

**Investment & Development Pattern
In Transport Sector In India
During Planning Period : A Study**

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RAMESH KUMAR DWIVEDI

**CENTRE FOR THE STUDY OF REGIONAL DEVELOPMENT
SCHOOL OF SOCIAL SCIENCES
JAWAHARLAL NEHRU UNIVERSITY
NEW DELHI - 110067
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CENTRE FOR THE STUDY OF REGIONAL DEVELOPMENT
SCHOOL OF SOCIAL SCIENCES.

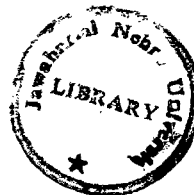
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C E R T I F I C A T E

This dissertation entitled "INVESTMENT AND DEVELOPMENT PATTERN IN TRANSPORT SECTOR IN INDIA DURING PLAN^{NING} PERIOD: A STUDY" submitted by RAMESH KUMAR DWIVEDY is in fulfilment of six credits out of a total requirements of twenty four credits for the Degree of MASTER OF PHILOSOPHY (M.Phil.) of the University. It is his original work according to the best of my knowledge. It may be placed before the Examiners for their consideration.

Kusum Chopra
(KUSUM CHOPRA)
Chairperson
21.7.89

Ishwari Prasad
(ISHWARI PRASAD)
Supervisor



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C O N T E N T S

Page No.

ACKNOWLEDGEMENT

LIST OF TABLES

LIST OF FIGURES

CHAPTER-I	INTRODUCTION AND ROLE OF TRANSPORT IN ECONOMIC DEVELOPMENT	1-23
CHAPTER-II	PATTERN OF INVESTMENT	24-62
CHAPTER-III	NATURE OF TRANSPORT DEVELOPMENT	63-128
CHAPTER-IV	CONCLUSION	129-142
	BIBLIOGRAPHY	143-150
	APPENDIX	

List of Tables

- 2.1 Pattern of Plan Outlay in Public Sector
- 2.2 Public Sector Investment/Outlay on Transport (at Current Prices)
- 2.3 Average Annual Public Sector Investment in Transport (at 1971 Prices)
- 2.4 Planned Transport & Communication Investment in Selected Countries during Initial period of Development.
- 2.5 Private Sector Investment in Transport & Communication.
- 2.6 Relative Share of Public & Private Sector in Total as well as Transport Investment (in percentage)
- 2.7. Public Sector Investment/Outlay on Different Modes of Transport (at Current Prices).
- 2.8 Public Sector Investment on Different modes of Transport (at 1971 Prices).
- 3.1 Indian Railways Development
- 3.2 Rail Route Density in Selected Countries
- 3.3 Rolling Stock Position in Railways
- 3.4 Progress of Railway Electrification
- 3.5 Growth of Traffic - Railways
- 3.6 Indices of Growth of Traffic & Inputs in Railways
- 3.7 Progress of Roads
- 3.8 Road Density in Selected Countries
- 3.9 Road Density in Different State/UTs.
- 3.10 Number of Motor Vehicles registered in India
- 3.11 Ownership Pattern in Road Transport

- 3.12 Growth of Shipping Traffic
- 3.13 Strength of Indian Merchant Shipping Fleet
- 3.14 Traffic Handled at Major Ports
- 3.15 Commoditywise Composition of Shipping Traffic
- 3.16 Capacity Creation & Utilization of Indian Airlines

List of Figures

- 1.1 Transport and Industrialization
- 1.2 Macro level forward linkages of Transport Investment

- 2.1 Trend of Public Investment in Transport

CHAPTER - I

INTRODUCTION

AND

ROLE OF TRANSPORT IN ECONOMIC DEVELOPMENT

INTRODUCTION:

Transport is a vital infrastructure for economic development. It is that part of economic activity which is concerned with increasing human satisfaction by changing the geographical position of goods and people¹. It provides mobility to men and material, which is positively related to the expansion of economic activities. Thus the main function of transport is to bridge the time and space gap, between the producers and consumers either by movement of goods or by movement of passengers². Just as immobility and backwardness goes together, mobility and development also go hand in hand. Mobility performs a dual role in a developing country like India. It not only does facilitate economic development, but also initiate developmental activities by opening up new regions. There are certain prerequisites, which can be termed as infrastructures, on which development of an economy or its different segments viz. industry, agriculture and trade etc. depend. Transport being, one of the most important component of infrastructure, requires greater attention for its expansion. Once transport infrastructure is created, the rate of economic growth will

1. Benson Don and Geoffery W., 'Transport and distribution' Longman, London, 1985. p.1

2. Milne, A.M., 'The Economics of Inland Transport', p.22

depend upon the nation's propensity to grow³. It has high potential to sustain the economy on the highway of growth, in spite of the fact that the direct contribution of this sector to GDP is very small. That is why National Transport Policy Committee asserts, "Transport development should be given greater attention on a priority basis"⁴.

In order to optimise the utilisation of scarce financial resources and to avoid its profligacy, the investment in transport sector must be done in planned manner. Further, there must be a balanced approach regarding the investment in various segments of transport; freight and passenger traffic, growing industrial and agricultural needs, urban and rural requirements. The sixth plan states, "The need for transport infrastructure, especially, the more vital sectors of it like - railways, ports and roads being allowed to develop in a manner commensurate with the growth of the economy, particularly of segments with high transport coefficients and to have, as far as possible, certain to avoid its becoming a serious

3. Hans Heymann, JR: 'The objectives of Transportation' in "Transport Investment & Economic Development" GARY FROMM (ed.), Washington, D.C. 1965, p.31

4. Govt. of India, National Transport Policy Committee Report, 1980, Planning Commission, New Delhi, p.339

bottleneck in the development of economy"⁵.

It is a widespread believe that 'transport acts as a development catalyst'. Since it is so difficult to evaluate objectively how much investment in transport infrastructure is indicated in any given situation, there is a tendency to be profligate and wasteful in this field. 'Unfortunately, in practice, the question of " how much transportation?" cannot be answered on the basis of objective principles. Thus the overall choice of the quantity of resources to allocate to transportation can be made only as a reflection of affirmative decision concerning numerous individual transport projects. The decision on total resource allocation to transportation must emerge as a result of evaluating individually, and in combination, the various transportation uses to which resources can be put in the quest for economic growth'⁶.

Transport system should be viewed as an integral and unified structure disregarding the fact that different transport services are operated by different agencies and under different ownership. Thus various modes of transport should develop as complementary services to each other and

5. Govt. of India, Sixth Five Year Plan (1980-85); Planning Commission, New Delhi 1980, p.226.

6. Hans Heymann, JR., op. cit., p.29.

could be able to meet the total need of the community at minimum cost possible. Since geographical factors are key variables in transport, the balanced development of an economy requires that all its regions must have a sufficient amount of basic transport infrastructure. Any duplication of transport services would be wasteful.

The most difficult problem in determining intermodal allocation of traffic is the estimation of the resource costs of movement by each alternative mode of transport. Three distinct elements are involved here. First, the costs are incurred by the operator, including the state, in providing the service. These include both infrastructure and running costs. Second, there are the costs incurred by the users of service. Third, there are the costs of social nature falling outside the customary costs of operators such as noise, fumes, damage and disruption caused to local communities.

Hence investment in this sector should be justified by the availability of finance on one hand and their direct and indirect impact on productive capacity on the other. In addition to it, the nature of transport needed should also be considered as a criterion, while investing in transport infrastructure.

Transport and Economic Development:

The common national objectives of developing economies are rapid economic development, industrialisation, development of agricultural and rural areas, export promotion and balanced regional development. Transport, the life-blood of economy, is a basic necessity for economic development. In fact, it is a 'fundamental precondition for the 'take off' of an economy'⁷.

There are several studies on the development of transport system in different countries and the role played by this sector in economic development of respective nations provides rich insight in retrospect. Francis⁸ has observed that transportation systems are ordinarily considered as facilitating agents for integrating and maintaining economy which is important for economic development. L.S.Payne⁹ has brought into the light, the pioneering role of transportation system in modernising an economy. Owen¹⁰ has discussed the developmental role of transportation at

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7. Rostow, W.W.: Stages of Economic Development : A Non-communist Manifesto. Cambridge University Press, London.
 8. Geoffery Francis - 'Transport and Society' Transport Journal, March/April 1974.
 9. Payne, L.S., 'The Transportation Scene' Transport Journal, July 1975.
 10. Owen Wilfred: 'Transportation and World Development', Johns Hoppins Press, London, 1987.

international level. Various facets of role of transport in modern India has been brought By K.P.Bhatnagar in a book edited, titled as 'Transport in Modern India'. All these studies have arrived at the same conclusion that development of transport plays a vital role in the economic development of a country. These studies indicate that in a transport deficient economy, bottlenecks are created impeding its economic development. Similarly, advance transport provision generates and strengthen the motivation of rapid economic growth. Owen has remarked that in nations with "traditional societies immobility perpetuates poverty, while in affluent society mobility is an essential ingredient of prosperity"¹¹. The effects of improved transportation facilities are many. (i) The expansion of transport services make direct improvement in the contribution of service sector in the national output, (ii) It provides ample scope for the development of new regions and resources for production, (iii) It expands the geographical extent of market thereby making possible the large scale production and operations that modern industries often require, (iv) It facilitates the flow of people, information and ideas, thereby helping to make possible to political and social integration of territory and uplift the levels of health,

11. Owen Wilfred (ed.), 'Transportation' Scientific Book Agency, Calcutta, 1967, p.VII.

education and awareness of people that would otherwise remained isolated.

