

privatization. However, so long as there are large labor forces employed by publicly owned carriers with high unit costs, the pressures to restrict competition and keep tariffs high to protect the least efficient carrier will remain strong, and this will protect not only the STUs but also serve as an umbrella to protect marginally efficient firms in the private sector as well — all at the expense of higher fares for bus users or higher taxes for the citizens at large.

18. Given the magnitude of the labor engaged by the STUs — their total labor force numbers more than 700,000 — and their present unprofitability, privatization cannot be accomplished overnight but will require a phased program. A central element of this program must be labor force reduction, retraining and re-deployment. This can be accomplished over time by natural attrition by not replacing employees as they retire or leave; by offering early retirement incentives to accelerate the process; by job retraining (either for outplacement or to fill different jobs within the STU); and by offering improved termination grants. Such measures can cushion the impact on affected employees and also provide well equipped labor to meet the broader economy's needs.

19. The appropriate focus of regulatory policy in the case of road passenger transport should be qualitative standards related to the safety of services, and the minimization of negative environmental impacts. Safety dimensions encompass vehicle road worthiness standards (brakes, steering, tires, visibility, lighting and signaling), driver qualifications and working hours, and avoidance of overloading. With regard to the environment, standards should be phased in to require low emission buses, and also control the disposal of lubricant wastes and other materials.

Motor Insurance Industry

20. Motor insurance accounts for about 40 percent of the gross insurance premiums written in the Indian non-life market, or over Rs.60 billion, which makes it the largest line of non-life insurance business in India today. Most of that is written by the 4 public sector companies. While no accurate statistics are available on how much is from the coverage of commercial vehicles, according to some estimates, commercial policies account for about 50 percent of the market. Insurance companies must use a standard insurance policy form issued by the Insurance Regulatory and Development Authority (IRDA) which covers both Own Damage (OD) and Third Party Liability (TPL). Tariffs are regulated. TPL is compulsory but compliance is poor with an estimated 50 percent of vehicles not covered.

21. The motor insurance industry in India is not performing a critical role needed to enhance road safety – penalizing poor driver performance through increased premiums or denial of cover. For liability insurance in India it is the vehicle, not the owner or driver, which is insured. Thus it is the vehicle's accident record that impacts on the experience rating aspects of the insurance premium. Consequently, an owner or driver with a bad accident record can replace the vehicle and thus avoid an adverse experience-rated premium increase.

22. Auto and truck liability insurance policies do not have an upper liability limit, while premiums are generally controlled, and as a result, loss ratios on truck insurance exceed 100% by a wide margin. Providing liability insurance is consequently not a business that the insurance industry pursues or seeks to develop. Removing tariff controls and allowing a free market to develop will enable the industry to turn this into a viable business and to invest in the kinds of enhancements needed, e.g. a system to maintain and access driver records in order to properly assess risk and charge premiums that reflect the risk profile of individual drivers.

23. There is a strong need for creating an integrated insurance claims database that can be shared jointly by the Indian insurance market. Such a database would prevent adverse selection and the possibility of bad drivers taking advantage of information asymmetry. More selective underwriting may, however, leave some bad drivers without insurance cover, and for them a motor insurance pool with punitive tariffs could be established.

24. The legal framework for the motor insurance industry, under the Motor Vehicle Act of 1988, lacks features common in more advanced legal frameworks such as a statute of limitations, liability limits and thresholds for claims adjudication. These are critical to the efficient and effective functioning of the system, and their absence results in a variety of abuses and shortcomings such as fraud, uncertainty for reserving against future claims, and excessive numbers of claims resulting in a backlog in the motor tribunal system.

Summary of Main Recommendations

Regarding the Trucking Industry:

25. To reduce delays at border crossings, particularly for high value or time-sensitive goods, the report recommends consideration of a system such as the European T.I.R., to permit sealed trucks which elect to use the system to operate without en-route inspections on the basis of a certificate issued at origin by a duly authorized and bonded issuing entity.

26. To encourage use of multi-axle vehicles and tractor-trailer combinations, thereby reducing transport costs and road pavement damage, it is recommended that incentives be put in place such as tax rates favoring such vehicles and reduced tolls on highways to reward their reduced impact on pavements.

27. Since a significant portion of the driver population is illiterate, it is recommended that audio-visual driver training materials be developed.

28. To prevent excessive hours of driving, it is recommended that trucks operating outside their home state be required to carry two licensed drivers at all times.

29. To improve axle load controls, changes recommended are: expand enforcement authority beyond officials of the Motor Vehicles Department; distinguish between minor (up to 5% of gross vehicle weight) and more excessive overloading for which there would be extreme penalties; and make abetment an offence to enable action against the broker or transporter arranging the load.

30. Invest in permanent weigh stations at strategic locations on the National Highway network to enable random checks of trucks passing the weigh station when the station is open. Require trucks found to be over-loaded to unload the excess load at their own cost and risk.

Regarding Inter-City Bus Services:

31. The STU reform proposals advanced by the ASRTU are unlikely to produce the desired improvements in inter-city bus services or stem the losses incurred by the STUs, and consequently, it is recommended that the strategy for STU reforms be reviewed.

32. Reforms in the Inter-City Bus services sector should include deregulation of tariffs, restructuring and commercialization of STUs, elimination of STU monopoly rights, changes in the tax regime to achieve uniformity of tax treatment of all buses operating in the inter-city markets, and creation of an independent agency to establish, monitor and enforce competition rules and ensure access to common user infrastructure (terminals, bus stops).

33. The appropriate public policy for the inter-city bus services sector would be to remove quantitative regulations restricting entry into the inter-city bus transport markets, and to allow market forces to determine both tariffs and the types of services offered.

Regarding the Motor Insurance Industry:

34. It is recommended that switching to a system where experience-rated premiums attach to the owner and the driver, not to the vehicle, be taken up as a matter of high priority by IRDA.

35. IRDA should initiate the development of an integrated claims database.

36. IRDA should also explore the creation of a motor insurance pool for bad drivers who have been denied cover by the insurance industry.

37. Finally, the report recommends amendment of the Motor Vehicle Act of 1988 to remedy deficiencies with respect to motor insurance such as the lack of provisions regarding a statute of limitations, liability limits and thresholds for claims adjudication.

EFFICIENCY OF ROAD TRANSPORT SERVICES IN INDIA

1.1. The World Bank has long been involved in financing road infrastructure in India and presently the Bank's transport program exceeds USD 4 billion in the road sector alone. Government policies that govern the organization and functioning of the road transport industry will have major implications for the economic returns and societal impacts of these large investments in highway infrastructure now underway. This study has been undertaken to assess the present policy regime, and identify measures which may be considered to improve the functioning of road transport, in particular long distance road transport, and enhance its already enormous contribution (3.9% of GDP) to the workings of the Indian economy. While the road transport sector encompasses a wide variety of activities, this study has focused on three aspects which were considered the most relevant to the investments in highway infrastructure — the trucking industry, inter-city buses, and in view of its very important but largely unfulfilled role in road safety, the motor insurance industry. The recommendations herein are consistent with the 2004 Country Assistance Strategy and the India Policy Review document "India: The Challenges Ahead" prepared by the Bank in 2002.

1.2. The report is presented in three sections corresponding to each of the three main topics: the trucking industry (Section I), inter-city bus services (Section II), and commercial motor insurance (Section III). The three sections maybe read as stand-alone pieces, and readers interested in a particular topic may go directly to the relevant section. The main conclusions and recommendations of the report are presented in the combined Executive Summary for the benefit of readers desiring a quick overview.

I. THE TRUCKING INDUSTRY

1.3. Despite many remaining impediments, mainly concerning the existing infrastructure¹, India has achieved a highly competitive, low-cost road freight transport industry for basic services, with highway freight rates among the lowest in the world (see Table 1.1) and indeed surprisingly low given the operating conditions in India. The development of trucking industry policy in India in recent years generally follows the recommendations of the 1999 Sundar Committee report entitled "Trucking Operations in India".² Presentations by trucking association officials at a workshop initiating the present study on January 8, 2003, and subsequent interviews with trucking operators and state government officials³ have generally echoed the picture painted by the Sundar Committee. Officials of the Ministry of Shipping, Road Transport and Highways (MOSRTH) have confirmed that the Sundar Committee Report is still a primary guiding force in the Government's trucking industry policy.

¹ The large scale improvement of road infrastructure through the National Highway Development Program, the Improved Riding Quality Program, and the increased assistance to the State Governments for improvement of road infrastructure are important measures already implemented by the Central government to address infrastructure deficiencies.

² Asian Institute of Transport Development for the Ministry of Surface Transport, *Trucking Operations in India: Report of Steering Committee* (November 1999, hereinafter cited *Sundar Committee*).

³ The study team visited India January 5-28, 2003 and conducted field observations of trucking operations and interviews with trucking operators, association representatives, central and state government officials in New Delhi, Maharashtra, Karnataka, and Uttar Pradesh.

Table 1.1: Truckload Freight Rates Charged in Various Countries (c 2002)

Country	Average cost per ton km (US\$)
Pakistan	0.015-0.021
India	0.019-0.027
Brazil	0.025-0.048
United States	0.025-0.050
Central Asian republics	0.035-0.085
Australia	0.036
China	0.040-0.060

SOURCE: Clell Harral, Ian Jenkins, John Terry, Richard Sharp, *The Efficiency of Road Transport in India: The Trucking Industry*, WB Background Paper, 2003.

1.4. Although this note generally echoes the Sunder Committee recommendations, it differs on two important aspects: (i) the degree of government involvement through regulation; and (ii) use of the trucking industry as a mechanism to enforce varying state sales taxes. As well demonstrated by worldwide experience,⁴ the trucking industry normally performs best where government involvement is limited primarily to provision of good road infrastructure, enforcement of safety aspects, and internalization of external diseconomies, i.e. the costs to society caused but not directly paid by the road user (e.g. pavement damage from too heavy axles, congestion, and environmental effects). Further government intervention has the potential to do more harm than good.

1.5. The Motor Vehicle Act of 1988 made major advances in the liberalization and harmonization of government regulations across the different states of India, but there remains much to be done to improve and streamline administration, reduce corruption, and enhance enforcement. Reliance on the trucking industry in India as an instrument for enforcement of varying state sales taxes across the states places an additional heavy administrative burden on the sector, and it is not clear whether the introduction of the Value Added Tax will ease that burden.

I.1 Structure of the Highway Freight Industry

1.6. India's trucking industry is deregulated and, as in many countries, highly fragmented.⁵ It is primarily composed of three types of enterprises as described below.

⁴ See the background paper to this policy note, Richard G. Sharp, et al., "A Cross Country Comparison of Regulatory Reforms to Promote Road Transport Efficiency" (HWTSL Informal Technical Note, May 2003).

⁵ Consider, for example, the United States, Great Britain, and Japan, as shown in the table below. It should be noted, however, that there are serious definitional problems concerning data relative to "percentage of vehicles in fleets of size", e.g. in the United States some of the largest trucking operators do not own vehicles, but instead subcontract all (in a few cases) or a large percentage of their total fleet.

Distribution of Truck Fleet Sizes

	Percentage of operators with		Percentage of vehicles in fleets of size	
	Less than 10 trucks	Over 100 trucks	Less than 10 trucks	Over 100 trucks
Great Britain	94	0.2	51	12
USA	79	2	19	45
Japan	42	2	11	19

NOTE: Figures for Britain and USA include both for-hire and own-account trucks, whereas Japan's figures include only for-hire trucks.

1.7. *Transporters*: These are trucking companies which have the primary contact with shippers and receiving customers. They solicit freight, largely on an annual price quote basis, bill, collect, and carry the accounts receivable, are responsible for cargo loss and damage claims and perform the other customer service functions. Some, like the Transport Corporation of India (TCI), are fairly substantial enterprises with many business locations. They typically own a fleet of trucks and often warehouses and terminals as well. But they rely primarily on small truck operators for their line-haul (intercity) transportation. In the United States they might be called broker-operators, although the latter would, in addition to cargo insurance, also carry third party liability insurance covering their trucking operators and sub-contractors.

1.8. *Truck Operators*: These individuals (often called owner-operators) typically own one or a very small fleet of trucks, which usually are financed by high-leverage debt. They usually drive the main truck and the other drivers are family members or are personally known to the owner. In India virtually all of these trucks are two driver units usually with a helper. These people virtually live in the truck, following the traffic flows and going home primarily when the load they are carrying takes them nearby. They contract with the transporter to perform the intercity transport of freight which the latter has contracted for with the shipper. The truck operator performs almost all the freight transport activity on a shipment and is paid either an agreed percent of the revenue or a flat amount. It appears the amounts and percentages paid the operators fluctuate continuously reflecting the supply-demand situation in the individual commodity and origin-destination segment of the market.

1.9. *Brokers, Agents*: These parties have relations with the truck operators and provide those operators to the transporters. They play a necessary role in India because they act as a quality control on the reliability of the truck operator and a means of facilitating prompt loading by the operators. With limited means of assessing a truck operator's record of timely, claim-free performance, the transporters, who have the customer relationships and are responsible for cargo loss and damage, need some way of determining the reliability of the truck operator. The brokers or agents take on that job. In the current Indian freight market, with an excess of trucks, they also seek out loads for their following of truck operators. They are usually paid a fixed amount per load; 300-500 Rupees was mentioned as the rate range in January 2003.

1.10. This industry structure is market driven and appears to be serving the market reasonably well. Customers need a substantial party to be their transporter because of the need for cargo loss protection, a stable freight price and a reliable supply of hauling capacity. The labor laws, road delays, and predominance of live-loading make small truck operators a lower cost alternative to big, company-owned fleets, so the transporters primarily use the small truck operators instead of their own trucks. In this context, there is a real need for a facilitating middleman, the broker, and thus the market has created that activity. All three groups are working in a market-determined revenue sharing cooperation. This is the way the deregulated Indian freight market has organized itself. Given the very low freight rates, one has to conclude it is an effective industry structure.

I.2 Freight Rates and Industry Profitability

1.11. Freight rates vary with the interplay of commodity type, size of shipment and the volume freight to be moved between any pair of points on any given day in relation to the supply of hauling capacity available. Transporters have been forced by the much larger customers to quote annual rates at which they will move goods. They assert these rates are adhered to, though there is no way to prove that statement. However, they admit that the amount they have to pay to the truck operators on any given day can vary from half of their revenue to more than 100% of the revenue.

1.12. The *Economic Times* and other newspapers publish freight rates daily; those in the *Economic Times* are for outbound Delhi 9 ton full loads.⁶ It is highly unlikely that these rates are lower than actual market rates, as shipper representatives would be very reluctant to tender freight at a rate above the published ones; there is evidence to suggest that actual rates are sometimes discounted from the published rates. Published long distance road freight rates in mid 2002 were about Rs.10.50 per truck km for a standard nine ton capacity truck, which is equivalent to Rs.1.17 per ton km assuming on average a full load, but not an overload (see Table 1.2 for details). These rates are not regulated by government and are considered to reflect market conditions. It is reported that rates can rise by up to 50% during the autumn peak agricultural season and fall by 20% or so at slack times, but the mid summer rate is close to the annual average. Due to imbalances in freight demand, freight rates vary with direction on some routes.

1.13. In practice the trucks often carry more than the registered capacity. In early 2003 truckers were reporting rates of about Rs.9-11 per km for trucks carrying normal loads, but Rs.13 per km if overloaded by 20% or more above the registered capacity. This could imply that freight rates per ton km are even lower than shown in Table 1.2.

1.14. The published rates were in line with the rate quotes given to the mission during its field work, and there is reasonable confidence that the published rates are representative of the average charges for legal, i.e. not overloaded, trucks. Rs.10.50 per truck kilometer, or Rs.1.17 (US\$ 0.023) per ton km, has been taken to represent a reasonable overall average. These freight tariffs are among the lowest in the world, as noted earlier in Table 1.1, which shows rates from several countries with competitive trucking markets.

Table 1.2 Published Long Distance Road Freight Rates in India

From	To	Freight Rate (Rs./truck)	Distance Km	Freight Rate (Rs./truck km)	Freight Rate (Rs./ton km)
Delhi	Mumbai	12,000-12,600	1,408	8.74	0.97
Delhi/	Kolkata	14,400-15,000	1,474	9.97	1.11
Mumbai	Delhi	14,000-15,000	1,408	10.30	1.14
Mumbai	Kolkata	22,000-23,500	1,987	11.45	1.27
Mumbai	Chennai	14,500	1,367	10.61	1.18
Chennai	Delhi	25,020	2,095	11.94	1.33
Average				10.50	1.17

SOURCE: Mid 2002 rates for 9-ton trucks, advertised in Economic Times of India, Financial Express of India; TCI

⁶ The Sundar Committee Report (p.199) includes a table of market based Mumbai outbound freight rates in June-October 1998. The current newspaper rates appear higher than those of the Sundar report, but by amounts that seem reasonable in relation to the time gap between the dates.

1.15. These freight rates are so low that one can readily accept the assertions of all those interviewed that the industry is suffering an intense period of low profits or losses.⁷ In such a competitive market, one would expect freight rates to vary little from costs, and our estimates of costs confirm that expectation. Pakistan's trucking industry is facing a similar situation.

1.16. One component-by-component estimate of the average financial operating cost of trucks in India is shown in Table 1.3, as provided in 2002 by the Transport Corporation of India (TCI), which is the largest operator in the country. These figures include administrative overhead costs that small operators would not normally incur, but do not include interest charges or any profit margin. While any transporter may have incentives to overstate its operating costs, the costs shown by TCI for the nine ton capacity truck (Rs.10.46 per truck km) has been cross-checked against HDM model estimates⁸ and agree closely also with India's competitive market freight rates described above for this type of truck.

1.17. We have estimated the financial operating costs for small operators, which make up the majority of the industry, as shown in Table 1.4. Consistent with the mission interviews with Indian truckers in three states in January 2003, these estimates assume lower utilization, lower staff earnings and less overheads, but include interest payments and a greater allowance for broker payments. If a modest profit margin of 4% of other costs is included, the total costs per truck km for the dominant 9-ton truck operated by the small operator would be Rs.10.77 (US\$ 0.215) per truck km; excluding any profit, the total is Rs.10.38 (US\$ 20.8) per truck km. Allowing a reasonable margin for error, these numbers are essentially the same as those reported by TCI.

1.18. These estimated costs, in relation to the low tariffs, lend support to the assumption of only a very modest profit level or break-even situation for the industry as a whole currently, with frequent bankruptcies at the margin. If the tariffs are now below the long term variable cost, they must ultimately adjust to that level, as the operators and transporters are all small, thinly-capitalized businesses, usually with a high degree of financial leverage. Revenue levels below variable cost will soon put enough capacity out of business that freight rates will rise to the level needed to draw investment back into the industry. In this context, actions by the government or market forces that increase costs or reduce efficiency of the operators, especially in areas of equipment utilization, soon find their way into higher freight rates.

1.19 The transporter, such as TCI, also operates on very thin margins. For its 10-15% of the revenue it must solicit, bill and collect for the freight, and bear the cost of bad debts and cargo claims. It must also carry the investment in driver advances, usually 50% to 70% of the amount ultimately due the driver, and the slow accounts receivable which appear to average about 60 days. The transporter also has to quote a relatively fixed annual freight rate which leaves it financially exposed. The transporters are probably reasonably profitable, but it is unlikely that they are generally able to take advantage of the truck operators, for there is also a competitive market among transporters in search of truck operators and truck operators openly compete against the transporters wherever possible. Similarly, the pure agent/brokers face competitive markets for their services and would not generally be able to take advantage of the truck operators.

⁷ The truckers' strike that occurred April 13-23 further underscores this point.

⁸ Ian Jenkins, "India: Efficiency of the Road Transport Industry— Modeling and Analysis" (HWTSL Informal Technical Note, May 18, 2003)

Table 1.3 Estimated Annual Financial Cost of TCI Truck Operation (Rs.)

Item	Type of Truck			
	5 ton	9 ton	16 ton	27 ton
Fuel	200,000	480,000	590,769	746,667
Lubricants	12,000	32,400	33,600	42,000
Tyres	50,400	90,720	126,720	191,520
Spares	12,000	32,400	33,600	42,000
Crew	90,000	123,000	135,000	177,000
Maintenance Labor/Repairs	12,000	32,400	33,600	42,000
Wayside Expenses	15,000	54,000	72,000	84,000
Overheads				
- Staff/ Administration	120,000	120,000	120,000	120,000
- Tax	27,690	47,690	49,330	54,910
- Interest	0	0	0	0
- Depreciation	66,000	88,000	126,000	315,000
- Other	21,750	28,750	37,500	79,500
Total Overheads	235,440	284,440	332,830	569,410
Total Annual Expenses	626,840	1,129,360	1,358,119	1,894,597
Annual Utilization (km)	60,000	108,000	96,000	84,000
Cost per truck km	10.45	10.46	14.15	22.55
Cost per ton km of capacity	2.09	1.16	0.88	0.84

NOTES: (1) Assuming an average price of Rs.20/litre for fuel. (2) Depreciation based on resale after five years (45% of purchase price) and truck prices of Rs.600,000 (5 ton), Rs.800,000 (9 ton), Rs.1,050,000 (16 ton) and Rs.2,250,000 (27 ton). No interest charges are included. (3) Other costs include brokerage and vehicle insurance. SOURCE: TCI (mid 2002), as reported by Davis (2002)

Table 1.4 Estimated Annual Financial Operating Costs of Small Operators (Rs.)

Item	Type of Truck			
	5 ton	9 ton	16 ton	27 ton
Fuel	150,000	356,000	492,300	711,100
Lubricants	9,000	24,000	28,000	40,000
Tyres	37,800	67,200	105,600	182,400
Spares	9,000	24,000	28,000	40,000
Crew	67,500	91,100	112,500	168,600
Maintenance Labor/Repairs	9,000	24,000	28,000	40,000
Wayside Expenses	11,250	40,000	60,000	80,000
Overheads				
- Staff/ Administration	0	0	0	0
- Tax	27,690	47,690	49,330	54,910
- Interest	16,800	22,400	29,400	63,000
- Depreciation	60,000	80,000	105,000	225,000
- Other	27,900	54,300	72,700	112,400
- Profit	15,900	31,100	41,500	64,200
Total Overheads	148,290	235,490	297,930	519,510
Total Cost	441,840	861,790	1,152,330	1,781,610
Annual Utilization (km)	45,000	80,000	80,000	80,000
Cost per truck km	9.82	10.77	14.40	22.27
Cost per ton km of capacity	1.96	1.20	0.90	0.82

NOTE: (1) Based on Transport Corporation of India (TCI) estimates, assuming 10-year depreciation, 14% interest for four years, reduced vehicle utilization, "Other" overheads equal 7% of other costs (including 4-5% broker fee and 2% insurance) and profit margin of 4% of other costs. SOURCE: Consultants' estimate (mid 2002 prices)

1.20. Enterprises similar in function to the transporter are common in the U.S., and they generally average about 15% of the revenue for their activity. One expects that these U.S. counterparts are much more profitable because of the almost complete absence of cargo loss exposure, the faster collections and almost complete lack of credit losses, and the fact they do not have to guarantee the freight rate to their customer. This tends to confirm the view that the transporters are not taking advantage of the truck operators in India. It is the highly competitive nature of the market that makes the truck operators' business so hard, at the same time delivers to India's shippers some of the world's lowest freight rates.

