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JOURNAL OF INDIAN SCHOOL OF POLITICAL ECONOMY is devoted to the study of the Indian Economy, Polity and Society. Emphasis is primarily on reviewing developments since Independence with roots in the British administration where relevant. However, papers with a similar focus but not necessarily reviewing developments since Independence will also be considered. When a review is based on statistical data, full statistical base data are presented as far as possible.

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FROM THE EDITOR

We, at the ISPE, do hope all our readers and well- wishers are taking all care amidst the raging pandemic situation which has gone on for more than a year and is expected to worry us for quite some time more. Our Journal has been delayed for more than a year now. We do hope the situation will improve on this front with active support from all of you and researchers who have been contributing papers for us. I fervently hope to come up to date by the end of 2021 or early next year, given things only improve and we see normalcy being restored slowly but steadily. For this Issue (4th one of 2019), we have just one paper, a book review and some documentation. You will see that we have introduced a new Section titled "Down Memory Lane" with contributions from two distinguished academicians. I expect to continue with this additional Section in forthcoming Issues with active support from all of you especially senior colleagues. Such meaningful contributions can be expected, I hope, to motivate and encourage young researchers, academicians and others in many ways to follow their pursuits in a far more focussed way in the direction they themselves think they are best suited for with some encouragement from others.

S. Sriraman

ECONOMICS OF SUSTAINABLE TRANSPORTATION IN INDIA - SOME PLANNING, GOVERNANCE ISSUES AND RECENT INITIATIVES IN INDIA

S. Sriraman*

Efforts are being made all over the world to increase the sustainability of development patterns. In many countries, particular attention is being paid to the critical role played by transportation. A sustainable development policy framework when applied to transport systems requires the promotion of linkages between environmental protection, economic efficiency and social progress. This paper makes an attempt to examine some of the economic issues within this framework related to more realistic pricing procedures, promotion of an integrated transport system, need for safety procedures and practices and more effective urban transport planning and governance which need to be looked at closely with a view to provide some guidelines for the future which would be useful in the formulation and development of a more sustainable transportation system while at the same time recognising full concerns regarding environment and societal issues.

1. INTRODUCTION

Major concerns about the quality of the environment, social and economic equity, and perceived threats from climatic changes have provided a basis for an emerging interest in the concept of sustainable development which, in general, refers to a state in which there is a balance of economic, social and environmental goals, including those that involve long-term, direct and indirect, impacts. Brundtland [1987] defined sustainable development as development that meets the needs of the present without compromising the need of future generations to meet their own needs. It reflects a basic human desire to protect and improve the situation on the earth with a focus on the integrated nature of human activities which requires coordinated decisions among different sectors, groups and across jurisdictions, local, regional, national and international. In other words, sustainable development aims to expand the objectives, impacts and options considered in the developmental process, which helps in ensuring that short-term decisions are consistent with strategic, long-term.

Sustainable development in the context of transport systems requires the promotion of linkages between environmental protection, economic efficiency and social progress. Under the environmental dimension, the objective consists in understanding the reciprocal influences of the physical environment and the practices of the industry and to ensure that environmental issues are addressed from all the concerned aspects of the transport sector. Under the economic efficiency dimension, the objective consists in enhancing progress by way of economic efficiency. In other words, transport must be cost-effective and capable of adapting to emerging and changing demands. Under the social dimension, the objective consists in upgrading mobility standards while at the same time ensuring higher standards of living and a better quality of life.

It must be noted that before energy efficiency and climate change became major policy concerns, sustainable transport was defined in terms of policies which were based on access-based transport planning oriented around planning for

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Note: This paper draws upon heavily from author's earlier papers, namely, Sriraman and Roy (2009), Sriraman (2013a), Sriraman (2013b),Sriraman (2014), Sriraman (2015), Sriraman (2017), Sriraman (2019a), Sriraman (2019b).

proximity. Today, the focus on energy saving and conservation, environmental impacts dominate the policy debates and frameworks of most countries in this context while, at the same time, basic issues of efficiency of planning, implementation and operating practices are not being given the emphasis that is also normally required to sustain systems in the long-term. In other words, sustainable transport has a wider framework and needs to be looked at more than just energy and environmental sustainability. It is being increasingly recognised that there is also a need to look at the basic economics which is commonly one of the factors contained within sustainability depictions. The common thread of these depictions is that sustainability is located in the region of overlap of the separate factors so that sustainability is an optimum mix of a number of desirable outcomes.

It is to be emphasised that, in recent decades, economic deregulation in many economies across the world has been involved significantly to promote non-sustainable behaviour such as high-vehicle ownership, use of high fuel-consumption-vehicles and consequently poor use of public transport. This development has given rise to the feeling that returning to more sustainable transport is unlikely until the time the policy framework within which people live drives them in a different direction. It is against this background that this paper makes an attempt to examine some of the economic issues within this framework which need to be looked at closely with a view to provide fresh guidelines which would also be useful in the formulation and development of a more sustainable transportation system while, at the same time, recognising that there are numerous other representations of sustainability that closely link parameters such as environment, society, economics, and sometimes justice and governance [Sriraman, 2013a]. In this paper, an attempt is made to outline a general set of guidelines for a sustainable transport system. To begin with, a brief explanation of an approach to a sustainable transportation system is given.

2. A SUSTAINABLE TRANSPORT SYSTEM - AN APPROACH

Such a system can be one defined such that:

* It allows individuals, companies, societies to meet their basic mobility needs in a way that human and ecosystem health needs are met and promotes equity within and between successive generations,
* It is affordable, efficient, offers a choice of transport and supports a competitive economy as well as balanced regional development, and
* It limits emissions and waste within the planet's ability to absorb them, uses renewable resources at or below their rates of generation and uses non-renewable resources at or below the rates of development of renewable substitutes, while minimising the impact on the use of land and the generation of noise.

To achieve these, we need to adopt an integrated transport planning approach with the following objectives:

A. Integrating the planning for different modes in synergy with each other, and allocating to each mode the traffic in accordance with its niche domain of cost advantage rather than standalone system for mode specific funding and planning;
B. Assessing the resource cost of transport movement for different modes rather than the financial costs, and identifying suitable measures to induce modal shift, in the light of the specific circumstances of the sector.
C. Identifying the gaps between ideal/optimal and actual traffic flows for each commodity and mode and finding out the reasons for the same;

D. Viewing transportation demand in conjunction with and identifying the boundaries with related concerns like land-use planning and environment policy, and also with upstream activities like vehicle production and technology;
E. Identification of goals and setting of performance measures for areas and modes, in relation to economic and social goals, for example, accessibility, mobility, economic development or quality of life, etc.

More specifically and for the purpose of this paper, the framework of an appropriate sustainable transport policy would seek to achieve, among other things, some of the following economic (and social) objectives:

* emphasis on realistic modal pricing methods to ensure that users pay the full social and environmental costs of their transport decisions and movement thereby to sustain long-term viability of the system.
* To strike the right balance between modes of transport in serving economic development needs of a country by proper planning within an appropriate policy framework.
* To provide for safe mobility.
* To provide better and efficient urban mobility.

We now consider each of these elements in detail separately with particular reference to the Indian context. Before we do that, we shall provide a critical overview of the transport sector in India as it has emerged especially in the past two decades or so with a view to identifying the various issues that have emerged relating to the dimensions mentioned above.

3. A BRIEF OVERVIEW OF THE TRANSPORT SECTOR IN INDIA - AS IT EVOLVED SINCE INDEPENDENCE

India's transport sector has been traditionally organized along a mixed pattern of public and private sector ownership with the constitutional responsibilities for the provision of transport services vested in both the Central and State governments. Broadly speaking, for nearly four decades the central government was mainly responsible for providing railways, national highways, civil aviation, domestic and international air transport services, and international shipping and major ports, whereas states held the responsibility for all roads except national highways, all minor ports, coastal shipping and inland water transport, and urban transport and the private sector providing a supplementary role especially in provision of services.

Indian Railways has been owned and managed departmentally by the Ministry of Railways as a government monopoly, though there has been some relaxation on provision of rail transport in urban areas which, since 1985, has been the responsibility of the central Ministry of Urban Development. Providing domestic air transport was deregulated in the 1990s thereby allowing private sector operators to compete with public operators. This was followed by the entry of private operators in international air transport during the early 2000s. Since then, airports have also gone into a private sector scheme with some new greenfield ones coming up, mostly in the private sector, and some older ones being upgraded by private sector parties. The road freight sector has always been in private hands but road passenger bus transport services were opened for nationalization by the state governments under an enabling Act, called the Road Transport Corporations (RTC) Act, passed by the Indian Parliament in 1950 (GOI, 1950). Under this Act, some states opted for complete nationalization of road bus passenger transport while others adopted a mixed ownership pattern,

allowing both public and private sector participation. Water transport services, both domestic and international, have been largely operated by private and public sectors. The port sector has also been attempted to be reformed with many upgradations of facilities at existing ports taking place with some role for the private sector but under supervision and control of the public sector. At the same time, some new ones have emerged (involving minor ports or non-major ports as they are called now) under the scheme of public-private partnerships with the some of the individual maritime states like Gujarat, Andhra Pradesh, Tamilnadu, Orissa, etc., participating actively in this process.

The transport sector as a whole has been one of the principal recipients of budgetary support with public sector transport undertakings depending heavily on the public exchequer to finance their development programmes as well as their operating losses. The new economic policy adopted in the 1990s required that these undertakings generate sufficient resources internally to meet their operating costs as well as finance their expansion plans. But transport undertakings in India especially public sector ones, as in many others, generally had no control on their pricing and investment decisions and have traditionally lacked the power and authority to run their businesses on commercial lines despite provision in the legal framework to do so. Equally serious has been the problem of bearing the burden of a host of public service obligations without receiving any explicit financial compensation from the governments. All these have imposed unnecessary burden on their financial positions. With the new economic policy being in place for quite some time, crucial issues, such as the extent to which these undertakings are allowed to determine their pricing and investment policies, obligations to carry out social obligations on behalf of the government, and the extent of compensation for such obligations, have come to the forefront and are still being debated even after about two decades. In this context, it must be noted that questions have often been raised regarding the reasons that have given rise to such a situation. To understand this, it would be useful to provide a brief review of the planning processes involved and the policy frameworks within which the sector evolved over decades.

Planning and Policy Mandates

The development of a correct transport planning model for a country should normally begin with an examination of the broad socioeconomic policies of the government and the objectives and priorities of its macroeconomic plan so that the development of transport proceeds in close conformity with the needs of the country. The central purpose of a policy and planning coordination mechanism is to create such technical, economic, and other conditions for the growth of transport and distribution of traffic between different modes so that it will help in ensuring, to the greatest extent feasible, that facilities in each mode are developed and operated keeping in view the need to satisfy the overall requirements of traffic at minimum cost to the community. The result hoped for is not complete coordination but a framework of economic policy and institutions conducive to coordination between modes of transport, especially land-based modes such rail and road.

India has a unique distinction among developing countries in that it has since the early 1960s developed a very sophisticated macroeconomic planning model using a highly disaggregated inter-sector input-output matrix, which can simultaneously treat both output and demand targets within an integrated framework. This adoption made the task of transport modelling easy as well as difficult, easy in that the model

could straightway start with traffic generation and distribution stages (following the standard, decades old transport planning model), and difficult since it was extremely time consuming to generate meaningful and consistent traffic flows for such a large number of sectors using the standard models, while, at the same time, providing for the spatial dimensions of movement thereby neglecting regional dimensions. The most obvious effect of this neglect was the failure to correctly forecast the volume of traffic demand in terms of traffic leads—which was nevertheless done but based on arbitrary assumptions. Consequently, right from the time the planning process began, while the volume of originating traffic has invariably been over-estimated, the average traffic leads have been under-estimated for most of the commodities. This inability to systematically take into account traffic leads has been considered by many experts as one of the main reasons why planners failed to make adequate provisions for investment in the transport sector, especially the railways.

As a result, a disconcerting development in the Indian transport scenario has been the emergence of road transport as a dominant mode. Further, given the lack of coordinated efforts between various elements, a governance analysis of transportation in India of the system [Sriraman, 2014] showed that this has contributed to misallocation of resources which has resulted—especially more so within a liberalized economic framework regime adopted since the 1990s—resulting in severe mismatches even between and within every transport mode in terms of developing transport infrastructure and the growth of service provision.

The problem of transport coordination was considered in great detail by the Committee on Transport Policy and Coordination appointed in 1959 (CTPC- Chairman Shri. K.C. Neogy till 1964 and then Shri. Tarlok Singh) [GOI 1966] which strongly felt that this role was best done by the Planning Commission which could use the Joint Technical Group on Transport Planning (set up by the Commission) as the nucleus of a new Transport Planning and Committee with the Planning Commission Member concerned with Transport as its Chairman (extracts from the report of the relevant Chapters 3 and 13 are reproduced in this Issue in the Section on Documentation). A comprehensive review of policies related to the transport sector in India was undertaken by the National Transport Policy Committee (NTPC -under the chairmanship of Shri.B.D. Pande) between 1977 and 1980 [GOI, 1980a]. To some extent, the recommendations of this Committee served as guidelines for transport development programmes of the Sixth Plan [GOI, 1980b] and the Seventh Plan [GOI, 1985]. This Committee recommended the setting up of a National Transport Commission to coordinate attempts at the macro level in terms of policies required for investment, pricing, fiscal strategies, regulatory mechanisms, and above all for the integration of modes. The Committee also recommended the setting up of Transport Authorities in major urban conglomerations of the country to tackle issues of coordination at the micro level (An extract from the report of the relevant Chapter 3 is reproduced in this Issue in the Section on Documentation in this Issue).

Though the concept of the Transport Commission was never taken forward, a nodal Ministry of Transport was established at the Central level in the mid-1980s with a supposed objective of attempting at some coordination between the various modes. Though no formal analysis of this attempt at coordination was ever undertaken, some findings indicated that the purpose of having a nodal ministry was never achieved in any sense, with each ministry chartering its own course with the experiment being abandoned soon

after. Since then, the sector has only been subjected to sub-sector reviews which have been undertaken from time to time and which have influenced subsequent Plans though in piecemeal ways. This is despite the fact that the Government of India formally introduced its first reform package plan in 1991 and subsequent ones in the past decade or so. While many infrastructure sectors such as telecom, energy have been fortunate in terms of attempts made towards a comprehensive policy framework and a limited implementation of policies contained therein, no such framework emerged as far as the transport sector is concerned though it must be noted that some components such as urban transport have received focused attention [GOI, 2006a]. It was heartening to note that this lacuna was being attempted to be remedied with the formation of a High-level Committee on National Transport Development Policy (NTDPC) (Chairman: Dr. Rakesh Mohan) in 2010. Though the Committee submitted its report in 2014 [GOI, 2014], there was no attempt to work out a policy framework for implementation even though it is widely recognized that transport sector challenges continue to confront us in ways that can definitely and significantly affect the process of development that we are on now (Chapter 5 of the Main Report of the NTDPC entitled "Institutions for Transport System Governance" contains strong recommendations, among many others, for creating a consolidated Transport Ministry to focus on system performance) strongly. All through, the Planning Commission (and equally so Niti Ayog, successor to the Commission though in a different role) continued its feeble attempts only to be taken lightly by the concerned authorities. And the situation has not really changed at all.

It is against this background that an attempt is being made in this paper to look at some of these basic challenges that the sector faces while attempting to reason out some possible ways of dealing with these. We then consider objectives that an evolving transport policy framework needs to take into account given continual changes in the Indian economy with a focus on its sustainability. Some of these ideas expressed have already been dealt with in GOI [2014] in a very detailed manner but since the recommendations have not found their way to implementation in any form, it was thought that it would be useful to revisit /reiterate the issues and provide guidelines for solutions in the current context. We begin with the issues in modal pricing practices followed by issues on the modal split front, emerging transport safety issues and then finally on urban transport related ones.

4. REALISTIC MODAL PRICING PROCEDURES

Sound financing is central to sustainable development. Funding for transportation can only come from three sources: (i) taxpayers (the city or national taxpayers of today or, in the case of loans, of tomorrow); (ii) transport system users (public riders, toll payers, and others); and (iii) other beneficiaries (employers, property owners, and others). According to economic principles, users, should pay for the benefits they receive which includes the costs they impose followed by other beneficiaries. Taxpayers should only pay when no other practical mechanism exists, and for transport projects, it should normally be the case that sufficient funds (a significant part) are available from within the system. However, this simple observation belies practice and reality. Who pays the price and how much they pay- these are all elements that interact, causing important challenges to surface. We now look at the explicit cost basis for price fixation and practices as they evolved with the extent to which they are covered. We focus on the railways.

In determining prices for the outputs of multi-product firms, for example, like the railways, policy-makers have long faced a number of issues that flow inexorably from the basic economic characteristics of the industry. The endemic economies of scale and scope imply that straightforward measures of cost cannot be used to dictate pricing. Economies of scale imply that marginal cost pricing will not allow the firms to break even. Further, shared costs that are a concomitant of economies of scope cannot be unambiguously identified with individual products, so that any rule selected to associate shared costs with individual services will be arbitrary. Such arbitrary measures as fully distributed (or fully allocated costs), therefore, cannot substitute for marginal cost measurements as decision rules for proper pricing and the search for any purely cost based estimate is a remnant of inappropriate reliance on the model of perfect competition. Alternatively, there are sound pricing principles, which promote economic efficiency while simultaneously removing impediments to appropriate reforms for operators. These principles lead to differentiated prices, sometimes referred to as Ramsey prices, which apportion all unattributable fixed and common costs of a railway among its services on the basis of the value of those services to consumers - mathematically expressed as their elasticities of demand. By providing that each service is priced at a mark-up over marginal costs, which is inversely related to the elasticity of demand for that service, economically efficient differential pricing combines cost and demand factors in an optimal manner. Hence, where the demand for a service is highly inelastic, a substantial addition must be made to the marginal cost. Where demand is perfectly elastic, revenue above the short-run marginal cost can be used to meet the financial target without distorting the allocation of traffic between services. These principles result in lower prices generally by establishing a set of rates, which encourage the purchase of more rail transportation services thereby creating a larger base over which unattributable costs can be, apportioned [Sriraman and Roy, 2009].

Historically, these principles have served as the theoretical basis for what has been popularly termed the "value of service pricing principle" which has been adopted by a number of railway systems including the Indian Railways. But it must be noted that such an approach was feasible in the absence of any effective competing mode. However, the rapid expansion of road transport services, over a period of time, has severely limited the scope of discriminating pricing (as it is based on the theory of price discrimination) which used to provide adequate returns to capital earlier. Essentially, the point is that railway user charges (especially on high-valued items) cannot be raised beyond the level at which the elasticity of demand for railway transport works against the interests of the railways. In other words, there is no evidence to bear out that the value of service pricing principle that is justified on theoretical grounds is the kind that is found to be practised on the Indian Railways. This is obvious from the observation that the rate-making process has been highly insensitive to changes in the relative advantages of modes (as reflected by elasticities) and as is evident from the gradual diversion of high-valued as well as low-valued items from the railways to road transport. Following the recommendations of the Railway Tariff Enquiry Committee [GOI, 1980c], there have been sharp increases in tariffs over the past three decades or so. For instance, the average rate per passenger km. rose from 4 paise in 1980-81 to 20 paise in 1998-99, to 24.3 paise in 2002-03, to 28.5 in 2010-11 and then to 44.13 in 2018-19 while the average rate per tonne km. rose to nearly 97 paise from 10.5 paise between 1980-81 and 2010-11and then to 165.98 in 2018-19. The Railway Fare and Freight Committee [GOI, 1993]

had nearly two decades back observed "the scope for mobilising large-scale internal surpluses by raising tariffs is limited due to proven shift away from the railways" (p. 189). It is obvious that passenger fares have risen very less when compared to freight tariffs. Later, Thoopal [1999] observed that railway pricing, over a period of time, had thus grown into a distorted charging system for the services provided resulting in one of the most unscientific fare to freight ratios (1:3.5) in the world. In this context it is also useful to note the observations by Anand [1998] who pointed out that "since 1950-51 the quality of passenger services had improved and its standards progressively upgraded thus increasing the average cost per passenger km. On the other hand, Indian Railways had, as a policy, nearly eliminated the wagon load and part wagon load traffic and consequently done away with a large part of its costly marshalling and shunting operations at junctions, thus reducing the average cost per tonne km. Therefore, the ratio of rate per pass-km. to the rate per tonne-km should have gradually appreciated over its initial value of 47 per cent in 1950-51. On the contrary it has gone down to 28 per cent in 1997-98" (p. 126). Thus, he concluded that passenger services were increasingly being under-priced while freight services were over-priced. The Expert Group on Railways observed "In the Eighth Plan, 18 per cent of the total plan spending was raised by additional resources mobilized. An unprecedented proportion of this share was from freight tariff revisions and this had other consequences" [NCAER, 2001, Vol. 11, p. 98]. When viewed from the perspective of cost recovery, Dalvi and Sriraman [1998] pointed out that there exist large gaps between costs incurred by the railways and prices charged by them especially in respect of passenger services. "Railways provide several services at prices that are below the cost of provision" [NCAER, 2001, Vol. II, p. 12]. Losses on account of Social Service Obligations (essential commodities carried below cost, passenger fare concessions, losses on Electric Multiple Units involving suburban traffic in urban areas, operation of Uneconomic branch lines, strategic lines, passenger fares below cost) in 2011-12 amounted to Rs. 23932 crores and had risen to Rs. 38313 crores in 2018-19.

At present, it is estimated that only about a quarter of the railway costs are directly attributable to either passenger or freight traffic and 75 per cent expenses are joint costs which are distributed between passenger and freight traffic on the basis of certain performance factors. Even today, it is observed that passenger traffic earned only about 30 per cent of the railways' total earnings while freight traffic earned 70 per cent. According to GOI [1993], the entire social burden of the railways was being fully borne by freight traffic. Accordingly, freight rates were, therefore, pitched at a level higher than fully distributable costs with the consequence that fixed costs were being almost wholly borne by freight traffic.

There has, thus, been an argument in favour of increasing passenger fares. This may have been specifically true for traffic in the second-class mail/ express component (mainly long-distance intercity non suburban). This segment has normally accounted for nearly 50 per cent of the passenger-km. and 60 per cent of the revenue generation. Even small increases per passenger-km. could, it has been argued, result in additional earnings. And it has been a widespread belief that there would not be response to fare rise (in other words, inelastic demand). Market surveys [Mckinsey Report as quoted in Thoopal, 1999] suggested that only 27 per cent of passengers travelling second class have annual incomes less than Rs. 30,000. Further, as much as 15 per cent of second-class travel is represented by affluent passengers with incomes exceeding Rs. 72,000. This was also the observation of the Expert Group which pointed out that the "railways

have a virtual monopoly on a large range of travel options in the middle of the transportation hierarchy. This represents an opportunity to increase usage of higher-class services" [NCAER, 2001, Vol. II, p. 70]. The recommendation was that rebalancing passenger tariffs would require an annual adjustment of 10 per cent in Second Class Sleeper fares and 8 per cent in Second Ordinary fares on a continual basis for about five years. At the same time Upper Class fares were to be raised by 1-2 per cent a year.

The railway budget of 2002 attempted a modest beginning but this exercise ended then and subsequent budgets even recent ones (included in the general budget since 2017) have avoided any passenger fare increase. However, after 2002, it must be mentioned that some remarkable changes indeed followed in the next five or six years- in the form of innovative managerial strategies which saw a steep growth in freight revenue after 2004. The increase in the freight revenue can be traced to three factors (i) increased axle load (ii) reduced wagon turnaround and (iii) market-oriented tariffs and schemes. The first two managerial actions increased the IR's capacity to move higher volume of goods while the third action — market-oriented tariffs and schemes - helped raise the per unit revenue from freight and passenger movements. While the first two factors contributed to reduction in costs and thereby net revenue, the third rationalised tariffs and helped in better revenue realisation. The issue of concern was whether this development was sustainable? Given limitations to the strategies of better utilisation of assets and the fact of sharply rising inputs costs made it imperative to move tariffs in alignment with costs especially passenger fares in order to correct the imbalance between freight and passenger traffic. But the feeling emerged that the potential to tap the middle segments of the transportation price and distance hierarchies in regard to passenger traffic could be severely limited in the years to come with the commissioning of the upgraded National Highway sections fully in place. To meet this potential risk to passenger traffic, it was thought that significant improvements in standards of service would need to be planned along with fare increases.

In the absence of systematic attempts to rationalise tariffs to contribute to internal resource generation, it has not been possible to sustain the financial and economic viability of the railway system thereby leading to a threat of the sustainability of the railway system. The implication of an improper pricing mechanism, in addition to other factors, has contributed to a modal split that has resulted in the Indian context over the past 5 or 6 decades. This is, it is widely agreed, is unsustainable. We now turn to this issue of modal split in the Indian context now.

5. TRAFFIC GROWTH AND MODAL SHARES

One of the most disconcerting developments on the Indian transport scene is the massive traffic growth and its increasing dominance by road transport. Over the past 5 or 6 decades, the share of road transport in the total surface traffic movement in India has been gradually increasing with a distinct shift away from the railways being observed. Most recent estimates give the road mode a share of nearly 73 per cent in freight movement [TERI, 2019]. In the case of passenger movement, the split has been in favour of the roads increasing to nearly 86 per cent in recent decades. This scenario that has actually emerged is the reverse of what has been expected or desired by the policy makers. It has very serious implications for the country not only from the point of view of energy conservation or the balance of payments problem- the objectives traditionally pursued but for the pursuit of what are now globally considered the most crucial objectives which any modern transport policy should seek to achieve as part of a sustainable development

strategy, namely, the control of environmental impacts and the reduction in the number of deaths and injuries in transport. These impacts have, in recent years, assumed such alarming proportions that they have almost everywhere threatened the lives of users and non-users of the system alike.