There is another dimension which describes the positive effect of transport development on economic growth. An improvement in transport capacity permits a more effective abridgement of distance. It makes possible faster, safer, cheaper and more dependable service which in turn allows a greater movement of goods and people per unit of time. The speed factor permits more intensive use of existing transportation facilities, which is capital - saving in two senses : (i) Less needs to be invested in transport to provide the same amount of service, assuming that depreciation does not rise in proportion to use per time period. (ii) Non-transportation producers may retain smaller inventories so that a greater amount and variety or real investment is possible. This permits a larger total output per unit of resource input. Improvement in safety standards tends to stimulate usage and reduce the hazards of movement. This brings about greater utilisation of facilities per time period and reduced costs in the form of damage, loss or insurance. The cost factor refers to the reduced inputs required to move any given quantity of goods between two points. These released inputs become available for other purposes, permitting greater total output. In general improved transport leads to a reduction

in the total resources required to produce and distribute a given volume and pattern of output per time period¹². In this way it contributes in rapid economic growth.

It is important to note that transport development plays only a permissive role in Economic Development. It allows a dynamic developing situation to work its way and it can reinforce motivations that already exists. The degree to which transportation creates or compels new activities will surely depend upon the existence of other conditions within the economy - the quality of administrative structure and social order, the nature of legal and property relationship and all the dimensions of a nation's propensity to grow. Where these qualities are deficient, no amount of transport will be likely to create an economywise dynamism¹³. Thus it is propensity to grow which is important in the context of the role of transport development in an economy.

Transport and Industrialisation : The important economic effects of transport development are increased productivity and lowered cost of production as the cost of transportation of raw materials, components and finished products is

12. Wilson, W.G., 'The Impact of Highway investment on Development', Washington D.C., 1966, p.6.

13. Hans Heymann JR., 'The Objectives of Transportation' in 'Transport Investment and Economic Development', op. cit. p.31.

always an important component of cost of a commodity. Therefore, transport is the vital element to influence the location of industries.

It is an axiomatic truth that any obstacle to adequate and timely supply of raw materials and delivery of finished product to market centres, which is usually caused by inadequate transport facilities, would hamper the smooth functioning of industries. Due to such transport bottlenecks industries will have to shut down or will have to produce at sub-optimal level. Hence the inability of the transport system to meet factory schedules often forces a slow-down of production¹⁴.

It can be said that transport development fosters industrialisation by, (i) combining the factors and materials of production together and making easier access over factors of production, thus making production possible, (ii) affecting the cost structure and cost of production, (iii) extending the geographical extent of market by narrowing the space gap and thus leading to specialisation and large scale production possible. In this way "cheap transportation reduces prices through the opportunity it makes for geographical division of labour or territorial specialisation"¹⁵.

14. Owen, Wilfred, 'Transportation and World Development' 1987, op. cit. p. 44

15. Locklin D. Philip: 'Economics of Transport' (1973), p.4

In India, it was the opening of railways which made possible the establishment of heavy and large scale industries because the movement of heavy and bulky raw material and finished product became possible at cheap cost. The development of road and road transport provides opportunities to industries for further specialisation. Government's proposal for development of growth centres in industrially backward regions could be successful only when a good transport network - especially feeder roads, will be created in these regions to provide adequate and cheap transport facilities. Thus the pattern of industrialisation is very much affected by the availability of adequate transport infrastructure. The interaction chain can be explained by Figure 1.1.

Transport and Agricultural Development : The extension of rural transport facilities leads to agricultural development and its commercialisation in a big way. In primitive economy where transport sector is backward, quick mobility is not available, agriculture is bound to be of subsistence nature. Then producers (farmers) have no incentive to produce market surplus on accounts for two reasons. First, the undeveloped transport network hampers the timely availability of inputs. Second, transport provides link between production centre (villages) and product market (Urban or Semi Urban centre, where agricultural Mandies are

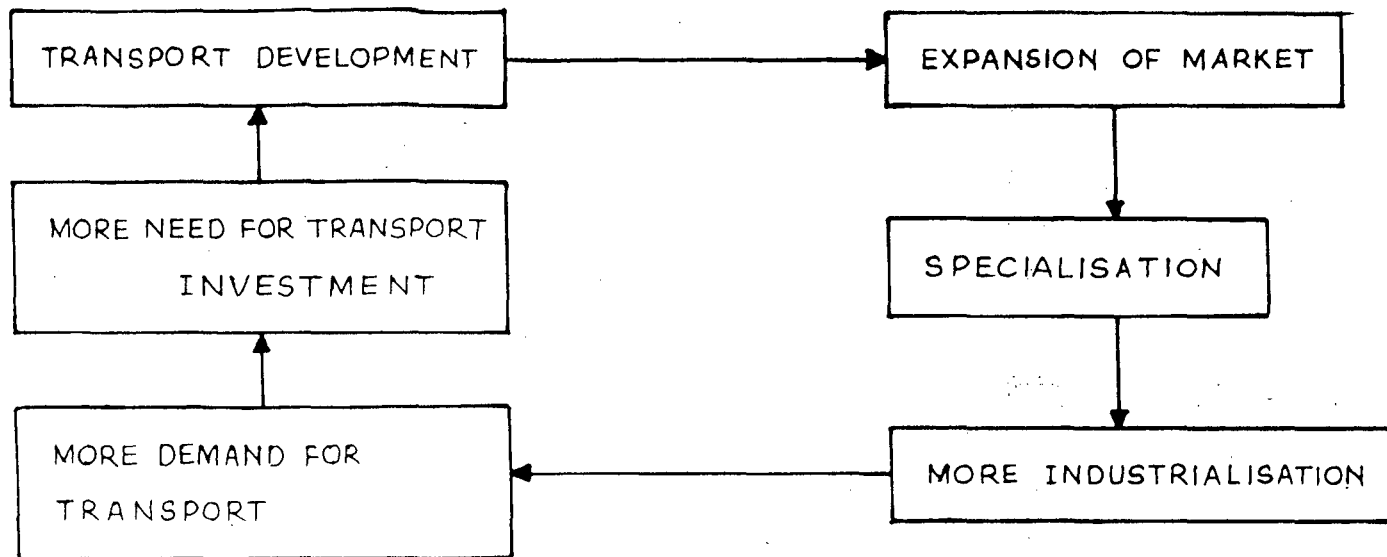


FIG. 1.1 : TRANSPORT AND INDUSTRIALISATION

situated), thus ensuring farmers for getting fair prices and good storage facilities for their produce. "The development of transportation increases the profitability of agriculture and related activities in area remote from markets"¹⁶. The economic effect of opening of the 'Friendship highway' in Thailand is a glaring example of how transport development generates agricultural development¹⁷. A quick transport facility stimulates the production of perishable agricultural and dairy products by carrying them to consumers in distant market.

In India National Dairy Development Board has initiated and executed to establish national grid for dairy products and vegetables based on efficient transportation facilities. Hence the potential of transport facilities in agricultural development is revolutionary in Indian situation.

Transport and Export : In a developing country like India, where there is an acute shortage of foreign exchange, export promotion is one of the major objectives of Government's development policy, development of internal viz. Rail and Roads and external transport system, viz. Air and Overseas

16. Ibid, Chapter-II

17. Wilfred Owen, 'Strategy for Mobility' Brookings Institution, Washington, (1964).

Shipping, is necessary to boost export. Shipping helps in exporting heavy and bulky raw materials such as iron ore crude petroleum etc., which constitute a major share in export basket of developing countries. For export of light and high valued commodities such as garments; Jems and Jewellery products, Air transport provides best facilities. Transport services in itself are exportable item. Air transport and shipping industry can contribute in earning of foreign exchange. The development of tourism industry which is an important new area for earning foreign exchange, depend upon good transport facilities¹⁸. Thus we can say that transport helps in big way in boosting export and earning foreign exchange.

Assigning the Role of Transport:

Transport an important infrastructure can act either as 'induced sector' or as a 'leading sector' in an economy.

Induced Sector: There is theory presuming the role of transport only as subsidiary to other sectors of the economy in the development process. This in other words is the idea of 'transport as an induced sector'. This postulates that transport should not grow faster than industrial and agricultural sectors. Instead, the growth of agricultural and industrial sectors should provide impetus for the

18. Yojana (Hindi): New Delhi, 16-30 June 1989, p.11

development of transport. The argument behind this view is that unbalanced sectoral development will unnecessarily create supply surpluses or transport inputs, thus the service generated by transport sector may remain unused and its capacity may be under-utilised. Hirschman while arguing Social Overhead Capital (SOC), an induced sector, makes it clear that if development of Direct Productive Activities (DPA) are undertaken first, DPA production costs are likely to rise substantially. Therefore, DPA producers will realise the possibility of making considerable economies through the installation of large SOC facilities. As a result, pressure for an increase in SOC would come into play and would indicate the next step in this sequence¹⁹. It is apparent from this hypothesis that transport plays a passive role in the growth process and thus it should be accorded second priority in investment plans. The expansion of transport, under induced sector hypothesis, takes place through shortages and pressures generated by the relatively faster expansion of DPA production. Transport is considered as a lagging sector in an underdeveloped economy because the degree to which it can create or compell new economic activities depends upon the existence of other conditions termed as 'nation's propensity to grow'. Where these

19. Hirschman, A. 'The Strategy for Economic Development' New York 1958, p.36

propensities are deficient no amount of transport investment is likely to infuse life in economic activities.