I.3 Quality of Service

1.21 Accurately measuring transport service is a statistically demanding task because of the many aspects of service (including speed, frequency, reliability, and security), the ebb and flow of freight volumes, and the many origin-destination pairs of points. The mission could not attempt it, and was not able to locate any systematic survey of transport users, i.e. shippers, on the subject. But discussions with the transporters, examination of the terminal facilities, and observations from intercity road travel done by the mission leads to the opinion that a relatively poor quality of service is rendered. The service may be adequate for much of the present traffic comprising low-value bulk products—much of which would normally be served more economically by railway or coastal shipping. It is not adequate for the higher-value manufactures or the time-sensitive export trade that comprises a growing share of the Indian economy. In comparison, China's and Pakistan's (Annexes 4 and 5) highways are better and there are much fewer inspections enroute, which results in faster service.

1.22 There was an excess of trucks everywhere the mission travelled (Haryana, Maharashtra, Karnataka, and Uttar Pradesh), so timely pick up seems assured. But the over-the-road speed looked very slow. The government-imposed multiple check point system, the mixed use of the roads by motorized and non-motorized traffic, the almost complete lack of highway safety enforcement, and the poor quality of the equipment has made transit times slow and reliability of timely delivery is almost certainly very poor by modern standards.

1.23. For example, truckers estimated that a Delhi-Mumbai load (1408 kilometers) takes three days; a Delhi-Bangalore load (2,019 kilometers) four to five days. In both cases the truck would have one or two drivers (excluding helper). The U.S. equivalent transit times, with one driver operating legally would be two and three days (actually second and third *morning*), respectively. If the U.S. carrier used 2-driver teams, a day would be cut from each movement.

1.24. One positive service aspect noted was that the loads are generally properly tarped to protect against weather damage. This suggests that the economic linkage between the transporter, who pays the cargo claims, and the truck operator, who is the person protecting the load from weather damage, is working at least to some degree.

I.4 The Vehicle Fleet

1.25. The Indian industry today uses mainly 2- and 3-axle rigid trucks with a small sleeper cab and an open top freight box of 30 to 40 cubic meters (1100 to 1400 cubic feet). The low cubic capacity reflects the present freight market of predominantly heavy, often unpackaged commodities. The trucks are of old, low-tech design with 135 to 165 horsepower naturally-aspirated engines. Tata and Ashok Leyland designs predominate with very limited numbers of the large new Volvo tractor-trailer units in a few market segments. In terms of traffic on the main national highway network, the 2-axle 9-ton truck constitutes roughly 75 percent of the trucks, as shown in Table 1.5. The Indian vehicles are low cost trucks; new unit costs quoted are US\$16,000 for the 9-ton and US\$20,000 for the 16-ton trucks, but the purchase price of the higher powered and modernized Volvo is quoted at US\$ 84,000 to 90,000, a relative price difference that has undoubtedly contributed to Volvo's limited market penetration so far. Compared to India, Pakistan has a larger proportion of 3-axle rigid trucks (9%) and multi-axle trucks (25%) in its fleet. In China, the proportion of medium trucks is declining and that of light vehicles and tractor-trailer units are increasing.

Table 1.5 Estimated Average Traffic Flow on the Main National Highways (2002)

Vehicle Type	PCU per Vehicle	Proportion of Vehicles	Average Daily Traffic (Vehicles)	Average Daily Traffic (PCU)	Proportion Truck
Motor Bike	0.5	15%	2,100 (15%)	1,050 (4%)	
Car (New)	1	20%	2,800 (20%)	2,800 (11%)	
Car (Old)	1	10%	1,400 (10%)	1,400 (5%)	
Bus	2.5	8%	1,120 (8%)	2,800 (11%)	
Truck (Light)	2	5%	700 (5%)	1,400 (5%)	13%
Truck (2 axle)	3	30%	4,200 (30%)	12,600 (48%)	75%
Truck (3axle)	3.5	4%	490 (3.5%)	1,715 (6.5%)	9%
Truck (multi axle)	4	2%	210 (1.5%)	840 (3.2%)	4%
TOTAL MOTORIZED		93%	13,020 (93%)	24,605 (94%)	
Bicycles	0.5	5%	700 (5%)	350 (1.3%)	
Others	4.5	2%	280 (2%)	1,260 (4.8%)	
TOTAL NON MOTORIZED		7%	980 (7%)	1,610 (6%)	
TOTAL ALL VEHICLES		100%	14,000	26,215	

NOTE: Typical average traffic composition on the Golden Quadrilateral and main East-West and North-South Roads.

SOURCE: Consultant's estimate based on national traffic statistics, Davis (2002), and classified counts described in Road Maintenance and Corridor Management for National Highways System in India (2000), Feasibility Report Consultancy Package VI for World Bank National Highways Project (1999), and CRRI, Updation of Road User Cost Data (2001).

1.26. Given the competitive market conditions in trucking, it can be inferred that the existing fleet mix is overall the most economical from the array of vehicles currently available to the Indian trucking industry under present conditions of the road network and mix of traffic. The Indian truckers appear satisfied with their trucks and generally run them for their entire lifetime — as long as 20 years. However, that is likely to change as the road network is improved, the mix of traffic changes, and the array of available vehicles is widened. Such factors are likely to play a growing role in India, as it transforms from a

largely rural agrarian economy to an increasingly urban, export-oriented manufacturing economy with rapidly growing high-tech and services elements.

1.27. Because of their low cubic capacity, current Indian vehicles are not so low cost when moving light-loading freight. The effect on transport costs can be seen by comparing light- and heavy-loading freight. In India cube is converted to weight for billing purposes at 12-15 kilograms per cubic foot. So the 1100 cubic foot freight box can carry 13,200 kilograms, clearly an overloaded truck, as commonly observed. But the average kilos/cubic-foot in the current US road freight market, for instance, is in the range of 4-5. So the 1100 cubic foot box could only handle about 5,000 kilos before cubing out. Yet it would still cost 10.50 rupees per kilometer to move those goods, and the cost per ton km would be at least $1.8(9,000/5,000=1.8)$ times as high as today's more typical cargo.

1.28. The contrast between the freight transport needs of Karnataka and other states is interesting. In other states traffic such as bagged grain, cement, and steel rods dominate the traffic flow, but in Karnataka computers and other high tech products are much more prominent. The open top rigid trucks that command the Indian freight market, with their low line-haul speeds and unreliability, are hardly suitable for the just-in-time logistic needs of the computer industry and other high-tech undertakings. India will need to introduce high cube vans and fast line-haul transit in the near future to serve these needs.

Prospective Savings from Wider Adoption of Tractor-trailers

1.29. Introducing more tractor-trailer multi-axle trucks into the Indian truck fleet would affect the overall cost of transport, including: the operating costs of the vehicles; the quality of trucking services; road provision costs; and environmental and other externalities. An attempt has been made to assess the cost impacts of introducing multi-axle tractor-trailer units in increasing proportions into the vehicle fleet.

1.30. This analysis is concerned only with illustrating the potential differences in vehicle operating costs. A number of hypothetical scenarios are defined:

- first, for different mixes of vehicle sizes, in which the road freight market share of multi-axle tractor-trailers varies from 10% at present up to 40%, and
- second, for different ratios of trailers to tractors for multi-axle vehicles.

The first of these sets of scenarios can indicate the potential cost savings of introducing more tractor-trailers into India, assuming that no increase in utilization and efficiency of the tractor trailer operation takes place; the benefit under this scenario is solely through the substitution of larger vehicles for smaller vehicles. The second set of scenarios indicates the potential additional cost savings that can be achieved if efficiency of tractor-trailer operations is increased by more intensive scheduling and increasing the ratio of trailers to tractors, so that any single tractor can service several trailers and thereby reduce its waiting time for loading, thereby increasing the productivity of the most costly component in the system

1.31 The analyses in this case are in terms of *economic* rather than *financial* costs, with taxes excluded from financial costs to derive a simple estimate of economic costs in keeping

with current planning practice in India. Results of the analyses are summarized in Table 1.6 and discussed below.

Increasing the Market Share of Tractor-trailers

1.32 As indicated in Table 1.5, tractor-trailers currently constitute only about 2% of all motorized traffic on the main highways of India (the Golden Quadrilateral and main east-west and north-south roads). This is only about 4% of truck km. However allowing for the different carrying capacities of the trucks, the current market share of tractor-trailers on these roads is 10% as shown in Table 1.6. The impact of increasing the market share of tractor-trailers has been assessed for three possible alternative cases:

- Case A: Increasing the market share from 10% to 20%,
- Case B: Increasing the market share from 10% to 30%,
- Case C: Increasing the market share from 10% to 40%.

1.33. The corresponding vehicle km on the main highways are shown in Table 1.6 — this raises from 1,016 million at present up to 3,928 million for Case C. In defining these alternative scenarios it was assumed that the light truck market share would remain unchanged because this type of truck serves its own market niche. For simplicity and to avoid introducing effects other than that of increasing the fleet of tractor-trailers, the market share of 3-axle trucks is also assumed to remain unchanged — implying that the number of 3-axle trucks that operators replaced with tractor-trailers would be balanced by the number of 2-axle trucks that operators replaced with 3-axle trucks.

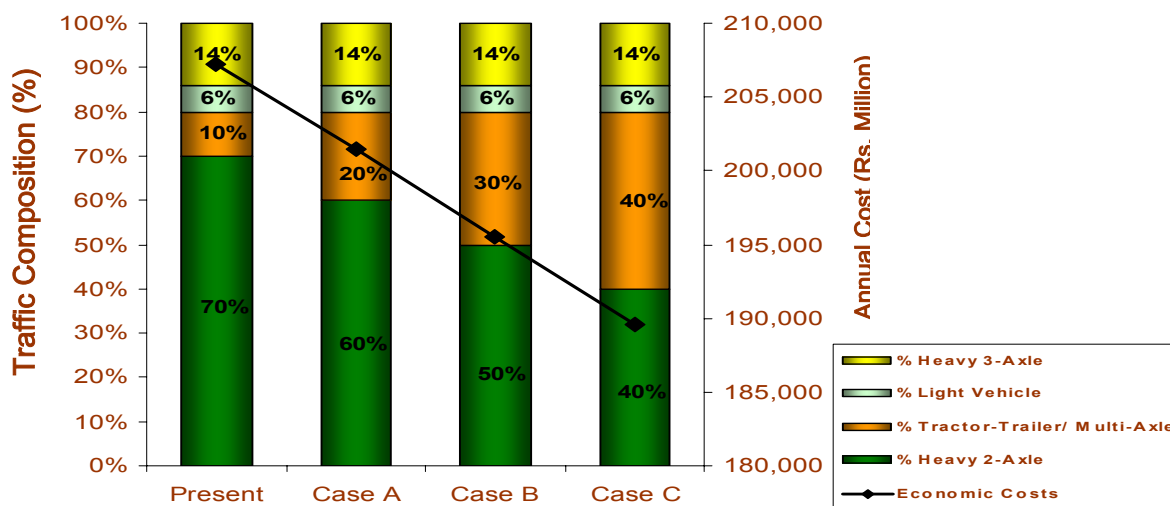
1.34. The annual economic vehicle operating costs of these alternative scenarios are also shown in Table 1.6, assuming the vehicle operating costs for each truck type estimated earlier. It is assumed that the increase in tractor-trailers only occurs on the main highways and not on other national highways. In practice tractor-trailer operation could also be extended to most of the national highways, so this underestimates the potential impact.

1.35 According to these estimates, the annual vehicle operating costs of trucks on the main highways in India could be reduced from about Rs.207 billion at present, to as little as Rs.190 billion for Case C. The estimated reductions are between Rs.5 and 6 billion for Case A, almost Rs.12 billion for Case B and over Rs.17 billion for Case C.

Increasing the Trailer/Tractor Ratio

1.36. The impact of increasing the ratio of trailers is also indicated in Table 1.6 for both the Cases A and C, assuming the vehicle operating costs vary for different ratios as shown in Table A1.4 of Annex 1. For Case A, the potential reduction in total costs of tractor trailers using the main highways is about Rs.2.8 billion, from Rs.201.4 to 198.7 billion, assuming that the ratio of trailers to tractors can be increased up to 2.0. For Case C the potential reduction is estimated at around Rs.5.6 billion.

Table 1.6 Road Freight Costs with Increasing Tractor-Trailer Use



Note: Case A: Increasing the Tractor-Trailer market share from 10% to 20%
 Case B: Increasing the Tractor-Trailer market share from 10% to 30%
 Case C: Increasing the Tractor-Trailer market share from 10% to 40%

1.37. It should be noted that the potential benefits of increasing the trailer/tractor ratio would be even greater for the modern units now being introduced into India. Because of the higher capital cost of these units, higher utilization is necessary to exploit fully the potential advantages of these units in terms of lower operating costs and/or greater performance and reliability. However at present it is not possible to estimate the relative costs and benefits of using the modern units due to lack of information about operating costs under Indian conditions.

1.5 Costs of Truck Delays and Facilitation Payments

1.38. The annual kilometer run by intercity trucks varies between 60,000 km and 100,000 km; and 80,000 km has been taken as a reasonable estimate for the average long distance unit. Almost all units are using one or two drivers and most also have a helper, a total of two or three people in the cab. As an illustration of good utilization, two driver units in the U.S. (called sleeper teams) would average about 400,000 kilometers per year.

1.39. The low equipment utilization has a number of contributing causes:

(a) Unlike tractor-trailer equipment, which dominates inter-city services in the United States and other countries with well developed road transport systems, the rigid equipment that dominates the Indian truck fleet requires power unit downtime while the truck is loaded or waiting for a load. The analysis in Section 3 above illustrates the potential that might be realized from widescale use of tractors with multiple trailers.

(b) The government checkpoint systems consume line-haul hours in unproductive waiting. Truckers reported that 15%-25% of line-haul time was lost at checkpoints, although other estimates were as low as 4%. The stridency of truck operator

complaints, and observations from time to time of long queues of trucks along the highways, confirm this as a real problem, although it appears to vary considerably from location to location and time to time. An estimate of the likely range of the downtime due to this problem is presented below.

(c) There is currently an excess of trucks in the Indian market; the mission observed large numbers of empty trucks sitting idle during times trucks would normally be loading and was consistently told by all parties interviewed that there is a large surplus of trucks.

(d) Trucking operators are reluctant to operate trucks without a substantially full load, and are often prepared to wait until the traffic materializes.

(e) The traffic mix of non-motorized and low-powered vehicles — even on divided four lane roads — compels low speeds.

(f) The under-powered and overloaded trucks themselves are not capable of fast highway speeds, even on uncongested roads. Loaded truck speeds of only 40 kilometers/hour are typical. The numerous old trucks on the highways are, in addition, delayed by frequent breakdowns.

(g) Inadequacies of the existing highway infrastructure, including lack of city by-pass roads, also lower average speeds and annual kilometers traveled. Outside the limited main arteries of the national highway network, road and traffic conditions typically do not allow sustained high speed operations.

Truck Delays Due to Administrative Controls

1.40. In addition to the delays caused by normal operational factors such as traffic congestion and the need for driver rest and vehicle maintenance, long distance trucks in India experience significant delays due to governmental administrative activities, such as control of sales tax collection. These delays can occur either at fixed check points or at road-side locations set up by mobile enforcement units. Delays even occur before the trip begins, while the driver completes the necessary taxation procedures for carrying the load.

1.41. The adverse impacts on productivity of conflicting administrative rules of diverse jurisdictions are difficult to measure, but the cross-country comparisons of regulatory reforms conducted for this study⁹ — as well as the quantification attempted below — suggest that these penalties are severe. State and local regulations are often enacted to serve parochial interests that do not contribute to national transport productivity. It is important to note that improvements in road transport performance in the United States after economic deregulation

⁹ R. Sharp et al., “A Cross Country Comparison of Regulatory Reforms to Promote Road Transport Efficiency,” (HWTSL Informal Technical Note, May 2003).

in 1980 were only partly attributable to federal deregulation itself. A host of other changes occurred to harmonize state regulations ranging from licensing, to vehicle size and weight standards, to driver and vehicle safety measures. In Australia, evidence of the value of such harmonization is even more clear. While economic regulations had been abolished for years, substantial productivity gains in the trucking industry were achieved after a mechanism was created in 1992 to achieve greater standardization and performance orientation in state motor carrier safety, vehicle and traffic control standards, licensing and insurance.

1.42. International experience does not sustain the argument that all state rules for motor carriers need to be made uniform or be replaced by a single national standard. Indeed, the Australian experience is notable in that the commonwealth has very weak regulatory powers and the states have harmonized their procedures with the facilitative assistance of a committee structure with no enforcement capabilities — the National Road Transport Commission (NRTC), which is somewhat similar to India's Transport Development Council. Important Australian reforms have been achieved by NRTC promoting a common vision, supported by research that demonstrated the efficiencies to be expected from state adoption of less restrictive performance standards and other liberalization measures. Whether such a voluntary cooperative mechanism of the various states in India could be equally effective is a matter that will best be assessed by the respective Indian authorities.

Truck Delay Costs

1.43. The economic cost of delays to trucks due to administrative controls has been estimated from:

- the amount of traffic on the national highways (truck km per year),
- the extent of traffic delays at check points or at the start of the trip (hours per truck km or per trip), and
- the unit cost of the delays (Rs. per truck hour) in terms of vehicle operating costs and cargo time costs.

Economic impact has been assessed purely in terms of user costs. There are other costs, including the administrative controls themselves (labor and other administrative costs) that are not included here.

1.44. Unfortunately, reliable information about delays and their causes is lacking. The evidence from available formal surveys¹⁰ indicate more limited delays than those reported by transporters and truckers interviewed by the study team. A simple approach is therefore adopted in order to indicate the approximate level of delay caused by all the various causes. Since there is considerable uncertainty about the delays, lower and upper estimates of the economic impact are given to indicate the sensitivity of the result to alternative assumptions.

1.45. Estimates of the annual economic costs to India of administrative delays to trucks are given in Table 1.7. These estimates include costs of delays on the whole national highway network but exclude costs of delays on state and other local roads where the

¹⁰ The only formal surveys that have come to the attention of the study team are the three done by the Central Institute of Road Transport in June-July 1998 for the Sundar Committee and reported in Annexure 3.1 of the Sundar Committee Report, although other less formal trip reports have also been reviewed.

likelihood of delay due to administrative control is relatively small. A detailed discussion of the derivation of these two tables is given in Annex 2.

1.46. From Table 1.7 it can be seen that truck delay costs due to governmental administration formalities are estimated to lie somewhere within the rather broad range of Rs.9 billion to Rs.23 billion, reflecting the fragmentary and uncertain nature of the available information. However, even the lower limit of this range, Rs.9 billion (US\$180 million) per annum, which may be considered a quite conservative estimate, is a significant magnitude, and the true number might easily be twice that.

“Facilitation Payments”¹¹

1.47. It is also a common practice for road transport companies and drivers to make (unofficial) payments to government officials to expedite clearances and/or to avoid payment of heavier taxes or fines. For example, vehicle overloading is a very common practice, and truckers report that as much as 10% of their freight revenues may be taken up in payments to facilitate passage of overloaded vehicles; some states have *de facto* legalized this practice by the issuance of formal permits, but the issue is probably more often dealt with by illicit payments. Available information about such “facilitation payments” made by truck drivers in the course of journeys is analyzed to assess the impact of these payments on transport costs. These are real financial costs to the truckers (which are undoubtedly passed through to shippers, given the structure of the industry), but they are merely transfer payments (or income redistribution), and do not constitute economic costs (additional consumption of economic resources).

1.48. The estimated range of “facilitation payments” is even wider, as might be expected considering their mostly illicit nature, running from as “little” as Rs.9 billion to as high as Rs.72 billion, as shown in Table 1.8. In this case, however, it must be recognized that these payments are often made to avoid larger, typically much larger, payments legally due, whether excise or other sales taxes or fines for violations of the law. The loss of revenues to the governments concerned is most likely a multiple of the estimates given in Table 1.8. Those cases involving failure to enforce traffic safety laws contribute to even larger economic and social losses from accidents that might be avoided.

¹¹ In the United States the term “facilitation payment” is often used narrowly to indicate a payment to get an official to expedite an action that he is legally bound to do in any case; here it is used more broadly to encompass also bribes to get an official *not* to take an action that he is legally bound to take.

Table 1.7 Estimated Annual Economic Cost of Administrative Truck Delays in India

	Type of Truck				
	Light	Heavy 2-axle	Heavy 3-axle	Multi-Axle	All Trucks
(A) Delays - Main Highways					
Vehicle km (million)	3,386	20,315	2,370	1,016	27,087
Delay per km (hours)	0.0025 – 0.0060				
User Cost per hour (Rs.)	58.6	71.4	100.4	193.6	
Total User Cost (Rs. millions)					
- lower estimate	496	3,643	595	492	5,226
- higher estimate	1,190	8,744	1,428	1,180	12,542
(B) Delays - Other Highways					
Vehicle km (million)	5,678	34,069	3,975	1,703	45,426
Delay per km (hours)	0.0012 – 0.0030				
User Cost per hour (Rs.)	58.6	71.4	100.4	193.6	
Total User Cost (Rs.millions)					
- lower estimate	399	2,933	479	396	4,207
- higher estimate	998	7,332	1,198	989	10,517
(C) TOTAL USER COST (Rs.millions)					
- lower estimate	895	6,576	1,074	887	9,433
- higher estimate	2,188	16,076	2,626	2,169	23,059

NOTE: (1) Traffic on main highways (13,252 km consisting of the Golden Quadrilateral and main east-west and north-south roads) is estimated as shown in Table 1.6. Traffic on other highways (44,448 km of national highways) is assumed to be half those on the main highways and delays per km are also half that on main highways. (2) The same user cost per hour is assumed for all highways and this is consistent with the finding of the CRR1 surveys which indicated that the average value of commodities does not vary greatly with category of highway.