Modal Split as it emerged over decades

In the 1950s, Indian Railways (IR) had near a monopoly in inland transport of goods. In the year 1950-51, its share in total inland movement of goods amounted to around 90%. IR could achieve this premier role not only because of its capability to cater to traffic in small and wagon loads as well as train-loads but also owing to lack of competition from road transport which, at that point of time, lacked necessary infrastructure in terms of roads and moving units to provide an alternative. IR had its share of increasing investments in development of infrastructure flowing from enhanced provisions in the first three Five Year Plans for strengthening of transport sector. Impact of improvements in infrastructure was reflected in the 63.7% decadal growth in originating traffic for the period 1950-51 to 1960-61. The historical growth of railway freight traffic is presented in Table 1.

Table 1. Historical Performance of Originating Traffic On Indian Railways (IR)

Year	Tonnes Originating (Million Tonnes)		Net-Tonne Kms (Million)		Average Lead (Kms)
	Revenue Earning Traffic	Total Traffic	Revenue Earning Traffic	Total Traffic	
(1)	(2)	(3)	(4)	(5)	(6)
1950-51	73.2	93.0	37,565	44,117	470
1960-61	119.8	156.2	72,333	87,680	561
1970-71	167.9	196.5	110,696	127,358	648
1980-81	195.9	220.0	147,652	158,474	720
1990-91	318.4	341.4	235,785	242,699	711
2000-01	473.5	504.2	312,371	315,516	628
2005-06	666.5	682.4	439,596	441,762	647
2010-11	919.36	924.08	625,084	625,835	677
2015-16	1106.14	1108.49	654,429	655,547	590
2016-17	1106.40	1110.89	620,749	620,855	559
2017-18	1139.54	1162.63	692.916	693,281	596
2018-19	1221.78	1225.28	738,573	738,925	603
2019-20	1208.41	1221.22	707,684	708,034	584

Source: GOI (Several years)

However, inadequate allocations in the ensuing three Five Year Plans led to an increasing gap between the demand and supply. Its impact could be seen in the progressive decline in the decadal growth of rail traffic from 40.2% during 1960-61 to 1970-71 and subsequently 16.7% during 1970-71 to 1980-81 and further in the next two decades but went up during the first two decades on this century.

In the early 1980s, IR, under pressure for transporting increasing volumes of bulk commodities facing capacity constraints, decided to do away with smalls and wagon-load traffic and resorted to end-to-end running of single commodity rake loads. As a result of this change in pattern of movement, IR could carry significantly higher volumes of traffic which was reflected in the decadal growth of 62.5% achieved by 1991. However, in the process, IR practically lost most

of the piecemeal wagon load traffic (including parcels) to a growing road transport system. GOI [1980a], in formulating its policy recommendations, had accorded an overriding priority to the objective of energy conservation, particularly the conservation of petroleum products whose import bill absorbed over 50% of India's foreign exchange earnings during the late 1970s. The Committee suggested a package of policy measure to conserve the use of petroleum products in transport. These measures intended, first of all, to divert traffic from roads to railways through pricing and fiscal policies. Second, they envisaged a greater use of electricity as a motive power for transport by encouraging measures such as the electrification of the railways. The railways, by the early nineties, had completed, to a large extent, the electrification targets but other measures were not undertaken with almost nothing having been done to change the pricing and fiscal policies to discourage energy-intensive use of transport. This scenario that has actually emerged is the reverse of what has been expected or desired by the policy makers. This has had has very serious implications for the country not only from the point of view of energy conservation or the balance of payments problem- the objectives traditionally pursued but also for the pursuit of what are now globally considered the most crucial objectives which any modern transport policy should seek to achieve as part of a sustainable development strategy, namely, the control of environmental impacts and the reduction in the number of deaths and injuries in transport. These impacts have, in recent years, assumed such alarming proportions that they have almost everywhere threatened the lives of users and non-users of the system alike.

While a major part of traffic has shifted to road transport, substantial quantities of Petroleum and Oil Products (POL) products have shifted to Pipelines. Movement of cargo by Coastal Shipping has also been on the increase. Inland Water Transport (IWT) accounts for a small share of traffic. During the immediate past decade, however, various policy initiatives and innovative measures were adopted by IR which resulted in improved productivity of assets and given a boost to traffic handling capability of the Railways. The historical performance of different modes in terms of share in total originating tonnes has been shown in Table 2.

Table 2. Historical Modal Performance (Inter-Regional Traffic)

(Million Tonnes)

Year	Total Originated Tonnes (Million)	Modal Shares in Total Originating Tonnes (Million)					
		Railways	Highways	Coastal Shipping	Airlines	Pipelines	IWT
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1950-51	82.2*	73.2 (89%)	9.0 (11%)	-	-	-	-
1978-79	283.40**	184.70 (65%)	95.60 (34%)	3.10 (1%)	-	-	-
1986-87	484.9**	255.40 (53%)	224.00 (46%)	5.50 (1%)	-	-	-
2007-08	2555.35	768.72 (30.08%)	1558.87 (61.01%)	59.10 (2.31%)	0.28 (0.01%)	113.50 (4.44%)	54.88 (2.15%)

* Exclusive of Coastal Shipping, Airways, Pipelines and IWT.
** Exclusive of Airways, Pipelines and IWT.
Source: RITES [2009]

More recent estimates brought out in a study (2018-19) put the rail share in freight traffic at around 27 percent [RITES, 2020]. The study also estimated that the rail share in traffic having leads beyond 300 kilometres reduced from 51.5 percent to 32.4 percent.

A useful exercise undertaken as part of the RITES [2009] study related to an examination of resource cost social cost) of movement by each of the modes in order to understand the break-even distances up to which each mode has a comparative resource advantage. This is because even movement of bulk items like ores over long distances was taking place on highways instead of on railways. Given the phase of development that we are still in, it is necessary to ensure that bulk movements especially over long distances are handled by railways which can take place only if there is a conscious effort to make corresponding investments while at the same time ensuring existing facilities are used efficiently. In other words, the work made an attempt to understand the breakeven points up to which each mode has a comparative resource advantage. We briefly report some details of this exercise with the implications.

Break-Even Distance Analysis

Break-even distance refers to a point of indifference between two choices, i.e., at certain distance user perceives that usage of any options (say rail or road modes) does not matter. The break-even distance is a ratio of difference of fixed costs of two modes to difference of variable costs of the two modes. The fixed costs comprise of user costs incurred per tonne for each mode of transport while the variable costs consist of resource costs incurred per tonne-kilometre. The break-even distances between rail and road for different commodities assessed in the study are indicated in the table (Table 3) below.

Table 3. Break-Even Distances (Rail & Road)

Sr. No.	COMMODITY	BREAK-EVEN DISTANCE (KM)
(1)	(2)	(3)
1.	FOODGRAINS	222
2.	FRUITS & VEGETABLES	313
3.	COAL & OTHER MINERALS	188
4.	FERTILIZERS	167
5.	SUGAR	372
6.	PETROLEUM PROD. (POL)	126
7.	CEMENT	160
8.	LIVESTOCK	162
9.	IRON & STEEL	173
10.	CONTAINERS	307
11.	OTHERS	307

Source: RITES, [2009]

It may be pertinent to mention that Break-even distances assessed above were based on resource costs and would vary from the lead distances observed in the market as the market phenomena are based on actual freight rates charged. The optimization exercises that followed integrated the cost and flow data on the transport network of the country. The model was built with two objectives: the first one was to model the current flows as they are flowing in the base year and the next one was to examine how the modes respond after the traffic is assigned to rail and road by applying break-even points.

Gap between Actual & Optimal Modal Mix

A comparative assessment of the impact arising out of the two different scenarios of modal mix, i.e., Actual and Optimal (applying Break-Even Distances based on resource cost) on the transport system during the base year (2007-08) in terms of Flows, Cost and Throughput is presented in the table (Table 4) below:

Table 4. Comparative Impact Assessment of The Actual Vs. Optimal Modal Mix on The Transport System

MODE	IMPACT OF ACTUAL MODAL MIX			IMPACT OF OPTIMAL MODAL MIX		
	FLOWS Unit: Million Tons	COST Unit: Billion Rs.	THROUGHPUT Unit: Billion TKMs	FLOWS Unit: Million Tons	COST Unit: Billion Rs.	THROUGHPUT Unit: Billion TKMs
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Rail	736.2	497.3	498.6	1,704.18	1,423.4	1,168.7
Road	1,558.9	1,555.6	692.3	590.86	244.8	66.5
Coastal	59.7	34.0	90.0	59.72	34.0	90.0
Total	2,354.8	2,086.9	1,280.9	2,354.8	1,702.2	1,325.2

Note: Coastal Flows NOT subjected to the optimal analysis.
Source: RITES, [2009].

The above assessment indicated that total throughput increased by 44.3 (around 3%) million tonne kilometres while cost decreased by Rs. Rs. 38,470 Crore, which constitutes about 16% of the total cost incurred on rail transportation during that year.

From a social perspective (taking into account society's resource costs), the mis-allocation resulting from a divergence from an optimal modal mix in favour of the roads was to the extent of around Rs. 40,000 crores in 2007-08 prices (which well could aggregate above Rs. 70,000 crores given that the modal split continues heavily in favour of the road mode and in today's prices). This was because even movement of bulk items like ores over long distances took place on highways instead of on railways. This indicated that the railways have an allocative efficiency advantage in various markets over other modes in providing some transportation services especially bulk items. Given the phase of development that we are still in, it is necessary to ensure that bulk movements especially over long distances are handled by railways which can take place only if there is a conscious effort to make coordinated corresponding while at the same time ensuring existing facilities are used efficiently. It has been pointed out emphatically by McCullough [2005] that in the U.S., it is clear that freight railroads have an *allocative efficiency* advantage in various markets over other modes in providing some transportation services especially bulk items. When all costs are taken into consideration —internal costs absorbed by firms and external costs such as pollution and congestion--railroads often generate lower marginal costs than the other modes. This advantage needs to be tapped in the case of Indian Railways through appropriate and effective governance practices in order to ensure long term sustainability.

6.TRANSPORT SAFETY AS A POLICY AIM

In almost all the developed countries, the question of safety of life and limb is regarded as much an economic objective as the prevention of damage to the business and physical environment. In many advanced countries, in regard to transport, governments have always set the target for drastically reducing deaths and injuries from accidents as part of their sustainable transport policy. Safety is thus an important issue of transportation services. Accidents may lead to loss of life, injury or property damage and none of these are acceptable. In addition, accidents also have an economic cost which are not easy to measure. The cost of transport related injuries and accidents can be viewed in terms of (a) medical

costs (b) other cost related to administrative legal and police expenditure (c) collateral damage in terms of damage to property and motor vehicle and (d) loss due to income foregone arising out of absence from work or impairment/disability. Minimizing this damage must be an element of a sustainable transport system.

The 2030 Agenda for Sustainable Development [United Nations, 2017] set an ambitious target of halving the global number of deaths and injuries from road traffic crashes by 2020. According to the World Health Organisation [WHO, 2018]:

* Approximately 1.35 million people die each year as a result of road traffic crashes.
* Road traffic crashes cost most countries 3% of their gross domestic product.
* More than half of all road traffic deaths are among vulnerable road users: pedestrians, cyclists, and motorcyclists.
* 93% of the world's fatalities on the roads occur in low- and middle-income countries, even though these countries have approximately 60% of the world's vehicles.
* Road traffic injuries are the leading cause of death for children and young adults aged 5-29 years.

Of the about 1.4 million deaths recorded in road accidents the world over, nearly 0.15 million deaths were reported to have taken place in India. In 2016, the estimated mortality rate in India was 22.6 per hundred thousand population as compared to 3.1 in the U.K., 2.8 in Sweden, and 4.1 in Japan. In terms of mortality per 10,000 vehicles, the rate in India is as high as 14.24 as compared to 2 in advanced countries [WHO, 2018]. Road traffic injuries cause considerable economic losses to individuals, their families, and to nations as a whole. These losses arise from the cost of treatment as well as lost productivity for those killed or disabled by their injuries, and for family members who need to take time off work or school to care for the injured. Road traffic crashes cost most countries a significant part of their gross domestic product. The social cost of road accidents has been assessed at one or two per cent of the GDP in developed countries. A recent study commissioned by the Ministry of Road Transport and Highways [GOI, 2019] estimated the socio-economic costs of road crashes at Rs 1,47,114 crore in India in 2018 which was equivalent to 0.77 per cent of the country's GDP. With massive investment on roads and an exponential growth in the number of vehicles in India, it has become absolutely necessary to have policies which integrate all disciplines that influence road safety and enable road transport to play a proper but effective role that is sustainable too.

Safety is a central issue that challenges decision-makers during the planning, implementation and operation of any transportation network, rail or road. It is well recognised that appropriate systems need to be in place to ensure effective, efficient and, above all, safe performance during operations. A most striking feature of say, for example, the railways as compared to other modes is that it is rigidly bound. The direction of traffic is either permanently decided as in the case of double line provision or determined every time in the case of single line. Also, a space interval (also known as the headway) is maintained between following trains with a safety zone by way of an overlap kept to take care of the contingency of over-running a signal over a short distance. Railway Transport has also two other features in the matter of operation as distinct from other methods of transport like the road. The first is that the train is "track bound", i.e., a train can move only along the fixed path made for it; and a train has the "right of way" which means other transport like road vehicles cannot come in its

path, except at certain places known as "level crossings". Both these features have an important bearing on the safety rules regarding operation of Railways. Historically, it may be mentioned that when the train first started a man had to go ahead of it with a bell to "make way" but that is a matter of the past. If the rules prescribed are observed by all concerned, there is no danger of any accident occurring. It is for this reason that railways are considered as the safest mode of transportation. And with technological developments it has been possible to progressively reduce the human element (or error) to a great extent. This briefly summarises the overall philosophy of railway safety [Dixit, 2019]. And these reasons need to encourage the rail mode especially where they are most economical, i.e., over medium and long distances with the road mode being encouraged for short distance mover to provide the first and last mile connectivity.

In the Indian context, since many decades, the subject of safety on the Indian Railways has been the subject matter of a number of high-powered Committees which have examined the various issues and recommended remedial measures. Though all aspects of Railway working affecting Railway Safety have been examined by several Committees and very detailed recommendations made in detail with remedial measures suggested, their implementation has been very slow a crucial constraint being the lack of adequate finances with the result that safety issues even today continue to be a matter of great concern to all the stakeholders. Ever since the 1990s, the Railways were not able to provide fully for the depreciation (by way of contributions to its own Depreciation Reserve Fund- DRF) needs due to severe financial constraints. The position was further aggravated by the implementation of the recommendation of the Vth Central Pay Commission. The steep increase in the working expenses of the Railways resulted in an erosion of the Railways' capacity to generate investible surpluses. During these years, the railways had to resort to drawing down from the balances of the DRF to enable minimal plan outlays. In wake of this, GOI [2001] recommended a grant of Rs. 15,000 crores to the Railways for wiping out the accumulated arrears of the replacement and renewals of the safety related assets. On account of its inability to provide such a large quantum of funds from within its own resources, a one-time grant for renewal of these over aged assets was sought by the Ministry of Railways. A non-lapsable Special Railway Safety Fund of Rs. 17,000 crore was created to expedite the works of renewal/replacement of overage safety related assets within a time frame of six fiscal years. It was decided that this fund would be funded through two sources, viz., (i) Railways' contribution through the levy of 'safety surcharge' on passenger traffic and (ii) through additional financial assistance to be given by the Ministry of Finance. GOI [2012] estimated that an estimated Rs. 100,000 crores would be required during the next five years to implement its recommendations.

Replacement of over aged track, rolling stock and signaling issues are yet be solved fully or even to a great extent. Implementation of identified safety measures like track circuiting advanced warning devices, anti -collision device is still progressing very slowly. And so too the pace of technological up gradation on IR to reduce dependence on human judgment has been slow. All this has meant that, in the absence of adequate safety related investments not only related to arrears but also due to new requirements, the full potential of the system is not being exploited. Such a situation has implications in terms of inefficiencies, diversion of traffic to the roads, unsafe travel, etc., which when corrected would not only serve the basis for greater revenue generation but also safe and reliable movement. In other words, there are a lot of gains — financial

as well as economic- that can be derived by a greater focus on safety related but timely investments on the railways while at the same time aiding the sustainability goal [for more details see Dixit, 2019]. We now turn to some recent initiatives that have been put in place in regard to the sector which provide some hope for sustainable transportation goals to be met.

7. URBAN TRANSPORT RELATED ISSUES

A Brief on the Significance of the Urban Transport Problem in India

As cities grow exponentially, an effective and sustainable urban transport system for people and goods movement is a pre-requisite for sustainable economic growth. Many Indian cities especially the metropolitan ones have attracted significant investments in high-technology industries thanks to a competitive and highly qualified workforce. Given this situation, it is well recognized that efficient and reliable urban transport systems are crucial for India to sustain a high growth rate. However, urban transport systems in most cities of the developing world like India are still underdeveloped and their transport capacities have been found to be grossly inadequate. Thus, residents are unable to fully exploit economic opportunities since they lack the mobility needed to support economic growth [Sriraman, 2013b; Sriraman, 2019b].

Over the last two decades, rapid population growth and spatial expansion has led to a sharp increase in demand for urban transport facilities and services in many cities in India. Although circumstances are different across cities in India, certain basic trends which determine transport demand (such as substantial increase in urban population, household incomes, industrial and commercial activities) are the same. Several factors have hindered the adequate and timely provision of services to match the ever-increasing demand. In many cities, densification and spatial expansion have occurred with little or no development planning, while in some cases the failure of the instruments of governance has resulted in a significant wastage of resources or substandard quality of infrastructure. Furthermore, the huge capital costs and time required to develop high-capacity transit systems have prevented the timely implementation of such systems in rapidly growing urban areas. As a result, many cities have relied on road-based systems, which have serious capacity constraints, negative environmental consequences and other limitations. The rising incomes especially in our urban areas provide attraction and an opportunity to the urban dweller to own a vehicle especially when public transport has failed miserably in its attempt to meet the demand. Urban transport systems in most cities suffer from major constraints such as insufficient financial resources, inefficient regulatory frameworks, poor allocation of road space, inadequate traffic management systems, institutional weaknesses and undeveloped public transport systems.

In most cities, road networks are severely deficient in meeting developmental demand. Residential areas have few and inadequate tertiary or access roads and very limited provisions for pedestrians, cyclists, etc. Meanwhile, increases in the number and uses of vehicles surpass the capacity of road space, adding to congestion and air pollution. As a result, transport conditions in cities are characterized by severe congestion and aggravated by the poor discipline among drivers, incoherent enforcement of traffic laws and an eclectic mix of vehicles. A failure to respond promptly to rapid motorization and the resultant congestion along with weak enforcement of vehicle emission standards, results in degradation of the environment and stunts cities' growth potential. The impacts of transport on the quality of urban life go further than that. As India

experiences a period of economic and urban growth, air pollution in its major cities has become a cause of national concern and generated worldwide attention. As manufacturing and power sectors are progressively cleaned up, the relative importance of the urban transport sector to air pollution increases. For the Indian cities to retain their attractiveness to international capital, and to compete with other international centres, they must be liveable. The environment is important to the economic health of the cities as well as the medical health [World Bank, 2005]. The worst off in urban transport may be the pedestrians, whose mobility and safety are hindered by non-existent, broken-down, and/ or obstructed sidewalks, difficult street crossings; and flooding in monsoon seasons. The bicycle riders, once a major urban transport mode in India, are gradually being pushed off busy roads by motor vehicles. Secondary and tertiary road networks have received almost no attention or funding, especially in low-income areas. While a large portion of the urban population relies heavily on public transport for its daily activities, public transport systems in most cities are not adequately developed and investments have been severely limited. Bus and para transit services, the predominant public transport services, are in most cities often exclusively operated by the private sector. The unregulated operation of private buses, particularly with regard to the allocation of routes and schedules, has spawned excessive competition, and as a result, the financial performance of public transport and the quality of service have deteriorated.

Along with the growth-related impacts of urban transport are the direct impacts of urban transport on the life of the poor. Currently, these systems also rarely integrate social concerns and the specific needs of vulnerable groups, thereby rendering such systems ineffective in relation to poverty reduction. Most of these factors disproportionately affect the urban poor in terms of limited accessibility to affordable transport services, ill-health from pollution and road safety concerns. Current urban transport systems, which do not fully integrate the specific needs of the poor, have worsened the perverse distributional effects of urbanization. Overstrained public transport systems restrict urban residents, particularly the urban poor from actively participating in economic activities. The social exclusion engendered by urban transport makes it more difficult for the disabled to access jobs and services. As a result, the poor find it hard to break out of poverty. In addition, the poor are disproportionately exposed to the risks of polluted air.

Governments' weak capacities have led to low institutional coordination and an inefficient institutional governance framework. A significant issue is the lack of coordination between various agencies administering the various facilities. Government agencies have overlapping or poorly delineated responsibilities, planning and programming are chronically fragmented and largely ad hoc, and institutional arrangements for policy implementation are usually incoherent. Experience indicates that piecemeal approaches to sustainable urban transport development are likely to fail and that capital investments need to be supported by policy, legal, regulatory and institutional reforms, which can improve governance of urban transport systems considerably. But these required changes need to be viewed in the larger framework of urban planning and governance. However, a neglected aspect of transport policy in India especially in urban areas has been the lack of adequate and serious attention to the relationship between transport and land use planning though it is well recognised that transport systems have direct land requirements and major effects on the evolution of human

settlements and location of industries, in turn, influencing the demand for movements. At the same time, it is also recognized that interaction between land use and transport is neither simple to understand nor easily quantifiable. But the since growth of traffic due to growing dispersal of populations especially in urban areas, there is an urgent need to properly integrate land use and transport policies so as to minimize separation between the workplace and the home. For this, formal or statutory responsibilities at the central, state and local levels are required to be in place to ensure that every transport decision takes into account all its impacts on land-use patterns. In other words, there must be judicious use of land such that it does not generate land sprawl and related costs that are excessive. Our transport systems stimulate an excessive amount of uneven development along their corridors making the provision of basic services very expensive. This needs to be regulated by land use regulations which are enforced strictly.

Regarded as a task for experts, transport planning left little room for stakeholder influence or buy-in. Transport planning was based on the completely unrealistic assumptions that the future could be predicted, that affordability was not a constraint and that implementation would be possible. Planners used deterministic transport models with optimistic inputs whose outputs were too readily accepted. The result was plans that were seldom realizable. When everything is a priority, nothing is a priority. All plans were characterized by a disconnect between what was planned, what was budgeted, and what was implemented. This represents a seriously dysfunctional process. Planning had little impact, and where implementation did occur, it did not affect core priorities. In cases where plans were implemented, little was known about the extent to which they were successful. While some risk analysis and management and performance assessments took place, planners simply did not assess the degree to which the implementation of policies resulted in the achievement of policy goals. Too often, technocratic endeavours were used to justify political decisions rather than to provide sound advice that helped set priorities and inform political action. Stakeholders wielded little influence and government failed to enable a productive policy environment. Taken together, these problems are extensive. With so much gone wrong with the existing approach, a different strategy to move towards transportation sustainability was clearly the need of the hour. We now turn to some initiatives taken in this regard during the past decade, some of which are in the process of implementation but have faced many challenges on the route.

8. SOME PLANNING INITIATIVES TO ACHIEVE SUSTAINABLE TRANSPORTATION DEVELOPMENT GOALS AND INITIAL GOVERNANCE CHALLENGES

The following three sub sections examine three major initiatives that have been proposed and are being currently being implemented. Two have been taken in the context of railway operations specifically to reverse the trend of diversion towards the highways. One of them relates to the development of Dedicated Freight Corridors which is currently under implementation with a section of this network already and in operation while the other concerns the policy of promotion of a multi- modal system with the railways serving as the backbone of such a system. The third one is related to initiatives taken to enhance urban transportation governance in the Indian context, all these are policies considered when looked at from transportation operations from a sustainability point of view. Also, there is a brief description of the very subdued attempts to tweak passenger rail fares in a very limited way to mobilise additional resources.

i) Dedicated Freight Corridors on Indian Railways

According to Hope and Cox [2015], the concept of freight corridors arose from the larger idea of a Transport Corridor which has both a physical and functional dimension. In terms of physical components, a corridor includes one or more transport routes that connect centres of economic activity. These routes will have different alignments but with common transfer points and connected to the same end nodes. A basic transport corridor will typically impact mostly the immediate area adjacent to the corridor. The economic potential of a basic transport route along with the hard infrastructures of one or more transport modes can then be developed into a transport corridor and as more freight and people move along the corridor, the soft infrastructure (logistics and institutions) also improve in order to maintain, or increase, efficiency. Such efficient corridor operations normally encourage further economic activity that leads to further investment and, ultimately, the corridor evolves into an "economic corridor". But evolution into a fully-fledged economic corridor requires broader investments in the area served by the corridor.

GOI [2006b] had observed that the competitive pressure on the Indian Railways would increase with the further upgradation of the National Highways on the Golden Quadrilateral in terms of six - laning. To compete with the highways, it was necessary to not only be price competitive but also to improve performance by way of the quality and quantity of services offered and especially catering to the requirement of the clientele. Also, there were major constraining factors on the existing high-density routes (Golden Quadrilateral) of Indian railways with 161 out of total 247 Sections, i.e., 65% of the sections running at 100% or above line capacity on High Density Network (HDN) routes [GOI, 2015a]. This limited throughput required dedicated freight corridors to be constructed on new alignments.

The National Transport Development Policy Committee [GOI, 2014] had recommended that by 2020, Indian Railways (IR) must accommodate 46% of the total freight traffic from the then estimated existing share at 31% to balance the modal mix. Only a strategy of Dedicated Freight Corridors (DFCs) could be expected to result in an improvement towards an optimal split which would then ensure long terms sustainability of freight movement at competitive costs. In other words, with a view to retain and even increase market share that was essential, the Railways needed to be repositioning itself differently in order to meet the competition from the road sector in terms of a market focus in its operation which could possibly be addressed more effectively only by an independent organization operating services on dedicated freight corridors than within a very large organizational set up, as of then. Accordingly, a major initiative that was set into motion was the one related to development of new DFCs connecting the four metropolitan centres (with diagonals) which are connected by sections on the Golden Quadrilateral.