Lead Sector: Transport infrastructure can be a 'Lead Sector', when the investment in transport is made in anticipation of future demand for transport. The commitment of investment in transport sector is made in advance under the assumption that a chain reaction will take place in other sectors and economy will move upward. In the words of Rostow - 'The Leading Sector will induce around it a whole set of change which tends to reinforce the industrialisation process on a wider front',²⁰. The role of transport investment in this sense is emphasised as a pre-requisite of development and therefore, investment is undertaken in anticipation of future demand generated by directly productive activities.

Now the question arises - why an economy should invest firstly in Lead Sector (in this case transport sector)? Its main reason is that such investment creates chain reaction which stimulates economic growth by increasing the profitability of investment in other sectors. This process of chain reaction is known as 'Linkage Effect'. Thus investment decisions are taken not only on the basis of their immediate contribution to output of the investment but also on the basis of inputs produced by an investment i.e.

20. Rostow, W.W.(ed.), 'The Economics of take off into Self-sustained Growth), Macmillan, London, 1971, p. 5

on the basis of linkages effects, which induces further investment in other sector and thus growth. One sector of an economy is related with other sectors by two way - backwardly and forwardly - in production chain. On the basis of above mentioned two-way-relation of an investment, there are two types of linkages effects - first forward linkages and second backward linkages.

Transport investment has very strong forward linkage effect, because services produced by this sector stimulates levels of economic activities in other sectors such as agriculture, industry and trade²¹. The macrolevel forward linkage of transport investment is shown by figure 1.2. It is clear from the figure that as an investment is made in transport sector, it leads to first - improvement in physical infrastructure, second - expansion of this basic infrastructure, third - reduction in the cost of transportation and last but not least - improvement in services.

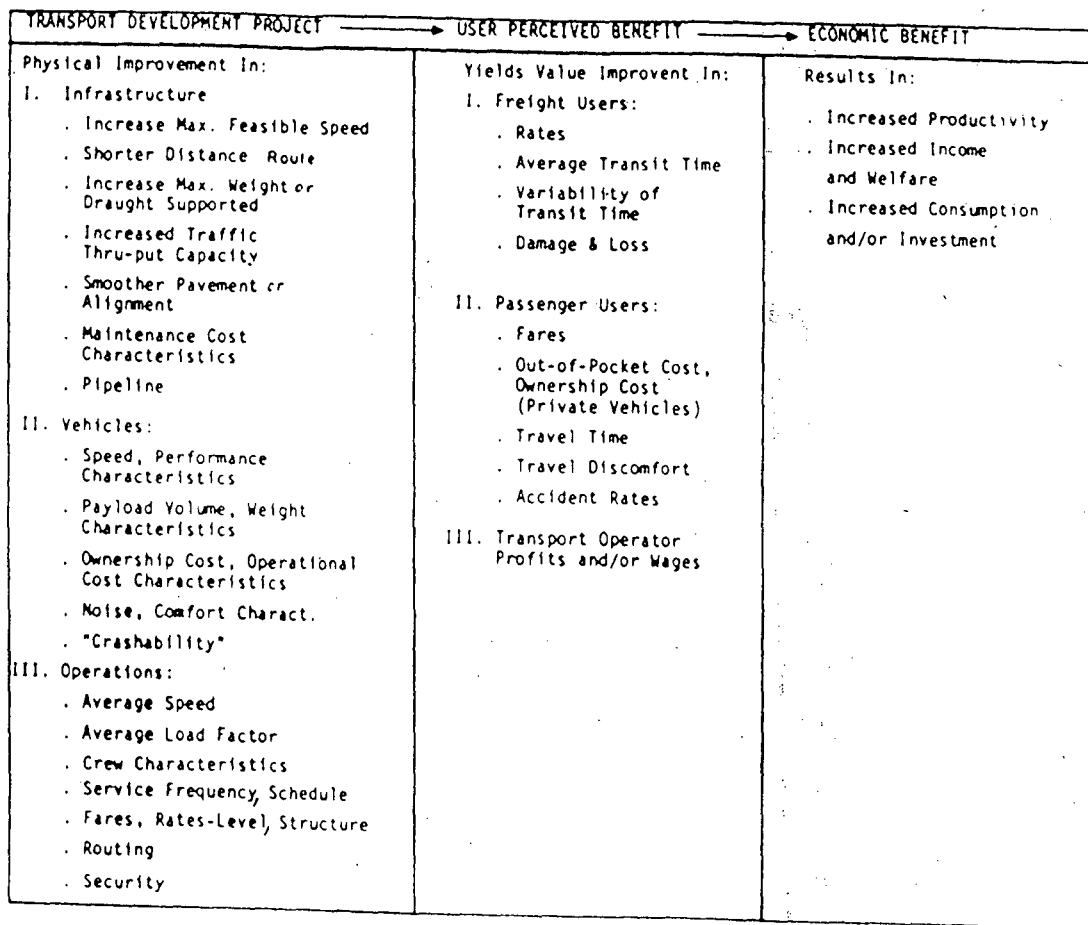
Backward linkages refers, as used in this sense, to the transport sector's need for production and technological development in other more basic sectors of the economy that are behind or upstream from the transport sector in the flow of production of services²². The industries which are

21. Moavenzadeh F. & Geltner D: 'Transportation, Energy & Economic Development: A Dilema in the Developing World' New York 1984, pp.99-129.

22. Ibid, p.139

Figure No. 1.2

Macro-level forward linkages of Transport Investment



backwardly related to transport investment are - iron and steel, cement, energy and agricultural and consumer products. Transport investment increases the demand for the products which are produced by these industries. Iron and steel and cement products are used in creation of transport infrastructure, energy sector's product - such as coal, petrol and diesel and electricity etc. are demanded by transport sector for operation of transport facilities and agricultural products provides wage goods to this sector. Thus demand side stimuli of transport investment leads to the development of these backwardly linked industries.

NATURE OF TRANSPORT INVESTMENT:

Investment²³ in an economy can be described as the additions made in productive capacities of an economy. Edward Shapiro defines it as 'the value of that part of an economy's output, for any time period that takes the form of new structures, new producers' durable equipments and changes in inventories.'²⁴ Investment results in capital formation in an economy which means the withholding of current consumption of a portion of the output, produced by

23. 'The New Palgrave: A dictionary of Economics' defines it - "Investment is capital formation - the acquisition or creation of resources to be used in Production": The Macmillan Press Limited; London 1987, p. 980.

24. Shapiro, Edward: 'Macroeconomic Analysis', Galotia Publications, New Delhi, 1984, p. 365.

the economy. Investment can be measured by the amount of expenditure incurred on the creation of new structures, new producers' durable equipment and inventories. Investment is made in an economy because it provides return to future generation and facilitates growth and economic development.

The development of infrastructural facilities for transport sector requires heavy investment. Transport investment, being an infra^astructural investment has three specific features, which distinguishes it from investments in other direct productive activities²⁵.

- i) The period of gestation and pay off are usually longer in transport.
- ii) Due to indivisibility of supply, its nature is lumpy, i.e. huge amount of resources are required to make network of transport in an economy;
- iii) The profits from it are returned to the community as a whole - through indirect chain of causation - rather than directly to the initiating entrepreneur. This is because of the very nature of transport infrastructure.

25. Rostow, W.W.: The Stages of Economic Growth: A Non-communist Manifesto, Cambridge 1964, Chapter-3.

There has been a long debate whether transport investment should be under the private or the public sector. There are two dominant reasons why transport should be under the public sector. The first is that if transport decisions are taken on the sole criterion of profitability, it would be seriously deficient. The transport sector is characterised by major indivisibilities of supply, joint costs and economies of scale which means marginal private cost may often be well below the average costs and therefore, there will be continuous losses. Since the private sector cannot sustain losses for a long period, hence transport services are best suited in the public sector. And second, transport is a service which creates major externalities and therefore, these cannot be captured by individual operators in their market behaviour²⁶. Both reasons suggest that transport is not suitable to be left in the private sector and that the public sector is technically more suitable for this type of services in the society.



Another reason for transport sector to be left in the hands of government is that it is an important overhead which helps in proliferation of diverse economic activities. For any programme of development transport facilities must be provided in advance before other economic activities can

26. Nash, C.A.: 'Public versus Private Transport (1976) The Macmillan Press Ltd., London, pp. 84-85.



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take off. It has, therefore, been universally accepted that public utilities must be under the public sector and cannot be left for the private operators to develop. In fact, all those activities which are potentially powerful instruments for the furtherance of state policy must be under the direct ownership and control of the state. Transport is an important agency for bringing changes in the economy, it would be harmful if left in the private sector to be operated for the sake of profit, which may cause dangerous cumulative effect.

Almost everywhere in the world the provision of the essential infrastructure for economic development has been the main justification for investment in the public sector. On these lines independent India from the very beginning has assigned a progressive and greater role to Public sector in transforming its backward and stagnant economy into a dynamic and progressive economy. To achieve this objective, planners of independent India have decided that the development of transport sector must be the sole responsibility of state with a supplementary role to private sector.

Scope and Data-base of the Study: This study makes an attempt to review the investment and development pattern of Transport sector in the Indian economy. In this context, it has been attempted to analyse the relationship between

transport development and the national objectives of a developing economy. For this, the trend and pattern of transport investment in Indian economy since planning era have been investigated. This has been extended to analyse the development pattern of various modes of transport, i.e. Railways, Roads and Road transport, Shipping and Civil aviation etc. It is hoped that such a study would exhibit the present state of affairs prevailing in the transport sector, which may help ⁱⁿ formulating a more suitable transport policy in the service of the Indian economy.

Data for this study have been primarily collected from secondary sources: such as published and unpublished government reports and other documents. Certain books and journals on the subject have been examined for this purpose.

Since data for this study have been compiled from different sources, there is a possibility of some discrepancy even after careful scrutiny.