SOURCE: Consultant's estimate

Table 1.8 Estimated Annual Unofficial Payments made by Trucks in India

(A) Payments on Main Highways	Low Estimate	High Estimate
- Vehicle km (million)	27,087	27,087
- Payment per km (Rs.)	0.13	1.00
Total User Payment (Rs. million)	3,521	27,087
(B) Payments on Other Highways		
- Vehicle km (million)	45,426	45,426
- Payment per km (Rs.)	0.13	1.00
Total User Payment (Rs.million)	5,905	45,426
(C) TOTAL USER PAYMENTS (Rs.million)	9,426	72,513

NOTE: Based on equivalent assumptions to those made in Table 7.

SOURCE: Consultant's estimate

1.49. Table 1.9 summarizes the costs of various inefficiencies in the trucking sector, and shows that between Rs. 17 and 46 billion of economic costs could be saved per year should the inefficiencies in the current system be addressed.

Table 1.9 Estimated Ranges of Economic Costs Saved as a Result of Reforms

Area of Reform/Impact	Economic Cost saved Low estimate (Rs. Billion)	Economic Cost Saved High Estimate (Rs. Billion)
<i>Administrative Controls</i>		
Reduction in Truck Delays	9.4	23.0
Reduction in Corrupt Enforcement ¹	9.4	72.5
<i>Vehicle Fleet Improvement</i>		
Increase in the market share of tractor-trailers	5.7 ²	17.6 ³
Increase in the Trailer/Tractor Ratio	2.0 ⁴	5.6 ⁵
Total Economic Costs Saved	17.1	46.2
Additional Financial Costs Saved	9.4	72.5

Notes: (1) These are real financial costs to the truckers (which are undoubtedly passed through to shippers, given the structure of the industry), but they are merely transfer payments (or income redistribution), and do not constitute economic costs (additional consumption of economic resources). (2) Assuming that the market share of tractor-trailers increases to 20 percent. (3) Assuming that the market share of tractor-trailers increases to 40 percent. (4) Assuming that the ratio of trailers to tractors can be increased up to 2.0, and that the market share of tractor-trailers increases to 20 percent. (5) Assuming that the ratio of trailers to tractors can be increased up to 2.0 and that the market share of tractor-trailers increases to 40 percent.

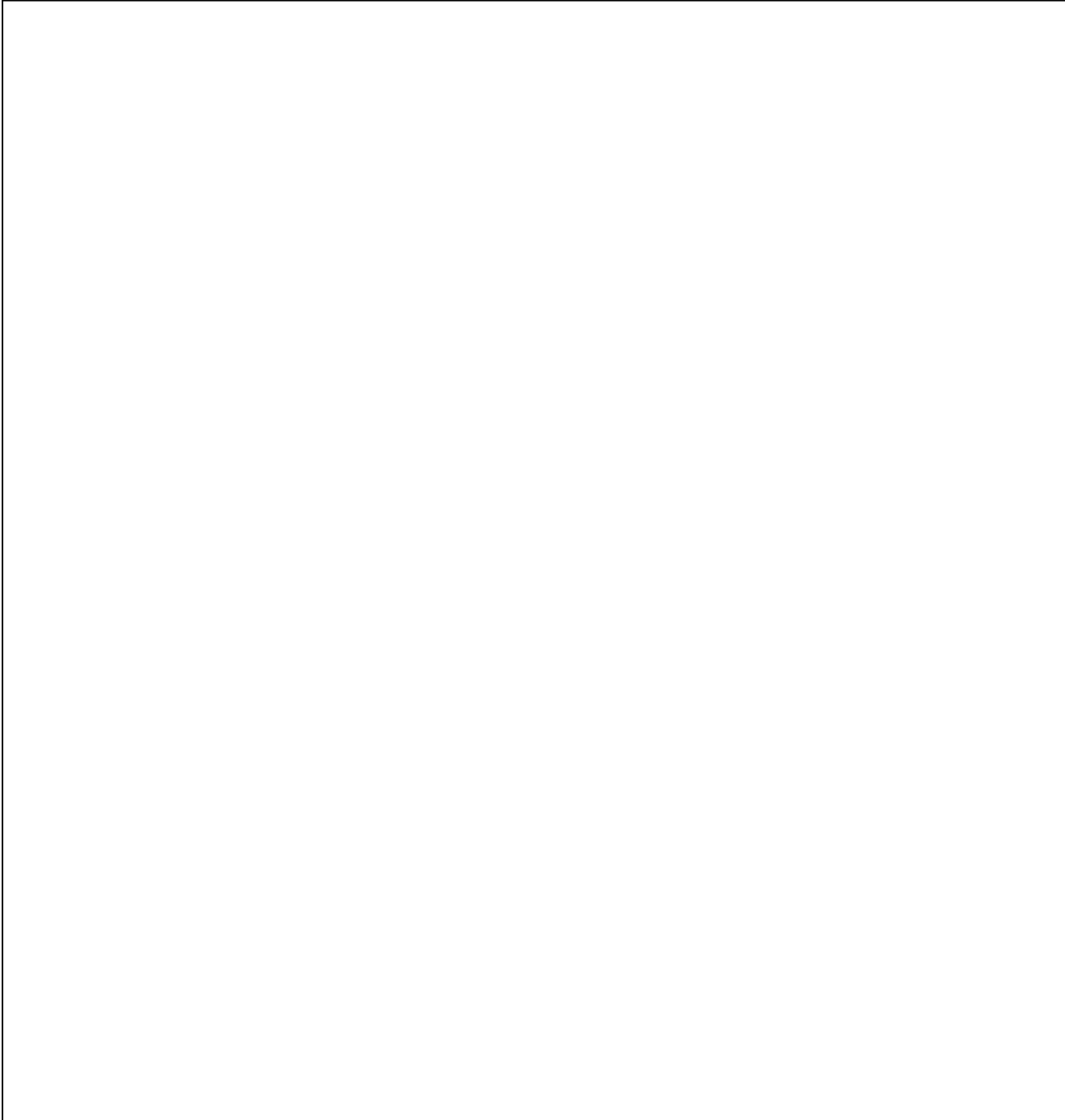
Source: Compiled by the World Bank using Clell Harral, Ian Jenkins, John Terry, Richard Sharp, The Efficiency of Road Transport in India: The Trucking Industry, WB Background Paper, 2003

1.50. A possible solution is to adopt a system like the European TIR Carnet developed by the UNECE to facilitate cross-border movement of goods. The system is described in some detail in the box overleaf. While the TIR was developed for use by vehicles crossing national borders, there is no reason why the concept could not be adapted to serve the needs of inter-state goods movements in India. The control issues facing various State authorities in India along a truck's inter-state itinerary are similar to those faced by national authorities at borders, and the costs and delays which the TIR was intended to eliminate are the same as the ones now faced by Indian trucks at these border crossings. It should be noted, however, that such a system would mainly be suitable for the movement of high value goods in closed trucks, which are the very cargoes most affected by frequent inspections and consequent delays at checkpoints. Shippers of such high value goods are also more likely to be willing to pay for the costs of the system. These costs would include the administrative costs of the system and the costs of underwriting the guarantees for the payment of various duties and fees applicable along the itinerary of the truck.

I.6 Trucking Safety

1.51. While road accident statistics are notoriously flawed and often conflicting, road accidents are unquestionably a grave problem in India — with a magnitude dwarfing the HIV/AIDS problem — and one which will get worse as levels of motorization rise from their

present very low levels. Best estimates by specialists place highway deaths in India at about 75,000 per year with an annual economic loss (excluding any allowance for pain and suffering) of approximately Rs.550 billion (US\$11 billion).¹² Trucks are reportedly involved in about half of all highway accidents, and a disproportionate number are caused by a relatively few accident-prone drivers. In the majority of cases (65%), rash and negligent driving is identified as the cause of the accident. However, it appears that those who cause accidents — whether rare or frequent offenders — very commonly escape the consequences. Driver training, licensing and labor conditions in the trucking industry, as well as strong deterrents to unsafe driving through the operation of the insurance system, are critical issues for the improvement of trucking safety.



Enforcement of Regulations

1.52. It is paramount that the Government takes action to enhance enforcement of existing regulations and laws — including road safety aspects, drivers licensing, axle load limits, and vehicle permitting — with the objective to reduce unsafe driving, improve vehicle utilization, and expedite cargo movement. Enforcement of various provisions of Motor Vehicles Act and Central Motor Vehicles Rules is often frustrated by use of fake driving licenses or Registration Certificates by many vehicle owners/drivers. This problem can be addressed to some extent by the computerization of RTO offices. Improved records keeping with full scale computerization to allow cross checking, is one important step. Some progress has been made concerning the control of fraudulent documentation. Standardized software for both back-end and front-end operations has been developed and made available free of cost to all the States, by MORTH. More than 10 percent of the existing RTOs have already done back-end computerization and many other RTOs are in the process of doing so. Soon, Smart Card based Driving Licenses and Registration Certificates will be issued with interoperability of the system throughout the country.

Trucking Labor

1.53. It is estimated that the trucking industry employs over 4 million drivers in India, and this number is likely to increase rapidly with the expansion of the highway network, and the consequent increased role of trucking in freight movements. However, unlike most other transport sectors (aviation, the railways, inland water transport or shipping), the conditions of labor, its training and licensing, and the penalties for negligent conduct are the least developed in the trucking sector. Some key information on the driver population and their conditions, based on a survey conducted in 1998, is presented in Table 1.10.

Table 1.10 Truck Driving Labor and its Conditions – Some Survey Data

Educational Level of Drivers:	Illiterate	20.06 %
	Literate	27.33 %
	Non-Matriculate	29.04 %
	Matriculate	21.86 %
	Graduate	1.71 %
Frequency of Returning to Base:	2 or less days	12.42 %
	3-4 days	18.89 %
	5-8 days	47.26 %
	More than 8 days	21.40 %
Night Rest Places of Drivers: (Percentages are based on the multiple choices indicated by respondents)	Roadside	24.24 %
	Petrol Pump	41.70 %
	Dhaba (roadside eatery)	74.84 %
	Other	6.69 %
	Any of the above	1.21 %
Average Driving Hours Per Day	4 or fewer hours	5.14 %
	5 to 8 hours	28.88 %
	9 to 12 hours	44.59 %
	More than 12 hours	20.39 %
Insurance Cover Carried	Only Third Party Liability	About 20 %
	Comprehensive and TPL	About 80 %

SOURCE: “The Indian Trucker and His Travails”, A. K. Bhattacharya, Business Standard, Month, Year.

1.54. The data in Table 1.10 have important implications for the development of the trucking industry and the Government's policies in the sector. With 20% of truck drivers illiterate, clearly driver training programs cannot rely solely on written materials for the training and licensing of truck drivers. There is a need to develop audio-visual training and testing materials in the local languages to serve the illiterate portion of the truck driver population. The survey data also indicates the importance of affordable arrangements for driver rest and relaxation. This should be an important consideration in highway facilities design. Safe and better controlled environments in rest areas, while improving driver performance, could also reduce the incidence of sexually transmitted diseases for which long distance truck drivers are second only to commercial sex workers, as the most important disease vector. That almost half of the drivers surveyed admitted to driving between 9 and 12 hours a day is also a cause for concern, and regulations requiring two drivers in the cab at all times may be the only way to ensure that a tired driver does not feel compelled to continue driving to meet a delivery schedule.

Insurance Issues in Trucking Safety

1.55. As clearly demonstrated in country after country, an effective insurance industry has a critical role to play in improving the safety of the road transport system. However, for reasons that are not entirely clear, the Indian insurance system has never assumed the pivotal role in highway safety that it has in other countries.¹³ Supporting law enforcement in imposing accountabilities for unsafe driving is, of course, not the only function of the insurance industry, but arguably it is its most important one from the perspective of public policy.¹⁴ The problems related to the insurance system are described in the following:

1.56. In liability insurance in India it is the vehicle, not the owner or driver, which is insured. Thus it is the vehicle's accident record that impacts on the experience rating aspects of the insurance premium. Since most accidents are due to the performance of either the driver of the vehicle or the owner who controls the driver, owners and drivers should bear the economic brunt of experience-rated premium increases if the driving or accident record is not good. As it stands now, it is a simple matter for an owner or driver with a bad accident record to replace the vehicle and thus avoid an adverse experience-rated premium increase. Experience-rated premiums should attach to the owner and to the driver of the vehicle.

1.57. In auto and truck liability insurance the policies do not have an upper liability limit while premium rates are controlled. The result has been loss ratios on truck insurance that exceed 100% by a wide margin,¹⁵ obviously decreasing any incentives the insurers may have to pursue such business. This is due in large part to government regulatory controls on premiums charged. Insurance industry representatives indicate that political lobbying by trucking interests has kept the premiums down. This constitutes an implicit subsidy to

¹³ Sundar Committee Report, Chapters 9 and 13. Much of the ensuing discussion draws heavily on these two chapters of the Sundar Committee Report, plus an interview with Shri KK Bhat (who was the member of the Sundar Committee from the insurance industry) and several interviews with trucking industry representatives in January 2003.

¹⁴ *Road Safety Guidelines for the Asian and Pacific Region*, Asian Development Bank, (1998).

¹⁵ The Sundar Committee (pp 75-76) reported that insurance claims outgo has on average been around 350% of premium income for Third Party Liability coverage, but only around 55% for the carrier's Own Damage coverage.

trucking, but one mainly realized by unsafe vehicle operators. Consideration should be given to allowing the insurance carriers greater flexibility to set policy limits and deductibles and to have more freedom in adjusting insurance rates on an owner or driver experience-rated basis. Some additional flexibility has been granted recently, whereby insurers can increase liability rates up to 400 percent of the base rate for a driver with a poor driving record, however, they cannot refuse to issue liability insurance.

1.58. Accident investigation and records-keeping are inadequate, and the insurance industry have either not been sufficiently motivated or empowered to compel improvements. Police are supposed to collect records relating to accidents, but according to the Sundar Committee, the Motor Vehicle Incident (MVI) reports mostly contain a statement that records were not produced, so it is not possible for the insurance company to prove any violation.¹⁶

1.59. The driver licensing system is badly broken. It is commonly stated that a majority of truck drivers have invalid commercial driver licenses. It is imperative for highway safety that the system of driver licensing function properly. This must include not only proper and reasonable driver qualification and testing, but also an open system so that insurers, vehicle owners and others with valid needs can get complete information on an individual driver's accident and violation record. This information will help insurers and truck operators get unsafe drivers off the road.¹⁷

1.60. In addition to accident liabilities, there are also problems in the cargo insurance area. The transporter is liable for cargo loss or damage though in most cases the prevention of that loss and damage is in the hands of the truck operator. While it is possible for the transporter to obtain carrier's liability coverage for the cargo, the insurance is high, and apparently is only available as part of a broader policy that is difficult or impractical for small transporters to obtain. The owner of the goods can obtain cargo coverage from insurers and usually does get such coverage on loss- or damage-sensitive cargo. In the event of a cargo loss the insurer pays the claim and then proceeds via subrogation to collect its loss from the transporters. This activity is only effective against the more financially established transporters; the small truck operators usually escape liability for their losses. Combined with the deficient driver licensing system, the ultimate result is both bad economics and bad safety performance. In conjunction with the overall reforms in this area, transporters should be allowed to buy individual cargo coverage for the goods in their (or their subcontractor's) possession on a basis that will draw insurance industry interest to that line of coverage.

1.61. A review of government policies that may inhibit India's recently privatized insurance industry from playing a much more prominent role in trucking safety is one of the more important and urgent policy actions that need to be considered by the government. The

¹⁶ Sundar Committee, p. 80.

¹⁷ It should be noted that, prior to 1986, truck drivers in the United States could obtain multiple licenses from different states and could conceal a poor safety record by keeping one license "clean" from any blemish. In 1986 a Federal statute was enacted which pre-empted the states' rights in this area and required a national registry of commercial vehicle operators in which they could have only one license, their "CDL." Even though the United States has had a shortage of long distance truck drivers, drivers with bad violation or accident records now cannot readily find jobs. See R. Sharp et al., "A Cross Country Comparison of Regulatory Reforms to Promote Road Transport Efficiency," Annex on Truck Safety Regulation (HWTSL Informal Technical Note, May 2003).

Sundar Committee did not fully appreciate the contribution made by the insurance industry to an orderly and safe trucking industry in other countries, and therefore did not lay sufficient stress on resolving the problems of the insurance industry in India. However, the Insurance Regulatory Development Authority (IRDA) has constituted a Committee headed by Shri Money which would be looking into these aspects. In view of its importance to the effective, from a safety viewpoint, regulation of the auto industry, and in particular its trucking sector, we have addressed issues in the auto insurance industry in some detail in Chapter 3.

I.7 Axle Load Controls

1.62. As noted earlier, the country's surplus of trucks and the industry's ownership structure, with a majority of trucks owned by small operators owning one or two vehicles, makes the road freight industry in India highly competitive. Consequently, the market operates at very low margins, with freight rates at times falling below operating costs. Given the pressures to turn a profit, and with lax enforcement of axle load controls, overloading of trucks is a widespread problem with axle loads often well in excess of the legal limit. Excessive axle loads have serious implications for the deterioration of roads, and for the funding required to keep roads maintained at an acceptable level.

1.63. The legal axle load limit in India is 10.2 tons, as amended by the central government in 1996 under Section 58 of the Motor Vehicles Act of 1988. However, most Indian highways, both national and state, were constructed for an axle load of 8.16 tons, the legal limit before the 1996 amendment. It has been estimated that strengthening this older network for the revised limit would require investments of Rs.20,000 cr to Rs.30,000 cr. Controlling axle loads is therefore critical to protecting these investments once they are made.

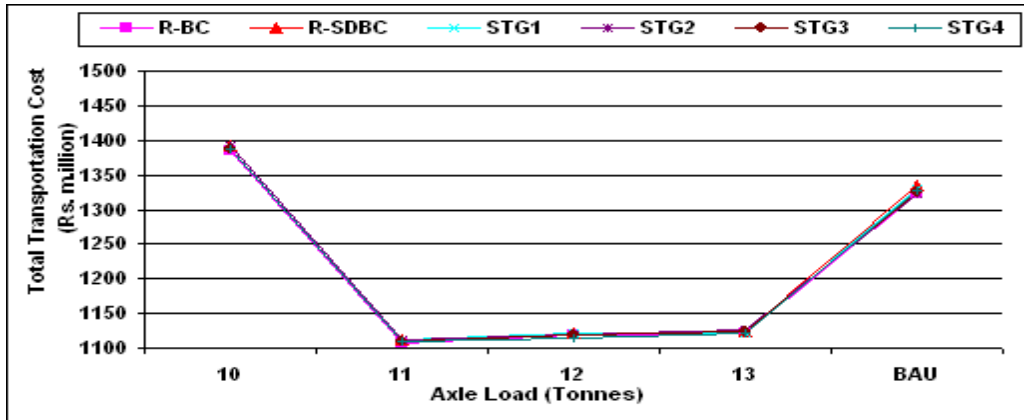
Optimum Axle Load Limit

1.64. *The optimum axle load limit* is defined as the value of the axle load limit which minimizes the cost of operating the vehicles, including the freight vehicles for a given tonnage of traffic, and constructing and maintaining the road network, such that the road condition does not deteriorate below an acceptable value of roughness. The damage caused by an overloaded vehicle increases exponentially (to the fourth power) with an increase in axle load, and consequently has a large impact on the condition of the road pavement, which in turn affects the operating costs of all vehicles on the road. To assess the optimal axle load under actual conditions, two road sections were analyzed based on detailed traffic and road condition data, which were used to simulate the effects of different axle load limits.

1.65. The two corridors, Agra-Bharatpur-Jaipur (NH) and Sirhind-Morinda-Ropar (SH), for which detailed data were available on pavement structure, traffic and axle-load distribution, were subjected to detailed study using the HDM-4 model to determine the optimum axle-load. The model was calibrated for each of the two cases to simulate the progression of pavement deterioration to reflect actual experience. The model was then used to determine the optimum maintenance policy to minimize the total cost for each case. The number of vehicles were calculated for the total tonnage using the axle-load distribution subject to varying axle load limits. The numbers of 2-axle trucks which carried less than 10 tons were kept constant. Similarly all MAV which carried less than 20 tons were kept constant. For all other vehicles the remaining tonnage was distributed equally among vehicles based on the defined axle-load limit to determine the number of 2-axle and MAV in the stream for the

given axle-load limit. The results of the simulation for road agency costs, vehicle operating costs and total system cost for various axle-load limits are shown below for the two cases.

**Table 1.11: Agra-Bharatpur-Jaipur National Highway
Agra-Bharatpur Section**



Bharatpur-Jaipur Section

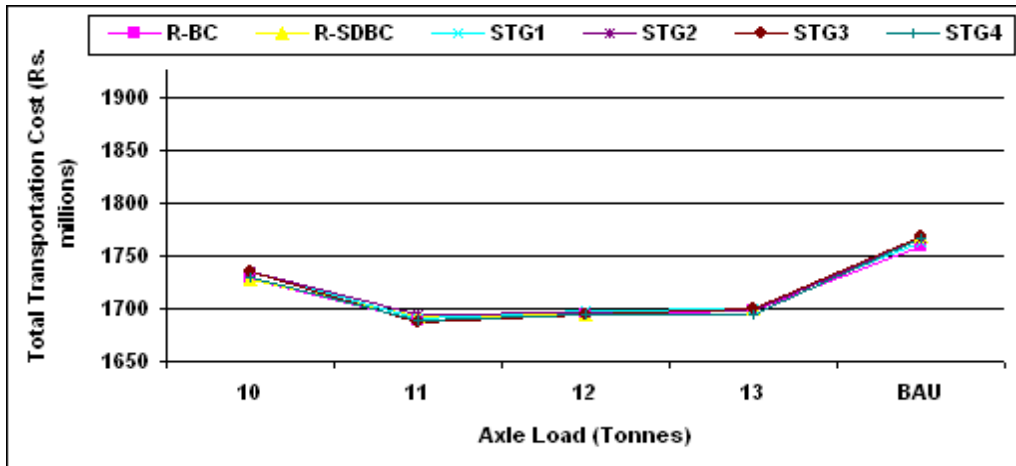
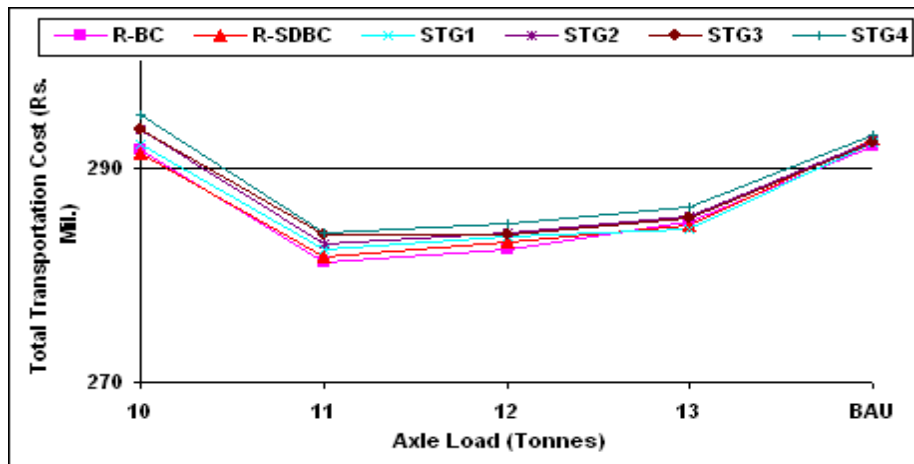


Table 1.12: Morinda-Ropar State Highway



SOURCE: Consultant's estimate.

