

Road transport development in India

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The road transport industry in India has emerged as the dominant part of the transport system. However, the industry is finding it increasingly difficult to meet emerging requirements. This may be partly due to the inadequacies of the road network, which if expanded and upgraded could go a long way in promoting efficient vehicle operations. Part of the problem also lies in the inability of service organizations, especially in the public sector, to deliver services efficiently. With the industry having suffered from a near absence of technological improvements in the design and manufacture of vehicles, there is urgent need to effect these changes immediately.

THE road transport mode in India has come to occupy a pivotal position in the overall transport system in India. Over the past four decades, the share of road transport in overall traffic flows has been continually increasing with a substantial shift from rail to road being observed. This mode is currently estimated to have a share of about 80% in passenger transport and 60% in freight transport. Despite such an impressive growth, it is increasingly being recognized that there is a wide gap between the demand for, and the supply of, road transport services, both from a qualitative as well as quantitative perspective. While the problem has been partly one of inefficient public sector management of its transport assets (especially in passenger transport services where it dominates), it has also stemmed, according to some, from restrictive policy and implementation measures as they have evolved over a period of time. In this paper, we focus our attention on some of the major emerging issues relating to efficient operations of the motorized road transport sector in India. We take up an analysis of these issues after providing a brief overview of the sector's evolution.

An overview

In the initial phases of the development of any economy, transport requirements tend to increase at a rate considerably higher than the rate of growth of the economy. This has been the case in India too. For example, during the period 1950-51 to 1964-65, rail freight traffic increased nearly two and a half times and traffic by road is estimated to have increased almost five times. In the case of passenger traffic, road traffic increased almost

three times. These increases can be compared with the growth in national income that was less than 50% (at constant prices) during the same period. However, when one observes the shares of the two principal modes, railways and road transport, there were considerable shifts. While road transport primarily served as a mode complementary to the railways in the early fifties, it appears to have begun to effectively compete with the railways since the early sixties. The Committee on Transport Policy and Co-ordination¹ that was assigned the task of formulating a comprehensive transport policy framework for the country during the early sixties pointed out this trend. A decade later, the National Transport Policy Committee (NTPC)² also noted a substantial share of passenger traffic for road transport while in the case of goods transport, the railways were still the dominant mode with a share of nearly 70% of the total traffic. Since the Committee's research studies³ showed the railways to be the most energy efficient transport mode, it was but logical for the Committee to recommend a modal split in favour of the railways. The eventual impact of this recommended policy was to be such that by the turn of the century nearly 72% of freight traffic would be moved by the railways and 28% by road as against the base year (1977-78) survey which revealed a split of 67% for rail and 33% for road³.

However, this survey was criticized for focussing mainly upon inter-regional movements, thereby neglecting short-distance or intra-regional movements⁴. If these movements are taken into account, as some recent studies⁵ have shown, the present share of road transport goes up to as high a figure as 55% in goods traffic and 80% in passenger traffic. Given that these estimates represent a true picture of India's current traffic scenario, then clearly the modal split has gone heavily in favour of road transport, in sharp contrast to what was expected by the National Transport Policy Committee⁶.

According to the Planning Group on Road Transport⁴, estimates of freight traffic handled by road transport in 1985 were NTPC's estimates for the turn of the century. Further, the Group's estimate for passenger traffic for the year 2000 was nearly four times the level in 1985. Recent estimates of the Ministry of Surface Transport reveal that road traffic would account for 87% and 65% of passenger and freight traffic respectively by the year 2000. The change in modal shares has clear important policy implications not only in regard to road transport but also in regard to the road network which is a princi-

pal component influencing the effective functioning of the road transport system^{7,8}. We take up these issues now.