Chapter Scheme : The present study is divided into four chapters. The introductory chapter deals with the role of transport sector in economic development. The second chapter describes the trend and pattern of investment in Transport during various plans. The third chapter deals with the development pattern of Indian transport system during planning period taking each mode of transport separately. The fourth chapter concludes the findings of the study.

CHAPTER II

PATTERN OF INVESTMENT

Pattern of Investment

This chapter makes an effort to analyse investment pattern in transport sector since the beginning of planning era. The analysis has been made in two phases: firstly, the investment pattern between public and private sectors and secondly, the distribution of investment among various modes of transport.

Planned development of the country began on the surface of the colonial order of the Indian economy. The British rule was a long story of systematic exploitation by an imperialistic government. The benefits of British rule were only incidental, if any.¹ Whatever development that took place during the last four-five decades, preceding planned development was partial and limited when judged in terms of country's needs and aspirations. Industrialisation and modern techniques registered expansion but affected limited spheres in the country. Almost whole economy was stagnant, because the main objectives of all British policies were to serve the interest of England.

1. Bipin Chandra, 'Modern India', NCERT, New Delhi, 1984. pp. 190-99.

After independence, an effort was made to create a huge network of infrastructure, so that national objectives of development could be achieved. The scale of efforts undertaken during various five year plans to create transport facilities for planned economic development of the country could be expressed by the magnitude of investment in transport sector. There are two aspects which should be kept in mind, while assessing the efforts made for generating transport facilities in the economy. The first aspect relates to the changed nature of scale of the transport efforts under the planned system. With the initiation of systematic development of different sectors of the Indian economy, the emphasis of transport requirement shifted from outward to inward. During colonial period transport was outward looking in the sense that it received impulses for expansion from metropolitan economy of England. But after independence the transport system has to subserve a much wider range of purposes than before. Now it has to support the growth of industries, agriculture, irrigation projects, power and mining of the country. The second aspect is that transport system comprises of a number of distinct agencies such as railways, roads and road transport, ports and shipping and airways etc. In order to optimise intermodal investment, formation of a transport policy of integrated approach is necessary. The whole

Table : 2.1

Pattern of Plan Outlay in Public Sector (IN %age)

Lead of Outlay	First Plan	Second Plan	Third Plan	Annual Plans (1966-69)	Fourth Plan	Fifth Plan	Sixth Plan	Seventh Plan
Agriculture & community development.	14.8	11.7	12.7	16.7	14.7	12.3	13.6	12.6
Major and Medium Irrigation	22.2	9.2	7.8	7.1	8.6	9.8	10.1	9.4
Industries & Minerals	3.9	24.1	22.9	24.7	19.7	24.3	15.5	12.5
Transport & Communications	26.4	27.0	24.6	18.5	19.5	17.4	16.0	16.4
Power	7.6	9.7	14.6	18.3	18.6	18.8	27.9	30.5
Social Services & Miscellaneous	25.1	18.3	17.4	14.7	18.9	17.4	16.9	18.6

Source : Ministry of Finance, Indian Economic Statistics : Public Finance 1985.

"transport should be viewed as a system in which modes of transport complement rather than substitute each other - each mode performing a job for which it is best suited on the basis of its comparative resource cost advantage."²

The public sector and private sector both have contributed to the total magnitude of investment in transport sector. In order to get a clear picture of investment pattern in this sector, it is necessary to analyse them separately.

Public Sector Investment in Transport:

India initiated its planned development since 1951, when the first five year plan (1951-56) was launched. The first plan envisaged that 'transport pattern in the country would undergo substantial changes as the various agricultural and industrial programmes included in the plan were progressively implemented.'³

Thus, the first five year plan aimed at "rehabilitation of the assets which had been postponed for a long time due

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2. Government of India, NTPC Report - May 1980, Planning Commission, New Delhi, p.6.
 3. Government of India, Draft First Five Year Plan, Planning Commission, New Delhi, p.46.

to various factors".⁴ A high proportion of fund, therefore, was allotted to the transport sector.^(ref. table 2.1) Hence a sum of Rs.476.6 crores, out of total plan outlay of Rs.1,960 crores, was allocated for transport sector which constituted 24.3 per cent of total plan outlay. The actual expenditure, however, was Rs.436 crores, i.e. 22.1 percent of total public sector expenditure. A greater proportion of this total expenditure on transport was spent on rehabilitation rather than the creation of new assets.⁵

During the second and the third five year plan rapid expansion of transport network occurred. The basic strategy of the second five year plan (1956-61) and the third five year plan (1961-66) laid heavy emphasis on rapid industrialisation. Thus not only 'the basic pattern of investment shifted from agronomy to industry but also within the industrial sector itself the focus was on spectacular capital intensive heavy

4. Ibid., p.461.

5. Govt. of India, Second Five Year Plan, Planning Commission, New Delhi, p.459.

Table : 2.2

Public Sector Investment/Outlay on Transport (at current prices)
(In ^{Rs.} Crores)

Plans	Total Plan Expenditure	Expen. on Transport	%age share of Transport.
First Plan 1951-56	1960	436	22.1
Second Plan 1956-61	4672	1100	23.5
Third Plan 1961-66	8577	1983	23.1
Annual Plans 1966-69	6652	1032	15.6
Fourth Plan 1969-74	15779	2522	16.0
Fifth Plan 1974-78	28991	4078	14.1
Sixth Plan (Outlay) 1980-85 (Actual Expnd)	97500 109292	12411.97 14208.4	12.7 14.5
Seventh Plan 1985-90 (Outlay)	180000	22596.0	12.6

Source : As given in Table 2.7.

industries'.⁶ During these two plans the greater importance was given to large scale industries like iron, steel, coal and cement. Transport facilities, therefore, were programmed to be developed on the basis of possible location of additional output and the source of supply of raw materials. Thus the second five year plan envisaged for 'substantial expansion of the country's means of transport, especially railways which was arrested for long

In the second plan a sum of Rs.1,241.2 crores was allocated for the development of transport facilities in the country, which constituted 26.98 per cent of the total public sector outlay. The actual expenditure, however, was much below, at Rs.1,100 crores at current prices, constituting about 23.5 per cent of total public sector expenditure. In third plan period actual expenditure was Rs.1,983 crores out of total plan expenditure of Rs.8,577 at current prices. This constituted a share of 23.2 per cent of total plan expenditure. Here we see that the relative share of transport during first three five year plans was near about equal, but absolute average amount spent during these three plans shows an increasing trend. Due to total failure of

6. Ray, S.K. Indian Economy, Prentice-Hall of India, New Delhi, p.400.

the third five year plan, there was a plan holiday for a period of three years (1966-67 to 1968-69). During annual plans transport sector did not receive enough attention, the reason being the state of economy and non-availability of financial resources for plan purposes.⁷ The total expenditure on transport sector was around Rs.1,032 crores constituting 15.6 per cent of total public sector expenditure during this period.

During the fourth five year plan (1969-70 to 1973-74) an outlay of Rs.2,641 crores was allocated for transport sector, which was about 16.61 per cent of total plan outlay. But this targeted outlay could not be achieved and the actual expenditure was Rs.2,522 crores, constituting only 16 per cent of total plan expenditure. It shows that the proportion of expenditure on transport to total public sector expenditure come to a lower level in comparison to earlier three five year plans. Its main reason was that the fourth plan mainly "aimed at accelerating the tempo of development in conditions of stability and at reducing fluctuations in

7. Govt. of India, INDIA-1987; A Reference Annual ,
Publication Division, Ministry of Information and
Broadcasting, New Delhi, p.322.

agricultural production following the Gadgil strategy".⁸ In this plan the main emphasis was laid on development of agricultural infrastructure and industries in order to make the country self-reliant in respect of food grains and industrial products. Thus transport development did not get special attention during this plan.

In the Fifth Five Year Plan (1974-75 to 1978-79) an outlay of Rs.5,697 crores was allocated for transport sector which was near about 13.8 percent of total plan outlay but this plan could not be completed due to change of ruling party at the centre in 1978. Thus during 1974-75 to 1977-78 (a period of four years) only Rs.4,078 crores could be expended on transport, out of total public sector investment of Rs.28991 crores depicting a lower relative share of transport, only 14.1 per cent.

During Janata Party's regime, a plan was formulated for the period of 1978-83, commonly known as 'Rolling Plan'.⁹ But because of mid-term election in 1980, once again the

8. Ibid., p.322.

9. The concept of Rolling Plan was given firstly by Prof.Ragner Frish, but Prof. Gunnar Myrdal made it popular.

Congress government came into power at centre. The new government abandoned the concept of rolling plan and a new sixth five year plan was prepared for the period 1980-85. 'The plan clearly brought out the relative and sector-wise priorities, taking an integrated view of planning. The strategy adopted for sixth plan was essentially moving simultaneously towards strengthening the infrastructure for both agriculture and industry so as to create conditions for accelerated growth in investment output and export.'¹⁰ But since the main attention was on direct productive activities a lesser share was allocated for transport sector. The transport sector outlay was Rs.12,411.97 crores out of total outlay of Rs.97,500 crores, which constitutes 12.7 per cent of total outlay. The actual expenditure was higher than that allocated for this sector. It was 14,208.4 crores, i.e. 14.5 per cent more than that of earlier allocation for transport, but the total actual expenditure increased by only 12 per cent over plan outlay (from Rs.97,500 crores to 109,291.7 crores).¹¹

10. Govt. of India, INDIA-1987, Op.cit., p.301.

11. Ibid., p.302.

The seventh plan (1985-90) emphasises on policies and programmes which could accelerate the growth in food-production, employment opportunities and raise the productivity within the framework of basic principles of Indian planning, namely growth, modernisation, self-reliance and social justice. The main emphasis was on "improvement in capacity utilization and efficient project implementation in all areas especially in irrigation, power, transport and industry" which are essential for achieving the basic objectives of the seventh plan and for putting the Indian economy on a high growth path.¹² In the seventh plan, transport got the third priority in terms of plan outlay after energy and social services.