1.66. From the above figures it appears that the optimum axle-load limit ranges between 11 and 13 tons. A higher axle load limit, while reducing the costs for vehicle operators would impose higher road agency costs for stronger pavements or increased maintenance expenditures. The present legal axle load limit of 10.2 tons appears to do the opposite, i.e. increase vehicle operator cost (per ton-kilometer) and reduce road agency cost more than would be optimal. Nevertheless, since a small degree of overloading, say 5 percent, would be treated leniently, operators could approach the optimal when necessary (high density loads) without excessive repercussions. Hence we might conclude that the present legal axle load limit of 10.2 tons is acceptably close to optimality.

Legal Framework for Implementation of Axle-load Limits

1.67. Overloading is an offence under the Motor Vehicle Act 1988, and is punishable with fines. The statutory provisions dealing with overloading are set out in Sections 113, 114, 194 and 200 of the Act. These are briefly described below.

- Section 113 limits the weight of each laden vehicle to its registered gross vehicle weight.
- Section 114 empowers the authorized officer of the Motor Vehicle Department to enforce the weighing of the vehicle and requires the driver to unload the excess weight at his own risk and cost.
- Section 194 punishes the violation of Section 114 through fines based on the amount of overloading.
- Section 200 deals with compounding of offences.

1.68. While these sections act as a deterrent to overloading, they do not have sufficient clarity and as a result different States interpret them differently. Many States at one time had issued a 'golden' pass to the vehicle operators allowing them to overload by paying an additional fee. The Act does not provide for minor infringements nor does it provide severe punitive action for really egregious infringements such as a refusal to allow inspection. Another difficulty with the present act is that even though Section 114 provides for unloading of the excess weight, the authority to enforce is confined to officials of the Motor Vehicle Department (MVD). Given the large area of a State and the limited capacity of the State MVDs, it is not possible for the MVDs to enforce the act effectively.

1.69. Specific amendments to these sections of the Act have been proposed (see Annex 3) and these are summarized below:

- Expand enforcement authority beyond officials of the MVDs, to include other duly authorized agencies of the State, e.g. State police.
- Distinguish between a minor overloading infringement (5%) versus more excessive overloading.
- Make abetment of overloading an offence, thereby enabling the punishment of entities beyond the trucker, such as the broker or transporter who organizes the load.
- Introduce the possibility of imprisonment for repeated offences.

Enforcement of Axle-load Limits

1.70. Enforcement of axle load controls, however, remains the most difficult challenge. This will require both investment in physical facilities, and introduction of appropriate procedures for inspection and the imposition of penalties. The following are recommended for enforcement of the axle-load limits:

- Involve the truckers associations in informing their members about the need to limit loading of their vehicles to the legal load and secondly in supporting the government in its enforcement efforts. The association could also be empowered to assist the operator unload and safely store any excess weight carried by vehicles detained at check points.
- Governments should set up permanent weigh stations at strategic locations to enable random, surprise checks on vehicles passing the weigh station when checking is underway. All vehicles found to be overloaded by more than 5% of the GVW should be detained and required to unload the excess weight before they are allowed to proceed on their journey. Sufficient space needs to be provided at the weighing stations to park overloaded vehicles for some duration. Facilities to unload/load the cargo, rest, etc. also need to be provided at these locations for a fee.

1.71. No detailed estimate of the needed investment in infrastructure has been attempted here. However, at approximately Rs. 2 crores per weigh station and with an average spacing between stations of around 100 km, the investment needed to protect the Golden Quadrilateral and its East-West and North-South diagonals would be around Rs. 250 crores. Considering the size of the investment protected this is well worth the expense.

Policy Changes to Encourage Use of New Technologies

1.72. As noted elsewhere in this report, the Indian truck fleet is largely made up of 2-axle rigid trucks with extremely outdated technology. Introduction of newer technologies is necessary for a number of reasons not least the need to reduce the excessive axle loads imposed by two-axle rigid trucks. However, for technological upgradation to occur two conditions need to be met — increased competition in the truck manufacturing industry, and changes in the cost structure to make the multi-axle truck more attractive to operators.

1.73. A set of incentives are needed to encourage the manufacture of modern multi-axle trucks. This could be achieved through differential tax treatments which recognize the lower costs imposed by vehicles incorporating features such as multi-axles, air suspensions, improved tyres, etc. This would help improve vehicle performance not just on axle loadings, but also on safety and driver comfort and productivity. Tax rates for such improved vehicles should be fixed at lower rates to encourage their use. For example the road tax on an MAV could be the same as for the 2-axle truck, rather than a linear function of the load carrying capacity, as at present, with in some cases even an increasing unit rate per ton of capacity. Similarly, road tolls could justifiably discriminate against two-axle trucks since they are the ones causing the most pavement damage.

II. INTER-CITY BUS SERVICES

2.1. Prior to the Road Transport Corporation (RTC) Act of 1950, road passenger transport in India was entirely provided by privately owned operators. However, the Government of India (GOI) was persuaded that the services on offer by the private sector up to that time were inadequate, and GOI in turn persuaded the respective state governments to directly provide public transport for urban as well as inter-city and rural services. The State Transport Undertakings (STUs) were granted monopoly franchises on key segments of the market, and, drawing on capital from the states as well as the central government, they grew several folds over the next three decades. By the time they reached their zenith in the early 1980s, they owned some 45 percent of the bus fleet in India. Up until that time, while the STU urban operations incurred losses, the rural operations generally covered operating costs. Thereafter operations of the STUs were increasingly politicized, they were used for more and more employment generation, fare discounts were offered to an ever widening body of special interest groups, and costs spiraled.¹⁸

2.2. The Motor Vehicle Act of 1988 reversed policy directions and encouraged greater reliance once again on private sector provision¹⁹ by liberalizing market entry in all market segments except for certain ‘nationalized’ stage routes where the STUs still retain some legal monopoly rights. The resurgence of private operators providing an increased range of services, and in many cases improved quality, in competition with the STUs further aggravated the latter’s financial problems. By 1991-1992 the STUs began to generate large deficits for rural as well as urban services, which reached more than Rs.2,200 crores (US\$ 440 million) overall in 1999-2000. Pushing for greater financial discipline and increasingly willing to rely on private sector solutions, the GOI has halted financial support to the STUs and encouraged state governments to do the same. The role of the STUs in inter-city transport is now receding throughout most of India, and several states (mostly in eastern India) now rely exclusively on private provision.

2.3. To bridge the gap between demand and supply, where the STUs have not met market demands, private operators have circumvented restrictive regulatory policies to operate clandestine services. Most of the private buses having Contract Carriage permits violate their permit conditions and operate as stage carriages. They compete with the multitude of smaller vehicles such as maxicabs, jeeps, vans and LCVs and tourist cabs, all of which operate freely without any regard to the permits they hold. These small vehicles do not adhere to any regulations concerning fares, routings or schedules, as their operations are fully flexible and can vary instantly with traffic demand. As a result India has a rather flexible inter-city passenger transport system, very responsive to the specific needs of passengers. It is unfortunate that this has been achieved at the expense of public law, typically leaving the licensed franchisee with the burden of the unprofitable mandatory public services and the government with that of enforcing the regulations.

¹⁸ M. Koteeswaran, “Policy Issues Concerning Road Transport” Association of State Road Transport Undertakings (undated, www.asrtu.org). See also M. Koteeswaran, “The State of the Public Transport” (paper presented to the Initiating Workshop for this study on January 8, 2003).

¹⁹ Consulting Engineering Services (India), “Privately Provided Inter-city Passenger Transport Services,” Report to the World Bank (June 2002).

2.4. In the next section we briefly examine the past and present role of the STUs, estimate the potentials for savings if the present legally monopolized STU ‘stage’ services were to achieve the same unit costs as private operators presently do, and consider measures to transition the STUs into a new structure to better meet future societal needs. In the third section we assess the present inter-city bus services provided by the private sector. The fourth and final section, considers the policy framework for inter-city bus services that could best serve the public interest.

II.1 The Role of the STUs Past, Present and Future

2.5. The RTC Act of 1950 created the STUs

“in the public interest and for public purpose... At that time, this State activity was not considered a business nor was profit a motive. Discharging social obligation providing basic facilities to the people at large was the prime consideration... The result was phenomenal. The villages that had never seen automobiles... saw buses on the roads to take them to places. At the time when the personalized motorized transport system was absent, the bus system integrated the villages and towns, the rich and the poor, the rural and the urban.”²⁰

Since then, circumstances have swung strongly against the STUs. The very purpose of the STUs has been twisted to serve the political patronage objectives of the state governments, both as a source of employment generation and as a source of patronage by fare discounts to wider and wider segments of the population (students, senior citizens, the handicapped, medical patients, freedom fighters, language fighters, etc). These concessions have cost the STUs hundreds of crores that have never been compensated by the state governments (although some STUs are reported to be compensated by government for these concessions).

2.6. Unit costs of the STUs have escalated because of high levels of redundant employees— with seven employees per bus on average — and the successful lobbying of the large labor forces that obtained wages that are now no less than three times the levels of that of private operators. The quality of service offered by the STUs has also failed to keep abreast of market expectations.

2.7. Nonetheless, the STUs still remain the largest players in the inter-city bus industry in most of India. In the year 2000-2001 they provided no fewer than 10.7 billion non-urban bus kilometers carrying a total of 375.1 billion passenger kilometers (pkm) of service. Continued reform of the STUs to better serve the public interest is thus a matter of vital concern.

2.8. It is to the credit of the Association of State Road Transport Undertakings (ASRTU) that much has been done to establish management information systems and make available to the public detailed information on the performance and costs of each of the STUs so that performance of each can be compared and judged accordingly.²¹ These benchmarking

²⁰ M. Koteeswaran, “Policy Issues Concerning Road Transport” Association of State Road Transport Undertakings (undated, www.asrtu.org).

²¹ *Profile and Performance*, a thick compendium with detailed statistics on every STU is published periodically by the ASRTU. Data for this report is drawn from ASRTU, *Profile and Performance 2000-2001*. It is not clear, however, to what extent the ASRTU independently audits the statistics reported by the various STUs to ensure accuracy or comparability.

systems not only help identify problem areas for management attention, they also create a kind of surrogate competition, which, though rather weaker than competition for survival in the market place, can nonetheless stimulate efforts to improve.

2.9. Before turning to an agenda for STU reform, we next assess the magnitude of the problem by comparing the average labor costs of STU operations with those of private operators and estimating the potential cost savings.

Reducing Costs of STU Stage Carriage Bus Services

2.10. The possible reduction in unit transport costs due to reducing the staff costs of State Road Transport Undertakings (STUs) has been estimated by comparing the vehicle operating costs for private and state operators²², and identifying where costs of state operators could be reduced to the level of those pertaining in the private sector. Only the effects of staff costs reduction are considered; other potential impacts from STU reform measures are not considered. The global impact is estimated by multiplying the possible unit cost reduction, per bus km, by the recorded bus km operated by the STUs.

2.11. The vehicle operating costs for stage carriage services in mid 2002 have been estimated as shown in Table 2.1 below. These are economic costs reflecting an estimate of the true cost to India, excluding taxes, subsidies, and other transfer payments.

Table 2.1 Economic Large Bus Operating Costs Non-Urban Stage Carriage Services, 2002

Item	State Transport Undertakings		Private Operators	
	Paise per km	%	Paise per km	%
Fuel	185	19	185	28
Lubricants	8	1	8	1
Tyres	34	3	34	5
Spares	44	4	42	6
Crew	319	32	105	15
Maintenance Labour	110	11	34	5
Overheads				
- Staff	122	12	42	6
- Tax	0	0	0	0
- Interest	34	3	44	6
- Depreciation	60	6	77	11
- Other (incl. profit)	75	8	128	18
Total Overheads	291	29	291	42
Total Expenses	992	100	700	100
Average Passengers per Bus	34		34	
Cost per Passenger km	29		21	

NOTE: (1) Assuming overall cost increase of 4% since 2000-2001 for STUs (the average increase found in Karnataka, Maharashtra and Uttar Pradesh). (2) Assuming for private operators, the number of staff per on road bus is 4.3 (2.5 crew, 0.8 maintenance and 1.0 other) and average monthly earnings per staff is Rs.3,500 (as reported in Privately Provided Intercity Bus Transport Services, CES, June 2002). Assuming average utilization is 100,000 km per year for stage carriage operation. (3) Assuming economic conversion factors described in Table 10 of the informal technical note on methodology, analysis and report preparation.

SOURCE: Consultants' estimate

²² Ian Jenkins, *et al.* "The Efficiency of India's Road Transport Industry: Modelling, Analysis, and Report Preparation" (HWTSL Informal Technical Note for World Bank, May 2003).

2.12. Future costs for the STUs have been estimated for three alternative sets of assumptions:

- Staff numbers are reduced to those levels pertaining in the private sector but the wage levels remain the same,
- Staff numbers remain the same but wages reduce to those pertaining in the private sector, and
- Both staff numbers and wages reduce simultaneously.

2.13. The results are shown in Table 2.2. According to this estimate the scope for reducing costs per km is greatest through reducing earnings rather than reducing staff. The overall potential reduction in passenger costs is 38% from Paise 29 to 18 per passenger km. The annual global reduction in bus operating costs has been estimated in Table 2.3 assuming that uniform reductions could be achieved for all the STU operations – both rural and intercity (including hilly regions).

2.14. The potential annual cost saving amounts to over Rs.40 billion (USD 800 million). Although this represents a substantial potential benefit to bus passengers, it represents a loss to the staff, so the potential overall economic benefit to India is less than this. In particular, reducing earnings per staff could be seen as a simple transfer from staff to passengers with little overall benefit to society (something that, even so, could possibly be justified on social redistribution grounds if bus passengers are perceived as generally less well off than bus staff).

Table 2.2 Estimated Potential Annual Cost Savings

Item	Current	Reduced Staff	Reduced Earnings	Reduced Staff and Earnings
Operating Cost (Rs. per bus km)	9.92	8.16	6.91	6.11
Bus km operated per year (million)	10,707	10,707	10,707	10,707
Annual Cost Saving (Rs. million)	n/a	18,844	32,228	40,794

NOTES: (1) Assuming staff numbers reduce from 6.6 per bus (4.3 crew, 1.3 maintenance and 1.0 other) to 4.3 (2.5 crew, 0.8 maintenance, 1.0 other). However, current labor laws may not permit such a large reduction in crew numbers. (2) Assuming average monthly earnings reduce 45% for all types of staff (from Rs.7,700 to Rs.3,500 on average). (3) Based on recorded km operated by STUs on non-urban routes in 2000-2001 (data coverage was 94.8% of the fleet so global benefits would be slightly higher than estimated above). (4) According to current plans the bus km operated each year would remain at current levels in future, so potential savings would not change from year to year.

SOURCE: Consultants' estimate

2.15. From the point of view of society as a whole, the way to achieve real net benefits is not by reducing earnings of staff but by redeploying the excess staff into other more profitable forms of employment. In this case, if the number of staff can be reduced as assumed above, the potential annual benefits would amount to almost Rs.19 billion (USD 380 million). However these benefits would not be achieved immediately due to the social problems caused by staff redundancy, pension and/or redundancy compensation costs and the need to respect existing labour agreements, a point to which we return below.

2.16. It must be noted that only part of these cost savings would be realized within the intercity bus market. Much of the bus market served by the STUs is rural rather than intercity in nature. The actual amount is almost impossible to determine due to the lack of a clear distinction between the two types of service. For the three sample states, the proportion of buses estimated to be operating intercity services constituted 30% in Maharashtra, 60% in Karnataka and 72% in Uttar Pradesh. If this represents a fair cross section of the STU fleet, the overall average would be about 50 %. So the potential benefits attributable to staff cost reductions in intercity operations would be 50% of those estimated above. The other 50% would be potential benefits in the rural bus market.

Reform of the STUs

2.17. The ASRTU has proposed a detailed agenda for reform of the STU sector, as summarized in the Box overleaf. We consider key facets of that proposal here.

2.18. Generally the thrust to corporatize the STUs as advocated by ASRTU and give them greater management autonomy with greater freedom from political considerations in day-to-day management is consistent with classic approaches to the reform of state owned enterprises. Where there are clearly defined goals and specific, monitorable targets (often in the form of an annual contract or business plan), *and* the managers are then actually given greater management autonomy to achieve those targets, this form of organization can result in improved management of resources and greater productivity.

2.19. However, experience shows that it is more often than not difficult to implement such schemes so long as government is still the main stockholder, and in recent years the further step of partial and then majority privatization in pursuit of greater efficiency has, of course, followed in many cases in many countries.²³ It is noteworthy that the ASRTU proposal [Items (b), (c), (d)] is also pointed somewhat in that direction, envisaging at least divestment of central government equity. Of even greater significance is the fact that at least four Indian states no longer have an active STU and instead rely entirely²⁴ on the private sector for provision of inter-city bus services. That seems the most likely outcome over time for many more states, but in the interim there are many steps that can and should be taken during the period of transition to improve STU performance.

2.20. It is an accepted principle of good governance, as urged by the ASRTU [items (n) and (o)] that any government that demands an enterprise meet unprofitable public service obligations should also be required to reimburse the enterprise for those services — provided, however, that the enterprise demonstrates that it is an efficient provider of those services. Accountability is greatest when the government that demands the services is the one that meets the bill; discipline is lost if a different level of government (often the center) is expected to meet the obligations demanded by another level (often the local government). That central government no longer financially supports the STUs but leaves this to state and local governments that demand the services is a move toward better governance.

²³ Shirley May and John Nellis, *Public Enterprise Reform: The Lessons of Experience* (World Bank, Economic Development Institute, 1991); Nasir Islam, "Public Enterprise Reform: Managerial Autonomy, Accountability and Performance Contracts," *Public Administration and Development*, Vol. 13, pp. 129-152, May 1993; Ian Duncan and Alan Bollard, *Corporatization and Privatization: Lessons from New Zealand* (Oxford University Press, 1992).

²⁴ Private operators are now said to be using bus terminals and other facilities previously provided for the STU.

ASRTU - AGENDA FOR REFORM OF STATE TRANSPORT UNDERTAKINGS²⁵

Excerpt from “Policy Issues Concerning Road Transport”

The following steps are suggested for improvement in public passenger transport system and restructuring the STUs.	
a)	The Road Transport Corporations Act may be repealed.
b)	The State Transport Undertakings under RTC Act, the Municipal and Departmental Transport Undertakings may register themselves as public limited companies under the Companies Act.
c)	The existing capital contribution (where applicable) made by the Central and State Governments be converted as equity in the new Company by allotting shares to the Central and State Governments.
d)	The Central Government may opt to disinvest its shares.
e)	The existing interest outstanding to the State Governments also be converted as equity shares.
f)	The existing properties held by the STUs are revalued at market rates.
g)	To start with the debt equity ratio is adjusted at 3:1.
h)	The State Governments may contribute a minimum of 25% of the total value of the assets and continue to maintain the owners’ fund at 25% level i.e., for every four buses purchased one bus shall be out of owners’ fund.
i)	State Governments may also provide an equal amount as long-term loan at 6% repayable in 12 years with 2 years’ moratorium.
j)	The STU may classify the routes it is operating into three categories as
	i) Yielding 105% and above of the total cost per km.;
	ii) Yielding between 95-105% of the total cost; and
	iii) Those yielding less than 95% of the total cost.
	Or it may perform a cost recovery analysis to identify those routes where it incurs cash losses.
k)	The State Governments may nominate the STU in each region to be the exclusive Provider of Passenger Transport Service and may authorize them to adopt one of the following models such that the region under the company’s control is efficiently and effectively networked and bus services are well co-coordinated so that citizens are able to secure public transport at an affordable cost with satisfactory levels of comfort, frequency, reliability and safety with due accountability.
l)	The STU may auction bundles of routes, each bundle containing judicious proportions of profit and loss making routes or auction only profit making routes or secure services under kilometer scheme to operate on the loss making routes.
m)	The STU may also ensure that in each region it retains its presence by operating its own services but not in competition with the private operators.
n)	The State Government shall reimburse in full to the STU the loss on account of concessions extended by the State.
o)	The State Government shall also reimburse the STU the difference between the collection made in the kilometer scheme by operating on loss making routes and the actual cost of operation paid by the STU to the private operators.
p)	The STU may augment its revenue by diversification into estate development through BOT and by commercial exploitation of other infrastructure which it may create like parking lots, driver training schools, terminal facilities, services to private operators, technical consultancy etc.
q)	It may also carry out periodic traffic and transportation studies for development of new routes; to make existing routes more profitable; resolve disputes between private operators; assess the correct cost of compensation and build data bank; set targets for citizens charter and publish the same; open and maintain public grievances cells; and promote and exploit Intelligent Transport Systems.
Source: www.asrtu.org	

²⁵ Excerpt from “Policy Issues Concerning Road Transport”, By Dr M Koteeswaran, Executive Director, Association of State Road Transport Undertakings

2.21. The main difficulty in implementing such a principle - in this context as in so many others - is in demonstrating that the provider, in this case the STUs, is an efficient provider. So long as STU costs greatly exceed the costs of alternative providers, as they clearly do, the argument for subsidized capital [items (g) through (i)] for reimbursement of STU losses on specific services may be viewed as subsidies to continued inefficiency — the tax payers, like the bus riders, would merely be subsidizing above-market wages and excessive workforces of the STUs.

2.22. At least in the case of inter-city services, which are inherently the most profitable, the case for subsidized routes [item (l)] is at best weak; most if not all inter-city services should be able, and should in practice, pay their full costs. Our assessment of this market is that private capital is ready, willing and actively investing to meet market demands. There is not a market failure argument in favor of government intervention.