Inadequacy of the road network

Despite the fact that plan allocations to the roads have been low relative to other components of the transport system, the total road length increased from nearly 4 lakh km in 1950–51 to nearly 22 lakh km, in recent times, accounting for more than a five-fold increase in the road length. At the same time, the surfaced road length to total road length went up from 38% to nearly 46%. All this is apparently remarkable although in terms of the road accessibility indices and quality of roads, India lags behind advanced countries. For example, India has a road length of 2.4 km per thousand persons and about 60 km per sq km of land which are respectively one-tenth and one-third of similar indices for developed countries. About 35% of the villages are without a road link. A significant part of the road network has been in existence for several decades and was primarily built to serve the needs of animal-drawn traffic. Because of congestion and poor road conditions, the annual avoidable vehicle operating and fuel costs are estimated to be Rs 15,000 crores⁵.

What really is a matter of concern from the point of view of road mobility is the slow expansion and low loadability of the country's National Highway System. Nearly 30% of the National Highway network is single lane. The National Highway network carries nearly 33% of the country's traffic and this ratio is expected to rise to 40% by the year 2000. The position is still worse with respect to State Highways where nearly 90% of the roads have single pavements. For smooth, efficient and safe movement of traffic, the minimum pavement required is a two-lane pavement, one lane for each direction of traffic. Single-lane roads that allow the usage of pavement by only one vehicle at a time force vehicles to travel on earthen shoulders whenever crossings take place. Thus, frequent deceleration and acceleration become necessary. Such speed changes result in increased fuel consumption. The Road User Cost Study⁹ pointed out these inadequacies as well as glaring deficiencies in the geometrics of road design and a total lack of norms for design and evaluation of road systems. In the context of an acute shortage of funds for building up assets, the periodic upkeep of already existing assets assumes great significance. The Planning Commission had observed in its Eighth Five-Year Plan document that the availability of funds for maintenance generally does not exceed 60% of normal requirements. As a result, continuous neglect on many high density traffic corridors has led to virtual loss of road infrastructure.

A World Bank Study on road deterioration in developing countries¹⁰ found that road maintenance is a very

cost-effective option since the rate of return on investment on maintenance is supposed to be as high as 50%. Thus, it becomes important to review even the present policy of expansion of the network at the cost of maintenance of existing roads. The importance of having a proper road maintenance programme can be gauged from the fact that nearly 90% of freight on National and State Highways is carried by two-axle trucks, which are generally overloaded and cause significantly more damage than vehicles with more axles which have a better load distribution. Thus, our country requires more expenditure than other countries because of the particular composition of its commercial vehicular fleet.

Performance of public sector road transport corporations

Public sector participation in passenger road transport services in India commenced with the passing of the Road Transport Corporations Act, 1950. At present, there are 71 State Transport Undertakings in the country comprising 21 Corporations registered under the Road Transport Corporations Act (1950), 31 Companies registered under the Companies Act, 1956 (this number may be different in Tamil Nadu now), 8 Departmental Undertakings and 11 Municipal Undertakings. As on 31 March 1995, there were around 1,11,200 buses in the public sector with a total investment of over Rs 6,000 crores and formed 27% of the country's bus population. These Corporations earned a total revenue of Rs 8,385 crores in 1995–96, showing an operating loss of about Rs 610 crores. The financial return on capital invested (net profit or loss/capital invested) was (–) 9.25%. According to a study by the Planning Commission¹¹, there has been a perceptible improvement in the rate of return during the last five years though the return is still negative.

As regards physical performance, there have been significant improvements during the 1980s and thereafter. The Corporations' performance could be measured in terms of two sets of indicators namely, (a) efficiency indicators such as utilization per bus per day in km, fleet utilization, staff–bus ratio, etc. and (b) quality of service indicators such as the number of breakdowns or accidents per 10,000 effective km. If we look at the daily utilization of buses, it is observed that the figure has gone up from 250 km in the early eighties to more than 300 km in 1995–96. Fleet utilization also went up from 84% to 89% during this period, the staff–bus ratio came down from 9.78 to 7.96 and mileage per litre of diesel consumed went up from 4.02 km to 4.43 km during the same period. As regards the quality of service indicators, the number of breakdowns went down from 1.03 to 0.54 and the rate of accidents from 82 to 31 per 10,000 km. However, it must be noted that there are

Total registered motor vehicles in India (in thousands)						
Year (as on 31 March)	All vehicles	Two wheelers	Cars, jeeps and taxis	Buses	Goods vehicles	Others
1951	306	27	159	34	82	4
1961	665	88	310	57	168	42
1971	1865	576	682	94	343	170
1982	5997	3043	1230	170	601	953
1991	21310	14047	3013	333	1411	2506

Source: *The India Infrastructure Report*, Ministry of Finance, Government of India, 1996.

considerable variations in the performance of different State Transport Undertakings.