This sector got Rs.22,971 crores out of total plan outlay of Rs.1,80,000 crores, constituting 12.6 per cent. When we compare the seventh plan's transport outlay to that of sixth plan we find that there is an increase of 90 per cent, whereas total public sector outlay shows an increase of only 85 per cent. During the first three years of the seventh five year plan, 69.5 per cent of transport outlay

12. Govt. of India, Seventh Five Year Plan, 1985-90, vol.1, Planning Commission, New Delhi, p.23.

has been utilized. In the seventh plan the crucial task for transport planning was to increase the capacity of the transport systems in correspondence with the economic development of the country. This task is to be managed through maximising the utilization of assets, technological upgradation, development of energy efficient mode and promotion of multimodal transportation systems. Replacement and rehabilitation of assets alongwith maintenance have to get precedence over development of incremental capacity as a more economic means of increasing the output of the system. Priority has been accorded for the completion of on going schemes which either improve the efficiency or add to the transport capacity. The development of rural roads to open up backward areas and to accelerate their socio-economic development has been pursued vigorously.¹³

To find the trend of investment we have taken average annual expenditure for each five year plans. It is given on 1971 prices. We have calculated chain base index and constant base index taking first plan's average annual expenditure as base.

13. Govt. of India, Mid Term Appraisal, Seventh Five Year Plan (1985-90), Planning Commission, New Delhi, 1988, p.148

Table - 2.3

Annual Public Investment

Plans	Average annual public sector expenditure on transport (1971 prices) Rs. crore	Chain Index No.	Constant base Index No.
Ist Plan (1951-56)	200	100	100
IIInd Plan (1956-61)	434	217	217
IIIrd Plan (1961-66)	615	142	307
Annual Plans (1966-69)	401	65	200
IVth Plan (1969-74)	451	112	225
Vth Plan (1974-78)	611	135	306
VIth Plan (1980-85)	868	142	434
VIIth Plan (1985-90) [Outlay]	1195	138	597

Source: As given in Table 2.8.

The chain index number shows the increase in average annual expenditure over previous plan's average annual expenditure. It is clear from above table that it was only fourth five year plan in which average annual expenditure

declined over its preceding annual plan's average annual expenditure. The constant base index shows the increase in average annual expenditure taking first plan period as base. It is clear from table 2.3 that during first three plan average annual expenditure has increased but there was a reduction in it during the fourth plan, but after it once again there is an increasing trend (Fig. 2.1).

So far the relative share of investment in transport is concerned, it was little less than one-fourth of total public sector investment during the first, the second and the third five year plans. But since then its proportion to total investment goes on decreasing. It was 16.0 per cent in fourth plan, 14.1 per cent in fifth plan, 12.7 per cent in sixth plan and 12.6 per cent in seventh plan.

From above analysis, the question arises about the reasonableness of the share of national resources committed to transport sector. While making a comparison of India's efforts during the first decade of planning with some of the underdeveloped countries, it can be concluded to be satisfactory but not afterwards. During earlier period of development, the share of transport and communication was 42.1 per cent in Thailand, 31.4 per cent in Vietnam and 26.7 per cent in Iran. In India also it was about 26 per cent.

Fig. 2.1

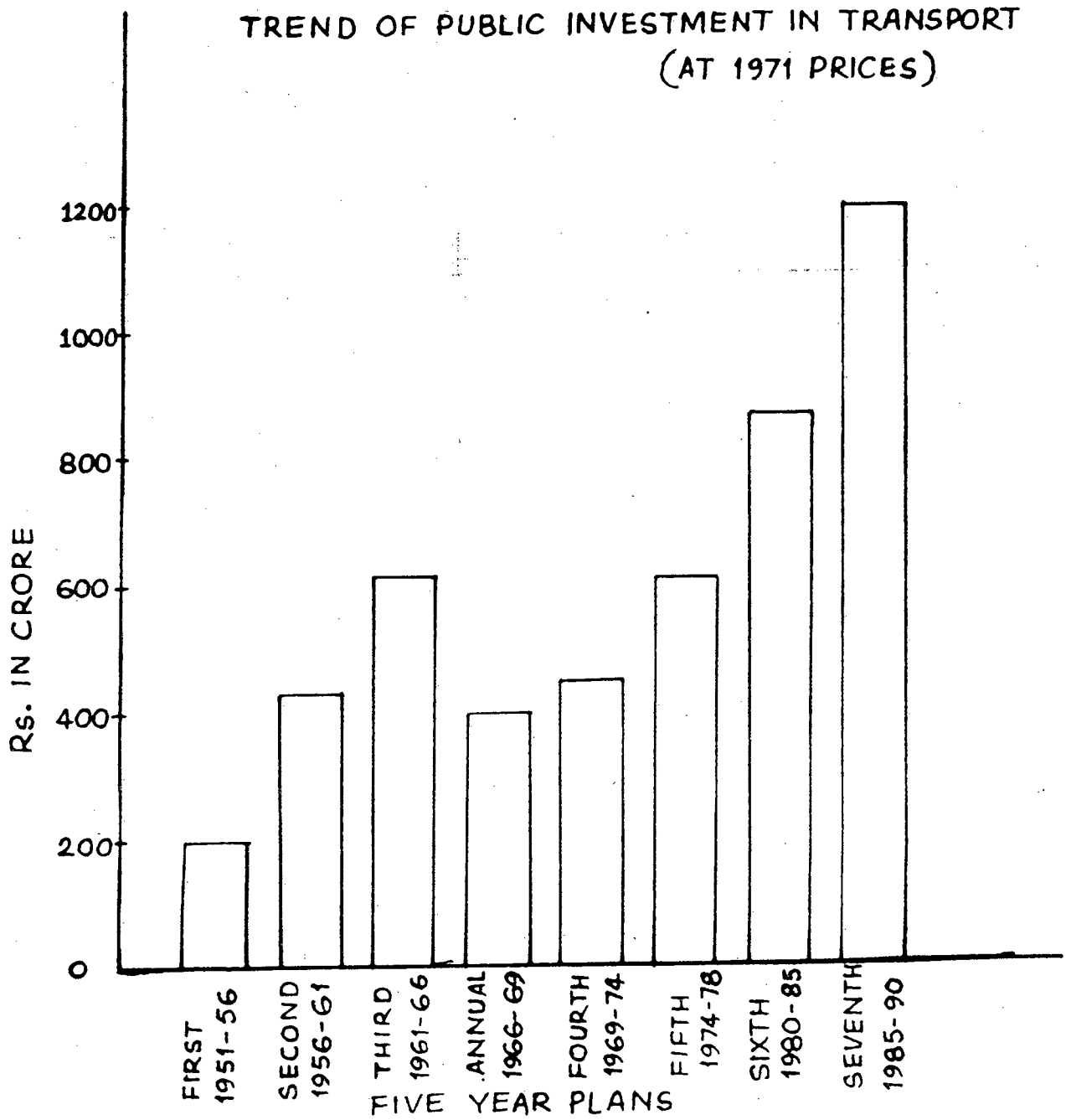


Table : 2.4

Planned Transport and Communication
Investment in Selected Countries during
Initial Period of Development.

Countries	Period	%age of total Public Expenditure
Burma	1956-59	23.8
Indonesia	1956-60	25.0
Iran	1944-55	26.7
Nepal	1956-60	33.8
Thailand	1952-56	42.1
South Vietnam	1957-61	31.4
Pakistan	1955-59	17.4
India*	1951-61	26%

* Average of first two five year plans.

Source : Wilfred Owen 'Strategy for Mobility'

The Brookings Institution, Washington-1968.

"The percentage of public investment devoted to transport has ranged from 24 to 43 per cent in many countries of Asia, which indicates that at beginning of every development planning a greater emphasis has always been accorded to build advanced infrastructure, because it has been considered as a pre-requisite for development. It is assumed that if proper infrastructure is built, expansion in other sector of economy will follow the lead."¹⁴

The foregoing analysis about the pattern of investment in transport indicates two trends. The first being related to the expanding size of investment and the second to its declining relative share after the second five year plan. There have been several reasons for a substantial size of total transport investment.

First, in the initial stages of economic development the movements of raw materials and other bulk commodities constitute the major share of traffic. Second, India being under colonial rule, its transport system was not suitable to meet the requirements of planned development of the country. The transport system needed remodelling. Third, modernisation^{!!!} within transport sector required a

14. Owen, Wilfred: 'Strategy for Mobility', Washington, 1964, p.45.

good amount of investment. Fourth, the transport investment is generally bulky and has long gestation period as explained in earlier chapter. For all these reasons, substantial commitment of resources to transport was necessary. Once infrastructures for transport facilities are created, the relative importance in terms of relative share of transport investment goes on decline. The reasons for small proportion after the second five year plan should be sought in this context.