The Expectations from the DFCs

Freight train movements in India have always suffered as high speed, express trains and even other passenger trains got priority to use the tracks with all trains using the same tracks. Both industry and the railways suffered as a result. It is expected that providing separate and exclusive tracks for freight trains would reverse the trend over time. To begin with, freight trains will run according to a timetable and as fast as express trains. The new tracks being laid for the freight corridor can handle heavier trains — this will increase freight handling capacity of railways. Freight train

capacity is proposed to be more than doubled from the current 6,000 tonnes to 13,000 tonnes. The Western Dedicated Freight Corridor (WFDC) would primarily cater to containerised traffic, mostly exports and imports, while the Eastern Dedicated Freight Corridor (EFDC) will be used most to move coals from mines in east India to power plants in north. It is also proposed to operate double stack container trains, thereby increasing the handling capacity of the railways and also help decongest ports when consignments arrive. Also expected is a sharp increase in the average speed of freight trains — from the current speed 25 kilometres per hour to 70kmph with the maximum speed of these trains reaching 100kmph or more. Moving most freight trains to the new corridor will also benefit passengers by reducing congestion on the main tracks and enable passenger trains to move faster.

The governance strategy of DFCs constitutes a significant departure from what Indian Railways has been doing historically, i.e., running mixed traffic (freight as well as passenger) across its entire network. Though the primary objective is building rail corridors dedicated exclusively to freight trains, the dedicated freight corridors are expected to have similar impact that rivers and highways had historically in the process of economic development in many countries including India. For example, it is expected that DFCs would induce large volumes of additional traffic which are likely to be generated by industrial corridors expected to come along the DFCS in terms of creating high impact development areas spanning a distance of 150 kms. on either side of the corridors like the DMIC (Delhi Mumbai Industrial Corridor) on the WDFC.

It is to be emphasised that DFCs have been planned to promote effective coordination between land-use planning and transportation planning which means that a more integrated approach in terms of effecting better governance is being attempted within a dynamic planning framework that explicitly recognizes the spatial relationships between the major freight hubs and transport links to and from distribution centres which are important not only to provide the large volumes but also ensure that the system is time-sensitive in terms of the scheduling. A fall out that can result is that this can help the railways gain increased access to high potential markets like consumer durables, fast moving consumer goods, etc., which presently go mostly by road even across long distances. However, it is necessary to ensure institutional arrangements like effective rail-road coordination are made to cater to this type of business (parcel) which is expanding and thriving in a big way.

Some Basic Governance Issues related to DFCs

According to reviews of the DFC initiative and its subsequent progress, many issues have been confronted (and to some extent solved) including those relating to land acquisition, the basic organisation structure of the DFC framework. With work on the Western and the Eastern Corridors having been taken up first, the land acquisition issue has almost been taken care of. However, doubts about the organisation of activity under the DFCs still continue.

Agarwalla and Raghuram [2012] concluded that the unbundling that has happened in other infrastructure sectors (aviation, maritime and road) to bring in greater autonomy and accountability and that was expected to begin in a significant way on IR happen cannot really happen since there does not appear to be as yet any clear sign of unbundling of roles in terms of policy making and licensing, operations, and regulations on the part of IR. In another critique on governance elements of the emerging DFCs, Pangotra and Shukla [2012] point out that the current

proposed organization structure of DFCCIL Corporate Office is a conventional structure based on functional classification, which is common in government organizations, one that leads to less than efficient coordination across departments. A programme-based structure, they feel, on the other hand, can lead to better coordination and better performance management. Therefore, coordination for greater programme effectiveness would be an important management challenge for DFCCIL especially when operating within a conventional structure. They also examined the potential for reduction of carbon emissions that was envisaged from the operations of the proposed projects in terms of developing elements of a sustainable transport system. The analysis showed that large transport infrastructure projects like the DFCs could have significant impact on CO2 emissions which thus can provide an additional dimension of sustainability to the efficiency gains for which these transportation projects have been undertaken thus recognizing substantial environmental benefits. In other words, the low-carbon characteristics of such projects make these case for large infrastructure projects even more compelling. However, it is emphasised that this strategy of transport investments which could benefit the economy in terms of low-carbon emissions needs to be aligned with low-carbon sustainable actions on several fronts in terms of proposed developmental activities in order to maximize social welfare gains. More recently, Raghuram and Verma [2019] pointed out that different technical standards have been adopted for the two Corridors. While the WDFC would have provision for double stacking of containers, EDFC would provide on for single stacking which could make it impossible seamless movement of trains from the WDFC to the EDFC. In regard to the structure, they felt that it would have been better to have considered the option of a non-IR owned entity. According to them, as per the draft business plan of the DFCCIL, the Indian Railways would be the sole owner and customer of DFCCIL. By virtue of it being the single owner and controlling its Board, IR would be in a position to influence all policy decisions including the charges payable by it to DFCCIL. It is further argued that the structuring of the DFCs has been a lost opportunity in terms of the opening of the railway sector in India while pointing out emphatically that the autonomy of Dedicated Freight DFCCIL in the proposed set up has been reduced so as to make the IR the sole owner and sole customer [see Sriraman, 2019a for more details].

ii) Containerised Multi- Modalism as a Significant Initiative

Transportation plays a key role in economic success of a country by allowing for safe and efficient distribution of goods and services throughout the supply chain. Transportation links various elements in this chain to provide for integrated logistics activities. Without transportation, the integrated logistics system breaks down. One of the challenges of transportation today is to increase capacity and reduce costs. Transportation has a significant logistics function for all industries and therefore it has large impact on escalation or reduction of logistics cost. It is against this background that multi- modalism or inter- modalism (the terms being used interchangeably for the specific purpose of this paper) in terms of the transportation components has emerged.

In simple words, Multimodal transport refers to interlinking of multiple modes of transport (Rail, Highways, water, air, in general and specifically in urban areas Buses, Metro, and Feeder services, Bikes, Taxis, etc.) to create a more seamless end to end transport from source to destination with low cost and better convenience.

The main objective to go for multimodal transportation is to enable agile and shared mobility with higher asset utilization, seamless connectivity and end to end visibility which would involve connected relations such as unified payments system basis, first and last mile delivery concept, institutionalizing the 'One Transport' concept thereby contributing in reduction of carbon footprints, and, above all, cost-effective. Transport being the backbone of the entire value chain has to be robust and resilient to market fluctuations. The growth of any organization lies on the agility, adaptability and alignment of its distribution model across the nation and also the globe. In the Indian context, logistics is expected to play an increasing role in driving trade in the country as well as the global economy. For quite some time, the country's infrastructure has been one of the biggest hurdles that has paralysed the growth of the logistics sector and thereby trade. It gets reflected in inadequate and low-quality modal and terminal transport infrastructure. Slow adoption of new technologies has been another big constraint. Equally important have been the inadequate availability of appropriately skilled manpower, regulatory hurdles, etc. In other words, the significant part of the services is still being delivered to the end customer in a disconnected, piecemeal way [Khandelwal, 2020].

A key feature of multi-modal freight transportation is the use of consolidation to obtain economies of scale. Standardized cargo units, such as the container, have been a great technical invention for improving the efficiency and effectiveness of international transport chains. Maybe the biggest advantage of these units comes from their modularity. Modularization can also be seen as a prerequisite for future transport systems while integrating the physical cargo flows and related information more closely with each other. And in this context, containerization is one of the most salient aspects in the development of multimodal transport. Containerization is considered to be one of the most vital factors in the context of multimodal transportation as it combines the advantages resulting from the consistency of rail movement, the flexibility of road movement, the cost-effectiveness of shipping, and the speed of air transport.

In the 1960s, Indian Railways played a crucial role in promoting multimodal transport in India. In 1966, Indian Railways containerized goods to give birth to intermodal freight transport in India. Indian Railways then started moving cargo in specialized DSO containers. Standardized ISO containers began to be used from the 1970s and it was in 1981 when the first ISO container was moved inland by Railways to the country's first ICD at Bengaluru (then Bangalore). In 1988, CONCOR was established as an offshoot of Indian Railways and took over the existing network of seven ICDs in the country. Container traffic in India has grown at a compound annual growth rate (CAGR) of nearly 15 per cent as compared to eight per cent globally, driving up its share of global container traffic. A large share of break-bulk commodities which has traditionally been shipped as non- containerized cargo is now sent in containers. Kadam [2017] observed that the period of recent growth had been boosted by rapid growth in containerization of general cargo that has increased from 60% in 2001 to around 68% in 2011 and projects that container penetration in India could reach 72% by 2020. Presently, containerized cargo represents about 30% by value of India's external trade, and this proportion is likely to grow as containerization increasingly penetrates the general cargo trades and increases its share.

Kadam [2017] also examined whether multi-modal containerized movement is cost efficient or not as compared to only rail movement or road movement. Using a range of models, the author attempted to point out the advantages that can accrue from a multi modal system especially that involves containerised movement. The author concludes on the basis of a comprehensive empirical modelling exercise that multimodal transport is a comprehensive approach in utilising the advantages of different modes of transport. At the same time, it must be recognised that by the integration of various modes of transport, one does not merely a simple addition of the strong points of all modes concerned. There is, in fact, a synergy effect in integrating different modes of transport into multimodal transport that needs to be tapped. India has witnessed good growth in multimodal movement in recent decades and an integrated transport sector is still evolving with containerization just emerging as a major process of movement.

In terms of legislative measures supporting multi- modal transport, The Multimodal Transport Act was passed by the Indian Parliament in 1993 to establish a standardized regime for the multimodal transport operators (MTOs). The Director General of Shipping was identified as the competent authority under this law. This Act paved the way for MTOs to register themselves with the authority and start their operations. This provided a boost to the inland movement of traffic under a single authority. IT has been a major enabler of multimodal transport in India and has been extensively used to automate the supply chain and documentation. To automate this process, the Indian Customs has introduced the Indian Customs Electronic Data Interchange (EDI) System (ICES) which provides a paperless, smooth and continuous system to transact customs clearance related information. ICES is currently operational at 245 major custom locations across India which handle more than 98% of India's international trade of import and export.

Multimodal transport was a monopoly on CONCOR till the early 2000s when licenses were given to private companies to operate their own freight trains. In order to encourage trade by Micro, Small and Medium Enterprises (MSMEs), Railways started the "road-railer" system where contained vehicles can run both on roads and rail tracks. Currently, there are more than 15 Private Freight Train Operators (PFTOs) in India with major companies such as Hind Terminals, DP World, Adani Logistics, CWC all moving their own trains. Indian Railways has also allowed PFTOs to run their own Private Freight Terminals (PFTs), a move which can add approximately 20-25 mn tonnes of additional loading capacity. IR also operates a scheme under which operators can lease rakes from Indian Railways.

The NTDPC [GOI, 2014] had laid out a clear prioritization on where investment should be focused in the transport sector with the approach to transport policy differing from earlier efforts in two key areas — a system base approach and an outward looking approach. The Committee strongly felt the need for significant investment in railways, which cannot be expected to happen in a business-as-usual scenario. This focus would require making certain strategic decisions regarding relative allocation of investments to railways rather than roads, with accompanying pricing and taxation policies that can be used to nudge transport demand towards desired modal shares. In other words, the key issue facing the country was the desired strategy for capacity extension of the railways sector over the next few years. This strategy could be expected to promote multi- modalism in a significant way with the railways focussing on long -distance movements and other modes on the final connectivity. GOI

[2015a] admitted that the biggest challenge facing Indian Railways today was not only the quantum of service delivery but also its quality. It is in this context, that the encouragement of multi-modalism on the part of the railways becomes an important objective.

Recent Initiatives and Governance Elements

In 2017, India has firmed up the contours of an ambitious multi-modal programme to reduce logistics costs which includes setting up 35 multi-modal logistics parks at an investment of Rs. 50,000 crore, development of 50 economic corridors and an investment template which involves roping in the states and the private sector for setting up special vehicles for implementation. Fifteen such logistics parks will be constructed in the next five years, and 20 more over the next 10 years [GOI, 2017a]. They will act as hubs for freight movement enabling freight aggregation and distribution with modern mechanized warehousing space. One such hub would be along the DFCs with a minimum 100 hectare of area and an inter spacing of about 400 kms common user facilities. Joint ventures will be set up between National Highways Authority of India (49% share) and the partner (51%) for the project may be a state government or a private entity. Of the land acquired for the project, 40% will be developed and returned to the land owner. While 20% of the land will be sold to finance the project, the profit from the rest 40% of the land will go to National Highway Authority of India.

It is being emphasised that relevance of logistic parks would be in terms of reduction in parcel size of traffic due to consolidation, induction of multi links in supply chain, aiding in increase share of rail in white goods and non-bulk traffic, promote the growing field of Roll on and Roll off (RORO) and Auto-car Carrier business. The overall development would be in the hands of a Nodal Agency (a proven multi-modal operator preferably from Government sector) which would create the common infrastructure and the integrated services including rail infrastructure inside the terminal, manage Inter Modal Terminals, make arrangement for warehouses, Container Freight Stations (CFSs), utility centres on Public Private Partnership (PPP) model, oversee administrative, financial, commercial and operations management of the Logistics Centre and also take care of the upkeep and management of common property.

In terms of port-rail connectivity, many projects have been identified as part of the National Perspective Plan, [GOI, 2016] under the Sagarmala programme including development of heavy haul rail line from Ib Valley/Talcher in Orissa to Paradip port. The project will help in transportation of thermal coal from Mahanadi Coalfields Limited (MCL) to various coastal power plants in southern India via coastal shipping. Other rail connectivity projects to major ports like Tuticorin and non-Major ports like Dhamra and Gopalpur in Orissa, Krishnapatnam in Andhra Pradesh have also been proposed. These projects will enhance port connectivity to the hinterland and help in reducing logistics cost and time for cargo movement making Indian trade more competitive.

The nature of freight being transported is changing fast from heavy bulk to lighter high-value goods to move in smaller consignment volumes. Speed in delivery is itself an important characteristic of product quality. The heart of the Indian Railways' freight strategy will be the creation of high-volume, high-speed freight corridors, with critical mass carried in train loads. It needs to create this critical mass in partnership with other players, aggregating/consolidating freight into train loads. Roads play a pivotal role for first/last mile connectivity; they need be

co-opted as partners. A major sector for the Indian Railways to focus on is the generic parcels traffic, which encompasses the express market. The Indian Railways may operate dedicated train formations conceptualised and developed by private entrepreneur/integrator analogous to envisaged private passenger train operators. Individual vans may be offered for intercity transport of freight/parcels/courier packages by fast passenger trains. Today, two recurring themes reverberate across the logistics domain-digitalisation and multimodality. An important mandatory ingredient of the new normal will be optimising asset utilisation, accelerating asset velocity, embracing digital technologies, reducing unit cost, ensuring speed, timeliness, reliability of deliveries, and ease of doing business [Dayal, 2020].

(iii) Recent attempts to fine tune Passenger Fare a bit

In Sriraman [2014], it was emphasised that the kind of investment that is envisaged in the growth scenario of the country required an exceptional commitment from IR to reform and reinvent the organization's pricing practices. The question is whether there has been any effort on this front? Even today, the social burden on account of losses on passenger traffic is huge with losses being covered by a process of cross subsidization. The policy of cross-subsidization for IR has resulted in freight rates of several commodity groups reaching unreasonably high levels, resulting in diversion of traffic to other modes, especially road transport, with attendant social costs in terms of higher energy consumption and environmental damage. 'This has had very serious implications for the country not only from the point of view of energy conservation or the balance of payments problem—the objectives traditionally pursued—but also for the pursuit of what are now globally considered the most crucial objectives, which any modern transport policy should seek to achieve as part of a sustainable development strategy, namely, the control of environmental impact and reduction in the number of deaths and injuries in transport' [Sriraman, 2014, p. 531]. The continually increasing levels of subsidization in passenger fares are also generating excessive demand, leading to extreme congestion and deterioration of services. The need to reorient tariffs especially passenger fares over a period of time to cover costs of provision has been emphasised in many high-level official committee reports including the recent National Transport Development Policy Committee [GOI, 2014] which clearly stated that 'For long-term sustainability, railways have to be run as a business on sound commercial principles. However, the several / national responsibilities of the IR prevent it from operating on a purely commercial basis. While IR has to fulfil both roles, it is essential that the commercial and social roles are kept distinct and separate' (p. 43, Vol. 3). Given that the pricing of passenger services is a highly sensitive political issue and not dictated by efficiency considerations, these services are underpriced even though the economic costs are high. GOI [2014] pointed out that the passenger fares had not increased in the last ten years with the then levels being ridiculously low even as compared to bus fares. It is against this background, the sustainability of cross subsidisation needed to be seriously considered and reversed.

One attempt was made recently to revise fares with the objective of covering losses on passenger movement related to the flexi fare (dynamic) pricing policy scheme that was implemented in 2016. The flexi-fare scheme was introduced by the Indian Railway Catering and Tourism Corporation (IRCTC) in 2016 for the 142 "premium trains" such as Shatabdi, Rajdhani, etc.

Indian Railways run about 12900 passenger trains per day and the railways is losing around more than 40% of what they spend on passenger trains. Trains like Rajdhani are the ones in which the elite class prefers to travel. So, some revenue can be garnered from them. The cost of service is almost double of what is being charged from the passengers. Freight business is already very expensive in India as compared to other countries in the world. Therefore, a further increase in this area is not feasible. Under the scheme, dubbed **"flexi fares"** by railways, base fares will increase 10% with every 10% of berth sold, subject to a ceiling for 1.5 times the base fare, for most classes except third AC for which the ceiling will be 1.4. No change was to be made in the fare of 1st AC and Executive class. The concept of flexi fare was introduced in Rajdhani, Shatabdi and Duronto trains in September 2016. Other supplementary charges like reservation charges, superfast charge, catering charges, goods and service tax etc., as applicable would be levied separately. The flexi fare then introduced was implemented only in Rajdhani, Shatabdi and Duronto trains which affects only 0.35% of the total passengers carried by Indian Railways. In this scheme with a number of variants, the objective was to cover some part of the losses being incurred annually on IR.

After the introduction of Flexi-fares, the railways lost nearly 700,000 passengers in just 11 months while the additional revenue earned as a result of the scheme was Rs. 552 crore. In 2018, Indian Railways has decided to scrap flexi-fares for 40 trains, in nearly a third of premium trains as it drove away customers. It was suggested that flexi fares would at times end up being costlier than airfare. As for the others, the plan was tweaked to offer convenience and competitive fares to passengers. The focus of the new move was to find a solution that is a win-win for both the passengers and the Railways. And the idea was to raise revenue through higher utilisation of seats and not by passing the burden on the travellers.

While drawing upon the fundamentals of dynamic pricing, what Indian Railways failed initially to introduce was a simple principle that Flexi-fares work both ways, hikes and declines. In other words, the railways model just focused on increasing fares with no provision for a decrease in price when demand is low. While many decision-makers in the Railway Board supported the move, many of them opposed it stating that what the railways require is an increase in ticket prices across the board. In December 2020, a very moderate attempt (we could miniscule) was made to increase passenger fares including ordinary passenger ones. We are not aware of any work that has examined the immediate impact of such an increase. Even this attempt appeared to be an ad hoc one, an attempt which was in no way related to recovery of costs of most of the services provided, which actually should be the overriding criterion for many services Only a pricing scheme based on cost recovery (except those services that are socially desirable and require some form of direct government financial support) could sustain the railways in the long run.

(iv) Initiatives Under Smart Cities Mission in India

Many of the outcomes of India's urban transformation pose enormous challenges for the country's planners and policymakers. The formal planning system has hardly changed since independence and even today most our urban areas rely on master plans which hardly correspond to the realities at the ground level. Consider, for example, current development control norms

which are flouted at every step with implementation undertaken by a weak governance system which neither guides nor enforces the implementation [Sriraman, 2017].

In spite of the sorry state of affairs, during the past decade or so, many of India's cities have introduced innovative measures in urban planning, management and governance, thereby, clearly demonstrating a reasonably well-articulated vision which has proposed creativity and a departure from the business-as-usual scenario. Improvements in public transport based on innovative planning and the use of modern technology are seen. Delhi, for example, has pioneered the use of Compressed Natural Gas, a low-polluting fuel, for all modes of public transport, while Ahmedabad has been operating an extremely successful Bus Rapid Transit system. Disaster risk management plans are being developed, institutionalised and implemented, as has been done by Mumbai, to protect cities and their residents from natural and man-made disasters. Renewal and revitalization of older areas within cities is also being promoted, by cities such as Ahmedabad, Jaipur, Pondicherry and Varanasi. Urban infrastructure, water and sanitation systems are being revamped — in fact this is the overarching focus of recent policy reforms; safety and security in public spaces is being enhanced through improved infrastructure and more responsive policing; and communities are being empowered through skill development, participation and partnerships in a number of cities across the country. The present nuances of the smart city concept have to be seen in this context and that of the forces of globalisation and the huge expansion of information technology that are expected to shape our cities and influence our lives.

Cities are complex systems which touch multiple agencies, departments and organizations. These have become too complex to handle and operationalize conventionally. New ways, systematic changes, and technology can enhance their efficiency, services and operations. A Smart City aims to drive economic growth and improve the quality of life of people by enabling local area development and harnessing technology that leads to Smart outcomes. The objective of the Smart Cities Mission of the Ministry of Urban Development [GOI, 2015b] is to promote cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and application of 'Smart' solutions for inclusive development. The concept and strategies of the smart city will be expected to continue to be an evolving one. The Mission did not provide any definition of the smart city but aims to harness the potential of the city which aspires to become smart through smart solutions. Smart solutions include e-governance and electronic service delivery, video crime monitoring, smart meters for water supply management, smart parking and intelligent traffic management to mention only a few. Application of smart solutions is expected to enable cities to use technology, information and data to improve infrastructure and services. It will also endeavour area-based development through retrofitting (city improvement) and redevelopment (city renewal). In addition, new areas/greenfield (city extension) will be developed around the city to accommodate growing urban population. Integration of major systems on a common network helps optimize use assignment and space configurations, eliminating unused or underperforming space. It is envisaged that the strategies for the development of a smart city will create enough jobs and take care of the poor. Thus, it is conceived that the smart cities would be inclusive. As a complementary to the Smart Cities Mission, the Atal Mission for

Rejuvenation and Urban Transformation (AMRUT) [GOI, 2015c] has been launched in 2015 to cover 500 cities with a population of one lakh and more. The mandate of the AMRUT confines to water supply, sewerage and septage management, storm water drainage, urban transport and development of green spaces and parks including capacity building and reform implementation by the Urban Local Bodies (ULBs).

The 'Smart' City Transport Initiatives and Governance Challenges

It is now recognised that efficiently managing the mobility of people in a sustainable manner would be a key challenge for Indian cities. And there is a growing realisation that for improving mobility, merely increasing the supply of road infrastructure is not sufficient and there is a need to tackle the demand side of urban transport as well and this would call for planning, designing and implementing smart and sustainable urban transport solutions in our cities. The smart city mission seems to attempt to provide efficient solutions. Indian smart cities have set their focus on upgrading their transportation systems through the use of technology. In fact, the main focus during a similar mission launched in India in 2006, known as Jawaharlal Nehru National Urban Renewal Mission (JNNURM) [GOI, 2006c] and now in the smart cities approach is in introducing new technologies as the argument is that it will solve the traffic chaos and will serve the high-density demands expected on a few road corridors in the city. But most of the cities which have developed such systems as the metros have really not looked at a comprehensive way of planning for these systems while developing new facilities thus failing the system in a city and forcing people to depend on private transport.

In regard to use of technology, the plan is to take steps to reduce carbon footprint by introducing measures such as Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) to encourage the adoption of fuel economy vehicles in the country, to propose new emission norms and adopt policies for scrapping old commercial vehicles etc. In this context, it is pertinent to remember to keep a focus on developing local technologies that are simple, environment-friendly and can be taken to the global markets. At present, India is attempting extensive research work in the areas of electric and hybrid cars, hydrogen fuel cells, multiple battery technologies, and also finding new ways of generating CNG to mitigate CO2 emissions. CNG, as an alternative source of fuel for transportation, is also gaining greater acceptance.

On the softer side of technology, it is necessary to encourage the trend in the "shared economy", which is driven mainly by an emerging number in the population that believes in renting assets rather than buying. The impact of this has been significant on car ownerships too, with the commuter giving preference to hailing an app-based taxi or riding the metro rail than self-driving. This requires a high degree of collaboration between auto manufacturers, fleet operators, technology and wireless service providers to create multimodal transport systems that assist in achieving last mile connectivity. As more automobiles connect, software competency is expected to provide an edge and open further opportunities for the service providers. It is to be noted that the use of GPS and cloud-based connected buses, using ITS (intelligent transport systems) are already making a difference to movements in Indian cities (though not in an extensive way), while giving passengers the convenience of real-time information on bus locations, schedules, routes etc. at the stops or on smartphones.

In a critique, the Centre for Policy Research, New Delhi in a review [Anand et.al., 2018] found that the bulk of transportation projects were focused on roads and parking lots (almost 40%), while only 20% of the budget was to be devoted to public transportation with only 2% of the entire transportation budget to be focused on bus transport. The rest of public transit focuses on BRT systems, hard infrastructure and communication systems. While the Mission focussed on non-motorised transportation to the extent of only 13%, a significant part was to be devoted to supporting motorised transportation systems. Given that one of the purposes of the Smart Cities Mission is enhancing sustainability, the materiality of the Mission seems to be in conflict with the goal of sustainability. The Mission also provided re-centralisation of power with State Governments indicating shifts in authority and power away from local democratic institutions. a feature weakens democratic processes. Finally, this study finds that the processes of citizen engagement are not recorded precisely in the proposals and indicate that despite the extensive rhetoric of public participation, most of the proposals do not provide a strong argument to justify the claims of citizen participation.