2.23. The proposal [items (j) through (m)] to classify routes, and bundle route segments so as to cross-subsidize unprofitable segments from protected profitable segments, is unwise, probably unworkable, and in any case unnecessary, in the case of inter-city services. *It is unwise*, first, because it is basically a mechanism for generating excess profits to cross-subsidize excess costs by restricting competition, where the appropriate solution is to open competition to force more efficient solutions; second, it distorts market decisions by exaggerating the costs of certain services and understating the costs of other services. *It is unworkable* in the absence of very tight constraints on market entry — as demonstrated countless times over the years in many contexts — as it creates strong incentives for cream-skimming competition for the most profitable services. That typically leaves the licensed franchisee saddled with a heavy burden of unprofitable services and the government saddled with a heavy regulatory burden. Not least, in the case of inter-city services *it is simply unnecessary* because the evidence is that those services are sufficiently profitable to support unrestricted competition. Nor is there an economic rationale to justify forcing inter-city travelers to help pay for either rural feeder services or urban services.

2.24. The proposal that the STUs should act not only as an operator but also as the government regulator [items (k) and (q)] would create an egregious conflict of interest and an unacceptable moral hazard with the prospect that the STU would act first to protect itself from unwanted competition on the profitable routes. The present circumstances are that there is too little competition for the stage carriage routes, many of which remain nationalized, i.e. the legally protected monopoly of STUs.²⁶

²⁶ In this context, it is interesting to note that in Karnataka and Uttar Pradesh the proportion of total market offerings of seats offered by the STUs vs private operators has been higher on the profitable inter-city services (respectively 22:78 and 26:74 percent) than on the rural services (respectively 19:81 and 14:86 percent). Of the three states receiving particular attention in this study, only Maharashtra STU offers a higher percentage of the market in the rural segment (54:46) than in the inter-city segment (39:61). Consulting Engineering Services (India), “Privately Provided Inter-city Passenger Transport Services,” Report to the World Bank (June 2002).

Competition, Restructuring, and Privatization

2.25. If the primary objective is the best quality service at the lowest possible cost, the long-run strategy will be to move the STUs to majority private ownership in competitive markets as early as possible. Arguably, competition is more important than privatization. However, so long as there remain large labor forces employed by publicly owned carriers with high unit costs, the political and market pressures to restrict competition to keep tariffs high to protect the least efficient carrier will remain strong, and this will protect not only the STUs but also serve as an umbrella to protect marginally efficient firms in the private sector as well — all at the expense of higher fares for bus users or higher taxes for the citizens at large.²⁷ In contrast to the idealistic motives of those who helped create the STUs — and undoubtedly many who are still engaged with them — the public investment that was intended to provide improved transport for a generally disadvantaged public has instead been diverted primarily to the benefit of the relatively advantaged workforces of the STUs.

2.26. Given the magnitude of the labor engaged by the STUs²⁸ —their total labor force numbers more than 700,000 — and their present unprofitability, privatization will not be accomplished overnight. However, delineation of a clear restructuring plan to transition toward that goal with the full participation of the major stakeholders can provide essential foundations, allay unwarranted fears in the short run, and facilitate orderly movement toward the ultimate goal.

2.27. A central element of this plan will be a labor downsizing, retraining, and re-employment program. This can be accomplished over time by natural attrition, by not replacing employees as they retire or leave for other employment opportunities; by offering early retirement incentives that accelerate the process; by job retraining (either for outplacement or to fill different jobs within the STU as vacancies develop); and by offering improved termination grants. Such measures can assist both in cushioning the personal impact on the affected employees and in providing well equipped labor to meet the broader economy's labor needs.

2.28. By now there has been vast experience with this sort of enterprise restructurings and privatizations around the world,²⁹ and the World Bank has been involved in a large number of them. It can provide not only technical assistance for planning these activities, but also in certain circumstances capital funding for retraining and re-employment aid programs, early retirement schemes, and other measures to assist in the transition.

²⁷ Christopher D. Foster, *Privatization, Public Ownership, and the Regulation of Natural Monopoly* (Oxford University Press, 1992).

²⁸ Some of the larger STUs have more than 100,000 employees; for example, Maharashtra State Road Transport Corporation (MSRTC) reports 112,116 employees.

²⁹ See, for example, David H. Fretwell, Jacob Benus, and Christopher J. O'Leary, "Evaluating the Impact of Active Labor Programs: Results of Cross Country Studies," World Bank Social Protection Discussion Paper No. 9915 (June 1999); Gopal Joshi (ed), *Privatization in South Asia: Minimizing Negative Social Effects Through Restructuring* (International Labour Organization, Geneva, 2000); Kaushik Basu, Gary S. Fields and Shub Debgupta, "Retrenchment, Labor Laws and Government Policy: An Analysis with Special Reference to India," Cornell University (undated); and Antonio Estache, Jose Antonio Schmitt de Azevedo, and Evelyn Sydenstricker, "Labor Redundancy, Retraining and Outplacement During Privatization," World Bank Institute Policy Research Working Paper 2460 (October 2000).

II.2 Private Inter-City Bus Transport

2.29. In recent years the private sector has won back a rapidly increasing share of the road passenger market, and in a few states private operators have already entirely supplanted state-owned services; only Andhra Pradesh reportedly has as yet no substantial private bus competition to the STU. Private bus operators have also established a new standard of service in long-distance inter-city services (particularly in Southern India), while the market for shorter-distance transport is being transformed by the introduction of modern small to medium (10-18 passenger) buses, which operate more efficiently on the rural routes. In other states, a policy of hiring private buses by STUs to supplement their fleet strength and to operate under STU management on still-nationalized routes has recently been introduced. Altogether, from a low of about 55 percent of the bus fleet in 1981-1982, by now more than 80 percent of the nation's bus fleet is reportedly in the hands of private owners.

2.30. However, far less is known about the private bus carriers who are now thought to meet about three-fourths of the bus transport demands in India than is known about the STUs that provide about one-fourth. That is partly because, in competitive markets without market distortions, the economic characteristics of the industry — few economic or technical barriers to entry and few economies of scale to firm size — dictate an atomistic industry comprising many very small suppliers who have little need for complex management information systems — in contrast to the huge state owned enterprises that comprise the STUs, which came about solely because of government intervention. Confidentiality of information in such competitive markets is also normal management practice.

Study of Private Bus Transport in Karnataka, Maharashtra, and Uttar Pradesh

2.31. To address the gap in available information, the World Bank in 2002 commissioned Consulting Engineering Services (India) Pvt Ltd to carry out a study of private bus operations in the states of Karnataka, Maharashtra, and Uttar Pradesh. The study³⁰ included primary surveys encompassing 63 bus operators and 4,302 bus users; in addition 128 passenger terminals in the three states were surveyed. The study was confined to inter-city and rural bus transport; urban transport was excluded. A summary of the findings is given below:

- In both rural and inter-city segments of the passenger transport market, stage carriage operations are still predominant. Restrictions are reported with respect to *grant of permits*, both in nationalized and non-nationalized areas, yet the STUs neither expand their fleet nor generally officially allow private operators in the nationalized areas. Although recently, in some cases private buses are being recruited under STU management under the km scheme.
- To bridge the gap between demand and supply, clandestine operations has thus become a rule rather than an exception. In reality the markets are increasingly competitive. Most of the private buses having Contract Carriage permits violate the permit conditions and operate as stage carriages. They also have to compete with the multitude of smaller vehicles such as maxicabs, jeeps, vans and LCVs and tourist cabs, all of which operate

³⁰ Consulting Engineering Services (India), "Privately Provided Inter-city Passenger Transport Services," Report to the World Bank (June 2002); hereafter cited "CES Study".

without any regard to the permits they hold. These small vehicles do not follow any regulations either in fares, on routing matters or in timings of operation, and their operations are fully flexible and vary instantly with traffic demand. In sum, where the STUs have not met market demands, the market is working around the failures of the government instruments — the STUs and the restrictive policies designed to protect them— to meet societal needs (albeit illicitly).

- In certain states, *both maximum and minimum fares and in other states specific fares are fixed, having due regard to physical terrain, road surface, type of service, area of operation... and volume of traffic.* It is, however, unclear to what extent fare regulations are observed; the CES survey reported conflicting results. Probably the true situation is a mixed pattern, with the degree of adherence to statutory fares depending on how closely those fares happen to match the market equilibrium prices at the specific time and place.
- The most striking finding of the CES study is that by a rather large majority bus users in the three states now appear to be reasonably satisfied with current bus services, as offered by both private operators and the STUs, although noticeably less satisfaction was expressed in Uttar Pradesh in certain respects. Between 63 and 70 percent of the users considered *the vehicle condition and overall quality of service* satisfactory or good; only in two districts of Uttar Pradesh did as many as one-third consider it bad. As to *frequency of service*, more than 90 percent in Karnataka and Maharashtra and 70 percent in Uttar Pradesh considered the situation satisfactory or good. On *seat availability*, more than 90 percent in Karnataka and Maharashtra considered the situation satisfactory or good, and in Uttar Pradesh the corresponding number was 80 percent, although 16 percent considered it bad. *Fares* were rated as satisfactory or good by over 90 percent of the users in all three states.
- With respect to *terminal facilities*, in Maharashtra 82 percent and in Karnataka 61 percent of bus riders rated them good or satisfactory, but in Uttar Pradesh, fully 69 percent rated them bad and only 10 percent considered them good. Typically private operators are not given access to the main terminals, which are controlled by the STUs.
- With respect to *users' opinions about competition*, they generally viewed competition favorably as it has resulted in more frequent service, more choice of modes (stage, contract, and tourist bus services, maxicabs and taxis) and a wider range of level of comfort to choose, better availability of seats, and more competitive fares.

2.32. One must be cautious in extrapolating from this brief survey of passengers in three states to the rest of India. However, we do know that markets normally work well when there is substantial competition, and less well where competition is limited for whatever reason — whether due to government restrictions on entry or fares, or natural economic factors that limit competition, such as thin markets where revenue potentials are less than costs of service provision, even for the most efficient producers. Fortunately, there is a wide array of technologies available to adapt to the characteristics of the diverse markets for road passenger transport — which vary spatially, temporally (by the seasons of the year, the hours of the day, and by degree of comfort (availability of seating, air conditioning) for those who can afford it. As noted above all of these (large, medium and small buses; maxicabs, cars,

trucks; standard, deluxe, super deluxe, air conditioned classes) are being deployed in the market to meet the demands of specific micro-markets.

2.33. We would therefore expect to find much the same conditions throughout India where the scale of the market is generally sufficient to attract competitive private providers of one form or another, except where significant, persisting market distortions — either those introduced *and enforced* by the Governments or by the efforts of private parties to twist the markets to their own advantage.

II.3 Revamping Government Policy to Better Serve the Public Interest

2.34. Governments have multiple (oftentimes conflicting) objectives and are universally constrained by resource availabilities. In the case of passenger transport, *equity considerations* may weigh as heavily, or possibly even more heavily, than economic efficiency. Equity considerations in this case include the concept that bus riders throughout a state (or particular sub-region thereof) should pay the same fare regardless of costs of providing the specific service³¹ and also the concept that certain groups in society (e.g. retired persons, school children, military personnel) should enjoy significant fare discounts. It is reasonable to infer that such equity considerations were key factors in the original decision by the GOI to establish the STUs in 1950, and the concomitant decision to restrict licensing for stage services as a monopoly for the STUs in order to create profitable routes that could cross-subsidize the unprofitable routes where the standard fare was in fact below the costs of service.³²

2.35. Such structures, which were quite common around the world at one time, have generally proved difficult to sustain, as the market disequilibrium thus created offers a very great temptation to private providers to enter the market in cream-skimming competition. As noted above, that has typically left the licensed franchisee saddled with a heavy burden of unprofitable mandatory public services and the government saddled with an ostensibly heavy regulatory enforcement burden — that in India has, of course, as we have seen, been circumvented by the market, undoubtedly aided from time to time by illicit payments to encourage enforcement officers to look the other way.

2.36. From an economic perspective it is fortunate that the market has managed to circumvent these restrictive regulatory policies, as the result is a more flexible transport system, more responsive to the specific needs of the passengers and the Indian economy. However, from the perspective of public governance, having government regulations flaunted so openly undermines the public's respect for law and order more generally.

2.37. In this context, the appropriate public policy prescription is to remove quantitative economic regulations restricting market entry, and instead allow markets to determine what

³¹ As in the bus official fares fixed by Karnataka and Maharashtra states, which are ostensibly applicable across the entire respective states. The fares fixed by Uttar Pradesh state at least attempt to reflect terrain and road condition.

³² The policy of Indian Railways in keeping railway fares far below even the variable costs of provision—to the extent that the railways are clogged with unprofitable passenger traffic and have had to forfeit other profitable traffic which the railway would be expected to carry far more cheaply than the modes now carrying it—also suggests that equity considerations of a kind in fact weigh more heavily to the Government of India in determining passenger transport fares than efficiency considerations.

services will be offered. At the same time, qualitative regulations to ensure safe, reliable services, and environmental protection, should be further developed and seriously enforced. In this manner the government could best ensure well functioning markets that provide the array of services the various market segments demand and at least cost.

Deregulation and Facilitation of Private Sector Entry and Competition.

2.38. With a view to creating a market in which passenger services of various types and size compete with each other, unassisted, policymakers in India should be concerned with putting in place a proper regulatory environment, and expanding the role of the private sector within this environment. In particular: (i) regulations that internalize social costs, such as those related to the environment, safety and congestion, so that the market can allocate resources in a socially desirable way; and (ii) regulations that establish basic rules for fair competition should be developed and implemented. The required reforms and changes in regulatory policy, necessary to promote public safety as well as low fares, have not yet taken place in all states. Without reform, private sector finance, maintenance and operation of passenger services is likely to continue with some undesirable consequences.

2.39. *Introducing Fair Competition*³³. There are many ways of introducing fair competition in service provision to the inter-city passenger transport markets in India. Route franchising is a means of maintaining some public control over the level of services and prices in the public passenger transport market, while using competitive forces to secure supply at the lowest cost. This can apply to non-remunerative bus services alone (as in most of the United Kingdom) or for all services (as in London and in Costa Rica); with the supplier either carrying only the cost risk (as in some cases in the United Kingdom) or carrying both the cost and revenue risk (as in New Zealand). Where fragmented competition is not possible because of the indivisible scale of operation, market disciplines can still be employed by competitively concessioning facilities or systems. This has been applied to the management of urban bus systems, particularly in francophone Africa.

2.40. Competition between groups within a licensed franchise system can be promoted by ensuring that the routes for which monopoly franchises are granted overlap sufficiently to encourage competition for customers on common sections of route. This approach is practiced to secure competition between different bus operators' associations in Buenos Aires and other Latin American cities and between operators of different kinds of public transport vehicles in some African countries. This form of competition makes it possible to some degree to organize supply, and limits anti-competitive operating practices, as long as there is a competent franchising authority to prevent the emergence of a single strong cartel.

2.41. Competition between modes can be effective where demand is dense and varied, as exemplified by the role of privately operated minibuses in Hong Kong and Dakar. Some flexibility towards the introduction of new categories of services at higher prices may be a means of reconciling the maintenance of a basic low fare with the provision of adequate total capacity and a sufficiently varied range of price/quality combinations to meet demand. Within regulated systems, this can arise by design as in the "two-tier" bus systems in Seoul or Shanghai. A system allowing a range of services to be provided legally by the informal sector may be less susceptible to the sprouting of illegal services.

2.42. *The Case for some Regulation.* There are two reasons why it may be desirable to retain some public regulation of the right to supply public transport in the inter-city bus markets. First, regulation may be desirable in some cases where an unregulated market process may result in: (i) matching of schedules (in local bus markets); (ii) increased pressure to engage in dangerous practices, such as racing of buses (often increasing accident rates as with the “red buses” in Delhi); and (iii) perceived losses in the stability and reliability of service, with losses in customers and reductions in vehicle occupancy, as occurred in the bus markets in some British areas after deregulation. Second, while cost reductions resulting from unfettered competition may allow previously unprofitable services to continue, and may even lead to more frequent services being provided on previously non-remunerative routes by using smaller vehicles that are more suited to low demand, sometimes social objectives may require direct financing of some services that might otherwise be lost through competition in the market. For example, the elimination of cross subsidies may reduce supply or increase the prices of services affecting the very poor, as in the case of rural bus services in Sri Lanka. In such situations, making markets “contestable”, through competition for the right to provide subsidized services at least cost, will still allow non-remunerative services to be provided at the least real cost. All of these defects of the market process may require qualitative controls but not necessarily monopoly franchises and never direct state involvement in service provision.³⁴

Monitoring for Anti-competitive, Cartel/monopoly-type Behavior of Companies

2.43. In an unregulated market, profit may be sought through the creation of an operators cartel, as occurred in the bus industry in Santiago, or by operators combining with suppliers of terminals or other infrastructure to exclude competitors from access to crucial facilities. Controlling anti-competitive behavior requires a regulatory institution to prevent the acquisition and exploitation of excessive market power.³⁵ In practice, the regulation of cartels is not a simple task as some forms of combination, such as operators associations in public transport (for example, in Buenos Aires buses) may actually contribute to the efficient workings of the market.³⁶ Even without cartels, wherever there is a financially strong incumbent in a market, there is a danger that anti-competitive predatory behavior will occur. The most efficient markets for road transport operations normally comprise very large numbers of very small producers, and government policies should in any case avoid trying to bias market determination of firm size. Only if, contrary to expectations, some firms or associations of firms, grow so large as to threaten the competitiveness of specific sub-markets, is it necessary for anti-monopoly authorities to intervene.

2.44. Also in the case of India, since larger firms cannot be expected to be more efficient providers in road passenger transport, it may be advisable to accompany deregulation with a restructuring of STUs into a number of smaller firms to curtail their market power. Ownership could be fragmented if necessary by sharing ownership of assets with employees.

³⁴ Darbera, R. 1993. “Deregulation of Urban Transport in Chile: What have we Learned in the Decade 1979-1989?” *Transport Reviews* 13 (1): 45-49.

³⁵ Henry, E. and R.S. Pacheco. 1994. “Relations de pouvoirs entre entreprise d'autobus et tutelle: re flexions à partir du cas du Brésil” in X. Godard (ed). *Les transports dans les villes du Sud*. Paris: Karthala. Quoted in World Bank, *Sustainable Transport*, 1995.

³⁶ Armstrong-Wright, A. and S. Thiriez. 1987. “Bus Services: Reducing Costs, Raising Standards ” WB Technical Paper 68, World Bank, Washington DC. Quoted in World Bank, *Sustainable Transport*, 1995.

Competition would then be subject only to general oversight by the competent national authority responsible for ensuring fair competition.

II.4 Recommended Public Policy for Inter-City Bus Services

2.45. The specific steps recommended are detailed in Table 2.3, and summarized below :

(a) To establish a true level playing field for competition, it will be necessary to restructure the State Transport Undertakings as outlined above to make them far more efficient, and probably to divide them into smaller units to curtail their market power.

(b) Monopoly restrictions on stage routes, including current restrictions on interstate stage carriage under bilateral agreements, should be removed by allowing free entry; only technical qualifications related to safe provision of services should be required.

(c) Terminal facilities should be opened to private operators on a pay-for-use basis. Where the capacity of these facilities is inadequate, a mechanism for periodic auctioning of slots could be instituted by an agency independent of the STU.

(d) Motor vehicle tax should be imposed on a common basis. The present system imposes passenger tax (as a portion of fares) on formally certified operators and increases their marginal tax rate above that of the public sector (lump sum per vehicle tax). A practical approach would be to tax all operators on a per vehicle basis.

(e) Some vigilance will need to be exercised against the efforts of either the restructured STUs or larger private carriers to monopolize the market or support formation of carrier associations or cooperatives that become cartels in specific market segments. The independent agency referred to in (3) above, could also serve this function of ensuring competition, preferably in the market, and where that is not feasible, by concessioning franchises that are contested periodically.

2.46. In the absence of any strong economies of scale to firm size, the dangers from monopolization or cartelization in the sector arise primarily from the efforts of the STUs to maintain their privileged, protected position or inappropriate government policies that would seek to lend market power to larger firms, cooperatives, or cartels than they would naturally have. In the CES Study in 2002, just as in the 1999 landmark Sundar Committee report on *Trucking Operations in India* — and also as in India's various Five Year Plans from the beginning more than 50 years ago — there is a marked preference by Indian analysts and policymakers alike for the government to stimulate the formation of larger companies in the bus and trucking industries. That is apparently due in part to the perception that there are substantial economies of scale to firm size in these industries — a point that is not generally sustained in the wider economics literature.³⁷ (The preference would appear at times also to

³⁷ The risk of market distortions due to the presence of scale economies relates to the structure of the bus industry. Some analysts note that after UK's bus deregulation, there was a significant reconcentration of the bus industry after an initial period of expanded entry, accompanied by fare increases. This was attributed to the hub-and-spoke structure of the UK bus industry developed under regulation which gave the large network carrier cost advantages over independents, plus the ability to foreclose competitors by providing inferior terminal access. By contrast, the US bus industry, although characterized by a single nationwide private carrier and numerous small local and regional carriers, has seen low prices and frequent price wars. This difference in

be due in part to the perception that larger firms are better organized and would provide government policymakers with better, more extensive information on which to base their policies — which, if true, would constitute an inversion of the proper relationship of policymakers to the market.)

Table 2.3: Recommended Policy actions for Inter-city Bus Services

Area	Policy/Reform Actions
Promote corporatization or commercialization of STUs and diversification of ownership	<ul style="list-style-type: none"> • Develop a restructuring and commercialization program for STUs • Develop a labor downsizing, re-training and re-employment program for STUs • Explore mechanisms to provide financial support for fleet modernization² • Eliminate subsidies (direct/ indirect), to STUs • Create an independent board of directors for each STU to hold management accountable; • Diversify STU ownership¹: <ul style="list-style-type: none"> -Offer stock ownership to employees -Convert long-term bank loans into stock
Formulate and implement competition policy	<ul style="list-style-type: none"> • Draft guidelines to indicate trade practices regarded as unfair or anticompetitive • Draw up regulations to restrict unfair practices and anticompetitive activities • Select agency responsible for monitoring and enforcing competition rules and ensuring access to common use infrastructure facilities. • Compile price information based on the tariffs filed (by operators) and disseminate aggregate data to the public so the market can function more efficiently
Establish a more flexible regulatory framework so bus operators can respond to changing market conditions more swiftly.	<ul style="list-style-type: none"> • Remove monopolies on state routes • Implement a uniform tax system on a per vehicle basis • Modify existing regulations to deregulate fares³ • Review current vehicle inspection system and coordinate efforts so as to eliminate any duplicated regulations/facilities • Implement regulation concerning safety and environmental impacts

Notes: (1) In some areas where immediate corporatization or commercialization may not be feasible due to the inadequate safety net and lack of legal framework, diversification of ownership should be pursued.

(2) This would include encouraging the creation of financial instruments (such as leases and equipment trusts and certificates) designed to provide the industry with private capital.

outcomes may reflect the linear organization of the US bus industry, where most routes are single bus point-to-point services. With few scale economies, regional competition from small carriers along individual routes is intense and there are few indications that market power by the largest carrier is of any concern.