Private Sector Investment in Transport:

In a mixed economy both public and private sector play an important and complementary role in the development process of economy. Since India has accepted mixed economy model, therefore, both public and private sector have got an important role in Indian economy. The idea of such a policy of allowing both the private enterprise and public sector is to reap the advantage of both capitalism and socialism and at the same time getting rid of the defects of both the systems.¹⁵ According to such a policy private sector provides scope for private profit motive, competition, freedom to consumers and producers,

15. Desai & Bhalerao; 'Economic Planning and Policy' (Himalaya Pub. House, Bombay, 1986), p.515.

whereas the public sector make it possible to avoid the emergence of monopoly and concentration of income and wealth in a few hands. "Under the Indian mixed economy the intention of planners was to 'let all flower bloom'. In this arrangement, the public sector remained overwhelmingly involved with the development of basic sector, while the bulk of development in terms of overall scope and quantum remained with the private sector."¹⁶

In Indian economy a part of transportation activities are in hands of private sector, where the profitability is higher. Almost all roads goods transport, a part of road passenger transport (urban and rural) and a part of shipping are in private sector. Thus in order to understand the overall trend of investment in transport activities it is essential to analyse the pattern of investment by private sector as it is playing a vital role in above mentioned segments of transport. The data on private sector investment on transportation activities are inadequate as it is mostly unorganised (trucking etc.) and unregulated (bullock cart, IWT etc.).

The magnitude of total investment as well as investment on transport in private sector during various plan periods

16. Ray, S.K., Economics of the Third World (Prentice Hall of India, New Delhi, 1983).

is given in table No. 2.5. Table 2.6 demonstrates the relative share of public and private sector investment in transport. It is clear from the table 2.5 that during second plan the private sector investment in transport was only Rs. 135 crores out of total investment of Rs. 3,100 crores in this sector, which constituted only 4.4 per cent of total private sector investment. During the third plan period Rs. 225 crores were invested which was 5.5 per cent of total private investment. This share was Rs. 920 crores constituting 10.2 per cent in the fourth five year plan. During the fifth and the sixth plan period, private sector investment on transport and communication was Rs.1,870 crores and Rs. 3,309 crores respectively. But during these plan period share of private sector investment in transport has declined. It was 6.9 and 4.4 per cent in the fifth and the sixth plan respectively.

In the seventh five ^{year} plan year a sum of Rs. 18,015 crores have been proposed to be invested in private sector out of a sum of Rs. 1,68,148 crores of total proposed private sector investment. Thus the share of private sector investment in transport and communication has increased to 10.7 per cent in the Seventh Plan.

Table : 2.5

Private Sector Investment in Transport & Communication

Plans	Total Private Investmt. (In ^{Rs} Crores)	Investment in Trans- port & Commu. (In ^{Rs} Crores)	Index taking second plan as base.	%age share of Transport and Communication
First Plan	1800	-	-	-
Second Plan	3100	135	100	4.4
Third Plan	4100	225	167	5.5
Fourth Plan	8980	920	681	10.2
Fifth Plan	27048	1870	1385	6.9
Sixth Plan	74710	3309	2451	4.4
Seventh Plan	168148	18015	13344	10.7

Source : Five Year Plan Drafts, - Planning Commission
Government of India, New Delhi.

Table : 2.6

Relative Share of Public and Private Sector
In Total and Transport Investment (In Percentage).

Plan	All Sectors		Transport & Communication Sect.	
	% Distribution of Investment (Public)	of Investment (Private)	Percentage Distribution (Public)	Percentage Distribution (Private)
Second Plan	54.6	45.4	90.6	9.4
Third Plan	60.6	39.4	89.4	10.6
Fourth Plan	60.3	39.7	77.9	22.1
Fifth Plan	57.6	42.4	79.2	20.8
Sixth Plan	52.9	47.1	78.5	21.5
Seventh Plan.	47.8	52.2	73.7	26.3

Source : 1. Five year Plan Drafts, Planning Commission,
Government of India, New Delhi.

2. Ministry of Finance, Indian Economic Statics :
Public Finance 1985.

The given Tables No. 2.5 and 2.6 demonstrate some important trends of private sector investment. First, there is a steady increase in the volume of investment over different plan periods. The amount of investment has increased from Rs.135 crores in the second plan to Rs.18,105 crores in the seventh plan, registering an increase of more than 133 times. This is probably due to expansion of transport activities in private sector. Secondly, it is evident from the table 2.6 that the share of private sector in total transport and communication investment is much lower than its share of investment in the economy as a whole.

The significant reason for the smaller share of private sector in transport being that government is responsible for creation of transport infrastructure, whereas private sector transport investment is limited only to profitable transport activities. It is for this that the contribution of private sector in transport is quite insignificant in comparison to public sector.

Composition of Transport Investment:

In India modes of transport available are Railways, Road transport, Civil aviation, Inland waterways, Coastal and Overseas Shipping and Pipelines etc. Each mode has its

own traffic and cost characteristics. The suitability of a particular mode of transport to cater the traffic requirements depends upon time, place, nature and levels of economic activities. Therefore, it is important to have a look on the pattern of distribution of investment among different modes of transport during different plan periods.

Table 2.7 and 2.8 show the plan investment on different modes of transport during different plan periods. Table 2.7 shows expenditure on different modes of transport at current prices whereas table 2.8 shows the average annual expenditure during various palan periods at 1971 prices. Both the tables are important to understand the pattern of transport investment.

In the first five year plan a sum of Rs. 217 crores was invested on Railways alone, constituting 50.0 percent of total expenditure on transport. The roads and road transport with its share of Rs. 147 crores, i.e. 33.8 percent of the total transport expenditure got second position. On ports and shipping Rs. 47 crores, or 10.9 per cent of total transport expenditure were made. Civil aviation recieved only a small fraction of 5.3 percent (Rs. 23 crores) for investment.

During second plan, highest priority in terms of outlay was given to transport and communication sector. Share of

Table No. 2.7

Public Sector Investment/Outlay on Different modes of Transport
(at current prices)

(IN Rs. Crores)

Sub Sector	Actual			Outlay				
	Ist Plan	IIInd Plan	III Plan	Annual Plan	Fourth Plan	Fifth Plan	Sixth Plan	Seventh Plan
1	2	3	4	5	6	7	8	9
Railways	217 (50.0)	723 (65.7)	1326 (66.9)	509 (49.3)	934 (37.0)	2202 (40.6)	5100 (41.1)	12335 (54.6)
Roads	147 (33.8)	242 (22.0)	440 (22.1)	309 (30.0)	862 (34.1)	1353 (25.0)	3439 (27.7)	5200 (23.0)
Road Trans- port			27 (1.4)	55 (5.3)	128 (5.1)	461 (8.5)	1195.6 (9.6)	1990 (8.8)
Ports	28 (6.5)	33 (3.0)	93 (4.7)	53 (5.1)	249 (9.8)	571 (10.5)	1414.6 (11.4)	1260 (5.6)
Shipping	19 (4.4)	53 (4.8)	40 (2.0)	32 (3.1)	155 (6.4)	450 (8.3)		827 (3.7)
IWT	-	-	4 (0.2)	6 (0.6)	11 (0.4)	32 (0.6)	71.7 (0.6)	22.6 (0.1)

(Contd...)

1	2	3	4	5	6	7	8	9
Light House & Others	-	-	4 (0.2)	2 (0.2)	6 (0.2)	14 (0.)	335 (2.7)	158 (0.7)
Civil Aviation	23 (5.3)	49 (4.5)	49 (2.5)	66 (6.4)	177 (7.0)	337 (6.2)	859.1 (6.9)	758 (3.5)
Total	434 (100)	1100 (100)	1983 (100)	1032 (100)	2522 (100)	5420 (100)	12411.9 (100)	22596 (100)

Note: Figures in brackets are percentages.

Source: Govt. of India, Planning Commission, NTPC Report 1980.

(2) : Plan Draft of Sixth and Seventh Five Year Plans.

almost all modes of transport increased during the period. In this plan railways received a sum of Rs. 723 crores sharing 65.7 per cent of total expenditure on transport. Expenditure on roads and road transport also increased substantially receiving a sum of Rs. 242 crores, an increase of Rs. 95 crores over the first plan period. As far as its share in the total transport expenditure is concerned, there was a drastic fall in it, as it was only 22 percent. It means a decline of 11.8 points in terms of percentage over the First plan period. Ports and shipping also received a small share of 7.8 percent. Expenditure of Rs. 49 crores was made on civil aviation which was more than double to that of the first five year plan, but in terms of relative share it also registered a fall from 5.3 percent in first plan to 4.5 per cent in second plan. In fact, there was a decline in relative share of all modes of transport except the railways, which received the lion's share.

For such a change in composition of transport expenditure, planning commission made the argument: "The main task in the field of transportation in the first five year plan was the rehabilitation of overaged assets which had been subjected to great strain during the preceding decades. Large amounts had to be set apart for rehabilitation of Railway rolling stock and for track

renewal as also for replacement of averaged shipping tonnage and equipment of ports and harbours. On account of the heavy replacement demands, the need for expansion could not be fully met in the first plan. In the second again, a large provision had to be made, particularly in case of railways for rehabilitation of overaged assets. The emphasis in the second five year plan was, however, shifted to the programmes required to augment the line capacity on different sections of transport, especially Railways and for procurement of additional rolling stock to meet the growing demand for Railways transport arising from the increased production in the agricultural and industrial sector of economy."¹⁷ Due to capital intensive plan of rehabilitation of railways which have already proven its worth, the other modes of transport, especially road and road transport could not receive adequate priority in spite of an ambitious road development plan, commonly known as "Nagpur Plan".