All the above proposals and their adoption, it is to be recognized, can be successful only if a strategy to increase investment in providing the necessary and basic urban infrastructure is undertaken. This seems grossly inadequate especially in regard to provision of greater bus fleets and other public transit facilities. Further, efficient use of facilities, physical, technological, etc., would depend on the improvements to the systems of governance that currently fail miserably. Under the JNNURM, for getting approval for transport projects, the guidelines recommended that the transport infrastructure improvement schemes should be in compliance with the National Urban Transport Policy [GOI, 2006a] that had laid down the guiding principle for sustainable mobility with clear thrust on public transport, non-motorised transport, and transit-oriented development. Several analyses of various projects showed that the identified and approved projects were in consonance with the word and the spirit of the NUTP. It was found that a good part of the funding was devoted to projects in the roads and flyovers category, which went against a basic principle of the policy that emphasised moving more people and not more vehicles. Further, one important policy aspect of governance, which related to proposed coordination of planning and implementation between the various agencies providing for the operation and maintenance of transport facilities in urban areas through the work of a Unified Metropolitan Transport Authority (UMTA), which was duly notified by several State Governments but has never really taken off. A major issue with the monitoring and evaluation framework for the JNNURM programme was found to be one that was typical of any government-sponsored programme based on tracking of utilisation of monetary funds associated with physical targets of construction work with least attention being paid to outcomes derived in terms of benefits. This may be true of the Smart Cities Mission. The poor state of governance in India cities, in general, is obvious to everyone living in our cities and this is also true of transport governance, in particular.

9. CONCLUDING REMARKS

The Vision Plan Document for the Indian Railways for 2017-19 [GOI, 2017b] had stated that while the Dedicated Freight Corridors are a step in the right direction towards this objective, there are other dimensions for support this strategy that need to be looked at and encouraged. The proposed capital expenditure (Rs. 8,50,000 crores) would focus on expand the railways infrastructure to support the aspirational (expanding the rail share) modal mix in freight

volumes and this was to be achieved by many proposed elements in terms of infrastructure upgradation by expanding the capacity and scope of terminal services by partnering with existing government agencies to build multi-commodity, multi-modal freight logistics parks. Many new service offerings such as end-to-end integrated transport solution for selected commodities through partnership with national road logistics player, use of dwarf containers to capture domestic cargo market and development of new rolling stock designs which would ultimately help capture new commodity traffic and with all this, the operation of heavy haul trains to improve bulk- freight business can be expected to enhance asset utilization for priority assets, e.g., rake turnaround at stations, wagon utilization, etc. Under the more recent National Rail Plan [GOI, 2020], a clear objective is to develop capacity and infrastructure and enhance rail freight share ahead of the demand. More specifically, the idea is to create capacity by 2030 that will cater to growing demand up to 2050. According to the Hindu (2020) the Cabinet Committee on Economic Affairs (CCEA), Government of India approved three major infrastructure proposals worth Rs. 7,725 crore for setting up greenfield projects. The three projects include construction of various trunk infrastructure components for the Krishnapatnam Industrial Area in Andhra Pradesh at an estimated cost of Rs. 2139.44 crore, at the Tumakuru Industrial Area in Karnataka at an estimated cost of Rs. 1701.81 crore and a Multi-modal Logistics Hub envisaged as the backbone of major transportation corridors such as the Eastern and Western Dedicated Rail Freight Corridors, the Expressways and National Highways, the connections to the ports, airports.

While all these pronouncements can be expected to lead us further towards our sustainable development goals objectives, there are a number of other concerns that are still worrisome. The current paper almost exclusively focusses on the railways' initiatives and to some extent on urban related transport issues, the progress on these and the limitations to be overcome. In the case of the road transport sector, it must be noted that nothing really by way of planning or governance changes has taken place over decades. Road transport is a subject under the jurisdiction of the States, which have hardly been attempting to revive and revitalize, for example, public-sector road transport services while only paying lip service by way of opening up of the sector in a haphazard way to the private sector. Except for some useful gains that have been observed in a few States, the general situation is pathetic in regard to public road transport services. Recent initiatives under the Smart Cities Mission cannot improve the situation, as observed earlier and, in fact, could make it much worse. One issue that can well be considered a governance one and that was taken up by the railways relates to the merger of the railway budget with the general budget of the Government of India in 2017. While the author of the present paper argued against such a move for a variety of reasons [Sriraman, 2015], it is now felt that such a move could have been beneficial if the move was taken forward to merge all the transport related Ministries into one single Ministry of Transport, which has been a strong recommendation of several Committees in the past including GOI [2014] but one that was attempted in the 1980s but given up soon after. Such a move (also at the State and local levels) could perhaps pave the way for better coordinated planning and implementation of the different transportation projects at the national, state and local bodies levels.

During the past three decades or so, it has been increasingly recognized that we have reached a stage all transport sectoral objectives must be subordinated to the concerns which have been globally raised in both developed and developing

countries to preserve the earth's environment from deteriorating further, if not improve it and to reduce the increasing number of deaths and injuries occurring in transport, in order to evolve a sustainable transport policy for mankind. In this context, some fundamental questions which we must therefore ask are: [Dalvi, 1997]

i) Is it right to go on meeting the country's continually growing transport demand?
ii) What implications the traditional 'predict and provide' policy has for the damage inflicted on the environment, public health, the quality of life to the efficient functioning of the economy itself?
iii) Whether there exist alternatives options to transport for satisfying human needs for accessibility and movement?

These will be key questions, among some others, that a new transportation planning framework in India, which is required to be in place soon, will have to address and provide reasonable solutions if sustainable development goals are to be met.

An efficient transport system is vital for the economic well-being and the quality of life. The efficiency of any transportation system is always on the radar of policy makers due to its contribution to the national economic growth objectives and specially the dynamic growth of metropolitan areas. According to Christodoulou and Finger [2012] planning followed by implementation and then governance determine the relationships between the main agents involved in the transportation system and those with the economy in general and emphasised that these relationships need to be represented and indicated and taken forward clearly in order to understand the mechanisms that lead to better performing systems. Deakin [2001] had stated emphatically that strategies for sustainable transportation must include, among other things, pricing policies and integrated land use and transportation planning.

More and better transport has no doubt been one of the main factors in India's economic development during the past five decades. However, more can be provided only in a planned way and at a price. The Eddington study [HMSO, 2006] in the context of the U.K. confirmed that there is a vital link between transport and the economy but what is advocated is a focused approach, targeted on congested and growing cities and their catchment areas, and key inter-urban links and international gateways where congestion poses the most serious threat to economic growth. Whilst investment in new infrastructure will sometimes be the only answer to a transport problem, there are other options that should be explored — including pricing, regulation and traffic management, encouragement of smarter travel choices, travel planning and development of new technologies. This is to be well understood, considered when evolving plans, policies and while implementing them for sustainable economic development to take place.

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CHINTAMANRAO DESHMUKH

Nilakantha Rath*

Remembering Chintamanrao Deshmukh is a pleasure, a privilege and an inspiration as well. Sir Chintaman Dwarakanath Deshmukh was the first Indian Governor of the newly formed Reserve Bank of India, and the first Finance Minister of the Republic of India during the first five-year plan. But that was not the most distinguishing aspects. As the Governor of the Reserve Bank of India he piloted India's role and contribution to the establishment of the International Monetary Fund and the International Bank for Reconstruction and Development, briefly called the World Bank. As the Finance Minister, he led the Union's finances during the first Five-Year Plan period and helped the Parliament's debates, discussions and formulations on financial matters with his budget speeches.

The Reserve Bank of India was statutorily formed in 1935. After serving as Deputy Governor for sometime he became the care taker Governor for a few months in 1943 and then became the first Indian Governor towards the middle of that year. India's sterling balances with the government of the United Kingdom were a feature right from the beginning. But it became growingly significant as the Second World War proceeded. By the time Mr. Deshmukh became the Governor, the Sterling Balances had grown significantly. There were indications by that time that the war was going to end in favour of the Allies. So, the export earnings of India held in London as Sterling Balances by the Reserve Bank was of great significance to the country after the end of the war. Discussions had started between the office of the Secretary of State for India in London, the Finance Department of the Government of India in Delhi and the Reserve Bank of India. It is interesting to note that though India was very much under British rule, the Reserve Bank did not fully share the views and perceptions about the Sterling Balances either with the Government of India or the Secretary of State for India in London. It took a position that it considered necessary and important for India as a country and a nation in the post-war period. A second financial matter also developed at this time. The allied powers, mainly the British and the Americans, began seriously thinking about the International financial system and some institutions that needed to emerge for the purpose. The British circulated the Keynes Plan and the Americans the White Plan in this regard. Right in the beginning even the draft plans were not made formally available to India, either the government or the Reserve Bank. But, somehow receiving these plans, Chintamanrao, as Governor, thought that while in the long run the Keynes Plan was a more suitable one, in the short run, in the immediate post-war years, there were many provisions in the White Plan that promised to be more suitable for an under-developed country like India in its post-war reconstruction and development programmes. When finally, these became available, Chintamanrao formulated his tentative reactions. "The main objective of both the plans was the promotion of international trade through the establishment of an international system of clearing, provision of credit upto a prescribed limit to member countries in balance of payment difficulties, arrangements for orderly changes in exchange rates, prescription of guidelines for action to restore balance of payments equilibrium within a reasonable time and the creation of a permanent machinery for consultation and co-operation in running the international monetary system." It appears that his ideas were not quite in keeping with the thinking of the Secretary of State for India, nor with that of the economic advisor to the government of India. He, however, decided to take the Board of Directors of the Bank into confidence and, led by Sir Purshottamdas

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Thakurdas, the non-official members helped and supported the Governor in formulating the Indian response to these plans. After some hesitation in the beginning, the economic advisor to the Government of India, Dr Gregory, fell in line. When finally, the plans were discussed in detail in an international conference in Bretton Woods, the Indian delegation was led by the finance Member and consisted of Mr. Deshmukh and two non-officials, Mr. Shanmugam Shetty and Mr. A D Shroff, and Dr Gregory.

The Indian delegation had two major objectives before it. The first, ".. to contribute .... to the development of productive resources of all members as primary objectives of economic policy", this being the final form in which it was accepted. As Sir Chintaman explained later, "Our case rested on the proposition that poverty and plenty are infectious and if the operation of an international body like that projected was not to grow lopsided, it was necessary to pay special attention to the development of countries like India with resources awaiting development. Our appeal was to enlightened self-interest".

The second objective was to include a provision for multi-lateral conversion of the wartime surpluses of certain countries (India and Egypt, etc. sterling balances). But this was opposed by the developed countries arising out of fear that it might put undue burden on the resources of the Fund. Despite valiant efforts, it was not accepted. Later Mr. Deshmukh in a speech said that this gives us a chance to plan for our post-war industrial development in a well thought out systematic manner, which is what the Five-Year plans did.

Very persistent efforts led to the contribution of India to the World Bank's Fund such that at last India became one of the top five contributors, automatically becoming a permanent member of the governing body. In all these efforts Mr. Deshmukh kept the interests and goals of a self-governed India in front, despite being under British rule. And, interestingly he took the non-official members of the Central Board along, proving himself to be an excellent institutional man.

This shows the values Of Chintamanrao. Let me quote a couple of paragraphs from the biographical account (Fragment of a Life) of (late) Dr Hamza Alavi, who was a distinguished Pakistani economist, banker and a liberal political analyst and activist. He writes:

> "I had joined the Reserve Bank of India (RBI) in 1945 as a Research Officer on the recommendation of, indeed at the behest of, my supervisor for Ph.D. at the Gokhale Institute at Poona. Professor DR Gadgil had been asked by RBI to recommend candidates for their research department. He asked me if I wanted the job. When I told him that my aim in life was to make a career in the academic world he said: young man, you had better learn something about life before you start teaching. He pointed out that my starting salary with RBI would be far higher than that of a university lecturer. You can come back to the academic world at any time on your own terms. So, I joined the Reserve Bank in 1945.
>
> "When Partition was announced, Governor Chintamani Deshmukh called me and pointed out that since too few Muslim officers had opted for Pakistan, the State Bank of Pakistan would have great problems without trained officers. It is interesting that a Maharashtrian brahmin was so concerned whether the State Bank of

> Pakistan would be able to function properly or not. Why should he care? He pointed out that research was a luxury. The State Bank of Pakistan would need people who could do practical jobs. He suggested that I should get some training. So, I was put on a programme of intensive training in the Exchange Control Department".

This shows he was much more than a nationalist, particularly in the very narrow sense it has acquired in recent years. Indeed, his nationalism was much more than what is implied in Jai Hind (which to him meant Jai Bharat and Jai Pakistan).

Not long after the end of his term as Governor, he was drafted as the Finance Minister of the Indian Republic, in which capacity he presented the first budget in February, 1951. He presented in all seven budget speeches, including an interim budget in 1952 on the eve of the first general election. His last was in 1956, presenting the budget for the first year of the second Five-Year Plan period. The budget speech of-course followed the conventional pattern of beginning with a review of the economic scene in the concluding year. But, as I read the six speeches, as an old student and teacher of economics, I was pleased and excited. The speeches are simple, logically sequenced, explaining the developments in prices, production, trade, balance of payments, tax measures, expenditures and their justification. I am sure even the less educated members of the new parliament, with vernacular translations, must have found the budget speech clear to their understanding, helping them ask explanations, raise questions and make suggestions. Those were post-war years of great economic uncertainty, with fluctuating prices, sudden declines in export and import demand for major farm and non-farm products, affecting sectoral incomes and balance of payments. But the finance minister had a simple way of sequencing and explaining, that makes the listener think he understands. The budget speeches are not burdened with details of the Development Plan since that subject was discussed separately in Parliament. The present-day newspaper reader may be surprised to know how small, in absolute terms, was the total annual revenue or expenditure of the Union; - in 1951 it was 370 crore rupees only. The major cereal crops were in short supply and the country had to depend on imports, mainly from the USA which was willing to help with grains whose sale proceeds were given to India as loans for development expenditure. Our major exports were jute and cotton, both raw and processed. Edible oil, oil-seeds were imported; they still are. Sugar was partly imported; it is now exported with subsidy. Petroleum products did not feature in the budget; to-day they are major source of import expenditure. The economy has greatly changed; that was the goal of planning. Customs duty was a major source of state revenue. The highest slab of annual income of an individual - above one lakh fifty thousand (which to-day is way below the tax exemption limit), was subject to 92.5 per cent tax! And the government earned only one crore from this slab! If the average income of the income recipients above this slab was ten thousand rupees, then there were only about a thousand people earning this income! Yet Mr. Palkhiwala used to blast the government for this level of taxation. We may be reminded that most developed countries had the highest tax rates above 85 per cent. But Mr. Palkhiwala's regret was that the more than five hundred Raja-Maharajas were paying no income tax nor were the big ex-Zamindars (Zamindaries had been abolished by 1953), since agricultural income was not subject to income tax. What would have Mr. Deshmukh thought if he were to see the present level on high incomes and the tremendous inequality in it in a poor country like India!

Talking about his budget speech I am reminded of his love for Sanskrit literature. In his time, it was a practice for the state finance ministers to send copies of their budget speech to the Union finance minister along with the budget papers. The finance minister of Odisha, in 1952 was also a new member of the Assembly and a new finance minister. On receiving his first budget speech, Mr. Deshmukh wrote to him a personal letter in which besides expressing his happiness with his budget speech, he remarked at the end that he greatly liked his quotation from the Vedas in his budget speech, and said, I wish I had remembered to quote it in mine. Look at his familiarity with and love for Sanskrit literature.

I had an unexpected opportunity of being introduced to him once. It was some time towards the end of 1956 or beginning of 1957. By then he had resigned from the Union cabinet, in protest against the refusal to form a separate state of Maharashtra. He had built a small house in Poona, across the road from the Deccan college. He used to come there occasionally. Once on a visit, he rang up Prof D R Gadgil to say that he would like to visit him in the institute. He had known Dhanajayrao for a long time; he had as Governor of RBI circulated a note on the Keynes and White Plans by Gadgil in the Central Board of the Bank, and delivered the annual Kale Memorial Lecture of the Gokhale Institute on Central Banking in India. He came to the Gokhale Institute one Saturday morning. Prof Gadgil took him round the Institute, visiting every room to introduce the research workers. In my room I was alone that day. They walked in. Prof Gadgil introduced me as a young staff researcher, specialising in agricultural economics. The mention of agriculture led to a brief conversation between them on India's agriculture for about ten minutes, and I was a fortunate listener. At one stage Chintamanrao said, you know the Planning Commission has planned for a five per cent annual growth in agriculture for the second plan period. The directors of agriculture of the different States were invited to a meeting and when asked about the plan for their state, every one stood up and said, five per cent! And I am sure, if we had called the district agricultural officers of the country for such a presentation, everyone would have said, five per cent! They laughed and left the room. I was amused and never forgot this remark by him. And, how true he was about the way bureaucracy thinks was illustrated to me over the next 15 years in two different incidents.

The first was relating to the district development plans in Maharashtra under the new (1961) Zilla Parishad Act. Under this revolutionary Act, every district was provided lump sum for all development activities within the district and left to plan for these. We in the Gokhale Institute were receiving copies of the district development plans prepared by the Zilla Parishads. My concerned colleagues and I were amused to find that in the first two years every district divided the total sum amongst different heads in the same proportion in which the Five-Year plan for the state had proposed. It was only from the third year, after some training, that the districts began to plan for their needs, as they thought appropriate. The second was my experience as a non-official member in the Odisha state Planning Board in 1971. The state was under President's rule at the time. In one meeting of the Board, the Governor, Mr. B D Jatti, who used to attend all meetings of the Board, told the Board that on a visit to Delhi, he was taken aside by the Deputy Chairman of the Planning Commission and told that the Commission had set aside a sum for special development of tribal areas, and since Odisha has a sizeable tribal population, he requested the Governor to send a plan proposal for the purpose in less than three months' time. He also requested Mr. Jatti not to mention it to others, since the sum was limited! The Governor asked the non-official

members to submit their ideas and proposals for the purpose. In the next meeting of the Board there was only one non-official note outlining ideas on an approach to the plan for tribal area development. But it turned out that the secretariat had already prepared a plan which was forwarded to the Planning Commission. The Plan was to select the Blocks with a majority of tribal population and the total population of these blocks was multiplied by four times the per capita plan expenditure of the state to constitute the special tribal plan for the state! One wonders how true was Macaulay when he designed an education plan for the country to create copy-clerks!

Macaulay of course was aware that knowledge of English will facilitate access of some to the writings and thoughts of European thinkers. But he did not realise what this might do. It created, in the last hundred years of British rule in India, a veritable renaissance in every linguistic-cultural region of India. Indians were made to learn in English, but they wrote mostly in their own mother tongues. And in literature, arts, socio-political thinking and even religious matters Indians thought, imagined and wrote what even to-day are foundations of modernity. Take only the Marathi speaking area. Here emerged Jyotiba Phule, Lokahitawadi, Dadabhai Nawroji, Mahadeo Govind Ranade, Pandita Ramabai, Lokmanya Tilak, Agarkar, Keshav-suta, Bhandarkar, Gopal Krishna Gokhale, Hari Narayan Apte, Vithal Ramji Shinde, V. K. Rajwade, R. G. Gadkari, Khandekar, Babasaheb Ambedkar, Tarkateertha Laxmanshastri Joshi, Irawati Karve, Durga Bhagavat and many more. Chitamanrao was one of them. In other linguistic regions one can list similar distinguished personalities and their works in different fields. In the present atmosphere of overwhelming retrogression, one has to seek inspiration from these builders of modern India, like Chintamanrao. That is the necessity of this 125th anniversary.

THE PLEASURES AND FOLLIES OF A PROFESSIONAL CAREER

T.V.S. Ramamohan Rao

> "At the deepest level, what matters most is finding a true measure of fulfillment - one that leaves you feeling that you have used all your talents to accomplish something worthwhile, make a difference in people's lives, and leave a legacy for those who follow." - Murphy [2010, p. 313].

As Oliver Wendel Holmes once said, a person should be judged by the direction in which he is going rather than by where he stands at a moment of time. I believe in this firmly. I also hold that one falls back on boast about past achievements only when there is frustration that further progress cannot be made. I resisted thinking about it for a long time. But not anymore. The world today is driven by advertisement and hype even if there is minimal achievement. A quiet academic is a relic of the past. Hence, I thought I should profile myself at my glorious best and look back to see how hollow and unreal the whole thing looks.

I will indulge in a brief retrospect of what I did (or did not do) over the past 50 years of my professional career. I have two basic propositions. First, each one of us has specific talents and limitations. Our accomplishments are also conditioned by the circumstances around us (I am looking for alibis to justify non-performance). Without any doubt the future belongs to the young at heart. As a result, the only valid test of achievement, or the lack of it, is the extent to which efforts have been made to achieve possible excellence subject to the constraints. Second, we have been through a knowledge revolution that demands change from each one of us. That requires a capacity to unlearn the obsolete and learn the new and emerging trends. We will be eventually judged based on our adaptability.

Several triggers lead me to this excursion. First, a relatively recent statement from a renowned friend. He sent me a paper of one of his students. He wanted me to comment on it since (as he put it) I was the only one in India who did any work at all in that area. Momentarily I felt rewarded. Second, I was told, but did not check the veracity of it, that another distinguished friend of mine said that I was quite useless and that nobody knows anything about my work. Third, somewhat more realistically, one of my esteemed teachers said in my face that the promise that I exhibited, as a student, was never fulfilled. I saluted him and readily accepted it. Fourth, one of the leading academicians in my department, a prominent international name, consoled me by saying that there will always be many people ahead of me and several others behind me in the line. I am sure that the more accomplished among you will sympathize with a fading old light.

At the time I as an M.S. student, my mentors, including Prof. C.R. Rao, were convinced that statistical techniques would become prominent in the study of economic phenomena. They suggested to me that I pursue the area of econometrics that was developing just around that time. Over time, as I pursued it in a way that I could, I recognized that the enterprise of econometrics involves four different disciplines: economic theory, statistical models, assembling the necessary data, and computational software and hardware facilities to implement the emerging ideas. My efforts involved all these aspects. In retrospect I see some basic connections of movement from one area to another. My excursions into different areas of economic research continues to this day. It may be a result of the frustration that I could not achieve much.

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Someone remarked that most of the work of Keynes was intuitive and that he lacked the expertise of algebraic generalization that has come to dominate economics since his time. In my judgment intuition is my dominant fort as well. I believe that "significant contributions are invariably incubated in the crucible of intuition."

A young person is often driven by idealism and emotion that he should approach realistic problems around him and offer practical solutions. I was not an exception. While I was an M.S. student the legendary Laxman published cartoons ridiculing the Planning Commission for its choice of small size industrial units citing the lack of adequate finances. I considered building a model to explore the optimal size. As luck would have it, soon after I finished my M.S., I was introduced to Prof. Alan Manne from Stanford who was trying to systematize that problem. I worked with him for about a year and produced a result that he found worthwhile publishing in his book from the M.I.T. Press. I got started.

For my Ph. D thesis, I chose optimal economic growth in the Indian context. It was the time when the Third Five Year Plan was being conceptualized. Several young students were getting into it. As theoreticians and econometricians, we were attracted by the latest techniques being used. Though the thesis was well received I soon realized that the techniques were way short of any capacity to handle the immense problems. I did persist with this for about ten years but was disillusioned even with the optimal growth framework. I put it aside. Sadly, almost ten years after that it was revived in the form of endogenous growth theory. But I was way behind by then and could not get back.

Some of you may be wondering why I did not continue with the earlier work. Two reasons, however flimsy, can be cited. First, Prof. Manne himself switched to another area after publishing two more papers on it. The topic had its limits however important it may have been. Second, I was in a new environment. Prof. Gerhard Tintner, the professor I was working with, had a different perspective on the emerging problems. As I put it earlier, circumstances did have an important role in the choice of topics that I worked on. The only consolation, as Madam Tintner told me on several occasions, was that Prof. Tintner considered me as one of his best students.

Unemployment problems still attracted my attention. While I was teaching in the U.S.A. I was persuaded that the Phillips curve and its theoretical and empirical implications were valuable. I spent a lot of time trying to see how I can use it in our context. Though I could publish some of my work I felt that the approach was grossly inadequate.

At that stage, fate brought me back to India. During my first year at Indian Institute of Technology, Kanpur (IITK), I came across a note by George Tobias who was then at the Ford Foundation in New Delhi. He argued that the unemployment issue must be addressed seriously. At the time, the prevailing argument was about the choice of techniques as exemplified by the work of Prof. Amartya Sen and Prof. T.N. Srinivasan. I, for one, thought that the techniques were pretty much fixed given the product range. Hence, I considered the nature of products rather than technology as the answer. I conducted a large research project and published a book. However, I was realizing that the problem is too big and complex to be amenable to easy solutions.

I attempted to show the cascading effects of the choice of techniques, products, investment, etc., on the employment issue in some of my later work. Prof. Austin Robinson was quite curious

and spent almost one hour with me trying to see how the idea can be implemented. The paper was published in one of his books from Macmillan.

I was beginning to realize that economic concepts have not been defined with quantitative implementation in perspective. Similarly, econometric methods were far removed from the economic reality that they were trying to portray. I wrote a paper suggesting the differences. Prof. C.T. Kurien published it in one of his books.

I then thought that the other tack would be to look at the ways of helping small scale firms in their growth, especially in rural areas, to get tangible gains in employment. I did considerable work on this and wrote another book. However, I realized that even this will be a small part of the solution.

At a more practical level, the changes in the monetary and fiscal policies towards the industrial sector in the late 1970s caught my attention. Further, I had already done some work on these issues in the context of optimal growth. The optimality techniques I was using took me back to my earlier interest on optimal growth. Some of my papers on this around this time received good international response and publications. Even today I enjoy reading my paper: Money, Convenience Services, and Economic Growth. During this time, policy orientation was shifting to corporate finance, financing working capital and so on. My interest in inventory investment also started at this time. More pertinently, I was zealous about making econometrics useful in industry studies because it was rather neglected at that time. Initially I sent some of my work to Prof. S. Chakraborty of IIM, Calcutta. He did not agree. But after a month or so he wrote back to me indicating that he discussed it with another colleague of his who convinced him that the idea was worthwhile. He eventually included that as a chapter in one of his books. The work was hampered by the poor computer facilities available at that time. I literally made Herculean efforts for almost five years. All I could achieve was another couple of books. It only showed that what I could achieve was very insignificant and that there are many more issues that need attention. My interests that started at that time continue till today.

Around this time, I had to diversify into many other issues because the Ph.D students were compelling me to change my orientation. I was already getting old and some of the idealistic zeal was giving way to pragmatic considerations. I was more interested in getting my professorship. Much of my involvement in industrial economics and econometrics started taking a back seat.