See Richard G. Sharp, *et al.*, “A Cross Country Comparison of Regulatory Reforms to Promote Road Transport Efficiency” (HWTSL Informal Technical Note, May 2003).

(3) Shifting the setting of rates from the Government to a system where operators set prices and file tariffs with transport authorities. The latter would take action only when tariffs grossly deviate from the rates on file and use their market power to discriminate against specific customers.

2.47. The appropriate focus of regulatory policies in the case of inter-city bus services should be qualitative standards related to ensuring, first, the safety of the services, and, second, the minimization of negative environmental impacts. Safety dimensions encompass vehicle road worthiness standards (brakes, steering, tires, visibility, lighting and signaling), driver qualifications and working hours, and avoidance of excessive overloading (riding on the outside or top of buses as happens from time to time in India is not conducive to safety). Unfortunately, in India these beneficial regulatory dimensions are also not generally enforced for the same reasons that economic regulations are not generally enforced, i.e. transport operators generally find it more advantageous to make “facilitation payments” to the transport authorities. In contrast to quantitative regulations, qualitative regulations can contribute greatly to improved safety and environment. They should be seriously enforced.

III. COMMERCIAL MOTOR INSURANCE

3.1. This section examines the role played by the commercial motor insurance industry in facilitating safer driving practices and improving the overall safety record on the Indian roads. The main premise underlying this is that the effectiveness of the commercial insurance market in improving road safety rests on the ability to differentiate between “good” and “bad” risks by providing strong economic incentives for better/safer driving through differential premium rates, varying deductibles, and outright refusal of coverage to reckless and dangerous drivers. Insurers can also serve a valuable role in researching motor accidents and supplying relevant information to the authorities.

3.2. The insurance companies’ ability to differentiate between “good” and “bad” drivers however is contingent upon the availability of adequate easily verifiable information on the insured drivers’ past driving record, work experience, training, type of vehicle driven, area of operation and other socio-demographic characteristics. In addition, the ability of an insurance company to provide fairly priced commercial motor insurance cover depends on fast and accurate reporting of claims and the quality of legal process guiding claim settlements. Any breakdown in the above described information flow, or in legal or institutional arrangements will create price uncertainty, thus resulting in rationing of insurance coverage either through higher prices or lower quantity of coverage offered by insurers.

III.1 Current State of the Indian Commercial Motor Insurance Market³⁸

3.3. India is among the most road accident prone countries in the world. While accounting for only 2 percent of the global car fleet, it is responsible for over 7 percent of all accidents world wide, which result in over 85,000 deaths and 250,000 injuries per year³⁹. Over 70 percent of these accidents are contributed by commercial vehicles, buses and trucks, despite the fact that they account for only 5 percent of the total car fleet. The rate of fatal accidents on the Indian road is one of the highest in the world, 20 deaths per 10,000 vehicles, which is over ten times of that in Holland and the UK. The overall social and economic costs of car accidents are about 2 percent of GDP⁴⁰.

Business Fundamentals of Commercial Motor Insurance

3.4. Motor insurance in general accounts for about 40.68 percent of the gross insurance premium written in the Indian non-life market, or over USD 1.4 billion, which makes it the largest line of business today. Most of that business is written by the 4 public sector companies. While no accurate statistics are available on how much of that premium should be attributed to the coverage of commercial vehicles, according to some expert estimates, premium from commercial auto policies is on the order of 50 percent which explains the importance of this business line for the Indian insurance market as a whole.

³⁸ From here onwards the term “commercial auto insurance” pertains to insurance coverage for trucks (both heavy and midsize vehicles) and buses driven professionally for commercial gain.

³⁹ Source – Loss Prevention Society of India.

⁴⁰ The World Report on Road Traffic Injury Prevention by WHO and the World Bank, 2003.

3.5. For years, the economics of the motor insurance coverage in India has been known for its poor and ever deteriorating fundamentals. This conclusion however should be qualified by distinguishing between the “own damage” (OD) and the “third party liability” (TPL) part of coverage. While the former is mildly profitable, with the loss ratios averaging around 60-70 percent, the latter is a plague on the Indian insurance industry, with loss ratios for the industry approaching 125%⁴¹. The loss ratio for the commercial TPL, however, is considerably worse, ranging between 220% and 500%, which by far makes commercial TPL the most unattractive line of business in the Indian insurance market.

3.6. To provide commercial auto insurance cover, insurance companies have to use a standard insurance policy form authorized by the Indian Insurance Regulatory and Development Authority (IRDA), which contains the following two main coverages: (i) own damage to the vehicle; and (ii) third party liability (TPL) to cover claims arising from damages caused to property, health and life of third parties. The cover contains no deductible and is introduced on the first loss basis. The TPL cover is compulsory for all drivers and can be bought separately. Unfortunately, the level of compliance with this requirement is quite low. While no detailed statistics are available, the surveyed insurers indicate that the level of insurance penetration for the TPL coverage is well under 50 percent of the driver population. The TPL cover is a direct extension of the Motor Vehicle Act of 1988.⁴²

Insurance Tariff⁴³

3.7. One of the main reasons cited by the surveyed insurance companies for the growing losses in the auto segment of their portfolios is the motor insurance tariff maintained by the IRDA for both OD and the TPL parts of coverage. Tariffs, per se, reduce the scope of competition, bring rigidity in the market, discourage adaptability to the changing needs of the insurance consumers and deprive the market of innovation.⁴⁴ Due to the fierce competition and political considerations, the “minimum” tariff has effectively become the “maximum” tariff charged by the state-owned companies.

3.8. Besides mounting financial losses of state-owned companies, the tariff regime discourages state-owned companies from engaging in proper screening and underwriting of motor risk. Indeed, at the moment any improvements in risk underwriting or investments in risk reduction by state insurers are unlikely to yield them any major benefits as long as they

⁴¹ Loss ratio is a relationship of incurred losses to earned premiums. For instance, loss ratios in excess of 100% are considered loss-making as they mean that an insurer pays out more in claims than it collects in premiums.

⁴² The main purpose of the TPL compulsory requirement is to provide a financial safety net to the dependents and victims of road accidents. The TPL cover addresses the natural consequences of a road accident to the victim such as trauma, injury, and if he is employed, loss of earnings. In cases of fatal accidents, the TPL cover compensates the dependents of the deceased for medical and funeral expenses, loss of consortium and loss of estate as well as income stream that would have benefited the family.

⁴³ The Tariff Advisory Committee (TAC) was established by an amendment to the Insurance Act, 1938 (effective June, 1969) to control and regulate the rates, advantages, terms and conditions that may be offered by insurers in respect of any risk or any class or category of risks in the general insurance business. The non-tariff products are filed by the insurers with the Authority under file and use procedures. In 2002-03, non tariff business constituted about 25 per cent of the gross direct premium underwritten in the non-life segment.

⁴⁴ IRDA Annual Report, 2004.

have no choice but to provide coverage at a fixed price to each and every customer applying for cover as a part of their social mandate. As a result, under the present regulatory regime, the state-owned insurers are unlikely to become the major driving force of change in the area of risk management and road safety.

3.9. In addition to the low tariff, the claims settlement process also imposes significant burdens on the industry. Due to the high frequency of car accidents in India and the particularities of the country's legal system (see Section II), the courts are overloaded with claims. As a result, on average it may take 3-5 years for a case to settle from the day it is filed. There are cases however which take much longer.

3.10. Due to the long-term claims settlement process, the TPL is viewed as a "long-tail" business for reserving purposes. This means that an estimated amount of indemnity plus accrued interest penalty (awarded in the case of India) has to be put aside in loss reserves once the accident has been reported. An additional amount has to be added to the incurred but not reported loss reserves as well to provide for potential upward revisions of the claim estimate in the future. These reserve amounts have to be revised annually based on the progression of the case. The state-owned insurance companies however simply do not have the internal technical or human resource capabilities to follow proper reserving practices. The main and most likely implication of this is considerable under-reserving which potentially can have a major impact on the companies' solvency.

III.2 Structural Impediments to an Efficient Indian Auto Insurance Market

3.11. The state of the existing legal framework, deficiencies in the process of generating accident data and data sharing, and the enforcement of safety regulations in the motor transport industry are the most serious structural impediments to the operation of the Indian commercial motor insurance market. Each of these issues is discussed below.

Legal Impediments

3.12. The legal framework guiding the operation of the Indian insurance market by and large is based on the Motor Vehicle Act (1988), and numerous Supreme Court Rulings on specific insurance related cases which provide for:

- *Unlimited financial liability of insurance companies.* The main negative side effect of the unlimited liability clause is that it encourages litigation and results in an unusually long claims settlement process, which may take up to 8-10 years to settle. This puts a major strain on the poorer victims or their families as they have to front the costs of the accident to the family in anticipation of the court award.
- *No Statute of Limitations.* The MVA envisages no time restrictions on period within which a TPL claim can be filed since the occurrence of an accident. As a result, it takes on average 18 months for a claim to be filed, which opens wide possibilities for fraud and results in major financial uncertainty for the insurers.
- *Very few limited legal defenses for insurers.* Section 149 of the MVA provides for only three legal defenses that can be assumed by insurance companies to deny claims.

In reality however these defenses were subsequently severely limited by the Supreme Court rulings, which in general took the position that the paramount role of insurance is to lessen the burden of social hardship regardless of accident circumstances thus effectively endorsing the concept of absolute liability by the driver.

Despite the fact that special commercial Tribunals were set up in every state to try legal suits arising from motor accidents, the sheer volume of suits quickly overwhelmed the institutional capacity of the Tribunals. One of the reasons for the growing claims backlog seems to be the financing of the Tribunal services. Currently, the Tribunals are financed by the Central Government since they are viewed as an extension of the overall Indian legal system. No filing fees or any other charges are imposed on the suing parties on the grounds of maintaining the Tribunals' independence. As a result, the government budgetary resources allocated to the Tribunals are very scarce and certainly do not provide for a major expansion of the system, recruitment of new staff, and computerization of the courts' records.

Information Flow

3.13. Insufficient information and inadequate means to verify it are at the heart of the problems plaguing the Indian commercial auto insurance market. Those include the integrity of licensing and registration systems operating at the state level, quality of drivers' training, training of local and traffic police in proper recording, filing and forwarding of accident reports, and the absence of integrated countrywide databases on commercial drivers that could be accessed by police, courts, insurance companies, and truck owners.

Safety Regulations and Enforcement of the Motor Transport Industry

3.14. Although there are rather strict requirements for commercial drivers their enforcement is highly suspect in the absence of national integrated databases on drivers' accident record and the ease with which licensing and registration procedures can be circumvented. This laxity with drivers' professional certification and the lack of training facilities are among the key reasons behind a very high rate of accidents for commercial vehicles.

3.15. In a highly competitive industry such as commercial trucking, and in the environment of no or minimum legal or social protection, the cost of labor remains under constant pressure to be revised even further downward, frequently to the detriment of road and driver's safety. Many drivers have multiple driver's licenses issued to different names, which in the absence of the national identification card, are very hard to verify. Today, the driver's safety record and his marketability are not correlated. In the case of vehicles, vehicle permit data are frequently unreliable and the driver's details recorded in the permit are not necessarily of the person at the wheel at the time of an accident.

III.3 Policy Recommendations

3.16. Establishing an effective motor insurance regime is going to be a complex undertaking, but definitely not one beyond the realms of what is possible given the current situation and the institutional infrastructure on which India can build. Our recommendations outlined here can clearly not be implemented at one go, but will need to be adapted and phased in accordance with the particularities of the Indian situation. These recommendations

are therefore intended much more as objectives for reform rather than a blueprint to be acted upon. The next step ought to be to devise a plan that is feasible and acceptable to the various stakeholders in the system.

Commercial Driver's Licenses and Vehicle Inspections

3.17. *Getting a Driver's License.* It is of paramount importance to tighten up licensing requirements for issuing commercial drivers' licenses, put in place a "points" system which records the accident history of the driver, and establish a country-wide network of specialized training facilities for commercial drivers.

3.18. *Vehicle Registration and Inspection.* Given the poor enforcement of vehicle registration and inspection requirements, India may consider international experience in registration of commercial vehicles with the view to tighten up the vehicle registration process and improve road safety. In that context, the GOI may consider contacting the International Road Transporters Union (IRU) about modern vehicle registration systems for commercial vehicles.

Motor Insurance for Commercial Vehicles

3.19. *Detariffing the OD and TPL.* The existing tariff regime for the OD and TPL appears to be among the key obstacles to the development of a full-fledged commercial motor insurance market. Detariffing both the OD and TPL parts of coverage would become an important step toward improving the financial viability of the auto insurance market and restoring the essential role of insurers as risk managers and commercial enforcers of safety on the roads

3.20. *Transparent Financial Reporting.* It is recommended that the existing financial reporting standards for insurers be modified by the regulator to provide for a more detailed breakdown of companies' premium income, with separation of motor business premium into a separate reported premium category.

3.21. *Claims Data and Reserving Practices.* Recording and reporting of claims remains one of the main challenges faced by all four state owned insurers. In the absence of adequate IT systems and qualified computer literate staff, motor claims are reported by branch offices with major delays and clerical errors are common. It is thus recommended that the IRDA jointly with the Tariff Committee commission an independent claims audit in one of the state owned firms to establish the true picture with regard to (i) the companies reserving practices; and (ii) adequacy of the current tariff given the companies' real loss ratios. Such a claims audit can also shed light on internal claims reporting practices in state-owned insurance companies.

3.22. *Integrated Claims Database for All Insurers.* There is a strong need for creating an integrated insurance claims database that can be shared jointly by the Indian insurance market. Such a database would enable insurers to limit adverse selection and the possibility of "bad" drivers taking advantage of information asymmetry. Such a database would also enable the insurance market to offer more efficient pricing for motor insurance covers to consumers. Integrated claims databases are not uncommon in developed countries.

3.23. *Changing Underwriting Requirements and a Pool for “Bad” Drivers.* Given the mandatory nature of the TPL motor coverage, the existence of minimum tariff, and the political pressures on state owned companies to provide insurance coverage at loss making rates, insurers have neither the room nor the incentives to improve the quality of their underwriting. Yet, this has to change if companies were to continue in the business. A more selective underwriting however, currently practiced by private companies, is likely to leave many drivers/vehicle owners with a poor driving record, without insurance coverage which is likely to be socially and politically unacceptable. A potential solution lies in the creation of specialized government sponsored motor insurance pools for drivers with “inferior” driving record.

3.24. *Establishing an Insurance Mutual⁴⁵ for the Motor Industry.* In the current information vacuum, there seems to be a role for a specialized insurance mutual owned and operated by truck owners/fleet operators/drivers. Due to a better alignment of incentives of those insured and mutual policyholders in such an institution, it would be well positioned to control moral hazard and adverse selection problems that currently plague this segment of the market.

3.25. Our recommendation to the IRDA would be to look into the possibility of lowering initial capital requirements for a such a mutual insurer given that it would offer coverage only to the members of the industry (say, commercial motor insurance and related coverages only) and thus will not pose any threat of insolvency to a broader public. This change however should be made contingent upon the ability of mutuals to meet minimum insurance operations requirements.

Legal Framework and Courts

3.26. *Statute of Limitations.* In the absence of statute of limitations insurance companies are faced with an increasing threat of fraud and overall uncertainty with regard to the reserving practices. It is therefore proposed that a legal act sponsored by the IRDA should be prepared to amend the MVA with a view to introducing the Statute of Limitations on the claims’ filing rights of accident victims. A short but reasonable period (say 3 months) should be considered.

3.27. *Unlimited Liability.* While the industry appears to be mixed about the real harm done to insurers’ balance sheets by the provision of unlimited liability in the MVA, there is certainly a strong case for introducing statutory limits on the insurers’ liability to reduce financial uncertainty and consequently, in a fully liberalized market regime, achieve efficient pricing of insurance products for consumers. It is thus recommended that an amendment similar to that of the Statute of Limitations be prepared and introduced to the legislature by the Insurance Regulator.

3.28. *Motor Claims Tribunals.* There is strong evidence that due to the growing volume of cases the claims tribunals are overwhelmed, which results in protracted waiting periods that on average take between 3-6 years. Facing the lack of trained staff, office space and equipment, the claims tribunals call for a major overhaul which cannot be achieved without considerable changes in the system of its financing. Currently, the tribunals are funded by

⁴⁵ In a mutual insurance company policyholders are also owners of the company, which means that the risk and rewards are completely mutualized.

annual budgetary allocations which do not reflect the growing annual volume of claims. It is therefore suggested that a system of court fees be introduced to enable the tribunals to recover the administrative costs from the claimants and thus boost its own administrative capabilities to process claims. Such fees would also serve as a deterrent to claims without merit or smaller claims and would help reduce the waiting time.

3.29. *Claims Thresholds.* Introducing thresholds, e.g., the levels at which an injured person can make a tort liability claim, may also significantly reduce the claim count and thus the backlog of claims in motor claims tribunals. Such an approach is the most common form of no-fault legislation, as it partially restricts the right to sue but does not completely eliminate it. Bodily injury claims that do not cross the threshold are limited to payment of actual economic loss — that is, medical expenses, a percentage of lost income, and substitute services expenses. When the threshold limit is exceeded, the injured person, in addition to his or her claim for actual economic loss, can make a claim for non-economic loss factors against the at-fault motorist.

IV. KEY RECOMMENDATIONS AND THEIR IMPLEMENTATION

Future development of the Bank's work in the road sector in India is likely to be extensively influenced by the findings and recommendations of this report. The findings presented on the trucking industry, on inter-city bus services and motor insurance have important implications for the benefits and costs of road sector investments. For instance, the present long delays to trucks at State border crossings tend to nullify the benefits from higher speeds and reduced congestion en route. Consequently, addressing border crossing delays must be a part of our road sector development strategy in order to obtain the full benefits of the investments undertaken. In the following we summarize the main recommendations of the report and indicate how these could be translated into programs and actions under various transport sector operations financed by the Bank. It should be emphasized that while the Bank can play a knowledge-sharing and advocating role in formulating these recommended reform initiatives, their effective implementation ultimately depends on the commitment and policy action by relevant federal and state government authorities.

Trucking Industry Recommendations

- 4.1. The report recommends consideration of a system such as the European T.I.R. to reduce delays at state border crossing checkpoints, particularly for high value or time-sensitive goods. Such a system would permit sealed trucks, which elect to use the system, to operate without en-route inspections on the basis of a certificate issued at origin by a duly authorized and bonded issuing entity. Since the present system of checkpoints is administered by the States, and involve at least four agencies (sales tax, excise, motor vehicles and forests), changes would need to be coordinated across agencies and states nationwide. Initiatives by the Bank should therefore be pursued at the national level, for instance with the Committee of State Ministers coordinating tax and trade issues in relation to implementation of the VAT.
- 4.2. Policies to encourage the use of multi-axle vehicles and tractor-trailer combination, would help reduce transport costs and road pavement damage. Towards this end, incentives such as reduced tax rates and tolls favoring such vehicles could be introduced. The Bank would encourage MoSRTTH to introduce such measures within future budgets and toll rate policies.
- 4.3. Since a significant portion of the driver population is illiterate, it is recommended that audio-visual driver training materials be developed in the local language. This is already being done in the ongoing Kerala and Karnataka state road projects, and could be further pursued in the new state road projects proposed for Bank financing..
- 4.4. To prevent excessive hours of driving, it is recommended that trucks operating outside their home state be required to carry two licensed drivers at all times. This too could be taken up as a policy initiative under various State road projects.
- 4.5. A number of policy changes are recommended to improve axle load controls: expand enforcement authority beyond officials of the Motor Vehicles Department (for instance Karnataka State has empowered PWD engineers); distinguish between minor (up to 5%) and more excessive overloading for which there would be extreme penalties; and make abetment of overloading an offence so as to enable action against the broker or transporter arranging the load.

Enforcement of axle load controls is critical to sustainability of road investments, and future Bank loans in the road sector should support effective enforcement of axle load control.

4.6. Invest in permanent weigh stations at strategic locations on the National Highway network to enable random checks of trucks passing the weigh station whenever the station is open. Require trucks found to be over-loaded to unload the excess load at their own cost and risk. This could be supported in the next national highways project financed by the Bank.

Recommendations on Inter-City Bus Services

4.7. The STU reform proposals advanced by the ASRTU are unlikely to produce the desired improvements in inter-city bus services or stem the losses incurred by the STUs, and consequently, it is recommended that the strategy for STU reforms be reviewed. It also needs to be noted that STUs now constitute a declining share of the market for inter-city bus services and consequently the thrust of policy in this area should be on ensuring the health and competitiveness of the industry as a whole rather than just the STUs.

4.8. Reforms in the Inter-City Bus services sector should include i.a. deregulation of tariffs, restructuring and commercialization of STUs, elimination of STU monopoly rights, changes in the tax regime to achieve uniformity of tax treatment of all buses operating in the inter-city markets, and creation of an independent agency to establish, monitor and enforce competition rules, ensure access to common user infrastructure (terminals, bus stops), and last but not least, the improvement and enforcement of safety regulations in respect of driver training, vehicle design and condition, and operating procedures, e.g. driver working hours.

4.9. The appropriate public policy for the inter-city bus services would be to remove quantitative regulations restricting entry into the inter-city bus transport markets, and to allow market forces to determine both tariffs and the types of services offered. These proposals could be followed up within the Bank's ongoing dialogue with MoSRTH.

Recommendations on the Motor Insurance Industry

4.10. It is recommended that switching to a system where experience-rated premiums attach to the owner and the driver, not to the vehicle, be taken up as a matter of high priority by IRDA. This will also require the development of an integrated claims database and the Bank could consider supporting this as part of its technical assistance program.

4.11. IRDA should also explore the creation of a motor insurance pool for bad drivers who have been denied cover by the insurance industry.

4.13 Finally, the report recommends amendment of the Motor Vehicle Act of 1988 to remedy deficiencies with respect to motor insurance such as the lack of provisions regarding a statute of limitations, liability limits and thresholds for claims adjudication.

4.14 IRDA is already pursuing a number of these reforms, and the Bank could work with MoSRTH and IRDA on preparing revisions to the Motor Vehicles Act needed to address the motor insurance industry issues.

A N N E X E S

ANNEX 1: ECONOMIC OPERATING COSTS FOR DIFFERENT TRUCKS IN INDIA

1. The financial costs data of Table 4 of the main text have been converted into economic costs using the conversion factors shown in Table A1.1 below. Economic prices have been derived from financial prices by simply excluding taxes, in accordance with current practice in India. This simple approach does not take into account such factors as the shadow price of labor and foreign exchange. However for the purposes of this study, such a simple approach is appropriate and is consistent with the approach adopted by the Central Road Research Institute (CRRI) in their update of road user costs. Note this is a long-run, not short-run analysis; in the very short-run, if there is a surplus of vehicles, the economic scarcity value of vehicle waiting time would be zero. The long-run is the appropriate time frame for policy development designed to improve the efficiency of the industry over time.