It is interesting to note that, during the third plan period, expenditure on transport was more than the outlay. A sum of Rs.1,326 crores was expended on the Railways, increasing its share in absolute as well as in relative

17. Govt. of India, Third Five Year Plan, Planning Commission, New Delhi, p.536.

terms. The expenditure on roads and road transport was Rs.467 crores constituting 23.5 per cent of total transport expenditure. It shows that there was a slight improvement in relative share of roads and road transport over the second five year plan. Ports received Rs.93 crores for its development. However, in shipping there was a fall of Rs.13 crores in the absolute terms and thus its relative share declined to 2.0 per cent in the third plan which was 4.8 per cent in the second plan. In civil aviation too, while the total amount remained constant there was a fall in its relative share in the total transport expenditure.

In spite of such structural changes in transport investment during the first three plans there was an imbalance in transport development. The Committee on Transport Policy and Coordination (CTPC, 1966) observes: "Continuous efforts have been made during the first three plans to expand the capacities of rail and road transport and other media of transport so as to meet the growing requirements of the economy. Over this period, however, from time to time, temporary imbalances have emerged between the supply and demand for transport and these have in turn, affected adversely the developmental efforts in other sectors, especially in mining and industry. When shortage in transport occurred about the middle of the first plan,

steps were taken to expand rail capacity through adjustment in plan allocations and state governments were urged to liberalize licensing policies for road transport. The transport position improved towards the end of the first plan but became difficult once again in the closing years of the second plan. In particular, there were pressures and bottlenecks in the movement of coal from Bengal-Bihar coal fields towards the northern, western and southern parts of the country. Difficulties were also experienced in the movement of raw materials and finished products of industries, such as cotton textiles, jute products, cement and iron and steel. In the first year of the third plan, these difficulties became even more acute. A series of measures were taken to increase rail capacity and augment rolling stock and bring about a marked improvement in the transport situation. Additional line capacity augmentation works were undertaken by the railways and road programmes were strengthened. Coastal movement of coal was stepped up and industries farther removed from the coal fields were encouraged to switch over from coal to furnace oil. The transport situation eased towards the end of the year 1962."¹⁸

18. Govt. of India, CTPC-Final Report, Planning Commission, New Delhi (1966), p.14.

During the Annual plan period, an amount of Rs.509 crores was spent on railways to meet the growing requirements of the traffic. Roads and road transport received a sum of Rs.365 crores, mainly to develop national highways and rural roads, Rs.53 crores were spent on the development of various ports in the country. Civil aviation received Rs.66 crores.

During the fourth and the fifth five year plans, there was a major shift in the distribution of resources among various modes of transport. The railways witnessed a decline in its share, both in absolute and relative terms during the fourth five year plan. In relative terms its share declined to 37 per cent in the fourth five year plan from 66.9 per cent in third plan. In contrary to earlier trend the relative share of roads and road transport was higher than that of railways during this plan. It was 39.2 per cent. The relative share of ports, shipping, civil aviation and inland water transport also increased. But this increase in relative shares of these modes of transport was not as high as that of Roads and Road transport. Thus during this plan roads and road transport got highest priority among different modes of transport.

During the fifth five year plan, the share of railways slightly improved to 40.6 per cent over the fourth five year plan. In absolute terms it was more than double, at Rs.2202 crores. Roads and road transport got Rs.1,813 crores, constituting 33.5 per cent of total transport allocation. There was a slight improvement in share of ports, shipping and IWT over the fourth plan. But the share of civil aviation shows a slight deterioration in its share from 7.0 per cent to 6.2 per cent in the fifth five year plan. Though in absolute terms it was Rs.337 crores, which was near-about double than that of the fourth plan. The cause of this major shift in the pattern of allocation of funds among various modes of transport was the structural changes occurred in the economy.

A rise in the share of road transport was necessitated because as large scale production in industries increased, the marketing of finished goods to far off and remote places became necessary. Furthermore, with a rise in industrialisation, the economy became technologically advanced. Many of the products of industries became lighter in weight but high in value. For such traffic road transport became more suitable than the railways. Hence there was a greater emphasis on road transport.

In addition, during the fourth and the fifth plan major emphasis was given to the growth of agriculture which essentially needs a network of rural roads. In this reference, the RTTE Committee has observed: "Rural Communities have to be connected by passenger and goods transport to the main markets and urban concentrations. The goal is as important to the city as it is to the villages for the growing urban population cannot be fed without increasing the shipment of food from the farms and the expanding industrial capacity of urban India will outpace the demand, if the vast majority of our countrymen are to be isolated and are to be without purchasing power".¹⁹ Therefore, to bring the rural areas into the main stream of national economic life, which was one of the major objectives of the fourth and the fifth plan, significance of road transport increased. That is why during these plans higher priority was accorded to this mode of transport. It is also important to notice that during this period, the pace of urbanization was very fast, hence in order to provide flexible transport facilities for urban communities it was necessary to pay significant attention to road transport.

19. Govt. of India, The Road Transport Taxation Enquiry Committee, Ministry of Transport, New Delhi, 1967, p.11.

During the Sixth and the Seventh plans an emphasis was again shifted towards the development of transport. Once again, the relative share of railways increased to 41.1 and 54.6 per cent respectively. The share of roads and road transport was 37.3 per cent of total transport expenditure during the Sixth plan period. In absolute term Rs.5,100 crores and Rs.4,634.6 crores was allocated to railways and roads and road Transport. The share of ports, shipping and inland water transport decreased in the sixth plan to 8.7 per cent of total transport expenditure. Though the share of air transport slightly improved to 6.9 per cent in the sixth plan over 6.2 per cent in the fifth plan. In absolute terms, an amount of 859.7 crores was allocated for civil aviation during this plan.

At the beginning of the seventh plan, the capacity of the entire transportation system including the road network had been felt falling short of demand for transportation. Therefore, the crucial task of increasing the capacity of the transportation system was decided to be achieved through the optimization of capacity, technological upgradation, stepped up investment and shift in priorities. As a result, the allocation of fund to the transport sector approximately doubled from its allocation in the sixth plan. Railways got

priority over other modes of transport by allocating 54.6 per cent against 31.8 per cent to road and road transport. In absolute terms, share of railways was Rs.12,335 crores which was more than two and half times than that of the sixth plan. Roads and Road transport got Rs.7,190 crores. Though ports, shipping, IWT and civil aviation have registered a decline in their relative share (figures being 5.6, 3.7, 0.1 and 3.5 per cent respectively), yet in absolute terms ports and shipping have received an increased allocation being Rs.2,087 crores against Rs.1,414.6 crores during the sixth plan. The share of civil aviation and IWT have declined in absolute terms. Civil Aviation got Rs.758 crores during this plan against Rs.859.1 crores in the sixth plan.

The above analysis shows that transport investment is dominated by railways and roads. The share of railways in total transport expenditure during various plan periods has shown a tendency to decrease, whereas the share of roads and road transport have shown a slight improvement. Road transport (not roads) has apparently received the lowest priority in the plan allocations. The share of this mode during planning era shows a marginal increasing trend. This low percentage is, of course, accounted for by the fact that almost the entire road freight transport and about half of the passenger transport is in the hands of private

Table No. 2.8

Public Sector Investment in Different Modes of Transport
(Average Annual Expenditure at 1971 prices)

(IN Rs.Crores)

Sub Sector	Ist Plan 1951-56	II Plan 1956-61	III Plan 1961-66	Annual Plan 1966-69	Fourth Plan 1969-74	Fifth Plan 1974-78	Sixth Plan 1980-85	Seventh Plan 1985-90 (Outlay)
Railways	100 (50)	285 (65.7)	411 (66.9)	198 (49.3)	167 (37.0)	231 (37.8)	413 (47.6)	652 (54.6)
Roads & Road Transport	68 (34)	96 (22.0)	145 (23.5)	141 (35.3)	177 (39.2)	237 (38.8)	320 (36.8)	380 (31.8)
Ports & IWT	13 (6.5)	13 (3.0)	31 (5.0)	24 (5.7)	47 (10.4)	57 (9.3)	76 (8.7)	79 (6.6)
Shipping	9 (4.5)	21 (4.8)	12 (2.1)	12 (3.1)	28 (6.2)	54 (8.8)		44 (3.7)
Civil Aviation	10 (5.0)	19 (4.5)	16 (2.5)	26 (6.6)	32 (7.2)	32 (5.3)	59 (6.9)	40 (3.3)
Total	200 (100)	434 (100)	615 (100)	401 (100)	451 (100)	611 (100)	868 (100)	1195 (100)

NOTE: FIGURES IN BRACKETS ARE PERCENTAGE

Source: Govt. of India, Planning Commission, Report of Steering Committee, Perspective Planning for Transport Development 1988.

operators. The public sector investment, therefore, has to indicate a smaller volume.

The Overall Impression of Transport Investment:

The above analysis of the pattern of transport investment during plan periods gives a broad conclusion about the manner in which investment in transport has been committed during this period. The first impression is that transport investment has been committed without any detailed calculation of traffic forecasting in the country. Though, to some extent, the railway expansion has been based on the expected traffic to be carried by them, the expansion of other modes has been done on an ad hoc basis rather than on the sound foundation of projected traffic. This fact has been recognized in both CTPC and NTPC reports. Therefore, Indian transport planning appears to be administrative in nature which could not be supported adequately by economic appraisal of transport projects taking into consideration the comprehensive view of future economic development of the country as a whole. The second factor noticed in the transport planning procedure is that different modes of transport have not been considered as a unified system. A systematic development of the transport sector must meet the planned economic expansion which requires that the capacity of each mode must be developed to met the specific demands

as well as in relation to the rest of the transport system. Committee on Transport Policy and Coordination (CTPC) and National Transport Policy Committee (NTPC) have specifically mentioned that the various modes of transport should develop as complementary to each other in such proportion and combination so that the mobility need of the country is met at each given stage at minimum cost to the economy. Our analysis of investment in transport suggests that such a framework has been lacking in our Transport Planning programme. Lastly, the transport costs of different modes of transport to handle traffic was never considered while allocating the share of investment to different modes of transport. The study of costs in the transport sector has remained a neglected field and their bearing on the future development of various transport services was never sufficiently appreciated.²⁰

20. Singh, T., India's Development Experiences, Macmillan India, Delhi, 1974, Chapter IX.

CHAPTER III

NATURE OF TRANSPORT DEVELOPMENT

NATURE OF TRANSPORT DEVELOPMENT

The objective of this chapter is to analyse the nature and dimensions of progress made by different modes of transport, viz - Railways, Roads and Road transport, Shipping and Civil Aviation as a result of planned investment. It is necessary to examine the development of various modes of transport separately, so that an evaluation can be made, whether the objectives of transport development have been achieved in the best interest of economic development.