An undercurrent was developing. In addition to teaching econometrics, I was well into microeconomic theory as well since we did not have anyone who could handle it. The Ph.D. level course was a challenge. Eventually I wrote a book on the Theory of the firm. After that Prof. Brahmananda used to call me Mr. Theory of the Firm. I still remember one incident. I was scheduled to present a paper at one conference. Prof. Brahmananda happened to be the chairman. To my surprise he introduced me and my paper in a delightful way. I cherish such moments even today.

Fate interfered at this stage in the form of a young student who was deeply interested in doing some work on transport economics. The fool I was, I felt a compulsion to help him though I knew next to nothing about the area. The next five years were occupied. This took me deeper into microeconomic theory. Fortunately, our work got international recognition. I managed to get an invitation from the department of Civil and Urban Engineering at the University of Pennsylvania,

Philadelphia, USA, to visit them as a professor. I was also then invited to the World Conference on Transportation Research held in Vancouver. The work resulted in another monograph for both of us. I was delighted that the young man held the only chair professorship for transport economics in the whole of India for several years.

By now I was deeply involved in microeconomic theory and its applications. However, one fallout from my earlier work was the conviction that institutional and organizational arrangements were at the apex of the success and failure of planned efforts. Microeconomic theory, in the guise of organizational economics, attracted my attention. More importantly, the prevailing emphasis in economics was on the market mechanism determining the performance of economies. On the contrary, a command type of economy within the firm was considered necessary for its efficient functioning. The M-form vs. U-form organizational arrangements were taking center stage. The M-form was of course advocating the use of a price mechanism generated within the firm. Two bright young boys agreed to pursue this tack for their Ph.D. work. Once again, we got into international publications. One of them worked painstakingly on the empirical implications of the organizational structure and conduct on corporate performance. It is pertinent to note that the underlying economic theory was inadequate to provide a quantitative translation. This issue persists even now. Prof. K.L. Krishna, who was then the Editor of the Journal of Quantitative Economics, complemented us on our effort. The other worked on the notion that motives, other than profit maximization, can disturb the efficiency of the performance of the firm. Several international publications certified our work. Spinger Verlag published a monograph on the economic efficiency of the organizational decisions of the firm. However, I was convinced that Leibenstein's notions of X-Efficiency required a good empirical foundation.

Decisions under conditions of uncertainty was hotly debated in the microeconomics literature throughout the 1980s. I got into it due to the econometric challenges that these problems posed. The pace was hectic and almost a dozen excellent international papers were published. I can briefly recall the following. One of our colleagues, a professor of mathematics, met an Australian at one conference. The Australian asked him if he knows me. He told him that one of my papers in the Advances in Econometrics caught his attention.

I was really at my best between 1987-1995. I was also chosen to be on the editorial boards of the Journal of Quantitative Economics and the Indian Journal of Economics.

I felt like going back to my work on corporate finance around this time. The estimation of managerial preferences in an uncertain environment was a challenging problem. I had the most difficult time with this problem. But it also resulted in the most satisfying work of mine. Several international papers and a monograph published by Kluwer Academic Publishers were the end products of this effort.

My interest in organizational economics could not but take me into the study of contracts. Coase thought that the cost of conducting transactions on a market were significant. He advocated its replacement by contracts and auctions. This contrasted with the command type control those internal organizational arrangements were advocating at the time. Essentially, individual initiative and a market type mechanism were brought back. I could write two books in this area. In the process I wrote a paper on the culture of

conference presentations in economics and econometrics. It was published in the Indian Economic Journal. Three years after that I met Prof. V.R. Panchamukhi for the first time. He immediately recalled reading that paper enthusiastically. I would recommend it to everybody as a good read even today. Another paper based on contracts was on the bailout mechanism in the contest of the financial crisis. It was published in a journal from Taylor and Francis. It was the number one read in that journal for six weeks continuously.

More recently, I developed curiosity about biotechnology. I have been making child like excursions into this area that will probably be one of the most important in the 21st century. An elementary book was published.

One of my relatives induced me to work on strategic management which has the making of an extension of the mechanisms design paradigm. The basic point is that another form of managing activities within a firm, other than command control or contracts, was emerging. We wrote several papers arguing that spinoffs from firms occur only due to the lack of organizational synergy of the new ideas with the existing setup. Incidentally, it should be noted that econometric implementation of contracts and auctions is still at a primitive stage with no significant progress in sight.

In the meantime, a new trend was noticed. In markets characterized as differentiated oligopoly, firms were trying to circumvent market competition by developing non-price strategies. I was attracted to the measurement of market power in such a setting since I could not find any useful conceptualization. I published several papers developing some theoretical concepts. In addition, it was difficult to get any data on the non-price strategies to implement the primitive ideas that I could develop. I ended up using Centre for Monitoring Indian Economy (CMIE) data though it was not very convincing. This resulted in a monograph on transient market power. It will be available in the market in a few months.

It is important to note that this work ignited the spirit of econometric theory in me once again. I am attracted to working on threshold regression models that I tried to avoid while working on the above book. I do believe that I have a basic theoretical contribution to offer. I sent a paper on this topic for publication. If energy permits, I will expand this further since some interesting applications for the management of viruses is possible.

As I interpret the events as they evolved, I find that a disproportionate amount of time has been utilized to develop the statistical tools. Most of them had very little to offer to economic analysis. More notable is the uncritical dependence on computer software. I recall reading some papers that pointed out how error accumulates if proper software is not utilized.

The more recent trend is the dependence on big data analytics, machine learning, and artificial intelligence. The use of Bayesian learning resulted in wrong conclusions. The important caution is that the empirical translation of economic phenomena, the econometric techniques utilized, and the computational practice can cause errors of inference without any clear idea about the extent of contribution of each of these to the projected outcomes. However, an appropriate course correction is not in sight.

Holistic approaches to solving emerging practical problems has not really been at the center stage. The dimensions of the task are so overwhelming that they may never materialize.

I noted two most glaring shortcomings of econometrics research. First, much of the economic theory is based on unverifiable assumptions. Much of it cannot be translated into econometric models. It is hard to visualize which of three types of modelling, viz., neoclassical, game theoretic, or asymmetric information, is relevant in a specific context. Further, as Rubinstein noted, contradictory conclusions emerge with even a minimal change in assumptions. Second, econometric inference is based on premises which are alien to economic thinking. In general, there is no acknowledgement of the constraints imposed by the economic mechanisms underlying the specific problem on hand. The need of the hour is in developing appropriate techniques that incorporate the constraints imposed by the data generating mechanisms implied by the underlying economic theory. As someone quipped, we can take the con out of econometrics only if we can do this. The problem is compounded by the plethora of computational software that is not suited to approaching many practical problems.

In 2014 IITK presented me the singular honor of choosing me as a fellow of IITK for my contributions to the development of the institute. None of my colleagues in the department had this privilege.

I turn somewhat philosophical now. None of us seem to know the global maximum that we can attain in professional life. Every one of us is swimming through the ocean somewhat randomly. Essentially, we are attempting a constantly shifting local maximum that we can conceptualize and achieve. In that endeavor, we take little steps attempting an invariant embedding to attain such goals. What we eventually accomplish depends on our innate talents, our efforts, the circumstances that provide opportunities and constraints, and may be, even the proverbial being at the right place at the right time.

I traversed many different areas of research. The transitions were motivated by a variety of factors. Sometimes I curse myself that I could not stay in one area of specialization. However, I have no regrets about my travel through the maze.

I am perhaps destined to leave this world wondering if any of my work will ever be useful to anybody. But the gains I have for my varied choices is that I had the opportunity to work with extraordinary talents. I could also visualize the interconnections between the different aspects of the problems being studied very clearly. Why should I feel guilty?

Perhaps the best way to conclude is by quoting Murphy again. As he put it, "You won't succeed because you have one good idea. You will succeed because you work ..., because you never give up, because you reinvent yourself constantly. You've got to be paranoid all the time, you've got to readjust based on every little piece of meaningful data. And, even after you've done all that, you still have to get lucky!" - Murphy [2010, p. 295].

REFERENCE

Murphy, B., 2010; The Intelligent Entrepreneur, New York: Henry Holt and Company.

DOCUMENTATION

The purpose of this section is to make available to the readers official documents such as reports of committees, commissions, working groups, task forces, etc., appointed by various ministries, departments, agencies of central and state governments and international organisations, which are not readily accessible either because they are old, or because of the usual problems of acquiring governmental publications, or because they were printed but not published, or because they were not printed and remained in mimeographed form. We also present in this section, official documents compiled from scattered electronic and/or other sources for ready reference of the readers. It will be difficult and probably not worthwhile to publish the documents entirely. We shall publish only such parts of them as we think will interest our readers. The readers are requested to send their suggestions regarding official documents or parts thereof for inclusion in this section.

We are also keen to publish Papers, Notes or Comments based on the material included in this section. We invite the readers to contribute the same to our journal, which we shall consider for publication in subsequent issues of the journal, after the usual refereeing process.

In the present section, we publish:

1. Extract from Report of Committee on Transport Policy and Coordination Final Report 1966, (Chairman: Shri K.C. Neogy), Chapter III and XIII

2. Extract from Report of the National Transport Policy Committee 1980, (Chairman: Shri B.D Pande), Chapter 6.

COMMITTEE ON TRANSPORT POLICY AND COORDINATION
FINAL REPORT 1966

CHAPTER III
APPROACH TO PROBLEMS OF COORDINATION
OBJECTIVE OF COORDINATION

CHANGES in patterns of traffic carried by rail and road, to which attention has been drawn in Chapter II, should be viewed, not as an isolated phenomenon, but as an aspect of the expansion of the economy and of the transport system as a whole. In part, these changes are accounted for by changes in demand for different transport services, in part by the relative costs at which the demands are met. If the transport system is viewed as an integrated network, disregarding the fact that each service may be operated by a different agency, frequently under diverse ownership, the objective of coordination may be stated to be to develop the various modes of transport as complementary services in such proportions and combinations as will meet the total need of the community at each given stage at minimum cost to the economy.

2. The problem of coordination in transport has to be considered, thus, in the dynamic context of growth. Its essential elements are, firstly, changes in the volume and composition of the services needed by the economy from period to period and, secondly, the cost at which these services can be established and operated. As between different transport services, the more important aspect is complementarily though, within a range determined by users' preferences and the prices at which individual services become available, there is also a significant element of substitutability. The problem of substitutability may arise in various forms. Within a single mode of transport, there may be the question of cost of substitution of one technology for another. Thus, it may be necessary to choose on the railways between electric or diesel traction and steam traction or between faster train services and full train loads and slower services and trains comprising wagon loads; in inland water transport between modern vessels and country craft; in road development, between wider roads with thicker surface and narrower roads of lower specification. As between different modes of transport, at given prices or for specific purposes, one mode may be preferred to another as occurs, frequently enough, between road! and rail transport or between rail and water transport. In either case, substitutability is conditioned as much by the factor of technical and economic efficiency, the quality of the service provided, as by considerations of cost and price. The price paid by the consumer of a service influences his preference. Cost may refer to the cost incurred by the individual operator of the service or by the community as a whole. In considering the problem of coordination in transport, it is cost in the latter sense, that is, social cost, which is decisive. The price paid by the user for a service may or may not reflect the cost to the operator. The operator's cost may or may not include significant elements of cost which have to be borne by the community. Since what requires to be determined are social costs, while making as careful an estimate as possible of the costs of operators of any transport service, there are other elements also which have to be evaluated, such as the cost of maintaining a road track. At the same time, while reckoning social costs, the social benefits derived from a service must also be considered. These are not always easy to measure. They may reflect the social values and judgment of the community functioning through its various organs and may in fact be of great importance in reaching conclusions on public policy for transport.

3. Planning for, transport involves decisions, which often remain only implicit, concerning the distribution of traffic between different modes of transport. These determine the quantum of resources — capital, foreign exchange, scarce materials and personnel — which should be devoted to the development of different services during any given period, the prices at which the

services are made available and the return on investment in the development of transport. The central purpose of transport policy is, therefore, to create such technical, economic and other conditions for the distribution of traffic between different modes of transport as will help ensure to the greatest extent feasible that facilities in each mode are developed in such proportions and operated in such manner as would meet the total needs of the economy at minimum cost to the community. In practice, as we shall see, this problem may not be easily resolved — and it certainly cannot be resolved by adopting any simple set of rules. Nevertheless, having regard to the limitations of resources and the large claims upon them, not the least by the transport sector itself, it, is important that every effort be made to achieve progressively as close an approximation to the objective as may be possible and, to this end, to develop systematically the necessary economic and statistical information for different modes of transport, to utilise such information in making the main decisions and to keep under constant review the facts concerning costs of transport and changes in the demand for various services and in the composition of traffic.

4. Three further observations may be made at this stage on the subject of allocation of traffic between different modes of transport. First, such allocation of traffic is intended to facilitate key decisions on the part of public authorities, including those concerned with planning, bearing, for instance, on investment and pricing policies. Secondly, since any allocation of traffic is at best based on estimates of demand on given assumptions, the broad trends which it implies are even more important for policy and action than the details of the estimates themselves. The primary purpose of traffic allocations is, thus, to provide a certain perspective on growth rather than a rigid frame. Thirdly, it is essential to take a fairly long-term view, both because decisions in the field of transport commit resources for the future and are not reversible at short notice and because allocations of traffic have the positive aim of promoting or stimulating action on the part of users and operators which may best subserve the overall interest of the economy over a period of years.

RAIL AND ROAD COSTS

5. Apart from reckoning cost elements of a social nature falling outside the customary costs of operators, even in estimating the latter there are several problems of method and approach on which much work still remains to be done. Before reviewing some of the available cost data for India, these problems may be briefly stated. Some of them are common to the transport sector as a whole, others pertain to particular services. One of the common problems is to apportion joint costs between different services or to different types of traffic. For instance, the railways provide both passenger and freight services. The track, signalling facilities and terminals as well as a considerable body of operating personnel are common. Maintenance costs, including such elements as embankments, drainage etc. are also common. Some elements in common costs are measurable, such as the cost of making and maintaining the track, signalling, terminals etc., but imputation remains a difficulty calling frequently for more or less arbitrary assumptions, not only for apportioning particular costs to different types of traffic, but also for making allowance for volume of traffic and for duration of the asset or service to which a given cost is related. In much the same way, the cost of making and maintaining a highway has to be apportioned between different road transport services, such as the movement of passengers and goods in different types of vehicles, taking account to the extent possible of factors like space occupied, frequency of service and wear and tear caused.

These are aspects of the problem of cost determination which cannot be adequately considered without the aid of technical and economic data which must be specially gathered through road tests, traffic surveys and other investigations. In actual practice, both for rail and road transport, it is necessary to conduct over a period a series of investigations into costs, both total and marginal, for specific sections and specific streams of traffic so as to build up a body of data on which dependable policy judgments may be based.

6. Another problem of considerable importance is the treatment of taxation. In the ease of road transport, taxation takes the form of taxes on motor vehicles, excise duties on fuel and accessories, import duties, sales taxes, income tax and corporation tax on surpluses accruing to individual undertakings and local toll taxes. On the one hand, it is difficult to isolate that element in taxation which may be attributed specifically as costs incurred by the industry on account of services or facilities received from public authorities; on the other, almost all taxation has larger social and economic objectives and none of the taxes may be regarded only as a specific charge on the road transport industry. Frequently, all taxes levied on the road transport industry are reckoned as costs. There would be good reason to do so in the case of taxes like the motor vehicles tax, taxes on fuel and accessories and sales tax, etc.; but income and corporation taxes and toil taxes should perhaps be kept outside the costs of the industry. Similarly, in the case of railways, the surplus transferred to the general budget after allowing for interest on capital could be excluded from costs of rail transport. Being a departmental undertaking the railways do not pay income tax or corporation tax, but they have to pay indirect taxes such as excise duties, sales tax and duties on imported component and materials. The important point to note is that the different elements of taxation that enter into the cost of a service need to be isolated and quantified as well as assessed with reference to considerations such as whether the tax represents a *quid pro quo* for benefits received without charge, or a contribution to general social purposes or a device to bring actual costs more in line with costs to the society or something else.

7. Studies of costs of transport have received a great deal of attention in recent years and much pioneering work has been undertaken in U.S.A. and other countries in the west. On the Indian Railways, until a few years ago, no detailed cost studies were done and the system of accounting in vogue did not lend itself readily to detailed analysis of costs of haulage of specific types of traffic hauled by the railways.

Recently, the Indian Railways have carried out a study of their existing system of accounting so as to facilitate cost calculations for specific services provided by the Railways. The Railway Board have issued instructions to the Zonal Railways to introduce a series of changes in the existing accounting system. These changes will necessarily be completed over a period. The Railway Board have also attempted a breakdown of the average operating cost figures into the cost of individual functional services like terminal services, marshalling, line haul, transhipment, etc. They have studied costs of goods traffic separately for (a) movement of ‘smalls’, and (b) movement of full load wagons. The results of this study, which takes into account goods traffic moving on the railway system as a whole and is based on the accounts for 1962-63, are summarised in the following table:

Table 1. Breakdown el railway freight costs (1962-63)

	unit	broad gauge	metre gauge
(1)	(2)	(3)	(4)
terminal			
smalls per tonne	Rs.	8.66	8.32
full load per tonne	Rs.	1.19	1.61
full load per wagon	Rs.	24.12	19.15
line haul			
movement per tonne kilometre (gross)	paise	1.08	1.82
other operations			
repacking of 'smalls' per tonne per handling	Rs.	4.60	4.94
marshalling per wagon per yard handled	Rs.	10.99	9.73
transhipment per tonne	Rs.	2.55	2.55

These data are in the nature of an approximation. Steps are now being taken by the Railways to ascertain as a regular practice unit costs for the functional group of services and also to work out costs of transport of specific commodities on the basis of data obtained from the Zonal Railways.

8. In respect of road transport services, little systematic work on costs has been done so far. In 1959-60, the Committee on Transport Policy and Coordination carried out a pilot investigation into the costs of operation of three selected road transport undertakings with the assistance of the Chief Cost Accounts Officer of the Ministry of Finance. The results of the study were set out in the Committee's Preliminary Report[1] and a resume is given in Appendix 7 of this report. The range between the highest and the lowest costs was found to be very wide. The cost per vehicle kilometre varied from 35.2 paise to 72.2 paise and that per tonne kilometre from 7.3 paise to 28.4 paise. Owing to the limited scope of the study, these results are to be regarded as illustrative rather than as a measure of the average costs of road haulage or of the prevailing range of variation between them. It may be of interest to note in this connection that the average rail costs for 1964-65 worked out to 3.48 paise per tonne kilometre on the broad gauge and 5.03 paise per tonne kilometre on the metre gauge.

9. More recently, the World Bank Study Team on Coal Transport has made a study of the costs of haulage of coal by railways, road transport, coastal shipping and other modes of transport, such as ropeways and pipelines which, though related specifically to coal, throws useful light on the comparative position of the railways, road transport and other modes in respect of services provided by them. The following table compares the costs of rail and road transport for the economy as worked out in the World Bank Study Team's report.

1. Committee on Transport Policy and Coordination, Preliminary Report pages 78-79.

Table 2. Costs of Haulage of Coal Per Ton to Economy

kilometre	rail costs	road costs	
		13 ton tractor and semi-trailer[2]	19-ton tractor and semi-trailer[2]
	Rs.	Rs.	Rs.
(1)	(2)	(3)	(4)
100	7.47	6.14	3.71
200	9.36	10.38	9.61
300	11.25	14.16	13.18
400	13.14	18.62	17.28
500	15.03	23.09	21.24

To determine rail costs to the economy, the en route and terminal costs have been adjusted by eliminating the tax portion, adding a domestic preference adjustment for the foreign exchange component and using a nominal rate of 12 per cent for return on investment. Similarly, in working out the cost of road transport to the economy all taxes have been excluded, domestic preference adjustments have been made on foreign exchange expenditure, and the rate of return on net investment has been taken at 12 per cent. On a comparison of rail costs and road transport costs under the most favourable conditions, the World Bank Study Team's report came to the following conclusion

> "These figures demonstrate that trucks of even higher capacity on good roads show a higher cost than rail except when the haul is less than 200 kilometres. However, the favourable trucking costs below 200 kilometres cannot be attained until there is a vast improvement in the condition of the highways near the collieries and on the main routes and until trucks of far greater capacity than those now in use in India are produced. Moreover, the trucking costs do not include any capital charges for improvements in highways. For the foreseeable future, therefore, it is indicated that the costs of the rail movement of coal will be well below those by highways."

10. We have also attempted a comparison of rail and road costs with the help of data furnished by the. Railway Board in regard to rail costs and data on road costs as worked out by, the World Bank Study Team. Such a comparison has been shown in Table 3, but it is necessary to stress that the data should be interpreted with caution. Rail costs were worked out separately for bulk commodities and for light merchandise. Road transport costs given in the table represent full costs as worked out in the World Bank Study.

11. It will be seen that road transport costs for a 13 tonne tractor-trailer are higher than rail costs for bulk movement at and above 100 kilometres on both broad and metre gauges. For light merchandise, costs of road transport in 8 tonne trucks are lower than costs of, haulage of light merchandise by rail up to a distance of about 50 kilometres on the broad gauge and up to about 100 kilometres on the metre gauge. The figures of rail costs of light merchandise have been worked out on the basis of wagon load movement. However, if rail costs are worked out on the basis

2. The trucking costs are based on a return trip 25 per cent empty.

of movements in 'smalls', they would be higher. The rail costs would be still higher if marshalling and transhipment costs are also added. The road transport costs would also be higher if allowance were made for the fact that light merchandise might not load as well as coal. Costs could also be worked out for trucks with pay load of less than 8 tonnes.

Table 3. Comparative rail and road costs

(Rupees per tonne)

distance (kilometre)	rail costs[1]				road costs[2]	
	bulk commodities		light merchandise		13 ton tractor and semi-trailer	8 ton trucks
	brood gauge	metre gauge	brood gauge	metre gauge		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
50	6.53	7.59	14.86	17.73	5.67	9.76
100	7.35	8.93	16.02	19.67	9.72	17.12
150	8.18	10.28	17.18	21.62	13.27	23.22
200	9.00	11.62	18.34	23.56	16.60	29.56
250	9.83	12.97	19.50	25.51	19.88	35.15
300	10.65	14.31	20.66	27.45	22.59	42.16
400	12.36	17.00	22.98	31.34	29.85	55.77
500	13.95	19.69	25.30	35.23	37.10	69.38

12. In comparing rail and road costs, it is somewhat risky to generalise on the basis of average costs. Therefore, it is necessary to obtain comparative data on posts pertaining to specific flows of traffic. At the request of the Committee, the Railway Board have prepared estimates of costs of rail movement for certain selected commodities on specified sections on the railways, which has taken into account marshalling, repacking and transhipment costs. The following table compares rail and road transport costs on these sections.

1. The following assumptions have been made in rail cost calculations:
   (i) Costs of rail haulage pertains to the railway system as a whole. They have been worked out on the basis of through train movement of full load wagons. Transhipment or marshalling costs en route have not been taken into account.
   (ii) In the case of bulk commodities, the loadability of wagon has been assumed to be 22 tonnes for broad gauge wagons and 14 tonnes for metre gauge wagons. In the case of light mechandise, the loadability bas been assumed as 13 tonnes and 8 tonnes, respectively.
   (iii) Terminal costs at each end, both for bulk commodities and light merchandise, have been taken at Rs. 24.12 per wagon for broad gauge and at Rs. 19.15 per wagon for metre gauge. These work out to Rs. 1.10 per tonne for broad gauge and Rs. 1.37 for metre gauge in the case of bulk commodities and to Rs. 1.85 per tonne for broad gauge and Rs. 2.39 per tonne for metre gauge for light merchandise.
   (iv) The tare weight or the weight of the empty 4-wheeler broad gauge wagon has been taken as 10 tonnes and that of metre gauge wagon as 6 tosses.
   (v) The empty return ratio is assumed to be 30 per cent for both bulk commodities and light merchandise.
   (vi) Local transport charges have been assumed at Rs. 3.50 per tonne for bulk commodities (only at one end) and at Rs. 5 each at the two ends, (i.e., Rs. 10 in all) for light merchandise.

2. Road cost estimates for 8 tonne trucks pertain to roads as they are at present: those for 13 tonne trucks refer to 'good' roads on which such vehicles can ply.

Table 4. Costa of movement per tonne by rail and road of specified commodities on selected sections (1962-63)

(rupees)

sections	distance (kms.)	name of commodity	rail[1]		road[2]
			wagon loads	small[3]	
(1)	(2)	(3)	(4)	(5)	(6)
Howrah-Nagpur	1131	building materials	33.7	46.2	150.3
Delhi-Nagtpur	1093	building materials	33.4	58.6	150.8
	837	machinery	51.9	67.6	
Nagpur-Bombay		foodgrains	27.8	53.7	115.5
		cotton-raw-loose	42.0	69.7	144.4[4]
		cotton-raw-pressed	33.0	58.5	
	693	fruits & vegetables	34.2	58.5	115.5
Madras-Cochin		foodgrains	25.2	40.6	95.5
	678	cotton-loose	50.9	58.9	119.4[4]
Howrah-Varanasi		iron & steel	24.8	52.2	
	491	mineral oils	29.2	64.4	93.6
Bombay-Ahmedabad		textiles	25.0	38.1	68.1
		cotton-raw-loose	40.1	46.3	85.2[4]
Bilaspur-Rourkela	305	limestone	13.4	..	42.6
Agra-New Delhi	194	leather manufactured	22.0	39.9	28.8
Bombay-Nasik	188	cotton, textiles	22.1	38.8	27.8
Palanpur-Ahmedabad	133	petroleum products	19.1	30.3	21.2
Calcutta-Kharagpur	116	tea	17.0	24.7	19.9
Calcutta-Burdwan	107	jute manufactured	15.5	34.0	18.3
Ahmedabad-Baroda	100	cotton pressed	16.0	29.4	17.1
Nepanagar-Khandwa	42	paper	17.3	34.5	8.2

Although the figures in the table are rather in the nature of approximations, they indicate broadly the differences in the costs of wagon load movements and movements in smalls on the railways and those between costs of haulage by rail and road transport. Road transport costs are generally higher than rail costs for distances beyond, say, 100 kilometres, and the disparity between rail and road costs tends to increase with increase in the distance of haulage.