According to Dalvi¹², the main point to be noted is the big difference between the performance of State Undertakings and private operators. While their fleet utilization is normally higher, their bus-staff ratio is much lower. Moreover, they are estimated to earn an average rate of return of 20% on their investment¹³. It must, however, be noted that State Transport Corporations besides paying a stipulated dividend, are also subject to heavy taxation while, at the same time, they are called upon to bear certain social burdens such as operating uneconomic routes, offering concessional fares to certain classes of users, etc. The Planning Commission study¹¹ noted that taxation has eroded the profitability of these units. This is specially true of the passenger tax which is based on traffic earnings and diminishes the impact of every fare rise since a sizable chunk of the additional revenue goes to the State Exchequer and gives only part relief to the Undertakings. Moreover, fare revisions are generally inadequate and do not, invariably, compensate for increases in input costs since they come into effect after a lapse of a considerable period of time. On the other hand, evasion of taxes by the private sector is rampant and this help protects their margins.

Considering the emerging demand for road passenger traffic, there is obviously a need to expand capacity. With the State Transport Undertakings facing an acute shortage of resources to keep their fleet intact, let alone provide for expansion, an emerging idea is that the private sector should be given a more significant role especially when the economy is being liberalized. From an economic theory viewpoint, we observe that the road transport market is a perfectly contestable market where there is hardly scope for economies of scale and where exit and entry barriers are few, if not entirely absent. In such a situation, the presence of a monopoly supplier can only serve to restrict user choice and thereby increase cost – which has possibly been the case in states which opted for total nationalization of the passenger road transport sector such as Maharashtra, Gujarat, etc. Deregulation would perhaps be desirable in the case of

these states. Studies relating to deregulation and privatization of urban bus transit services in the countries have shown that most parties have gained from such policies¹⁴.

In Britain, a combination of privatization and deregulation has softened the effects of subsidy cuts on users. In developing countries like Sri Lanka, Chile, etc. privatization and deregulation have generated large service expansion with little or no fare increases even when public subsidies have been reduced if not withdrawn. At the present moment, the preferable policy approach would be to enhance competition between public and private operators through deregulation rather than denationalization that can come at a later stage depending on the outcome of this experiment.

The roads goods transport industry in India

Road freight operations in India have almost been always in the hands of numerous private operators. In the four decades since independence, the number of trucks rose from around 80,000 to an impressive figure of more than 15 lakhs in recent years. In the past ten years alone, the figure has doubled.

The principal legislation regulating the industry is the Motor Vehicles Act of 1939 that was amended comprehensively in 1988. The amended Act, by its various provisions, appears to recognize the potential of the industry as an essential ingredient of the social and economic infrastructure (for long endorsed by different Committees) rather than support the earlier predominant view that the industry only needed to be supervised and controlled. Though such a perspective provides for a more liberal policy framework and at the same time a strengthened regulatory mechanism, the implementation needs to be qualitatively different.

For instance, while the purpose of the permit system is essentially to restrict numbers, it is quite possible to achieve this objective by emphasizing the qualitative aspect of the provision. These relate mainly to the responsibilities to be fulfilled by the operators. On a broader level, issues relating to the problem of

Growth of Indian road network (km)		
Category	1951	1995
Expressways	—	—
National highways	19,811	34,000
State highways	60,000	131,000
Other roads	318,000	1,935,000
Total	400,000	2,100,000

Source: *The India Infrastructure Report*, Ministry of Finance, Government of India, 1996.

detentions, at check-posts/octroi posts need to be sorted out soon. A study undertaken nearly two decades ago¹⁵ had revealed that a carrying capacity equivalent to 80,000 trucks or capital equal to Rs 670 crores was locked up in check-posts/barriers. In addition, fuel consumed during the halts amounted to about 10% of the total fuel consumed.