2. Tax rates vary considerably between states and so only approximate conversion factors can be estimated, however they give a reasonable indication of economic prices. For example the resulting factors are similar to those used in the CRRI study mentioned above and produce economic unit prices that are similar to those assumed in recent economic evaluations of road projects⁴⁶.

Table A1.1. Economic Conversion Factors

Item	Conversion Factor
Fuel	0.50
Lubricants	0.77
Tyres	0.77
Spares	0.77
Crew	1.00
Maintenance Labor/Repairs	1.00
Wayside Expenses	0.30
Overheads	
- Staff and Administration	1.00
- Tax	0.00
- Interest	1.65
- Depreciation	0.77
- Other	0.90
- Profit	1.00

- NOTES: (1) The conversion factor for fuel assumes an economic fuel price of USD 0.20 per litre.
 (2) The conversion factor for lubricants, tyres, spares and vehicles (depreciation) assumes an average combined tax of 30% (mainly excise and sales taxes).
 (3) Staff and administration, profits and maintenance labor are regarded as mainly labor.
 (4) Wayside expenses are assumed to be 70% bribes (for which a conversion factor of 0.00 is appropriate for such transfers) and 30% administration costs (conversion factor of 1.00) in accordance with the findings of Trucking Operations in India, AITD, November 1999.
 (5) Conversion factor for interest is based on assuming an economic opportunity cost of capital of 12% averaged over a ten year vehicle life.

SOURCE: Consultant's estimates based on figures in Central Road Research Institute, *Updation of Road User Cost Data*, (2001).

⁴⁶ "HDM4 Representative Road User Costs for India", World Bank Note, R Archondo-Callao, June 2000.

3. The results of applying these conversion factors to the financial costs of Table 4 in the main text are shown in Table A1.2 below.

Table A1.2. Estimated Annual Economic Operating Costs of Small Operators (Rs)

Item	Type of Truck			
	5 ton	9 ton	16 ton	27 ton
Fuel	75,000	178,000	246,150	355,550
Lubricants	6,930	18,480	21,560	30,800
Tyres	29,106	51,744	81,312	140,448
Spares	6,930	18,480	21,560	30,800
Crew	67,500	91,100	112,500	168,600
Maintenance Labor/Repairs	9,000	24,000	28,000	40,000
Wayside Expenses	3,375	12,000	18,000	24,000
Overheads				
- Staff and Administration	0	0	0	0
- Tax	0	0	0	0
- Interest	27,690	36,924	48,462	103,848
- Depreciation	46,200	61,600	80,850	173,250
- Other	25,110	48,870	65,430	101,160
- Profit	15,900	31,100	41,500	64,200
Total Overheads	114,900	178,494	236,242	442,458
Total Cost	312,741	572,298	765,324	1,232,656
Annual Utilisation (km)	45,000	80,000	80,000	80,000
Cost per truck km	6.95	7.15	9.57	15.41
Cost per ton km of capacity	1.39	0.79	0.60	0.57

NOTE: Estimated from main text Table 4 and Table A1.1.

SOURCE: Consultant's estimate

4. To provide a basis for applying these cost estimates to different situations, the main assumptions about unit prices and utilization rates are summarized in Table A1.3.

5. Note that the assumed average load factor is about 100%. This reflects current operating practice where few trucks operate without load (especially over long distances) and there is frequent overloading — typically 30-40% of trucks are overloaded by between 25% and 50% according to some operators. Of course trucks with specialized bodies such as tankers only achieve load factors of about 50%. The reluctance to operate without load would be one reason for the low utilization of trucks (only 80,000 km per year, although higher rates are achieved with two drivers operating shifts).

6. The economic vehicle operating costs given in Table A1.2 for the 27 ton tractor-trailer was based on an assumption that the fleet of such vehicles consists of one trailer paired with one tractor unit. The vehicle operating costs for tractors in fleets with alternative ratios of trailers/tractors has been estimated in Table A1.4 based on the figures in Table A1.2. The figures for a trailer/tractor ratio of 1.0 are the same as those in Table A1.2. For higher values of this ratio, the costs have been increased assuming that:

- utilisation of the tractor increases in proportion to the carrying capacity of the trailer fleet, from 80,000 km to up to 160,000 km for a tractor in a fleet with a trailer/tractor ratio of two

- variable costs such as fuel, tyres, spares and crew increase in proportion to tractor utilisation

Table A1.3 Main Assumptions for Typical Truck Operating Cost Estimates

Item	Assumption
Vehicle	
- Carrying Capacity	9 ton
- financial cost	Rs. 800,000 (USD 16,000)
- economic cost	Rs. 615,000 (USD 12,300)
- lifetime	800,000 km over about ten years
- annual utilisation	80,000 km per year
- operating hours per year	2,200
- Average Load Factor	About 100%
Diesel Fuel	
- Financial Price	Rs. 18 - 24 per litre (USD 0.36 – 0.48) depending on state
- Economic Price	Rs. 10.0 per litre (USD 0.20)
- Consumption Rate	4.5 km per litre
Tyres	
- Unit Financial Price	Rs. 11,000 for a new tyre (USD 220)
- Unit Economic Price	Rs. 8,500 (USD 170)
- Lifetime	70,000 km (including one retread)
Staff	
- Crew per Truck	1.5 drivers and 1.0 helper
- Maintenance Staff per	0.25
Truck	
- Average Monthly Earnings	Rs. 3,000 (USD 60) including expense allowances

SOURCE: TCI, A. Davis, "Data Collection for Efficiency of Indian Road Transport Study" (2002)

7. The increase in utilization assumes that the scheduling of tractor and trailer movements can maintain present levels of trailer utilization – this is reasonable under suitable circumstances provided operating practices are changed to allow more intensive operation of the tractor, including allocating tractors to more than one driver and operating more than one shift per day.

8. Truck operators in India report that the ratio of trailer/tractor prices is higher than assumed above, but this seems unlikely to apply in future because, based on international experience, the ratio is usually lower than 50%. Therefore the assumed increase in capital cost is a compromise estimate that would apply in the next few years. The assumed tractor and trailer prices apply to currently available vehicles that have been traditionally manufactured in India. Recently more modern tractors and trailers have been introduced into the country, costing significantly more.

9. As shown in Table A1.4, the operating cost of tractor-trailers can be reduced by about 10%, from Rs.15.4 to 14.0 per km, through increasing the number of trailers operated by tractors. In other words, the increased capital cost of acquiring more trailers is more than outweighed by the advantages of lower costs offered by increased tractor utilization.

Table A1.4. Annual Economic Tractor-Trailer Vehicle Operating Cost (Rs. per truck)

Item	Ratio of Trailers/Tractors			
	1.00	1.25	1.50	2.00
Fuel	355,550	444,438	533,325	711,100
Lubricants	30,800	38,500	46,200	61,600
Tyres	140,448	175,560	210,672	280,896
Spares	30,800	38,500	46,200	61,600
Crew	168,600	210,750	252,900	337,200
Maintenance Labor/Repairs	40,000	50,000	60,000	80,000
Wayside Expenses	24,000	30,000	36,000	48,000
Overheads				
- Staff and Administration				
- Tax				
- Interest	103,848	112,502	121,156	138,464
- Depreciation	173,250	187,688	202,125	231,000
- Other	101,160	126,450	151,740	202,320
- Profit	64,200	69,550	74,900	85,600
Total Overheads	442,458	496,190	549,921	657,384
Total Cost	1,232,656	1,483,937	1,735,218	2,237,780
Annual Utilization (km)	80,000	100,000	120,000	160,000
Cost per truck km	15.41	14.84	14.46	13.99
Cost per ton km of capacity	0.57	0.55	0.54	0.52

NOTE: For a tractor-trailer with 27 ton carrying capacity.

SOURCE: Consultant's estimate

ANNEX 2: COSTS DUE TO ADMINISTRATIVE CHECKS AND FACILITATION PAYMENTS

Traffic Flow

1. As reviewed in the road development plan vision: 2021 by the Indian Roads Congress and the Ministry of Transport (November 2000), various estimates have been made of traffic flow in the past, some based on more reliable and comprehensive data than others. The approach adopted in this work is based on the sources deemed most reliable – namely the national traffic statistics, complemented by detailed traffic surveys at particular locations (usually carried out as part of feasibility studies for road rehabilitation projects).
2. The road network of India includes 57,700 km of national highway plus about 124,000 km of state roads. In addition there is a vast network of local roads. The best estimates of truck delays are available from surveys on the 13,252 km of main highways that form the Golden Quadrilateral and the main north-south and east-west roads of India. The estimate of truck delays throughout the whole of India is therefore based first on estimating the delays recorded or reported on these main highways and then applying appropriate factors to allow for delays experienced on other roads.
3. The average characteristics of traffic flow on these 13,252 km of main roads is estimated in Table A2.1 from national traffic statistics and recent classified counts, especially those carried out as part of feasibility studies for the World Bank’s highway projects and which were reviewed especially for the current work, as described in Allison Davis (2002), “Data Collection for Efficiency of Indian Road Transport Study.”

Table A2.1 Estimated Average Traffic Flow on the Main National Highways (2002)

Vehicle Type	PCU per Vehicle	Proportion of Vehicles	Average Daily Traffic (Vehicles)	Average Daily Traffic (PCU)
Motor Bike	0.5	15%	2,100	1,050
Car (New)	1	20%	2,800	2,800
Car (Old)	1	10%	1,400	1,400
Bus	2.5	8%	1,120	2,800
Truck (Light)	2	5%	700	1,400
Truck (2-axle)	3	30%	4,200	12,600
Truck (3-axle)	3.5	4%	490	1,715
Truck (multi-axle)	4	2%	210	840
TOTAL MOTORIZED		93%	13,020	24,605
Bicycles	0.5	5%	700	350
Others	4.5	2%	280	1,260
TOTAL NON-MOTORIZED		7%	980	1,610
TOTAL ALL VEHICLES		100%	14,000	26,215

NOTE: Typical average traffic composition on the Golden Quadrilateral and main East-West and North-South Roads.

SOURCE: Consultant’s estimate based on national traffic statistics, Davis (2002), and classified counts described in Road Maintenance and Corridor Management for National Highways System in India (2000), Feasibility Report Consultancy Package VI for World Bank National Highways Project (1999), and CRRI, Updation of Road User Cost Data (2001).

4. This estimate of overall traffic level on this core part of the road network, with the highest flows, is consistent with recent National Highway Statistics on 30,000 km of national highways which have an average ADT of about 23,000 PCU. It is also consistent with the average ADT for motorized vehicles of about 10,000 vehicles (minus motor bikes) estimated for 25 typical road sections of the main highway network, of total length 992 km, investigated by Davis (2002). There is no reliable estimate of the overall proportions of vehicles of each type on the whole of the main road network, but the values assumed in Table A2.1 are consistent with available overall estimates of passenger and freight traffic such as those in the *Road Development Plan Vision: 2021* (2000).

Truck Delays

5. The greatest uncertainty in estimating the economic impact of truck delays is due to the lack of information about the incidence, length and nature of the delays. Only one formal survey has been carried out in recent years, and this covered only three truck journeys.⁴⁷ The results from this survey have therefore been cross-checked with other, more informal estimates.

6. In the formal survey, the time spent at check points on the main national highways was measured by traveling observers on three typical long distance trips. The results are summarized in Table A2.2. Delays were recorded at both inter-state and intra-state check points and during the preparatory period at the start of the trip. The inter-state check points included checks of inter-state transport permits (Road Transport Officials) and sales tax documentation. The intrastate check points were mainly due to local octroi tax collection activities. In addition there were random checks by police and RTO officials who check transport documents and inspect vehicles.

Table A2.2 Recorded Journey Time of Trucks on National Highways

Route	Distance	Total Trip Time	Delay at Check Posts		Getting Papers/Advance	
			Hours	Hours/km	Hours	Hours/km
	Km	Hours	Hours	Hours/km	Hours	Hours/km
Mumbai – Delhi	1,430	62.6	3.0	0.0021	4.4	0.0031
Delhi – Kolkata	1,490	89.5	2.1	0.0014	0.4	0.0003
Kolkata – Chennai	1,845	142.3	2.6	0.0014	0.0	0.0000
Average	1,588	98.1	2.6	0.0016	1.6	0.0010

SOURCE: Sundar Committee Report, Annexure 3.1 (November 1999).

7. In another, less formal survey carried out on another route in 2002, between Hyderabad and Chennai, an observer traveling on a truck has noted that about 2 hours were spent at 12 check posts over a distance of 625 km. This is equivalent to 0.0030 hours per km. All delays were modest in duration and were confined to formal check points. Time was spent getting the first control stamp before the trip began and no random checks by police or RTO officials took place.

⁴⁷ By the Central Institute of Road Transport in June-July 1998, for the Sundar Committee.

8. Operators report that delays at check points can vary considerably, from a few minutes in most cases to delays of several hours, or even days if there is some problem with documentation. Some operators claim that trucks spend a total time of up to two or three hours at check points per day, equivalent to 5-10 hours per long distance trip, although this could not be confirmed.

9. It is clear that the occurrence of delay varies considerably between one state to another because the sales tax controls at inter-state borders differ in accordance with the prevailing sales tax rates in adjoining states. Furthermore although no such difficulties were observed on the four trips described above it is clear that some long delays do occur from time to time and this would add significantly to the overall average. For example it was observed during the survey that the particular drivers being observed knew the likely locations of mobile enforcement officers and had already established close relations with the officials on their routes. Other drivers with less experience of particular routes would be likely to experience longer delays.

10. It therefore seems reasonable to assume that the range of delay time experienced at check points on the main highways is usually between 0.0015 and 0.0040 hours/km. The associated delay with getting the paperwork sorted out is similarly estimated to be between 1.6 and 3.0 hours per trip (equivalent to between 0.0010 and 0.0020 per km for typical long distance trips).

User Costs

11. Two types of user costs are affected by truck delays:

- vehicle operating costs that are fixed rather than vary with distance operated,
- cargo time-related costs, which are mainly cargo holding time costs caused by increased inventories.

12. There are two main issues in estimating these user costs: fixed v/s variable costs and the extent to which time savings can be used in practice.

(a) Fixed Versus Variable Costs

13. This issue is about the extent to which costs are fixed rather than vary with distance: delays do not affect costs that vary only with distance, but they may increase costs that are fixed because an increase in journey time would tend to increase the number of trucks required to meet demand. Non-overhead vehicle operating cost elements such as fuel, tyres, spares and maintenance labor are likely to vary almost entirely with distance traveled, so they can generally be excluded from the assessment of delay time cost. On the other hand, overheads such as interest payments (or, in economic terms, the opportunity cost of capital) can generally be regarded as fixed, and therefore would contribute to delay cost. However the situation is not so clear in the case of crew costs, administrative costs and depreciation (which may vary with distance to a greater or

lesser extent , in other words, some of these costs are likely to be lower for vehicles which have lower utilization).

14. This study makes the simple assumption that non-overhead cost items such as fuel, lubricants, tyres, spares, crew, maintenance labor and wayside expenses all vary wholly with distance traveled. For overhead cost items, interest, depreciation and profit are regarded as fixed whereas other overhead items (which include broker fees and motor insurance fees) are regarded as variable. This should result in a reasonable estimate of fixed costs because effects of delays such as additional fuel consumed by idling vehicles at check points (assumed to be variable but in practice somewhat fixed) will be offset by effects such as reduced depreciation caused by lower vehicle utilization (assumed to be fixed but in practice somewhat variable).

15. The main contributor to cargo time costs is the cargo holding time cost and so the study considers this to be a wholly fixed cost, varying with time rather than distance.

(b) Extent to Which Time Costs can be Realized in Practice

16. Small savings in trip time may be unlikely to achieve significant benefits in terms of reduced vehicle fleet and general overheads, because there is little scope for alternative ways of exploiting these resources. However in the case of delays at check points, significant time savings can be generated during the course of a long journey, amounting to several hours of truck and staff time. Since this creates opportunities for rescheduling vehicles and staff, real cost savings can be expected from reducing delays at check points.

17. For the same reason, cargo holding time costs can be expected to achieve significant inventory cost savings, although of course this varies with the value of the commodity.

18. The annual fixed costs for each type of truck have been expressed in Table A2.3 in terms of Rs. per hour by dividing the annual overheads by the number of operating hours per year (2,200 hours for most heavy trucks, representing the typical current operating pattern of trucks in India⁴⁸). The cargo holding cost for each truck type has also been estimated in Table A2.3 based on the measured average value in Rs per ton of commodities carried by trucks⁴⁹ and the average load carried by each type of truck.

19. The impact on the main highways is based on the flows estimated in Table A2.1 above, while the estimate for other highways is roughly estimated assuming that they have a daily flow of about 13,000 pcu compared to about 26,000 pcu on the main highways. This is a reasonable assumption considering that state roads, which are next lowest in the road network hierarchy have a recorded average daily flow of about 5-10,000 pcu.

⁴⁸ "HDM4 Representative Road User Costs for India," World Bank Note, R Archondo-Callao, June 2000.

⁴⁹ "Updation of Road User Cost Data," Central Road Research Institute, Delhi, July 2001.

20. Delays (per km) are assumed to be 50% lower on roads that are not on the main highway network. This is reasonable considering that the trucks operating on these other roads would be operating on shorter distance hauls which are less likely to cross administrative boundaries, and may therefore be less subject to tax and permit controls. Delays that may occur on state roads are not included in Table 7 of the main text so the estimate of overall delays in India should be considered to be a conservative estimate.

Unofficial Facilitation Payments

21. Unofficial payments such as bribes and donations made by drivers in the course of long distance trips have been recorded by traveling observers on the same three trips on which the truck delays were recorded. The results are described in Table A2.4. Unofficial payments included bribes to enforcement officials, donations exacted by villagers for festivals and fairs, and payments to staff at loading/unloading points.

22. Most of the payments were made at check points (RTO, tax inspectors or Octroi officials) or during other road-side checks by police or RTO officials. These payments were particularly high on the trip between Mumbai and Delhi because the truck was overloaded by 3-4 tons.

23. During similar observations in 2002 on a 625 km trip between Hyderabad and Chennai, total unofficial payments amounted to Rs.30 (to government officials). The low level of payment probably reflected the fact that the truck did not encounter any road-side police or RTO checks, which normally are reported to incur bribes of about Rs. 20 per inspection. Some truck operators claim that up to 10% of revenue is paid in bribes, which would be equivalent to Rs.1,500 per long distance trip, which is higher than recorded in the surveys. Other truck operators report that typically at least Rs. 50 per day is paid in bribes (Rs.200 per trip). It is understood that some truck owners make regular payments to RTO officials to enable free passage of their vehicles without check point delays or bribes – this could be one reason for low levels of bribes paid en route by some operators.

24. Based on these observations it seems that unofficial payments, including those not paid en route, vary widely but usually range between Rs.200 and 1,500 per trip (Rs. 0.13 and 1.00 per km). The bribes are reportedly normally higher for overloaded trucks.

Table A2.3 Time-related Road User Costs

Item	Type of Truck			
	Light	Medium	Heavy	Multiaxle
(A) Vehicle Operating Cost				
- annual overheads (Rs/truck)	89,790	129,624	170,812	341,298
- Annual hours per truck	1,800	2,200	2,200	2,200
- Cost per truck hour (Rs)	49.9	58.9	77.6	155.1
(B) Cargo Holding Cost				
- Average load per truck (ton)	5	9	16	27
- Average value (Rs./ton)	26,107	26,107	26,107	26,107
- Cost per truck hour (Rs)	8.7	12.8	22.8	38.4
(C) TOTAL COST (Rs/hour)	58.6	71.7	100.4	193.6

NOTES: (1) The vehicle operating costs are based on annual overheads per truck estimated in Table 5 in the informal technical note on methodology (excluding "other" overheads). (2) The average cargo value is based on a measured financial value of Rs 26,667 per ton recorded for long distance trucking in 2000, increased by 10% to apply to 2002. The economic cargo holding cost is estimated assuming a conversion factor of 0.89 (equivalent to an average tax of 12%) and a 12% opportunity cost of capital.