13. In interpreting these data there are important limitations which should be kept in view. For instance, costs of rail transport will vary widely under different circumstances, as for instance, according to the nature of the commodities carried, distance of haulage, extent of empty haulage, category of train services (fast or slow, train loads or otherwise), total train tonnage, loadability of the commodities carried, density of traffic on the lines, mode of traction, traffic handling techniques etc. Road cost data are sub-

1. To the figures of rail costs, local delivery costs have been added at the rate Rs. 3.50 Per tonne at one end only in the case of limestone and at the rate Rs. 10/- each at both ends in the case of other commodities.
2. Based on the World Bank Coal Transport Study.
3. Cost estimates for 'smalls' are approximate and vary according to size of the unit load carried.
4. For cotton loose 25 per cent more cost has been assumed.

ject to even greater limitations. Besides the limitations in estimating the costs of operations of rail and road transport services, there are several other aspects to be considered. For instance, since cost estimates should be converted into cost indices to facilitate ready use, it may be desirable to employ a set of accounting prices. In view of the scarcity of capital resources, for comparing initial capital costs, there may be a case for reckoning the cost of capital in terms of a rate of interest other than the current rate. Again, to take account of the scarcity of foreign exchange, there may be a case for placing a prescribed value on the foreign exchange resources needed in alternative lines of investment. These and other possible refinements need fuller consideration. Basic of course to any scheme of cost determination is the existence of a suitable accounting system at each level of the industry which will permit ready ascertainment and analysis of costs for specific flows of traffic. The steps taken recently by the Railway Board to modify their accounting system will go a long way to facilitate systematic and continuous determination of railway costs. So far as road transport costs are concerned, in view of the nature of the industry, commercial accounts maintained by State undertakings and the larger private companies will need to be supplemented by *ad hoc*, periodical enquiries to be initiated by the Ministry of Transport. For accurate comparisons to be made between rail and road transport costs, it is essential that on key issues of definition, criteria and methods of analysis a common approach should be developed between the authorities concerned. Finally, account will also need to be taken, through appropriate money values being set, where possible, on the social aspects of costs and benefits of alternative modes of transport, such as, in the case of road transport, door to door service or saving in time, employment possibilities or developmental role in relation to rural areas or hilly tracts.

14. In the light of the preceding discussion, it may be useful at this stage to state a few broad propositions on the subject of rail-road coordination. In interpreting cost data due attention has to be given to the different economic and technological characteristics of rail and road transport since these necessarily influence their suitability for different types of traffic. As a major undertaking operating a large scale transport industry on a national scale, the railways carry a large fixed plant and have to undertake heavy long-term capital investment. They require a special track and large and expensive rolling stock which can only be used on the fixed track. The element of fixed or overhead costs is very high in rail transport, and, within the limits of available capacity, the greater the volume of traffic the lower is the unit cost. Further, to the extent that there are reserves of line capacity on the railway system, increased demands for transport can be met with comparatively limited additional investment. To ensure the economy of large scale operation on any route, it will frequently be in overall economic interest that rail movements should be supported by adequate traffic as well as loading and unloading facilities such as will permit the maximum utilisation of available capacities. As the proportion of fixed costs is high on the railways, the total cost of a rail haul tends to diminish as distance increases, since this enables the overhead costs to be distributed more economically. On the other hand, with increase in distance beyond a point, road transport costs per unit of traffic tend to increase. The railways are, therefore, inherently better adapted for long distance haulage as compared to road transport. Traffic density or the size of the traffic flow has a marked effect on railway costs. With high traffic density, the railways are able to operate at low unit costs. Railway costs are considerably higher on branch lines and sections with low traffic

density than on trunk routes.[1] The railways enjoy a relative advantage in respect of heavy consignments such as mineral products which are moved in wagon loads; even more so if they are moved in train loads. The nature of the route is also an important consideration in determining the suitability of rail transport for carrying a given traffic. The railways are in a position of relative advantage when the places of origin and destination for the traffic to be carried both fall on a main route, or when the points of despatch and destination are both provided with railway sidings.

In respect of passenger traffic also, as a mass carrier, railways are suited particularly for suburban and commuter traffic where large numbers of passengers have to be moved within certain fixed hours to and from urban centres. Railways also constitute a more convenient mode of transport for long distance passengers.

15. As distinguished from rail transport, road transport is operated through small units, each unit requiring relatively small capital investment. The capacity of the average individual unit is also much smaller. Fixed and overhead costs are a much less important element. The main characteristic of road transport is its flexibility. Goods can be moved readily from any one point to another, provided some kind of road exists. Road transport can provide a door to door service, thus dispensing with or at least reducing multiple movements such as are unavoidable with the railways, where goods have first to be carried from the place of business of the shipper to the railhead and then again from the destination point to the place of business of the consignee. As road vehicles can operate over the whole network of roads, they are able to serve large territories in depth and thus promote diffusion of industrial and economic activity. Because of the small size of the operating unit, an element of personal service on the part of the transport operator and his customers is easily developed. Goods can receive greater attention in transit and avoidance of multiple handling makes road transport specially suited for such traffic as fragile and perishable goods requiring special care, such as certain kinds of machinery, glassware, medicines, fruits, etc. There are less stringent packing conditions in the case of road transport than on the railways. Due to the shorter time required for delivering goods, business houses may find it possible to achieve quicker turnover through speedy haulage by road transport. On the other hand, the inadequate capacity of the road system and gaps such as missing bridges, and growing traffic congestion on road near the larger cities as well as road accidents may place certain real limitations on road transport. 16. In basing decisions on existing cost data pertaining to rail and road transport, possible effects of technological and other advances should be kept in view, For instance, costs of operation of road transport over fairly long distances may be lower as roads of higher specifications come to be built and heavier motor vehicles become available in larger number. Similarly, technical advances on the railways such as the development of electric and diesel traction, modern signalling devices, improved

1. The Railway Board have drawn special attention to the following facts: On the Indian Railways, about 61 per cent of the total freight traffic is carried over 18 per cent of the railway system. Sections on this part of the railway system carry a throughput of 10,000 tonnes per day or more. Almost all the branch lines of the metre gauge and some of the branch lines of the broad gauge have a density of traffic of less than 1,000 tonnes per day. As between the broad gauge and the metre gauge systems, the net tonne kilometres per route kilometre per day on the broad gauge worked out to 8,449 in 1963-64 as gainst 1,756 on the metre gauge. The cost per tonne kilometre was 3.14 paise on the broad gauge against 4.90 paise on the metre gauge. The bearing of the density of traffic on the tstilisation of fixed assets and railway costs may be seen from the fact that the incidence of interest charges on capital investment on the limited broad gauge system of the Northeast Frontier Railway where the density of traffic is relatively small was as high as 10 paise per tonne kilometre in 1963-64 as against 0.7 paise on the broad gauge system as a whole and 0.5 paise each on the broad gauge of the Western and the Central Railways.

types of wagons, and mechanised handling, may lower rail transport costs. Transit time for consignments between important commercial centres may be reduced through the introduction of 'super express' goods trains which run to scheduled timings. In allocating traffic in terms of the economy as a whole or for different regions or in relation to different classes of goods, it if necessary to take a forward looking view regarding the technical and economic possibilities presented by alternative modes of transport. Moreover, this view, while being checked in terms of actual performance from time to time, should at each stage be for a period of years and should not be restricted too closely to the facts of the current transport situation or to trends over very short periods.

METHODS OF ACHIEVING COORDINATION

17. Given the facts of the relative growth of transport services set out in the preceding chapter and the state of knowledge of rail and road costs and the aims of coordination described in this chapter, we are faced with the problem that there exists in practice a wide gap between the objectives of policy and the practical means by which they can be fulfilled. As the experience of many countries bears out, there are no ready or universally applicable answers available. In each country, the problem arises in a given institutional, economic and historical context; invariably the approach adopted is pragmatic, combining search for general principles and criteria with practical compromise and preparing the ground for adjustments in the direction of broader concepts of public policy and economic expansion. Among the more advanced .countries the view has gained ground that the legislative and administrative instruments devised mainly before the second world war for the regulation of different modes of transport have become less meaningful in relation to the altered technical economic and social conditions which have developed over the past decade and in face of the still greater pace of change foreshadowed over the next decade. In the less developed economies, seeking to lift their people from the state of backwardness, the role of transport is even more fundamental and dynamic, and the growth of basic capacities in transport, increase in mobility, diffusion of industry and economic activity and changes in the structure of production and consumption also call for adjustments in the perspectives and instruments of policy for the future.

18. As has been stated earlier, the central purpose of transport policy is to create such technical, economic and other conditions for the growth of transport and the distribution of traffic between different modes of transport as will help ensure to the greatest extent feasible that facilities in each mode are developed and operated in keeping with the need to satisfy the overall requirements of traffic at minimum cost to the community. This statement may serve as the starting point of the present discussion on means for achieving, coordination. The, elements to which attention should be drawn are, firstly, that the result hoped for is not complete coordination as such, but a framework of economic policy and institutions conducive to coordination between different modes of transport, specially rail and road; secondly, coordination, set in the context of growth and expansion of the economy and of the system of transport subserving its needs should be achieved at minimum cost to the economy, that is, in conformity with essential investment criteria; and thirdly, to make such development and investment possible, the quantum of transport to be provided and its pattern of allocation between different modes of transport should be in conformity with the needs of the community assessed with reference to social costs and benefits, including preferences of consumers and other relevant considerations. The two latter propositions are in fact interdependent. For, unless we

arrive at a correct estimate of transport requirements and their allocation between different modes, we cannot secure the appropriate order and distribution of investment as between different services and over time. The basic question, therefore, is how we may ascertain in relation to any period of time the extent to which transport facilities should be established, both in the total and in specific forms and locations.

INVESTMENT POLICIES

19. We may address ourselves first to the question of determining the total capacity for transport to be brought into existence and then consider how it may be allocated between alternative modes of transport, taking rail and road transport as the primary illustration. In the past different modes of transport frequently tended to be viewed separately and plans for them were not dovetailed adequately. Recently there has been greater recognition that the various transport services should be considered, both in theory and for policy and practical action, as a composite network in which each element should be complementary to the rest to the greatest extent possible. This object will be facilitated by systematic application of investment and cost benefit criteria in the transport sector. With this approach in mind the Ministries of Railways and Transport and the Planning Commission, through the Joint Technical Group for Transport Planning which they have together constituted, have initiated a series of technical and economic studies. These include investigations into the transport requirements of major commodities, transport capacities and needs of different regions in the country, comparative costs of transport in specific situations and problems of transport in relation to location of industrial and economic activities. These studies will, it is hoped, make it possible to determine, more accurately than in the past and in a manner permitting systematic review from time to time, the transport capacities needed in relation to the principal commodities moving or expected in the future to move between important centres of activity for the country as a whole as well for different regions. The studies will help distinguish the capacities already existing, those requiring to be added, the extent to which technical considerations will determine the modes of transport and the areas in which economic choice remains to be made. It is true that, in several respects, the data which the studies will yield will at first be incomplete and no more than approximate. Nevertheless, it is expected that these studies will provide a basis for considering carefully how the expected traffic might be best allocated between different modes of transport. It should be possible on the basis of the results of these studies to draw up programmes for the development of different transport media on an integrated basis and to relate them sufficiently closely to developments in other sectors of the economy.

20. In a country like India where major developments in the transportation system are expected to take place in future as part of plans for the growth of the economy as a whole, it should be possible to take care of the problem of coordination of different transport services largely through investment policies under the plans which should be directed to build up right combinations of different transport services in keeping with the ’needs of growing traffic. In the future growth of the economy, both rail and road transport and, in fact, other forms of transport have a crucial role. As far as we can foresee, the railways will continue to be the backbone of the transport system. The future development of the railways, however, will have to be directed increasingly towards meeting the needs of traffic of basic and heavy industries, traffic in minerals like coal and iron ore and long distance movements of manufactured goods as also agricultural products. Development programmes for the railways will have to aim largely at augmentation

of capacity on the trunk routes and introduction of technical improvements such as new forms of rolling stock including container services, and other devices like modern signalling, electrification and dieselisation to enable the railways to run faster and heavier trains. There may, on the whole, be limited additions to the railway network to meet the requirements of particular traffics or for development of particular areas. In other words, most of the new investment on the railways will have to be devoted to building up of an increasingly efficient rail transport system rather than to the expansion of the network itself. With diversification of production and expansion of consumption goods industries, road transport also will have an expanding role in the economy so that, together rail and road will provide an adequate composite network of services. Road transport facilities will be needed on a larger scale than even before to open up new and less developed areas, to carry economic development and social services to the farthest village, to promote the growth of agriculture and the rural economy and to provide for intra-city transport services. In the Past, the growth of road transport was less rapid than it might have been, because of inadequacies of the road system and the inability of the automobile industry to produce vehicles in the numbers needed. As these deficiencies are overcome, still larger opportunities for growth will open up for the road transport industry. Indeed, the tasks which the industry will be called upon to undertake are of truly challenging dimensions. Wherever possible, inland water transport and coastal shipping should provide useful supplementary services to cater particularly for movement of bulk traffic over long distances. Further investment in these services will have to be directed to modernisation of the services and technological improvements for reducing their costs, etc. Other means of transport, such as ropeways and pipelines, have still to be developed on a significant scale and it should be possible to integrate their development into the transportation system as a whole.

ROLE OP PRICING POLICY

21. Given the adoption of right investment policies in future in accordance with relative social benefit and cost considerations, the next important question that arises concerns the operation of different modes of transport. The pricing or rate policies adopted by different modes of transport will obviously influence not only the distribution of traffic between different transport services but also their relative profitability and, therefore, future growth potential. What constitutes a proper pricing policy for vast enterprises such as the Railways and road transport services is not an easy question to answer. A few general guidelines, however, can be laid down so that any departures from them are made consciously for specific considerations.

It is now generally recognised, both in India and elsewhere, that pricing policy for major undertakings should be such as to yield a net return which corresponds to the scarcity value of capital In the economy in general. Taken as a whole, the operations of each system of transport, therefore, should earn at least that rate of return which cannot be considered low in relation to the return obtained in alternative forms of investment. Equally, it can be said that the price charged for a particular transport service should cover at least the marginal cost of providing that service.

Beyond the two propositions just mentioned, it is often argued that the price charged for each particular service should bear a close relationship to the total cost of providing that service. For each mode of transport, in other words, the margin of profit charged for carrying different commodities should be the same. The theoretical justification for what might be called a fully cost-based pricing

policy is that when demand is distributed between different modes of transport at prices which reflect the relative costs of providing the different services, the overall profitability of each mode of transport will reflect more adequately the extent to which that mode of transport is able to maximise social benefits or minimise social cost. In this sense, the profitability of each mode of transport, given fully cost based pricing, will serve as an indicator for future investment decisions. While there is some theoretical justification for fully cost-based pricing systems, it has to be recognised that it is based on a number of assumptions which are not always fulfilled in real life. Apart from the fact that costs may not always measure social cost and consumer preference is expressed in the market does not always reflect social benefits, there is the consideration that the consequences envisaged above in theory can ensue in practice only under more or less perfect competitive conditions.

22. An indispensable condition for the free play of competition is the freedom on the part of the user to choose the means of transport he wishes to employ. This, no doubt, is an important consideration in practice. However, the user's freedom of choice at any time is circumscribed by the prevailing conditions of supply. The supply of transport cannot be augmented to any great extent in the short-run. This is specially true of rail transport. In the case of road transport, there is much greater scope for adjusting supply, not in the total perhaps, but in specified areas and situations, either by action of public authority or in response to the price mechanism But even in the case of road transport, supply conditions are frozen within limits at any given time.

Again, under conditions of planning and coordinated investment of the kind that we have discussed earlier, it is not necessary to assume that future investments will be guided solely by relative profitability in the present. Nor can we overlook the fact that while a public undertaking like the Railways could be made to adopt any particular pricing policy, the operation of private road vehicles will be guided by the desire to maximise profits in the aggregate rather than by the rule to equalise profits under each separate group of transactions. Granted the fact that at any given time, competition between different modes of transport can at best be imperfect, departures from a fully cost-based pricing system would become inevitable—in the absence of regulation —in response to the desire to take advantage of specific demand situations. As long as it remains impracticable to enforce the same set of pricing policies on all modes of transport, it would not be feasible to insist on any particular mode of transport following a particular pricing policy as far as relative prices to be charged for transporting different commodities are concerned.

23. In adopting an appropriate pricing policy in the short run, there are two other limitations to which attention may also be drawn at this stage. In the case of the railways, investment takes the form of large units, generally indivisible and associated with similar complementary investments. It has to be undertaken in relation to long and intermediate period assessments of demand rather than as a response to short term variations in demand under conditions of competition. The railways in India, as in many other countries, are a Government undertaking. They are charged with important public service obligations and function on the basis of responsibility to the community as a whole. This implies non-discrimination and stability in rates and liability to provide services in accordance, with published schedules. The Indian Railways have already taken important steps towards developing their accounting system along commercial lines; yet to bring about approximation of rates to the costs of

services is a process which, as the experience of France bears out, will inevitably be spread over several years. The incidence of capital costs on the railways being heavy, costs will show wide variations with changes in the density of traffic. Thus costs vary considerably between trunk routes and branch lines and indeed from one section to another, depending upon the extent of utilisation of capacity and other related factors. Because of the very wide variations in costs under different conditions of operation, which must naturally obtain in different areas, it is difficult for the railways to adjust rates on the basis of costs in all cases. The obligation to have uniform rates all over the railway system further limits the capacity of the railways to adopt cost-based rates.

The road transport industry consists of large numbers of single truck operators with a sprinkling of larger and well-organised enterprises. The smaller units need help and protection in several ways. Unlike the position in France or West Germany, there are yet no organised associations in the road transport industry which can assist public authorities in enforcing the minimum regulation of fares and freights, supervising the working of the industry from the point of view of public interest and assisting small operators in obtaining steady business. An essential condition for the operation of competition in a basic public utility like transport is that short-term imbalances between supply and demand should lead to appropriate remedial action rather than to large fluctuations in prices. Such fluctuations cannot by themselves alter the supply of the services; they can merely put additional profits in the bands of operators who happen to be in business at a particular time or lead to shortages elsewhere. The availability of vehicles and the capacity of the automobile industry are an inevitable constraint on the supply of road transport in the short period.

24. Having regard to all these considerations and qualifications, allocation of traffic between alternative modes of transport based, as far as possible, on (a) careful technical and economic studies and (b) progressive approximation of rates to costs both for rail and road transport may be expected to offer three principal advantages. Firstly, it should provide better and more dependable guidance than is available at present for taking practical decisions and planning for investment over a period. Secondly, it should furnish a basis for recommending fiscal measures and pricing policies in support of traffic allocations in terms of which technical development plans are undertaken. Thirdly, the fact that users have a degree of choice between alternative modes of transport and the scheme of allocation of traffic provides for a measure of competition both on the side of carriers and of users should be an aid in maintaining the efficiency of all transport services and promoting technical and organisational innovations. At the same time, because transport is a public utility entailing heavy long-term investment, and the community as a whole has a vital and continuing stake in major national assets such as the railways or the coastal fleet, the principle of competition cannot go so far as to become wasteful of resources or destructive of investment. This will not, of course, exclude the possibility of adjustments over a period in keeping with long-term assessments.

25. As stated earlier, the scheme of allocation of traffic for any period, whether for the economy as a whole or for a region, and the investment plan for the transport sector and the individual services comprised in it, rest on the same foundation of facts and logic. They are essential ingredients in the plan of development. But they are not likely to be sufficient for putting the plan into effect. Three types of supporting measures have to be

considered and incorporated into the development plan before an effective scheme of coordination between rail and road transport or, for that matter, any alternative modes of transport can be formulated. These are (a) fiscal measures and pricing policies, (b) regulation and (c) integration in organisation and operations. Since, in later chapters of this Report we offer some specific suggestions on these aspects, it will be sufficient here to explain briefly .the approach we have in view.

FISCAL MEASURES

26. Assuming that we have adequate knowledge of costs and in principle rates are to be as close as may be feasible to these, there may be several considerations necessitating resort to taxes and subsidies from wider economic and social aspects. Certain kinds of traffic may be deliberately carried below cost, for instance, metropolitan and city passenger traffic with a view to reducing the congestion of population, or goods manufactured in and plant and equipment despatched to markedly under-developed regions whose economic development is sought to be accelerated. If, for instance, it is considered that long-distance transport of goods by road involves less efficient use of resources, and that movement by road over short and medium distances should receive greater encouragement, there might be scope for differential taxation. Such a case might also exist in favour of certain less developed regions so that larger volumes of road transport could become more readily available for them. Similarly, as is the situation in a number of countries in Western Europe, there could be heavier taxation on trucks maintained by individual enterprises to carry their own goods beyond short distances in preference to use of public transport facilities.

27. Fiscal measures are, thus, a useful instrument in the hands of the Government and of Parliament and State legislatures to bring about, with conscious purpose, a rate structure within the transport industry which will correspond closely enough to the social costs of providing different services and the social benefits derived from them and, at the same time, to be able to assess the value of the burdens imposed or the concessions conferred. There are, however, three factors limiting the efficacy of fiscal measures which will need to be kept in view. The first is the inadequate knowledge of costs. Step by step, it is hoped, that more accurate data will become available, not only for rail transport, but also for road transport. Secondly, where a large number of operators are involved, as in the road transport industry, working for markets which vary widely, costs will differ over a wide range. Rating policies and fiscal measures have inevitably to be based on certain more or less representative norms, so that their incidence and effectiveness in securing the restraint or stimulus that may be intended from the larger angle of economic and social policy will not be the same for all operators or for all areas. Thirdly, there may be absolute preference for one or the other mode of transport which users may wish to exercise in their interest and be willing to pay for them accordingly. Despite these limitations, taxes and subsidies can be expected to assist in incentives or disincentives in the use of given forms of transport for specific traffic within the overall scheme of allocation of traffic. They have considerable value in securing a degree of self-regulation in the allocation of traffic between alternative modes of transport and in translating the overall economic judgment of the community as a whole into specific measures.

REGULATION

28. In the thirties, in India, as in several countries in Western Europe and also in USA., special legislation was enacted for the regulation of road transport. Everywhere the primary motive was to safeguard the interest of the railways in face of what seemed likely to assume the form of unfair competition, depriving the railways of some of their high rated traffic, yet leaving to them the burden of their public service obligations. Since Governments had themselves a heavy stake in the financial soundness of rail transport, they considered it necessary to regulate road transport. Invariably, this took the shape of control on road transport capacity through licensing of number of vehicles which could ply over given distances or in specified areas and, to an extent, of measures to protect the interests of road transport operators in relation to one another. In U.S.A. there is no restriction on the number of vehicles to be employed under a permit, but the use of vehicles is restricted to the carriage of specified goods on specified routes and provision is also made for regulation of rates. In the initial stages, passenger transport received even greater attention than the movement of goods by road, which had yet to assume significant proportions. These measures of regulation arose in many instances in the period of depression in the early thirties. Since the end of the second world war, while the principle of regulation has been retained and, in face of losses incurred by them, the importance of financial viability on the part of the Railways has been stressed even more than before, a two-fold approach is being adopted. Firstly, some efforts are being made to liberalise the road transport system through relaxation of distance limits and quota systems. These are often accompanied by regulation of tariffs, strengthening of organisations within the road transport industry for supervising the operations of various units and supporting the action of public authorities, and resort to differential taxation for long distance transport and transport maintained by individual enterprises for their own use. Secondly, in several countries the railway administrations are being enabled to eliminate uneconomic services, to introduce more flexible rating policies, to recover from the exchequer the cost of services which they would not institute on commercial grounds alone and, generally, to improve their capacity to compete with road transport.[1] In recent years, the contribution which road transport can make and is likely increasingly to make towards the promotion of mobility and economic growth has been recognised much more clearly than before the war.

29. Regulation of operations of different transport media has to be conceived as a measure in support of investment and pricing policies, aiming at securing an optimum distribution of traffic between transport services. Regulation of railways, which are a public undertaking, has to take mainly the form of control over their investment and expansion programmes in keeping with the requirements of allocation of traffic. The railways have a number of obligations of a public service character, including the obligation

1. For instance, in West Germany, legislation provides for the "normalisation" of the accounts of the German Federal Railways, that is, compensation is to be paid to the railways if a rate reduction is imposed or if they are compelled to continue an unprofitable service. The subsidy is not to be paid if the railways make a profit. In U.K., no direct subsidy is paid to the railways for running certain uneconomic services which it may be necessary to continue on social grounds. However, the cost of keeping open such lines as have been the subject of a direction by the Minister would be covered by taking it into account (a) in the total subsidy paid to the railways, and (b) in setting financial 'targets' under the procedure outlined in the White Paper on Financial Performance of Nationalised Industries.

to give preference, in the public interest, to the transport of such goods as may be specified by Government. Their rating structure is determined, to some extent, on considerations of public interest, and they are expected to have a system of uniform tariffs and to publish their rates. These obligations act as constraints on the railways which cannot, on this account, function precisely in the same way as other commercial undertakings, although the future trends have to be increasingly in this direction. Regulation of road transport has to be seen as an attempt, firstly, to enable the road transport industry to expand to the extent and in directions indicated by the scheme of allocation of traffic; secondly, to strengthen the internal structure and organisation of the industry, so that it can obtain the technical and economic resources needed for its development, and thirdly, to safeguard the interests both of the small operator and of the consumer. Thus, regulation of road transport has to be thought of as a positive means for fulfilling the role assigned to industry in the total transport plan and not, as was stressed in the past, for the purpose of affording a measure of protection to a long established and mature transport service such as the railways.