Suitable policy recommendations for the industry have been made by a number of high-powered Committees appointed from time to time. While most of them dealt with very specific issues such as pricing, taxation, etc., the Committee for Transport Policy and Co-ordination¹ formulated a comprehensive policy framework for the first time. An important recommendation of this Committee was to get the organization of activity of goods operations on a cooperative basis so as to achieve certain economies of scale. The National Transport Policy Committee² which also had a chance to look at the problem of viable units observed, on the basis of their own detailed analysis, that it was not true to say that single truck operations were unviable. At the same time, the Committee admitted that the better-organized firms earned a much higher rate of return. But the Committee was of the opinion that the more pressing problems related to inadequacy of working capital, lack of proper facilities for maintenance and repair, especially for small operators. A more recent study carried out by the Central Institute of Road Transport, Pune¹⁶ reveals that single truck operations are viable provided that the vehicle is new and they are involved in long-distance haulage. As far as organized firms are concerned, it was found that an average return of 17% was possible – assuming different fleet strengths.

However, the study points out that 'the system output has suffered much due to such fragmentation'¹⁶. The study further points out that productivity will improve if viable units undertake as many transport-related activities as possible and are not confined to haulage alone. A viable unit with a sizable fleet and infrastructure may be made a pre-requisite for lending in contrast with the small industry mechanism approach adopted by financing agencies at present.

Technology and road transport development

It has been well established that road user costs are significantly influenced by the pavement quality⁹. This brings into focus the desirability of optimizing pavement investment in the overall interest of minimizing total transport costs in the long run. Small *et al.*¹⁷ emphasize the need for optimal investments in road durability, which would produce thicker pavements and would result in substantial benefits in the long run. It is in this context that the role of rigid pavement technology based on different types of cement concrete becomes significant. The changing relative price structure of bitumen and cement and the total road cost concept which considers construction costs and maintenance costs over the design life tend to render cement concrete roads viable. However, the inherent structural characteristics of such roads require that they are built to proper structural standards and appropriate maintenance standards are used. They have good scope for use on four laning of National Highways and on Expressways.

The compulsion for a technological change in the automobile industry in India became necessary only when the market became more competitive in the early eighties. Until this time, the different strategies mainly related to modernization, scale, production process, etc. which did not affect costs and thereby had no effect in market shares of different firms. Thus, there was a delay in the introduction of new and more efficient technologies although individual manufacturers updated their product lines from time to time through limited research and development efforts¹⁸. Some of the technological improvements that have resulted from foreign collaborative ventures/indigenous efforts in recent times include fuel-efficient, weight-effective, high-performance engines, modern aero-dynamic cabs, improved suspension systems, etc. To increase the payload capacity of the vehicles so that fuel consumption per tonne-km is reduced, the use of multi-axle vehicles and tractor-trailers need to be introduced in a significant way. This would bring about a change in the composition of the commercial vehicular population that consists mainly of two-axle vehicles.

According to the Vehicle Fleet Modernization and Road User Charges Study¹⁹, if three-axle vehicles were to carry about 25% of the inter-regional freight by early next century, compared with the then existing ratio of 3%, the annual saving would be Rs 1,800 crores in 1987 prices. In this context, it would be pertinent to note that the current vehicle taxation scheme is road damage-related but levied on gross-vehicle weight rather than potential axle loads. This results in under taxation of the two-axle vehicle relative to those with more vehicles. In such a situation, there is pressing need to develop a coherent road taxation system in India based upon the re-

lationship between the damage imposed on the road by different vehicles and the costs of developing and maintaining the roads to a suitable degree.

Concluding remarks

The enormous growth in total traffic volumes and the shift in the market share of traffic in favour of road transport have important implications for policies related to the road transport sector. While the importance of an adequate road network hardly needs to be reiterated, the essential thrust of policies would have to be on creating a more competitive regime in order to improve the productivity of the road transport system. The State Road Transport Undertakings will have to compete with the private sector even though the former may continue to play a dominant role. Ultimately, it is only an efficient public sector that can help the Government meet its social obligations.

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