SOURCE: Consultant's estimate

Table A2.4 Recorded En Route Payments by Trucks on National Highways

Route	Distance	Total Expenses	Unofficial Payments at Check Points (including other road-side police and RTO checks)		Other Unofficial Payments (e.g. loading/unloading)	
			Rs	Rs/km	Rs	Rs/km
	Km	Rs	Rs	Rs/km	Rs	Rs/km
Mumbai – Delhi	1,430	8,100	1,880	1.31	100	0.07
Delhi – Kolkata	1,490	6,550	650	0.44	0	0.00
Kolkata – Chennai	1,845	7,500	561	0.30	123	0.07
Average	1,588	7,383	1,030	0.65	74	0.05

SOURCE: Trucking Operations in India, AITD, November 1999

ANNEX 3: PROPOSED AMENDMENTS TO THE MOTOR VEHICLE ACT 1988 TO OVERCOME OVERLOADING

Present Provision	Proposed Amendment
<p><i>Section 114(1)</i> Any officer of the Motor Vehicles Department authorised in this behalf by the State Government shall, if he has reason to believe that a goods vehicle or trailer is being used in contravention of Section 113 requires the driver to convey the vehicle to a weighing device, if any, within a distance of ten kilometres from any point on the forward route or within a distance of twenty kilometres from the destination of the vehicle for weighment; and if on such weighment the vehicle is found to contravene in any respect the provisions of Section 113 regarding weight, he may, by order in writing, direct the driver to off-load the excess weight at his own risk and not to remove the vehicle or trailer from that place until the laden weight has been reduced or the vehicle or trailer has otherwise been dealt with so that it complies with Section 113 and on receipt of such notice, the driver shall comply with such directions.</p>	<p><i>Section 114(1)</i> Any officer authorized in this behalf by the State Government shall, if he has reason to believe that a goods vehicle or trailer is being used in contravention of Section 113, may require the driver to produce a certificate or other proof from a government authorized weighing device and in case of failure to produce such a certificate, require the driver to convey the vehicle to a weighing device, if any, within a distance of ten kilometers from any point on the forward route or within a distance of twenty kilometers from the destination of the vehicle for weighment; (2) (a) If the laden weight is found to be within the gross vehicle weight specified in the certificate of registration of the vehicle, the vehicle shall be allowed to proceed. (b) In case the laden weight exceeds the gross vehicle weight specified in the certificate of registration of the vehicle by upto 5%, the fines specified in Section 194 shall be imposed by the authorized officer and the vehicle allowed to proceed to destination. (c) In case the laden weight exceeds the gross vehicle weight specified in the certificate of registration of the vehicle by more than 5%, the authorized officer may, by order in writing, direct the driver to off-load the excess weight at his own cost and risk and not to remove the vehicle or the trailer from that place until the laden weight has been reduced or the vehicle or trailer has otherwise been dealt with so that it complies with Section 113. (3) Whoever drives a motor vehicle or causes or allows a motor vehicle to be driven in contravention of Section 113 or Sub-Clauses (b) and (c) of this Section shall be punishable with a minimum fine of two thousand rupees and an additional amount of one thousand rupees per ton of excess load or part thereof.</p>
<p><i>Section 114(2)</i> Where the person authorized under sub-section (1) makes the said order in writing, he shall also endorse the relevant details of the overloading on the goods carriage permit and also intimate the fact of such endorsement to the authority which issued that permit.</p>	<p><i>Section 114(2)</i> The existing provision may be dropped.</p>

<p>Section 188 Whoever abets the commission of an offence under Section 184 or Section 185 or Section 186 shall be punishable with punishment provided for the offence.</p>	<p>Section 188 The existing provision may be enlarged to include overloading. The amended provision will be as follows: “Whoever abets the commission of an offence under Section 113, Section 114, Section 184, Section 185 or Section 186 shall be punishable with a fine and a term in jail as provided for the offence”.</p>
<p>Section 194(1) Whoever drives a motor vehicle or causes or allows a motor vehicle to be driven in contravention of the provisions of Section 113 or Section 114 or Section 115 shall be punishable with minimum fine of two thousand rupees and an additional amount of one thousand rupees per ton of excess load, together with the liability to pay charges for off-loading of the excess load.</p>	<p>Section 194(1) Reference to Sections 113 and 114 may be deleted in view of amendment to Section 114 suggested above. Section 194(1) shall read as under: Whoever drives a motor vehicle or causes or allows a motor vehicle to be driven in contravention of Section 115 shall be punishable with minimum fine of two thousand rupees and an additional amount of one thousand rupees per ton of excess load or part thereof, together with the liability to pay charges for off-loading of the excess load.</p>
<p>Section 194(2) Any driver of a vehicle who refuses to stop and submit his vehicle to weighing after being directed to do by an officer authorized in this behalf under Section 114 or removes or causes the removal of the load or part of it prior to weighing shall be punishable with fine which may extend to three thousand rupees.</p>	<p>Section 194(2) Add “or imprisonment upto one month” at the end of the Section. The Section shall thus read as follows: “Any driver of a vehicle who refuses to stop and submit his vehicle to weighing on being directed to do by an officer authorized in this behalf under Section 114 or removes or causes the removal of the load or part of it prior to weighing shall be punishable with fine which may extend to three thousand rupees or imprisonment upto one month”.</p>
<p>Section 200(1) Any offence whether committed before or after the commencement of this Act punishable under Sections 177, 178, 179, 180, 181, 182, Sub-section (1) or (2) of Section 183, Sections 184, 186, (Section 189, Sub-section (2) or Section 190), Sections 191, 192, 194, 196 or Section 198, may either before or after the institution of the prosecution, be compounded by such officers or authorities and for such amount as the State Government may, by notification in the Official Gazette, specify in this behalf.</p>	<p>Section 200(1) Delete Section 194 from sub-section (1) of Section 200.</p>

ANNEX 4: CHINA – THE EFFICIENCY OF ROAD TRANSPORT INDUSTRY

Background

1. The rapid economic development of China has created high transport demand since 1980. Passenger traffic grew by 4.8 times to 1.32 trillion pkm in 2001 from 228 billion pkm while the freight traffic grew at a rate of 7 percent to 4.76 trillion tkm from 1.16 trillion tkm in the same period. The road network nearly doubled over the same period, from about 0.9 million km to 1.76 million km of which 50 percent is paved. China also embarked on the construction of major arterial corridors to facilitate the movement of freight to support the growing foreign trade and industrialization. The additional road length mainly consisted of higher level highways and expressways thereby creating more additional capacity than just the increases in length would indicate. The road network includes about 125,000 km of national highways of which 25,000 km are expressways and another 27,500 km are divided 4-lane highways.
2. The number of motorized vehicles (excluding agricultural vehicles and tractors) increased ten times to 18 million in the same period. However, the number of non-motorized vehicles reduced during the same period. China has poor road safety records. In 2002, it recorded 770,000 road accidents resulting in 109,000 fatalities. It is estimated that almost 70 percent of accidents involved trucks.

Institutional Arrangement

3. The Highway Administration Bureau of Ministry of Communication (MOC) is responsible for road transport operations, road construction and maintenance. Its Planning Department plans the development of the national road network and formulates policies. Communication departments of provincial governments are responsible for road administration. Transport administration is with the Highway Transport Administration Bureau while traffic and safety is the responsibility of the Provincial Public Safety Bureau.
4. Initially the local communications departments owned road construction and freight and bus service companies. As the reforms deepened the role of the state shifted gradually from that of owner, investor and manager to that of regulator and policy maker encouraging the development of independent providers of services. This led to detaching of most of these State Owned Enterprises (SOEs) from the local communications departments. However, some local departments still own and operate bus and truck companies.

Regulatory Framework

5. Passenger and freight services were initially operated as SOEs. However, in 1986, the State Economic Commission, now abolished, approved a tentative regulation on management of highway transport (Joint Regulation). This set out the regulatory

framework for licensing, customer and operator relationship and rules for provision of transport services. It marked a significant milestone in the transformation of a planned economy to a market-oriented economy. Since then MOC has issued a series of regulations to align road transport services with the market economy and encourage private provision of services and competition.

6. *Licensing System*: The Joint Regulation provides the basic framework for the licensing system. Licenses must be obtained from the appropriate transport authority (provincial, prefecture, or county communications departments). This regulation also addresses licensing criteria pertaining to social needs, the applicants' capability to provide services, business scope, technical qualifications, and operational conditions. Normally, the licensing criteria including the following: (a) size of fleet owned by the enterprise, (b) condition of vehicles, (c) adequacy of parking facilities, and (d) proper certification for technical staff in charge of safety control and vehicle maintenance. To facilitate the entry of individuals, it has, however, set out more lenient criteria pertaining to number of vehicles, their condition, parking and compliance with related regulations.

7. A second licensing system is vehicle permits, which ensures every bus and truck used for service meets safety and economic criteria. It is designed to check engine performance, the operation of main driving components, and the level of pollutant emissions. Vehicle permits must be renewed annually, are valid throughout China and must be carried on board the vehicle.

8. *Price Control*: For decades the policy has been to allow local governments to set prices under general guidelines issued by MOC. Proposed tariffs are submitted to the pricing authorities of each local government for approval. Once approved, tariffs are reported to MOC. To ensure observance of these tariffs and monitor their application, transport operators are required to use tariff vouchers on which the basic rules of tariff applications are printed and submit these vouchers to appropriate government authorities.

9. As a part of the economic reform, in the last 15 years, policies have shifted away from rigid tariff control mechanisms. In 1984, MOC issued a Regulation on Passenger and Freight Transport Tariffs (RPFTT), which permitted local governments to set cargo rates that differ from national standards. The RPFTT allowed for prices to vary by 20 percent in consideration of local conditions. Further in 1987, the State Planning Commission and MOC jointly issued a Regulation on Motor Vehicle Transport Tariff Management, which left the power of setting tariffs to the Provincial Communications Departments (PCDs) in consultation with provincial pricing administrations. Today, the tariffs for passenger transport are still under the government control. Upward adjustment can be made during the peak season with prior public hearing. However, competition has resulted in market prices generally lower than the government published prices. Thus such published prices serve only as the ceiling during peak periods or high demand routes. In freight transport, fierce competition led to the de-facto abolition of tariff controls.

10. *Check Points and Forced Stops:* In general, passenger and cargo traffic moves freely throughout China. There are no check-points at provincial boundaries. The national law prohibits stopping of vehicles by any institution other than traffic police. No fine can be collected in the absence of traffic police. In addition, commercial taxes such as sales and commodity taxes are collected where the business is registered rather than en-route. Fines for overloading have to be issued jointly by road authorities and traffic police.

Road Transport System

11. *Passenger:* The interurban bus service plays a vital role in moving China's rural population and urban long distance travelers. By 2001, there were 205,941 bus service providers throughout China. These operators ran 139,000 bus lines covering 99.3 percent of China's communes and townships and 91.8 percent of villages. There are over 10,120 bus terminals throughout China with daily departure of 1.04 million buses. The interurban bus service expanded rapidly in the past decade. From 1990 to 2001, bus transport output increased from 6.5 billion passengers to 14.0 billion passengers, which is an average growth rate of 7.3 percent per annum. In terms of passenger-kilometers, output increased from 262 billion to 720.7 billion (9.6 percent per annum). Bus transport share in the inter-city trips increased from 46.6 percent in 1990 to 54.8 percent in 2001.

12. Passenger services are divided into four categories — inter-provincial, inter-prefecture, inter-county and intra-county and classified into 5 classes based on fleet size, assets, annual revenue, output and experience. The Class 1 operator is allowed to operate buses in any of the categories while the Class 5 operator can operate only intra-county services.

13. *Tariffs:* Tariffs vary significantly with the lines and regions the bus serves, the conditions of the bus and the tolls the operator pays. In Hebei Province, for example, the tariff for regular buses (large bus) is about US 2-4 cents per passenger-kilometer. On the other hand, in Hubei Province, tariff is about 2-5 cents per passenger-kilometer. This figure is about 2 to 3 times of rail passenger tariff rate.

14. *Industry structure:* The industry has undergone a major change with many private operators entering the bus transport industry. However, the SOE still play the dominant role controlling about 55 percent of total passenger seats available. SOEs generally have larger fleets with an average of 21 buses while the private operators own on an average only 1.7 buses. This clearly indicates that the private operations are fragmented with individuals providing the services. Most private operators go for medium and small size buses to provide intra-county and inter-county services. There has been a decline in the fleet of large buses since 1996.

15. *Freight:* For many decades up until early 1990s, China's road freight service sector had played a role subsidiary to rail in the nation's transport system. During this time, the rail system has been the logistics backbone of the Chinese economy and the primary basis for the nation's material distribution system. It is particularly well suited to support a planned economy. Even as late as 1990, the highways' market share for freight

was only 24 percent of combined road and rail haulage. One of the main reasons was the underdevelopment of highway infrastructure. Significantly, China's highway market share for freight is lower than for other countries at comparable phase of economic development. As the shift toward a market economy accelerated, structural changes in Chinese industry have gradually shifted the production mix to higher value and lower density products, typically produced in smaller lot sizes. This shift has increased demand for faster, more reliable and flexible transportation services, i.e. trucking.

16. In 2001, China's trucking industry moved 10.6 billion tons of cargo with a total output 633 billion tkm. The annual average growth rates for cargo movement (in tons) and haulage (in tkms) was 3.9 and 5.9 percent respectively. Highway market share has grown from 24 percent to 30 percent of combined road and rail haulage.

17. The freight services are divided into 6 categories based on the type of cargo moved- normal cargo, less than truck load, oversized, container, refrigerated cargo, and hazardous material and firms are classified into 5 classes on the basis of total capacity, annual turnover, assets and years of experience. Class 1 and 2 operators are allowed to operate all categories of cargo while Class 5 could carry only normal cargo.

18. *Industry structure:* The trucking industry in China is currently undergoing dramatic changes in the number of operators, composition and market share. The for-hire trucking industry is made up of two distinct segments, (a) state-owned enterprises (SOEs) and (b) private operators. By 2000, each of the two segments owned around 1 million and 2.1 million trucks, respectively. In addition, there are 3.2 million own-account trucks. The private segment has grown at 16.2 percent per annum between 1996 and 2000. This stands in sharp contrast to zero growth for SOEs during this period. The fast increase of private operators is mainly due to very few entry barriers in the market. Virtually anybody who purchases a vehicle can obtain a license. In many cases licensing itself is not strictly enforced. This has now led to over capacity, and the nationwide average payload/capacity ratio is only about 0.5.

19. *Fleet:* Truck fleet has grown rapidly in recent years (see TableA4.1). The annual growth rate of for-hire and own-account trucks reached 8 and 5.9 percent, respectively. Correspondingly, the load capacity for each group grew 4.9 and 7.2 percent.

Table A4.1: Truck fleet

Year	No. of trucks ('000)						Annual growth rate
	1996	1997	1998	1999	2000	2001	
For-hire	3035.4	3579.5	3836.7	4077.9	4306.1	4467.6	8.0%
Heavy truck	1418.7	1630.8	1711.2	1739.3	1745.6	1703.7	3.7%
Medium truck	537.7	531.3	487.7	490.5	460.3	464.4	-2.9%
Light truck	1079.0	1417.4	1637.8	1848.1	2100.2	2299.5	16.3%
Own-account	2714.9	2432.8	2442.2	2691.6	2857.1	3184.8	3.2%
Total	5750.3	6012.3	6278.9	6769.5	7163.2	7652.4	5.9%

SOURCE: Consultant's estimate.

In the for-hire truck fleet, heavy trucks grew at a moderate rate of 3.7% per annum while the medium truck actually declined. On the other hand, light trucks grew at a much faster pace than others. This indicates that the trucking fleet in China is moving into two distinctive directions, one for lighter and the other for heavier trucks. The large trucking companies are replacing their old medium size truck with modern, efficient heavy trucks, while the farmers who mostly own a single truck are going for smaller vehicles.

20. *Tariff:* Freight tariffs, even though set by the government, vary significantly depending on operating conditions. For example, in Anhui Province, the tariff is US 4-5 cents per ton-kilometer while in Zhejiang and Guangdong, the tariff is US 5-6 cents per ton-kilometer. On average, the freight tariff for road transport is about 2 to 3 times that for rail transport.

21. *Intermediary agencies:* The trucking industry has a number of intermediaries who play important role in facilitating the road freight business. These include freight forwarders and brokers. The freight forwarders usually are engaged in the business of collecting, forwarding or distributing goods carried by trucks. Their revenues are from the difference between the tariff they charge from the customer and the amount they pay to the truck owners/operators. On the other hand, brokers take commissions from the truck as well as freight owner for providing demand and supply information.

22. *Vehicle technology and overloading:* About half of the truck fleet in China is made up of small size trucks (with loading capacity less than 4 tons) and 10 percent of medium size trucks. Both small and medium size trucks are 2-axle vehicles and most of them are domestically produced. The heavy trucks are generally imported from Europe and USA, or jointly made in China. Sales of these vehicles are rather limited because of high prices, even though these models have much higher performance.

23. Since the RMF, HTMF and toll rates are based on designed loading capacity, to avoid taxes and tolls, carriers like to buy vehicles with low design capacity but higher carrying capacity. The local manufacturers tend to build vehicles meeting the customer's demand. The vehicles are built to carry additional load without adding extra axle, which results in overloading, and is very common throughout China. This causes a great deal of damage to pavements and other structures. Realizing the severity of the damage, MOC and the Ministry of Public Security jointly issued regulations in 2001 to prevent overloading. The regulation calls for much stricter enforcement of axle-load limits and heavier punishments. But the problem is so widespread and opposition so strong that the new regulation is not consistently enforced. Some provinces are now pursuing a new approach by building weigh stations at toll gates and are charging tolls based on actual weight rather than design capacity. Some are even experimenting with actual axle-load based toll rates to provide incentives for introduction of multi-axle trucks.

ANNEX 5: PAKISTAN – THE ROAD TRANSPORT INDUSTRY

Background

1. Pakistan's road network has grown many folds since 1947, from a mere 50,000 km to over 250,000 km by the end of 2000. During the same period the total number of motor vehicles has increased from 20,000 to over 5 million. With increased investment in the road sector compared to the rail sector in successive 5-Year Plans, the share of road transport has increased significantly.
2. Pakistan's road network has only about 9000 km of national highways and motorways running north-south connecting the only major port, Karachi, to its hinterland and the major cities. The main highway corridor connecting the port also serves the land-locked countries of Central Asia and Afghanistan.
3. With increasing development of the road network, road transport has become the major mode for both the freight and passengers. Roads now carry almost 90 percent of the total freight whereas in 1947 it carried only about 15 percent. This has created strong pressures to develop better roads, and the Government of Pakistan has planned the development of access controlled motorways along the major transport corridors. From Lahore to Islamabad the motorway has already been in operation and the others are either under construction or are at the planning stage.

Institutional Framework

4. The road network in the country is the responsibility of the federal, provincial, district, local and municipal administrations depending upon the type of road. The network is classified into motorways/national highways, provincial roads, farm to market roads and urban roads. The National Highway Authority (NHA), is responsible for the motorway / national highways, the Communications and Works Ministry of each province for provincial roads, and the district administrations for the district and local roads.
5. Provinces are responsible for issuing permits for freight transport operations and the trucks are free to operate all over the country on the particular route for which the permit is issued. The provinces have different fee structures for truck permits which affects the registration of vehicles in different provinces. Most vehicles are registered in the province of Baluchistan which has the lowest charges.

Price Control

6. There is no price control for the road freight and the freight haulage rates are determined by demand and supply. In most cases freight rates to Karachi are lower than from Karachi since most traffic originates/terminates at the port and the amount of outbound cargo from Karachi port is more than the inbound cargo. The only exception is the NLC which was established in 1978 by the army's commercial organization. The prices for tankers are determined by the oil companies.

Road Freight Transport

7. *Industry Structure:* The trucking industry in Pakistan is mainly private sector. There are a large number of enterprises owning up to 5 vehicles, and a few with 20-25 or more vehicles. In addition to truck operators there are booking companies and freight agents. The booking companies book the cargo and get it shipped. The freight agents work as an intermediary between the shipper and the truck operator on commission basis. Small truck operators have formed an association to safeguard their interests, and prevent exploitation by booking companies and freight agents. There were about 4000 such associations in 1994.
8. *Fleet:* The truck fleet, a total of about 140,000 trucks, is divided into three categories- 2-axle (66%), 3-axle rigid (9%) and 3 or multi-axle articulated (25%). The truck manufacturing industry is relatively new in Pakistan. Most of the fleet (53 percent) consists of 2-axled Bedford trucks manufactured in the country. The cost of different trucks vary significantly, from a low of about Rs.300,000 for a Bedford truck to 3,100,000 for an articulated Volvo truck with a carrying capacity of 60 tons. Most of the fleet is old with an average age of about 20 years. The multi-axle vehicles are generally newer.
9. *Freight rates:* The prevailing market structure of the road freight industry results in intense competition forcing truck operators to quote prices at times lower than their operating costs. The unit prices vary for different routes as well as by vehicle type. For a 2-axled truck carrying 12 tons the tariff ranges from a low of Rs.0.48 per tkm on Lahore-Karachi route to a high of Rs.1.04 per tkm on Lahore-Peshawar route. While for a multi-axle truck-trailer carrying about 50 tons, the tariffs are Rs.0.25 and Rs.0.77 per tkm for the respective routes. On the other hand, the unit operating cost, per tkm, of different vehicles have been estimated at Rs.1.24 per tkm for a 2-axled truck and Rs.0.64 per tkm for a multi-axle truck based on their authorized loads.
10. *Over loading:* The over loading of trucks is rampant in Pakistan. The difference between operating costs and the prevailing freight rates, as discussed above, necessitates over loading to recover even the operating costs. The legal limit for 2-axle truck is only 7 tons which is quite low by international standards. Therefore, most trucks are carrying almost double the legal axle load with an average of 12 tons for a 2-axle truck.
11. In this context the National Highway Authority has embarked on a plan to establish weigh-bridges on the 8,479 km of federal controlled roads in the country. These weigh-bridges will be built at strategic locations, and would check commercial vehicles as they enter the federal Highways and Motorways network. NHA is also coordinating with the provincial C & W Departments so that weigh bridges are installed on provincial roads as well. Implementation will be staggered over a period of years. The highly effective National Highway and Motorway Police (NHMP) will enforce the program, in addition to their normal duties. There was a concerted effort to conduct an awareness campaign through the Transport Owners Associations so that by the time the program became effective on 1st July 2003 the trucking industry was ready to conform. The

customers of the trucking industry will eventually bear the burden of the major changes in the structure of overland carriage, as it will increase their transport costs. While a more efficient trucking industry may eventually be realized in the long term, difficult times are predicted in the short and medium term. There is a need for concurrently raising the legal axle load limits.

12. *Traffic Safety*: From the limited statistics maintained by various government agencies it has been ascertained that commercial vehicles in the country are the main cause of serious accidents on both highways and in urban centers. This includes all types of commercial vehicles (buses, trucks, tankers, taxis etc). While the numbers of such commercial trucks are much less than the overall vehicle population, the percentage of accidents where at least one commercial vehicle is involved is almost 70% of the total. The factors that contribute to such a poor safety record are two folds – the machine and the driver. The age of the vehicle fleet has already been mentioned. By and large drivers are illiterate and undisciplined with no incentive to improve their driving skills. They are required to work under tough conditions — long working hours that leads to fatigue, which is a serious safety hazard. Yet another government program is under consideration to introduce reputable private driver training institutions that would also be involved in issuing driving licenses. This program has as yet not been implemented but needs to be put in place as early as possible. Good road engineering and better enforcement are the two other effective methods of improving safety on the network. Steps have already been taken to address both these issues. The federal NHA and provincial C & W Departments are upgrading the roads within their jurisdiction and have plans to install road furniture that is presently lacking. Already positive results have emerged on the sections of N5 (the National Highway) and M2 (Motorway between Islamabad and Lahore) that have come under the control of the federal NH&MP. It is also expected that the restructured provincial police departments would exercise better control now that the Traffic Police have been separated from the main force.

13. *Computerized Vehicle Registration*: This has commenced in the province of Sindh closely followed by the provinces of Punjab, NWFP and Baluchistan. It is logical that the program would record the various aspects of each vehicle i.e. age, number of axles, make, etc. but provisions for producing the relevant statistical reports may not have been made yet. Each province has developed their systems independent of each other and it is likely that their compatibility with one another has not been taken into consideration. It is therefore important to address this issue. This will bring much-needed efficiency in the enforcement of traffic rules in addition to generating up to date statistics as and when required.

14. *International Carriage of Goods by Road*: With the prospects of overland transit trade through Pakistan between the Central Asian Republics and the sea ports of Karachi, Port Qasim and the under construction Gwadar port, there is a need to promote the movement of vehicles and cargo over international borders. While all these land -locked countries including Afghanistan have ratified the international Conventions covering TIR and CMR, Pakistan is the only country in this region that has not yet done so. The TIR Convention allows the easy movement of vehicles across international frontiers as it is a

form of a “passport” while the CMR Convention is a Contract for the Carriage of Goods by Road and gives legal status to the haulier as an instrument of international trade. In view of the rapidly changing scenario in this region, there seems to be little alternative for Pakistan but to ratify both these Conventions.