30. Regulation of road transport has to be exercised largely through control over licensing. In the chapter on Road Transport (Chapter VI) we explain the need for licensing vehicles and suggest a number of changes in the existing system. In particular, we make a broad distinction between inter-State and intra-State road transport and propose that the former should be the special responsibility of the Central Government and the latter of State Governments. In view of the fast growing and changing needs of the economy, we do not favour the traditional forms of distance limits and have made a number of recommendations for liberalisation. We recognise that there are a few sizeable regions which can be identified as being markedly backward and in which transport facilities have considerably lagged behind. In these particular regions, we see the need for integrated transport plans with special emphasis on the development of the road network and to an extent licensing of vehicles on a regional basis accompanied by concessional tax rates and other incentives to operators to provide transport services in these regions.

INTEGRATION

31. We have now considered in relation to the scheme of allocation of traffic and of investment embodied in the transport development plan the contribution which could be made by fiscal measures and pricing policies and by regulation of the road transport industry towards coordinated development and operation of rail and road services as a composite system. In principle, this process could be carried still further if the two modes of transport were under common ownership, for, in that event there could be complete integration in services and no question of relative gain or loss would arise, provided the services were priced with due regard to the costs involved. On the other hand, an integrated concern would need to discover devices other than competition between different operators to provide incentives to continuous efficiency and technical change. In any event, the road transport industry lends itself to small scale and dispersed operation and consists at present of more than 150,000 operators owning some 270,000 vehicles, about 89 per cent of the operators holding no more than one vehicle. More than two-thirds of passenger transport and almost all goods transport by road is in private hands. Proposals under consideration for the period of the Fourth Plan do not visualise much more than expansion of public operation of passenger transport to about two-fifths of the total number of vehicles, some steps towards Government participation in goods transport and promotional activity in favour of cooperative transport services wherever conditions are

favourable. This would leave the road transport industry substantially as a private industry, organised mainly through small units, with no more than a leavening of commercial organisations and public enterprises. In the circumstances, the approach of integration can be extended with advantage in three principal directions. Firstly, wherever possible, joint rail-road transport for passengers and goods should be facilitated through arrangements arrived at mutually between the Indian Railways and State Road Transport Corporations as well as Corporations which the Central Government might set up for operating on special inter-State routes. Secondly, efforts should be made to develop the operations of the Central and State Corporations, with the participation of the Indian Railways, on a scale sufficient to give them a significant share of the traffic and; therefore, influence on the working and organisation of the road transport industry, maintenance of scheduled tariffs and services and complementary operations of rail and road transport. Thirdly, wherever at present public transport enterprises are organised as departmental undertakings they should become corporations or companies, so that they can operate on wholly commercial lines and enter into joint operations and services to the greatest extent possible with other units in the industry. More and more, road transport should take on the character of a well-organised industry, working on the basis of responsibility to the community as a whole, functioning wherever necessary in a complementary relationship to the railways, and taking generally a leading role in opening up the countryside and stimulating the growth of the less developed regions.

CONCLUSION

32. To sum up the foregoing discussion, coordination between different modes of transport has to be seen as an important aspect of the expansion of the economy and the growth of the transport system as a whole. Together, the various transport services have to meet a total demand, each service being complementary to the others. Investment policies should be directed to achieve the right combinations of different transport services in the country. In the measure in which prices of various services come to correspond to their social costs and benefits, it becomes possible to approach an optimum allocation of traffic between different modes. Therefore, the key to the problem of allocation of traffic is the determination of transport costs as accurately as possible and application of fiscal measures such as would ensure a close correspondence of rates and fares to costs. In the last analysis the scheme of allocation of traffic and the investment plan for transport arc derived from the same basic economic and technical data and form essential ingredients in the plan of development. Certain supporting measures are required for putting this plan into effect. These have been discussed under three heads-fiscal and pricing policies, regulation and integration of organisation and operations, and a number of specific suggestions hive been offered. However, even with the aid of these devices, what is hoped for is not complete coordination but a set of conditions favourable to coordination and development progressively in the direction of a composite transport network under which various transport services become available to the extent needed and at minimum capital and operational costs to the community.

COMMITTEE ON TRANSPORT POLICY AND COORDINATION
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CHAPTER XIII
MACHINERY FOR COORDINATING TRANSPORT PROGRAMMES AND POLICIES

IN THE preceding chapters we have considered a wide range of problems affecting different transport services and have stressed at each point the importance of viewing these services as parts of a composite network to be developed in keeping with the changing and growing needs of the economy and the perspective of development over a period of years. In Chapter III we have set out at length the approach to problems of coordination, with special reference to rail and road transport and have developed the theme in some detail in subsequent chapters. In this chapter we consider what is perhaps the most difficult aspect of all, namely, the machinery, the organisation and the instruments through which transport programmes and policies may be developed continuously along the lines indicated, given effect to and reviewed from time to time as part of a functioning system in which all the agencies concerned, both at the Centre and in the States, act as partners working within a framework of common policies and assumptions. We are aware that the gap between, policy Objectives and the practical means for fulfilling them may not be altogether bridged, and any machinery that may be devised must change and grow over period until it becomes more adequate to the tasks entrusted to it and more capable of operating with knowledge of facts and understanding of problems affecting those who are responsible for different services and with a degree of flexibility in dealing with changing situations.

POLICY ASSUMPTIONS

2. Before considering the scope for coordination and the machinery that may be appropriate, we may recall certain key propositions made earlier in the Report

(1) Planning for transport involves judgements concerning the distribution of traffic between different modes of transport. On these judgements depend the quantum of resources devoted to the development of different services during any given period, the prices at which the services are made available and the return on investment in the development of transport.

(2) The central purpose of transport policy is to create such technical, economic and other conditions for the distribution of traffic between different modes of transport as will help ensure that facilities in each mode are developed and operated in keeping with the requirements of traffic at minimum cost to the community. The essential condition is that the various transport services should be considered, both for policy and practical Action, as a composite network in which to the greatest extent possible, each element is complementary to the rest. Only in this context does it become possible to apply investment and cost benefit criteria in the transport sector.

(3) The first step is to arrive at a correct estimate of transport requirements over a period of years in the total and in specific forms and locations. The allocation of traffic between alternative modes of transport has to be based on (a) carefully ascertained technical and economic data and projections and (b) progressive approximation of rates to costs. The scheme of allocation of traffic for any period, for the economy as a whole as well as for each region, and the investment plan for the transport sector and the services it comprises are essential ingredients in the plan of development and rest on the same foundation of facts and logic.

(4) For an effective scheme of coordination to be evolved, for instance, between rail and road .transport, certain supporting measures must also be incorporated into the plan of development. These fall under three heads: (a) fiscal measures and pricing policies, (b) regulation and (c) integration of organisation and operations: These have been considered fully in Chapters III, IV, VI, and VII. The aspects to which attention may be drawn here are:

(i) Fiscal and pricing policies can assist in bringing about a rate structure within the transport industry which corresponds more closely to the social costs of providing different services, provided the latter are known with sufficient accuracy. For ascertaining costs there must be suitable accounting systems at each level in the industry permitting analysis of costs for specific flows of traffic. For accurate comparisons of costs on different modes of transport a common approach on questions of definition, criteria and methods of analysis has to be evolved between the authorities responsible for different services.

(ii) Measures for regulation proposed in this Report are intended to assist the distribution of traffic between different transport services on economic consideration. They have to be applied increasingly on the basis of careful economic studies and estimates of demand for different services undertaken continuously and in a scientific manner. The existing machinery for regulation of transport, both at the Centre and in the States, is not adequate, and regulation is undertaken largely on an ad hoc basis, without sufficient knowledge of the quantum and composition of traffic or of comparative costs of operation or of the requirements of coordination from the standpoint of the economy as a whole. Policies adopted at present for the taxation of commercial transport are not related to the scheme of regulation. The road transport industry itself is not organised on a sound commercial basis, nor are there representative associations which can support public policies, maintain standards, assist small operators and protect the interests of users.

(iii) Having regard to the present structure of the road transport industry and the fact that, apart from a leavening of public undertakings and of organised commercial enterprises, the industry will continue substantially as a private industry, mainly composed of small units; there are nevertheless some directions in which it should be possible to develop integrated operations between rail and road services to the mutual advantage of both.

SCOPE OF COORDINATION

3. It is essential to devise suitable machinery within the Central Government as well as at the State level for carrying out the policies outlined in our Report and, more specially, for assessing the volume and composition of traffic, coordinating investments, obtaining data on relative costs, fares and freights, proposing from time to time appropriate fiscal measures and pricing policies and changes in the scheme of regulation and promoting greater integration between different services. In considering the nature of the machinery that may be required for achieving coordination of transport in its various aspects, it is useful to distinguish three different but related concepts, namely, ‘planning’, ‘coordination’ and ‘operations’. ‘Planning’, involves, in the first place, determination of the volume, composition and phasing of investments in different transport services over a period, which may be the period of, say, a Five Year Plan, or even a longer term.

Investment decisions have to be taken by the Government specifically and in detail in respect of services, provided by public undertakings. Similar decisions have to be taken by private agencies engaged in providing transport services. To facilitate these decisions, public policy and plans formulated by Government provide a broad framework within which private agencies can largely determine their own action. It may be that in some fields, as in shipping, the role of public policy and of measures by which it is supported may be quite decisive even for The plans 'of private parties. The second aspect of 'planning' consists in the formulation in broad terms of policies and measures by which investment decisions, to be taken by Government and Government undertakings as well as by private agencies, are to be given effect. As distinct from 'planning', the concept of 'operations' would refer to the actual running of a service or undertaking within the general system provided by the scheme of 'planning' and 'coordination', which together constitute the substance of a national policy for transport.

4. Action by way of 'coordination' lies between 'planning' at one end and 'operations' at the other. The principal tasks to be undertaken by way of coordination may be said to be:

(a) to study from time to time the relative costs of providing different transport services and Government's fiscal and pricing policies and related fare and freight structures, having regard to the scheme of allocation of traffic under the approved plan of development;

(b) to propose measures for correcting imbalances between availability of transport and the requirements of the economy in respect of different modes of transport both in the aggregate and in different parts of the country; and

(c) to suggest specific measures for the regulation of transport in pursuance of principles and policies approved by Government, including traffic envisaged for different services.

This may be taken as a broad statement of the scope of coordination. As stated earlier, coordination is necessarily in the nature of an approach, a progressive approximation, and it may be only after considerable practical experience has been gained and a body of accurate economic and statistical information has accumulated that an adequate degree of coordination between different services, specially in relation to particular regions and particular commodities may take the shape of a functioning system. Efforts should be made to devise machinery which may, over a period, succeed in attaining such coordination, but the task is admittedly difficult.

5. For planning, the necessary machinery already exists to a large extent. The Planning Commission, acting in close cooperation with the Central Ministries concerned and the States, formulates plans which, on receiving the approval of the Central and State Governments and of Parliament, are implemented by the administrative and other agencies concerned. Information and data required for planning flow ultimately from information which arises in the course of 'operations' and is utilised for actual implementation. There is considerable scope for improving such information and for processing it so that it serves more readily the requirements both of better management and of better coordination and plaguing. In Chapter XIV we offer suggestions for organisation and collection of data on traffic flows and transport costs. Such data have to be further supplemented by special technical and economic studies. A beginning in this direction has been made through the setting up three years ago of a Joint Technical Group for Transport

Planning, which is at present staffed by personnel drawn from the Planning Commission and the Ministries of Railways and Transport, and is intended to assist all the agencies concerned with transport in the study of problems of common interest. The Joint Technical Group functions under the aegis of the Planning Committee for Transport, which has the Member of the Planning Commission concerned with Transport as Chairman and includes the Secretaries of the Ministries of Railways and Transport as well as of the other Ministries concerned. The Group has been engaged in studies relating to transportation requirements of major commodities, has initiated, in cooperation with State Governments and the Ministries of Railways and Transport, a series of regional transport surveys and proposes to undertake studies of comparative costs for different media of transport under given situations as well as studies of industrial location in relation to transport. The results of these studies are expected to contribute significantly towards the formulation of the transport plans of the Central as well as State Governments and to help in drawing up a long-term transportation plan for the country as a whole. Progressively, the Joint Technical Group is equipping itself for the study of relative costs and of fare and freight structures and of such other aspects as may assist in achieving greater and more precise planning and coordination within the transport sector. Whatever machinery may be set up for securing coordination at the national level, in the Joint Technical Group, which is at present concerned with studies relating to preparation of long term transport plans, there exists already the nucleus of an organisation which can be developed further for providing the continuing economic and statistical appraisals needed for effective coordination in the field of transport.

6. As stated above, data needed for coordination and planning of transport will, in the main, flow from information which is thrown up in the course of operations undertaken by various transport agencies, both public and private. While there is necessarily a great deal of scope for improving such current information and enhancing its value for the wider objectives of coordination and planning, it is important to stress the distinctive place of 'operations' in the organisation of transport. The machinery for operating a transport service lies within each appropriate executive agency. The responsibility of each agency for implementing its programme of development, maintaining its services and, in general, achieving efficient management cannot be too greatly stressed. Corresponding to this responsibility, there must be a large measure of freedom and autonomy and any interference in the name of coordination or planning in the actual operation of a transport service must be sedulously avoided. This is not to say that within each operating agency there will not be need for continuous efforts to raise the level of efficiency, to set higher norms of productivity, to build up surpluses for further development and to adopt appropriate pricing and other policies. In a large measure, these are matters to be determined by each agency for itself although, in their wider aspects, they are also an important element in planning at the national and State level.

7. We have referred above to the nature and machinery for 'planning' and for 'operations' and have drawn attention to the fact that, while the data required for planning and coordination may need to be supplemented by special technical and economic studies, in the main they will flow from current operations. In any given period 'coordination' for transport as defined earlier has to be achieved in the following principal contexts:

(a) between the network of transport services taken together and the requirements of transport for the economy as a whole;
(b) between different transport services *inter se* and, more specially, between -
  (i) rail and road transport,
  (ii) rail, road and inland water transport and
  (iii) rail and coastal sea transport;
(c) within the Central Government, between the Ministries concerned with transport and problems of policy affecting transport;
(d) between the Central Government and each of the State Governments; and
(e) within each State or region, between different transport services, specially rail, road, inland water transport and ports.

In a sense, these are different facets of a common problem which arise inevitably as between various modes of transport and at different levels within the national economy. Special attention has been drawn above to those transport services which could frequently get out of step with one another and would, therefore, call for deliberate measures and policies for achieving coordinated and complementary action on a continuing basis. There are other transport services such as ports, air transport and shipping in relation to which, in the main, coordination is best achieved through the planning of investments to meet the requirements of the economy as a whole. However, from time to time, even in respect of these services, there will be specific problems which will call for closer study of costs, fare and freight structures and related policies. These problems will fall within the purview of whatever machinery is set up at the national level for achieving coordination of transport.

SOME GENERAL CONSIDERATIONS

8. The question of devising suitable machinery for coordination has to be considered from two different angles. Firstly, for any given transport service, there has to be coordination at different levels in the economy or in the administrative structure of the country. Thus, for roads and road transport, there should be close coordination between the Central and the State Governments. There should also be coordination between them in respect of the operations of major ports, which are directly the concern of the Central Government, and those of intermediate and minor ports, which are under the administration of State Governments. Each connected group of major and intermediate and minor ports should function as a system in which the role of each unit is clearly envisaged. Secondly, taking different transport services together, there should be a coordinated approach between them (a) for the country as a whole and (b) for different regions and States. Responsibility for securing coordination should follow the level at which the appropriate authority functions. Thus, in the field of transport, the overall responsibility of the Central Government is a necessary condition of, planned and coordinated development. The Central Government is in a position to see the picture as a whole in relation to the present and future needs of the economy and to integrate with these the requirements of national defence. It can provide an appropriate framework of policy - economic, social and legal - within which State Governments may undertake development in the spheres assigned to them and ensure the necessary coordination between different transport services.

9. Within the Central Government, three main agencies are at present responsible for providing transport services - the Ministry of Railways, the Ministry of Transport and the Ministry of Civil

Aviation.[1] In principle, it is possible that functions entrusted to these three Ministries could be assigned to a single Ministry in charge of Transport. Such a Ministry would then be called upon not only to operate a variety of transport services now administered by several different agencies, such as rail transport, air transport, shipping and ports, but also to secure the necessary coordination with State Governments, for instance, in road development, road transport, inland water transport, etc. Too often, the problem of transport tends to be seen in terms of separate modes of transport. As we have repeatedly stressed, the various media of transport have to be viewed as a composite network, as a total service to be provided in adequate quantity and at a level of efficiency in keeping with the growing requirements of the national economy as well as the economies of different regions. In other words, the problems of coordination of transport go far beyond the limited issue whether, at the national level, all transport services should be assigned to one Ministry or to more than one Ministry. It is true that a number of administrative problems affecting coordination of transport could be resolved more swiftly if one Ministry were to be made responsible for all media of transport at the national level and were able to take a total view of the requirements of the economy and to plan for them accordingly. At the same time, for a single Minister to bear responsibility for so large a segment of the national economy would be an extremely heavy burden to carry, and the organisation under his control would have to be most complex and elaborate. In fact, there would be need for special arrangements for achieving coordination on a continuing basis whether one Ministry were held responsible for all transport services or various modes of transport were assigned to different Ministries. In this sense, the problem of creating suitable machinery for the coordination of transport and equipping it adequately with resources in personnel for reviewing relative fare and freight structures, bringing together data on costs, framing policies for the regulation of transport and anticipating and correcting short-term imbalances is a distinctive one. It is against the background of these general considerations that we make our specific proposals for establishing what may be regarded as the minimum machinery needed for achieving coordination of transport programmes and policies.

RECOMMENDATIONS CONCERNING MACHINERY FOR COORDINATION

10. Recommendations Concerning machinery for coordination in the field of transport may be grouped under two main heads, namely arrangements at the national level and arrangements at the State level. Under each head we envisage establishment of certain new agencies as well as strengthening and re-organisation of existing agencies.

11. *Machinery at the national level.* - At the national level, coordination of transport programmes and policies is secured partly through investment and other decisions taken in the context of Five Year and Annual plans and partly through inter-departmental consultations. From time to time, important matters of policy are considered by the Cabinet or by a Committee of the Cabinet. There is, however, no standing machinery for coordination of transport within the existing structure of the Central Government.

12. For any coordination machinery to function effectively, the first condition is the building up of an organisation capable of undertaking independent studies and economic appraisals,

1. Subsequent to the completion of our Report, on January 24, 1966 the Ministries of Transport and Civil Aviation were merged into a new Ministry of Transport, Aviation, Shipping and Tourism.

providing data on relative costs and following up decisions with authorities responsible for implementation. The nucleus of such an organisation is now available in the Joint Technical Group for Transport Planning. We recommend that this unit should be strengthened and equipped adequately for undertaking studies and collection of data required for coordinating development programmes and rating policies in respect of different modes of transport.

13. The Joint Technical Group for Transport Planning at present functions under the direction of the planning Committee on Transport, which includes the Secretaries of the Ministries of Transport and Civil Aviation and Chairman, Railway Board, as well as Secretaries concerned with industrial and mineral development. The Member of the Planning Commission concerned with Transport serves as chairman of the Committee. We recommend that the Planning Committee on Transport should be reconstituted and should function as the Transport Planning and Coordination Committee. It should consist of the Member of the Planning Commission concerned with Transport as Chairman, and have as members the Secretaries of the Ministries of Transport and Civil Aviation, the Chairman of the Railway Board, the Secretaries of the Department of Coordination in the Ministry of Finance, Planning Commission, Ministry of Industry & Supply and the Department of Mines & Metals in the Ministry of Steel and Mines and the Chairman of the Inter-State Transport Commission. The Joint Technical Group for Transport Planning should serve as the Technical Secretariat of the Transport Planning and Coordination Committee. The Committee should meet at regular intervals and consider reports and studies prepared by the Joint Technical Group and research organisations in the Ministries of Railways, Transport and Civil Aviation as well as in the States.

14. In most matters, the Transport Planning and Coordination Committee may be expected to reach agreed decisions but there will be issues which the Ministries will wish to place before the Cabinet or before a Cabinet Committee. To facilitate consideration of important questions of policy and to provide guidance from time to time to the Transport Planning and Coordination Committee and to the Ministries, we suggest that the Prime Minister may constitute a Committee of Ministers, consisting-of the Ministers incharge of Railways, Transport and Civil Aviation, Minister of Industry, Minister of Planning, Minister of State in the Ministry of Finance and the Member of the Planning Commission in charge of Transport. The Prime Minister may appoint a member of the Committee to serve as Chairman. It should be mentioned that the composition suggested here for the Committee of Ministers is on the basis of the present set up of the Ministries.

15. The existing agencies for development and coordination at the national level include the National Harbour Board and the Transport Development Council, the latter being supported by the Advisory Committee for Roads and Inland Water Transport. The National Harbour Board is presided over by the Union Minister of Transport and includes Ministers from the States as well as representatives of major ports. The Advisory Committee for Roads and Inland Water Transport includes a few official representatives from the States as well as individuals representing private interests engaged in road transport and inland water transport. Its recommendations are placed before the Transport Development Council, which is presided over by the Union Minister of Transport and is composed of State Ministers incharge of Roads, Road Transport and Inland Water Transport. The Transport Development Council was set up in August 1958 as a high level body to advise the Government of India on matters of policy relating to roads, road transport

and inland water transport. The Council has served as a useful forum for the consideration of common problems affecting the development specially of those sectors of transport which fall within the plans of States. In relation to these it has done much to help evolve a consensus from the point of view of the country as a whole.

16. The existing arrangements for coordination of transport programme, and policies at the Centre will be strengthened through the setting up of the proposed Committee of Ministers and the Transport Planning and Coordination Committee supported by a technical Secretariat jointly established and maintained by the Planning Commission and the Ministries concerned. There are, however, important directions in which a national transport policy encompassing all modes of transport, cannot be evolved, much less implemented in detail, without complete coordination between the Centre and the States. In a federal structure such coordination has to be based, in the last analysis, on common objectives and on plans of development formulated after full consultation and based on careful study of needs and problems. To secure an adequate measure of coordinated action by way of implementation, the necessary machinery should exist and should be in a position to function continuously and with the support of the Centre and the States. These considerations have led us to recommend the setting up of the Council for Transport Coordination. This body would be concerned with the general and overall problems of coordination and, besides reviewing implementation of measures and policies pertaining to the coordination of transport, would provide direction and guidance to the road transport industry and other interests as well as advise on programmes of studies to be undertaken by the Joint Technical Group for Transport Planning, by research organisations in the Ministries and technical units established in the States. The Council would be composed of members of the Committee of Ministers on Transport at the Centre and State Ministers incharge of Transport and Roads. As we see it, the Council for Transport Coordination would supplement and carry further the work of the Transport Development Council, specially in fields where larger considerations of policy demand unified action between the Centre and the States and problems of the transport sector as a whole have to be considered in their wider setting. The Chairman of the Committee of Ministers would serve as Chairman of the Council for Transport Coordination. The three organisations proposed above, namely, the Transport Planning and Coordination Committee, the Central Committee of Ministers on Transport and the Council for Transport Coordination may be set up under a Resolution of the Government of India in the Cabinet Secretariat.

17. At the operational level, in accordance with our recommendations, the Inter-State Transport Commission, constituted under the Motor Vehicles Act, 1939 (as amended in 1956), would be responsible for determining the requirements of mechanised motor transport on inter-State routes, preparing plans for meeting these requirements, coordinating these with the road transport plans in the States and, generally recommending measures and policies for achieving coordination of road transport with the railways and other modes of transport. We have also proposed that the Inter-State Transport Commission should be strengthened through the appointment of a full-time Chairman drawn from public life and the provision of adequate staff for maintaining information and studies concerning road transport throughout the country and pursuing such administrative action as may be necessary. We have also suggested the redesignation of the Inter-State Transport Commission as the Inter-State Road Transport Commission.

18. *Machinery for coordination at State level* —In the scheme of coordination for road transport which we have proposed, the broad line of distinction is between inter-State road traffic and intra-State road traffic. Corresponding to this, responsibility for coordinating road transport within a State would devolve on the State Transport Authority. Since an overall view has to be taken of the requirements of road transport in terms of the integrated development of transport facilities, State Transport Authorities should function increasingly on the basis of systematic assessment of requirement for road transport made by them and, for the country as a whole, by the Inter-State Road Transport Commission. On wider questions bearing on policy and coordination, the Transport Planning and Coordination Committee at the Centre could provide a measure of support to the State Transport Authorities.

19. At present there is some kind of overall transport plan for the country as a whole, but nothing in the nature of an integrated transport plan is drawn up for individual States or regions. Planning for road and road transport development in the States takes place without adequate assessment of requirements for transport as a whole in relation to the growth of the regional economy and without deliberate coordination in relation to other means of transport, specially the railways, inland water transport and ports.

Consequently, at the State level, the economic and statistical data on which the plans of agencies concerned with road development and rail and road transport development are based cannot be said to be adequate. If a systematic body of information were available and there were closer coordination between States, the Zonal Railways and the port authorities, it would be possible to formulate in relation to each State fully coordinated development plans for all modes of transport in relation to economic and industrial programmes and the long-term perspectives of development. To facilitate this we recommend that each State Government should constitute a State Advisory Transport Board. Besides the principal agencies of the State Government, such as the Road Planning Board, the State Transport Authority, the Transport Commissioner or Secretary of the Transport Department and the Development Commissioner, others to be represented on the Board might be the General Managers of the main Zonal Railways, the Chairman of the Port Authority of the Major port (if one exists in the State) and persons drawn from the road transport industry, both public and private. State Advisory Transport Boards are expected to give material help in the formulation and review of composite transport plans for the Fourth and Fifth Plan periods which, it is hoped, will emerge as a consequence of the regional transport surveys which are now under way in different parts of the country.

RESEARCH AND TRAINING IN TRANSPORT

20. In concluding our recommendations, concerning the setting up of an adequate machinery for coordinating transport programmes and policies, we feel the need to look beyond the question of organisation to the kind of facts and analyses which will be needed in the future and the outlook and training which it will be necessary to impart to those who have to view the transport system and its problems as a whole. It is not generally realised that the field of transport studies has remained comparatively neglected, not only within the agencies concerned with different modes of transport, but also, in its general aspects, in the universities and in research institutions. For most of the regional transport surveys which are now being undertaken personnel has been drawn from the railways and the States. The principal research institution which has been able so far to give a significant lead in relation to transport studies is the National

Council of Applied Economic Research, which accepted responsibility for regional transport surveys in Madras, Kerala and Mysore and has also initiated other studies. Two promising developments which have occurred are the constitution by the Research Programmes Committee of the Planning Commission of a Committee on Transport Research and the transport survey of the Punjab, Himachal Pradesh and Delhi region which the Punjab University are at present undertaking. The work on commodity studies, now being undertaken by the Joint Technical Group for Transport Planning, is comparatively new, but useful experience is being built up. There are aspects of transport research, such as studies of transport costs and cost-benefit appraisals of transport projects, for which qualified personnel have yet to be trained and problems of methodology and data will need careful investigation. We have, therefore, come to the conclusion that to stimulate transport research and studies, both within the Government and the universities, it would be desirable to promote the development of a Centre for Transport Research and Training.

21. Such a Centre could be set up as a non-government institution fully supported by the Planning Commission and the Ministries of Railways, Transport and Civil Aviation and Finance and also the States. The Centre should undertake research into the basic problems of long-term transport development, including studies of comparative costs, and should assist the Central Ministries and the States, in undertaking special investigations and surveys. It should provide facilities for work and training to persons drawn from Central and State organisations concerned with different transport services, from the road transport and other transport industries and from universities. The Centre for Transport Research and Training could be set up by itself or as an extension of an appropriate existing organisation such as the Institute of Rail Transport. After it has made some headway, the Centre could provide not only intensive training courses for specialised personnel engaged in or required for research in transport problems, but also shorter orientation courses for senior personnel drawn from the railways, from road transport organisations, port administrations, shipping and major industrial projects. In due course, the work of the Centre should come to exert increasing influence on the quality of data available for planning and coordination and on Methods of planning in the transport sector. There is much to be gained if, increasingly, different modes of transport can be seen in their mutual relationships in the context of inter-dependent growth and as a composite transport system serving a rapidly developing economy, rather than as distinct and isolated services, as has happened too frequently in the past. A detailed project on these broad lines should be drawn up by the Transport Planning and Coordination Committee in consultation with the Planning Commission and the Ministries concerned and provided for as a specific scheme in the Fourth Five Year Plan.

REPORT OF THE
NATIONAL TRANSPORT POLICY COMMITTEE 1980

CHAPTER 6
MACHINERY FOR CO-ORDINATION OF TRANSPORT POLICY

6.1 Background

6.1.1 The constitution of an appropriate and effective agency to co-ordinate transport policies and programmes at the Central and State levels was examined earlier by the Committee on Transport Policy and Co-ordination (CTPC) 1966. While considering various aspects of transport policy, such an agency would have to deal with three different but related sets of functions, namely, planning, co-ordination and operations. Planning, according to CTPC, involves in the first place determination of volume and composition of traffic and its allocation between modes of transport on the basis of their comparative cost and efficiency. Secondly, it aims at formulation, in broad and indicative terms, of policies and programmes to: guide investment decisions by transport agencies in public and private sectors. The term "operations" includes actual running of a service or an undertaking within the general system provided by a scheme of planning and co-ordination which, together, constitute the main substance of a national transport policy. Measures for co-ordination, according to CTPC, lay between planning at one end and operations at the other. The Principal, task of co-ordination is to review transport situation from time to time both in aggregate and in different regions to ensure that no imbalances occur between availability of modes of transport and requirements of economy.

6.1.2 Within this functional framework, CTPC considered that the Planning Commission, acting in close co-operation with Central Ministries and the State Governments, was an agency for planning development of transport system. The Planning Commission was to be supported in this task by a Joint Technical Group (JTG) for Transport Planning formed by drawing expertise from Ministries and organisations concerned with transport. The operations of transport services were naturally left to appropriate executive agencies which were to furnish data and information for planning and co-ordination. For co-ordination, CTPC proposed a two-tier structure, one between Ministries at the Central level and the other between the Centre and the States. At the Central level, it recommended the constitution of a transport planning and coordination committee consisting of the Member of the Planning Commission concerned with transport as Chairman and Secretaries of Ministries of Transport, Civil Aviation, Finance, the user Ministries and Chairman of the Railway Board as members. Within the Planning Commission, JTG was to serve as a technical secretariat of this Committee, the principal task of which was to meet regularly to review transport situation and consider its reports and studies. CTPC expected the proposed transport planning and co-ordination committee to reach agreed decisions on most transport matters. However, to consider important issues of policy and provide guidance from time to time, CTPC suggested the constitution of a committee of Ministers, of Ministries for Transport, Industry, Planning, Finance and Member of the Planning Commission in charge of transport. This committee was to be constituted by the Prime Minister who was also to appoint one of its members as the Chairman.

6.1.3 CTPC noted that a few forums were already functioning within the Ministry of Shipping and Transport to co-ordinate transport development at the national level. These included the National Harbour Board and the Transport Development Council, the latter being supported by the Advisory Committee for Roads and Inland Water Transport. The Board was presided over by the Minister of Transport and included Ministers from States as well as representatives of major ports. The Council, set up in 1958 as a

high-level body to advise Government on matters of policy relating to roads, road transport and inland water transport, was also presided over by the Minister of Transport. CTPC recommended continuation of both these forums which had served the useful purpose of examining common issues of policy affecting areas of transport sector falling within their respective spheres.

6.1.4 For co-ordinating development of road haulage industry, there was already the Inter-State Transport Commission, constituted under the Motor Vehicles Act, 1939 (as amended in 1956) within the Ministry of Transport. CTPC suggested that this Commission, be redesignated as the Inter-State Road Transport Commission and strengthened by appointing a full-time chairman drawn from public life and providing adequate staff for maintaining information and studies concerning road transport.

6.1.5 This structure was enough, according to CTPC, to co-ordinate transport policies and programmes at the national level. However, CTPC had realised that, considering the nature of transport industry and division of constitutional responsibilities for regulation and development of transport system, it was not possible to evolve a co-ordinated transport policy, much less to implement it, without complete co-operation between the Centre and the States. To secure an adequate measure of consensus between the Centre and the States transport policy and ensure co-ordinated action by way of implementation, the Committee therefore, recommended the setting up of a Council for Transport Co-ordination. This Body was to include members of the Committee of Ministers on transport at the Centre and State Ministers in charge of transport and roads. The Council was expected to supplement and carry further the work of the Transport Development Council, especially in fields where larger considerations of policy demanded unified action between the Centre and State and transport sector problems as a whole were to be examined in their wider inter-State and national setting.

6.1.6 At the State level CTPC had not visualized any precise arrangement for co-ordinating transport policy, except for existence of State transport authorities which were expected to coordinate development of road transport in States within the overall framework determined by the Inter-State Road Transport Commission and transport planning and co-ordination committee at the Centre.

6.1.7 Though a high-level committee had made a number of recommendations for constitution of a suitable co-ordinating agency. no effective institutional arrangements have so far ben evolved. On the contrary, the arrangements for inter-modal co-ordination are either inactive or have been dismantled. For example, both the Cabinet Committee on Transport and Tourism and Secretaries Committee oh Transport, Tourism and Aviation, which used to meet at intervals for inter-modal co-ordination, have not been functioning for some time. Similarly, the Joint Technical Group for Transport Planning, which was to serve as a technical secretariat for the proposed transport planning and co-ordination committee, was discontinued after the valuable work it had done in commodity flows and regional transport surveys. Thus, for all practical purposes, the Planning Commission presently is the only institution which through investment and other decisions taken in the context of Five Year and Annual Plans and inter-State consultations, has been co-ordinating transport policies and programmes. The Inter-State Transport Commission has more or less remained a defunct body, and the Transport Development Council and the National Harbour Board have merely served as discussion forums.

6.1.8 That this is not an adequate or satisfactory arrangement for co-ordinating transport policies and programmes is obvious. The Planning Commission only co-ordinates inter-model investment decisions; many important segment of policy like pricing of transport agencies being determined by respective agencies themselves. Co-ordination of transport policy cannot be achieved through co-ordinating investment and pricing decisions alone; it also requires co-ordination at the operational level. Such co-ordination is essential for optimising use of available transport capacities. For example it is possible to optimize existing port capacity by regulating port entry and to ensure congestion-free flow of goods to and from the country. Most existing institutional arrangements for co-ordinating transport policies and operations are of advisory nature.

6.2 Rationale of Co-ordination

6.2.1 Co-ordination of transport services should aim at organising the transport system in such a way as to allow each form of transport to retain its separate identity and, at the same time, to regulate relations between various agencies to promote efficiency and economy in use of resources for transport sector as a whole and satisfy total transport demands of the economy. The central purpose of transport co-ordination is to create such technical, economic and other conditions for allocation of traffic among modes of transport as will help development of transport facilities in each mode in required proportions. to meet needs of the economy at minimum cost to society.

6.2.2 In principle transport co-ordination can be achieved by controlling investment and fares and freights charged by different agencies and by administrative regulation and licensing of services. Investment decisions in transport are co-ordinated to a large extent by the Planning Commission. Responsibility for development of railways, national highways, civil aviation, major ports and shipping rests entirely with the Central Government, while development of roads other than national highways, minor ports, inland water transport, and urban transport other than railway projects is broadly the States' responsibility.

6.2.3 The practice followed so far by the. Planning Commission for co-ordinating transport investment by operating on traffic trends has proved generally satisfactory and inter-modal allocation of traffic so determined has by and large met needs of consumers. In an attempt to improve its methodology the Commission has, from the Fourth Plan, adopted the convention of setting up in collaboration with concerned Ministries a number of planning and working groups for different sectors of transport to make a critical review of progress made in the previous Plan, assess the likely requirements for transport, and formulate proposals for future development in respective sectors. The Planning Commission has also been advising State Governments to constitute similar working groups in transport sector. Being inter-Ministerial, these working groups are expected to establish linkages between the likely demands for and supplies of transport both in aggregate and constituent parts, so that their recommendations could provide a correct basis for directing transport investment into the desired channels.

6.2.4 Except in inter-modal investment decisions the Planning Commission's role is purely advisory The sanction behind the National Plan formulated by the Planning Commission is of a consensus, not statutory in nature. There are also procedural delays. Even after the Plan has been approved by the Cabinet, the projects included in

it are not automatically implemented unless they are further approved by the Public Investment Board (PIB), Ministry of Finance and the Cabinet. Moreover an anomalous situation has been created in coordinating transport investment, as while prior approval of PIB is needed for any investment project involving an expenditure of Rs. 5 crores or above, rail investment projects do not need PIB approval. Thus, procedures vary for different modes and arc applicable only to Governmental investment, limiting their effectiveness in overall co-ordination. We feel that criteria for appraising transport projects should be common, irrespective of mode and agency.

6.2.5 There is no mechanism for co-ordinating transport pricing decisions. Nor is there any effective administrative or licensing framework to bring about co-ordination between modes of transport at the Central or State levels.

6.2.6 Transport pricing decisions are generally made for each mode by the concerned agency without any guidance or directive from a co-ordinating authority. Historically, rail rate structure in India has been determined in the context of "what the traffic can bear"; only recently the rail system has tended to adopt cost-based rates for different kinds of traffic. It appointed a Rail Tariff Enquiry Committee to look into fare and freight structure and make suitable recommendations. Thus, while the rail system aligns fare and rate structure with costs from time to time, no such machinery or system has been evolved for road transport. Although, under Motor Vehicles Act, 1939 (as amended subsequently), States can issue directions to the transport authorities to determine fare and freight for stage, contract and public carriers, it is difficult to co-ordinate them. First, there is a plethora of fares and freight rates emanating from pricing practices in various States. Secondly, enforcement of rates prescribed by any single authority is difficult. For such modes of transport as inland water transport, coastal shipping and civil aviation, powers for fixing fares and freight rates are vested in the Central Ministries and, to the extent they have jurisdiction over these modes, co-ordinated action is theoretically possible but not in practice.

6.2.7 In our view, there is need for a centralised pricing authority to recommend a common criterion for fixing fares and freight rates for different modes. In principle it is sensible to establish a single co-ordinating agency for transport in which the functions of pricing, investment and regulation are vested for effective and meaningful co-ordination. For this reason we consider constitution of a National Transport Commission important. However, if our recommendations for establishing such a Commission is not accepted, we recommend setting up of an independent transport pricing board as a partial solution to problems of transport co-ordination. The composition and functions of the pricing board may follow the pattern described for the National Transport Commission in the following section.

6.3 Machinery for Co-ordination

6.3.1 Keeping in view the federal structure of our polity and division of responsibilities for transport between the Centre and the States, the problem of devising a suitable agency to co-ordinate transport services should be viewed from two angles, First, an agency for horizontal co-ordination among modes should be devised so that each serves as a complement to the other in its common task of transport at a minimum cost to the community. Secondly, a vertical integration has to be achieved between the Centre and the States and within each State as well as between the State Government and regional and local authorities dealing with transport. Clearly for

effective implementation of transport policy, co-ordination must be attained in both these respects at each administrative level in the economy.

6.3.2.The overall responsibility for framing a national policy for development of transport must rest with the Central Government, which alone can take an integrated, all-India view of transport needs of the economy and determine proportions in which these should be met in conformity with priorities and objectives of socioeconomic policy. Any institutional arrangement for co-ordination of transport services should also function within the broad framework of a national transport policy approved by the Central Government.

6.3.3 At Central level co-ordination is difficult because at present three main agencies are responsible for providing transport services, namely, the Ministries of Railways, Shipping and Transport and Civil Aviation. In principle, functions entrusted to these Ministries could be assigned to a single, unified Ministry in charge of transport. If such a single Ministry of Transport is set up for all modes, it would be easier to view various agencies as a composite network for investment as well as pricing decisions, without having to rely on an outside authority for co-ordination. We seriously considered this proposal but eventually found it somewhat impractical as a single Ministry of Transport would have to carry an immense burden of work in the present circumstances. Already each Ministry concerned with a particular mode of transport is carrying a heavy responsibility for its development. In such a situation a single Ministry in charge of all modes is likely to slow down decision-making processes, jeopardising transport development programmes. It appears to us that a more effective solution for transport co-ordination should be sought within the existing structure of Central Government.

6.3.4 Two feasible institutional arrangements suggest themselves for consideration. One is to rely primarily upon the Planning Commission to bring about the desired level of co-ordination in transport sector; for it can in principle effectively co-ordinate inter-modal investment decisions, provided its data base is improved. The two-data key-sets required for any scheme of inter-modal traffic allocation relate to traffic flows and transport cost. A beginning has been made in this direction through setting up of a systematic study in the Planning Commission of traffic flows and transport costs. This is, however, a one-time exercise and can only be of limited relevance for future investment planning. What is, in fact, required are collection and analysis of such data on a continuing basis. For, in a country of India's size, with varying regional and geographical characteristics, traffic patterns and cost relationships are likely to change at short notice, necessitating quick adjustment in investment allocations from year to year. This is one of the difficulties the Planning Commission is presently facing and will continue to face in the years ahead.

6.3.5 Another problem involved in relying only on the Planning Commission for co-ordinating transport policies is that while it can coordinate investment decisions as part of its investment planning function, this would still leave co-ordination of pricing and regulatory aspects beyond its purview. No doubt, for fixation of fares and freights an independent coordinating agency on the lines suggested could be set up. But, in that case, we shall have a dual structure with powers for co-ordinating transport investment vesting in the Planning Commission and those for pricing in transport pricing board. This can hardly be an effective solution for co-ordination of a national transport system.

6.3.6 All this leads us to examine other organisational arrangements which seem to be more feasible and effective as a policy instrument, namely, a National Transport Commission at the Centre and Transport Boards at State levels. The proposed Commission should be concerned with all modes and deal with all aspects of transport policy, including investment, pricing, and regulation, within a common policy framework, The principal tasks of the proposed Commission could be:

(1) To survey from time to time traffic pattern flows and real movement costs, and frame a correct policy "mix" to channelise traffic into various modes;

(2) To analyse demand for transport services scientifically and determine share of different modes in projected traffic in an effort to evolve an optimal inter-modal mix;

(3) To examine fare and freight structure of transport agencies and bring them in close conformity with real costs;

(4) To study fiscal and taxation policies, including subsidies, followed by both Central and State Governments in respect of transport to ensure that no distortions or inefficiencies are introduced in spatial resource allocation;

(5) To monitor functioning of transport system on a continuing basis and identify well in time any imbalance between availability of modes and requirements of economy, both in aggregate and constituent parts, and suggest suitable measures to correct it;

(6) To suggest specific measures for regulation and development of transport in pursuance of objectives and principles of a national transport policy, as approved by Governments; and

(7) To advise Central or State Governments on any other matter of transport policy referred to it, including undertaking of cost-benefit appraisal of special transport proposals of national importance, on which its opinion may be sought by any Government agency.

6.3.7 The proposed Commission could either be a statutory body formed under an Act of Parliament or a body set up by a simple resolution of the Central Government, such as the Planning Commission itself. The decision on the Commission's status is left to the Central Govern, molt which, doubtless, would consult State Governments on it. We are inclined to prefer a non-statutory body which may be set up by the Planning Commission on its own initiative by issuing an appropriate resolution to that effect. The main reason why we prefer the proposed Commission to be a non-statutory rather than a statutory body is to provide for flexibility in its scope, of functions and day-to-day operations. Ultimately, the usefulness and effectiveness of the proposed Commission would depend upon its composition and work. For this, if for no other reason, we recommend that the Commission should have as its members, persons of wide and varied experience, including that of transport sector. In particular, the chairman of the proposed Commission should be a person of high standing in public life, with a rich background of administrative experience in various fields of government so as to provide a broad perspective for policy formulation and effective co-ordination. Other members of the Commission, not exceeding six, should be experts on various modes. It would be functionally useful to have a transport economist on the Commission as a member.

6.3.8 To make the Commission more effective and purposeful in policy formulating processes, we recommend that its chairman should be equivalent in rank to that of a Member of the Planning Commission and other members of secretary to the Government of India. The Commission may draw technical staff from the three transport Ministries, the Planning Commission, transport undertakings and academic institutions. There should be a regular turnover of staff to get fresh ideas.

6 3.9 The Commission so constituted would in effect be an expert body, the services of which would be available to the Planning Commission in formulation of transport investment programmes and projects and to concerned Ministries State Governments and executive agencies for determination of fares and freights on rational considerations and other related matters. It can also contribute to regulations and operation of transport system from the point of view of users. For this purpose it may investigate problems faced by users and suggest remedial measures, especially where national interests are involved.

6.3.10 An independent non-statutory body of this type would be free to suggest measures of co-ordination for smooth functioning of the system better than present organisational set up is capable of doing.

6.3.11 The establishment of a Transport Commission may lead to restructuring of present institutional arrangements devised for co-ordinating transport policy. In some cases the present arrangements may not be continued, as their functions would have been entrusted to the Commission.

6.3.12 The idea of setting up a National Transport Commission is not new. Such a proposal was made by M.R. Bonavia, a British transport expert, in his memorandum submitted to the earlier Committee on Transport Policy and Co-ordination. But the Commission proposed by us is a purely planning and co-ordinating agency which will not take up management responsibility. The nearest parallel to the proposed Commission we could think of, is the Canadian National Transport Commission, a statutory body, set up in 1967, with the explicit objective of co-ordinating transport policies and advising the Minister of Transport on evaluation of an optimal transport network in that country.

6.3.13 The proposed Commission is not only expected to bring about inter-modal co-ordination at the Central level; it will also coordinate transport policies between the Central and State Governments. Instead of many coordinating agencies recommended by our predecessor Committee, we emphasise that only one agency can effectively co-ordinate activities of Ministries and agencies at the Centre on the one hand and between the Centre and States on the other.

6.3.14 we also recommend that similar arrangements be considered for co-ordinating transport policies and programmes at the State and local levels within the overall policy frame prepared by the Central Government. We would suggest that, more or less on the same lines as the National Transport Commission at the Centre, State Governments should set up Transport Planning Boards to co-ordinate transport development programmes in the States. These Boards may also regulate licensing of motor and other forms of transport in their respective areas.

6.3.15 In a later Chapter* we have recommended establishment of a single transport authority for large urban centres which would *inter-alia* be responsible for planning and implementation of schemes for all modes, including traffic control and regulation, formulation of fares policy and land-use planning. Such authorities already exist in varying forms in the three major metropolitan cities, namely, Bombay, Calcutta and Madras. These authorities are engaged in planning and regulation of transport as part of an overall urban development planning exercise. In our view this is a desirable institutional arrangement which may be extended to other larger cities to promote an integrated development of transport system in the country.

* See Chapter 12.

BOOK REVIEW

Acharya Viral V., *Quest for Restoring Financial Stability in India*, Sage Publications India Pvt. Ltd., New Delhi, 2020, Pp. lv+330, Price: Rs. 695/-.*

Several economists have modelled the strategic interaction of a central bank with a government as a game of chicken [for example, Sargent 1984 and Barthelemy, et al., 2000]. One important difference between the two institutions is that a central bank run by technocrats has a longer time horizon than a government subject to electoral pressures. Such differences complicate the coordination of monetary policy with fiscal policy under a common sovereign budget constraint.

Quest for Restoring Financial Stability in India can be read against such a backdrop. Viral Acharya was Deputy Governor of the Reserve Bank of India before his premature exit in June 2019, six months before the three-year term was to end. The seventeen chapters are a selection of his public speeches as deputy governor, as well as his formal remarks during the meetings of the monetary policy committee that he attended. Two big concerns lie at the heart of the book - the role of financial stability in the agenda of an inflation targeting central bank and the problem of fiscal dominance over Indian central banking.

Financial stability is not one of the formal goals of Indian monetary policy. The Reserve Bank of India Act of 1934 does not mention it. The monetary policy agreement signed by the government and the Reserve Bank in February 2015 says, "The objective of monetary policy is to primarily meet price stability, while keeping in mind the objective of growth". The management of the external sector and maintaining financial stability enter only as implicit goals for central banking practice, because each has profound implications on both output as well as prices.

Many of the chapters in this book cover the implications of financial instability on the real economy. The growing burden of bad loans in the balance sheets of banks, poor transmission of changes in policy rates to the borrowing costs of private sector agents and the risks from external sector imbalances have been important challenges for Indian policy makers in recent years. Acharya warns against policy responses such as providing bank capital delinked from underlying performance and episodic regulatory forbearance to make it easier for banks to underreport problems.

Many of the concerns expressed in this book reflect the emerging view that analysis of the financial cycle has to be integrated into the monetary policy framework, which traditionally looks at some form of the Philips Curve tradeoff between inflation and output. The task is even more complicated since empirical analysis shows that the financial cycle is not necessarily synchronous with the business cycle [Behera and Sharma, 2019].

In his published comments in monetary policy committee meetings, included in chapter 9 of this book, Acharya often used the "finance neutral output gap" as a more relevant guide for monetary policy than the traditional output gap. This measure defines the output gap not only in terms of its implications for inflation, but also financial sector indicators such as the growth in bank credit, equity prices and exchange rate movements. Much of this thinking is parallel to the work done by the Bank of International Settlements on how economic growth may be unsustainable even under conditions of low inflation, in case financial sector imbalances are increasing [Borio, et al., 2013]. The most well-known example of this is the North Atlantic financial crisis in 2008.

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* Although the book under review was published in 2020, since the release of present issue of the Journal has been delayed, we have included the above book review in this issue.

Why is India prone to financial sector stress? In a long and tightly argued preface to this book, Acharya makes a powerful argument that the roots can be traced back to fiscal dominance - or what he describes as the theory of everything in India. The main literature on fiscal dominance over monetary policy largely concerns itself with inflation control. In a celebrated paper on unpleasant monetarist arithmetic, Sargent and Wallace [1981] showed that the ability of a central bank to control inflation through tight monetary policy is limited when fiscal policy is expansionary. Acharya broadens the argument to analyse the impact of fiscal dominance on financial stability in India, and the ability of the central bank to adequately deal with the latter.

There are several threads to the argument. Governments under fiscal pressure use the public sector banks to pursue policy goals. The lack of adequate budgetary resources to recapitalise public sector banks means that there is pressure to create treasury gains through low interest rates. Regulations are asymmetric in the sense that treasury losses can be recognised in bank income statements over several quarters while treasury gains are booked as income at once. Restrictions on volatile capital inflows are relaxed to help companies get access to global savings when the domestic savings pool gets dominated by the government borrowing programme. The central bank balance sheet is used to support the government budget through transfer of profits as well as statutory reserves. Some of these very issues became points of friction between the Reserve Bank and the Government when Acharya was Deputy Governor. The chapters in this book were written before the covid pandemic struck. As with most other countries, India has responded with fiscal expansion, interest rate cuts and regulatory forbearance. The extent of the crisis justifies most of the macro policy responses after March 2020. The Reserve Bank of India has used a series of unconventional monetary policy measures to accommodate the sharp rise in government borrowing, through large open market operations as well as managing the entire sovereign bond yield curve. Reserve money growth has also been very rapid because of purchases of dollars in the foreign exchange market. The exit from these extraordinary monetary policy measures while managing a record government borrowing programme will sharpen the focus on some of the issues that Acharya had raised in a less stressful economic situation.

"The heavy lifting for protecting the economy from fiscal dominance must come from those individuals within the government who value the quality of long-term outcomes from the economy," writes Acharya (page xivi). The idea that career bureaucrats or technocrats who come in as advisors can resolve what is actually a problem rooted in political economy seems incomplete. They can at best help political leaders in their pursuit of policy reforms, so the alignment of political incentives as well as institutional design are also important. The financial markets can play some role in keeping fiscal policy in check, but betting against the central bank in a shallow bond market such as what we have in India is not an easy task. Witness the Reserve Bank's recent strictures against bond vigilantes. Acharya himself ruffled feathers when he warned the governments against incurring "the wrath of the markets," in a speech he gave in October 2018, which is included in this book [Pp. 277-297).

Quest for Restoring Financial Stability in India shines light on some of the most important issues on the conduct of Indian monetary policy in the shadow of large fiscal deficits. It deserves to be read by scholars, students, practitioners and journalists.

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Chakravarty, S. 1987; *Development Planning: The Indian Experience*, Clarendon Press, Oxford.

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4. For a critique of recent industrial policy proposals, see Marshall [Marshall, 1983, Pp. 281-98].

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