Railways

The development and expansion of railways has revolutionised the transport system the world over. It is a convenient mode of transport for long distance and heavy and bulky goods like iron ore, iron and steel, heavy machinery and minerals etc. Railways carry raw materials from mines, quarries and other interior areas of the country to the industrial centres. They link up the various regions of the economy and increase the occupational mobility of people.

The Indian Railways began in humble surroundings in April 1853, when the first railway train steamed off from Bombay to Thana, a stretch of 34 km. Over the years the

Indian Railways system has grown to be the largest in Asia and fourth largest in the world.¹ Till independence railways grew but not as a public utility, rather to further intensify the colonial exploitations and consolidation of British empire. It served a powerful link with the economy of British to help achieve massive export of raw materials and import of finished goods to India. Indian Railways helped Britain to industrialise but push back India to depend on agriculture. But during the plan period, Indian Railways have undergone significant changes and have contributed their best to fulfil the national objectives of development.

At the beginning of the planning, the Indian Railways were in bad shape due to the war and partition of the country. 'By 1950-51 Indian Railways had 53,596 kms. of route length built by a total investment of Rs.855 crores. It had 5976 stations and 914 thousand staff. During that year it moved 12,890 crores passengers and 93 million tonnes of goods traffic.'²

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1. Govt. of India, Ministry of Information and Broadcasting, INDIA-1987, New Delhi, p.528.
 2. Govt. of India, Indian Railways Accounts and Statistics 1986-87, New Delhi, p.VII.

During the plan period the capacity of Indian Railways has increased substantially. Let us have a brief account of the policies adopted for Railways development during various plans.

The first plan was devoted mainly to rehabilitate and modernise the rolling stocks and the fixed assets. On account of the heavy replacement demands, the need for expansion could not be fully met in the first plan.³ The second plan also had to make a substantial provision for rehabilitation of over-aged assets. The emphasis in this plan, however, shifted to the programmes required to augment line capacity on different sections of the railways and to the procurement of additional rolling stock to meet the growing demand for railway transport arising from the increased production in the agricultural and industrial sector of the economy.⁴ The third plan envisaged a rapid expansion of railways due to their importance for industrial programmes particularly, the carrying of heavy goods like coal, iron ore and other materials for the steel plants etc. It was also recognised that in view of the difficulties of coping with anticipated

3. Govt. of India, Review of the First Five Year Plan, Planning Commission, New Delhi, p.230.

4. Govt. of India, Third Five Year Plan; op. cit. p.536

increase in traffic with steam traction in the regions where the coal-fields and the new steel plants were situated, electrification and dieselization had become an operational necessity. Provision was accordingly made for the electrification of a number of sections on the Eastern, South Eastern, Central and Southern Railways.⁵

The basic objective of the fourth plan for railways was to provide in full for the increase in freight and passenger traffic expected to modernise the railway equipment and operations, to improve the efficiency of the system within the limits of the funds available and to convert 1676 kms of metre gauge to broad gauge in areas of rapid economic development and high traffic potential.⁶ Expenditure on railways in the fourth plan stood at Rs.1419 crores of which, expenditure on rolling stock, track renewals and line capacity works constituted about 70 per cent.⁷ Thus in the fourth plan main emphasis was on modernisation of the system to improve efficiency of operations. During the fifth plan the main thrust of railways development was to make improvement in the existing capacity rather than the

5. Ibid., pp. 542-44.

6. Govt. of India, Fourth Five Year Plan, op. cit. p.340.

7. Govt. of India, Draft Fifth Five Year Plan, p. cit.

extension of the railway system and to maximise the operational efficiency in railways.

The basic objective of the sixth plan was also to augment the capacity for handling the expected increase in freight and passenger traffic; to modernise the railways system and to promote better utilisation of the existing assets.

The objectives set for seventh five year plan were replacement of overaged assets, modernisation and technological upgradation of railway system, development of rapid handling terminals and improved maintenance. The pace of electrification and dieselisation of routes being intensified in this plan, to make railways more energy efficient.⁸

Expansion of Network and Physical Assets since 1951

Table 3.1 and 3.3 give an idea of various dimensions of expansion of railway's network and capacity. In 1950-51 the route length of Indian Railways was 53,596 kms, which increased to a length of more than 61,600 kms. in 1984-85, including some 13,000 kms with multiple tracks. Out of the

8. Government of India, Seventh Five Year Plan (1985-90), Planning Commission, New Delhi, p.213.

TABLE 3.1
Indian Railways Development

Year	Route Length (Kms)	Running Track (Kms)	Electrified Route Length (Kms)	Passenger Coaches Capacity (in 1000)		Wagons Capacity (M.Tonnes)	Wagon & Coach Utilisation (indices)	Coach @ Utilisation (Indices)
				EMU	Conventional coaches			
1950-51	53,596	59,315	388	88.00	854.7	4.14	100	100
1960-61	56,247	60,602	748	150.9	1280.8	7.30	199	100
1970-71	59,790	71,669	3706	340.5	5105.0	9.35	289	159
1975-76	60,216	74,255	4191	382.9	1626.1	10.17	336	193
1976-77	60,666	74,839	4720	451.9	1620.3	10.61	355	211
1977-78	60,693	75,012	4720	450.6	1649.3	10.74	369	229
1978-79	60,777	75,195	4722	471.1	1667.9	10.86	351	249
1979-80	60,933	75,450	4820	487.3	1691.1	11.02	354	262
1980-81	61,240	75,860	5345	500.6	1695.0	11.14	359	279
1981-82	61,230	75,964	5473	512.1	1692.3	N.A	N.A	N.A
1982-83	61,385	76,197	5815	534.3	1674.8	N.A	N.A	N.A
1983-84	61,460	76,407	5971	544.5	1705.2	N.A	N.A	N.A
1984-85	61,850	76,280	6325	-	-	-	-	-

* Rounded off & Net tonne Kms. @ Non-suburban Passenger - Kms.

Source : Indian Railways Year Book, 1985-86

total route length broad gauge makes up 53 per cent, metre gauge 40 per cent and narrow gauge accounting for the remaining 7 per cent.⁹ During last three decades the growth of route length on the Indian railways was just over 8,200 kms. which works out an annual increase of 0.41 per cent.¹⁰ (). The increase in total route length consisted of 5750 kms. of new lines, about 900 kms. of restoration of dismantled lines and nearly 350 kms. of lines taken over from private railways.¹¹ While route kilometres have grown only by 15 per cent, running track kilometres have increased by about 30 percent due to double and multiple tracking, mostly on broad gauge system.

There are certain specific features of the expansion of railway network in the country. The railway track availability is at a far higher level in other countries of the world than in India even after three decades of planning. Table 3.2 gives a comparative figure of route kilometres per 10,000 sq. km. of land and route kilometre per million of population of various developed^{and} developing countries.

9. Ibid., p. 209.

10. Ibid., p. 285.

11. Government of India, NTPC Report, Planning Commission, New Delhi, 1980, p.139.

Table : 3.2

Rail Route Density in Selected Countries

Country	Per Capita income in US\$ (1976)	Railway Route Density	
		Route Kms. per 10,000 Sq.Km of land Area.	Kms. per Million of population
USA	7890	360	1534
France	6550	671	694
Australia	6100	53	3045
Japan	4910	652	218
U.K.	4020	824	359
USSR	2760	62	601
Malaysia	860	52	147
Egypt	280	48	124
Pakistan	170	106	122
India	150	185	100

Source : Chakravarti A.K : Railways For Developing Countries ;
Chetna Publications, New Delhi.
1982. P. 280 - 82.

It is evident from the above mentioned table that practically all affluent nations have a much denser railway network either in terms of land area or of population than the under-developed countries. It indicates the established fact that railways development has special relevance for industrialisation and urbanisation.

There are several reasons for the slow progress of expansion of railway network in India; First higher proportion of investment was accorded for rehabilitation during the early plan periods; Second - there has been a shift of emphasis from railways to roads during later plans. It was only after the oil price hike of 1973 that a new realisation of importance of the railways has emerged as this mode of transport is more energy efficient for long distance and heavy movement than other modes. The inadequate availability of railway track has been stumbling block in the way of economic progress. The task of railways cannot be performed by other modes of transport particularly when the natural resources of the country are highly localised.

The utilisation of network capacity is not uniform for different gauges. Broad gauge constitutes 51 per cent of the total route length but accounts for 86.4 per cent of freight tonne kms. and about 76 per cent of passenger kms.

Metre gauge covering about 42 per cent of the route accounts for only 13.4 per cent of freight tonne kms. and 23 per cent of passenger kms. Narrow gauge, comprising about 7 per cent of network, accounts for the residual 0.2 percent of freight and 1 per cent of passenger traffic. Distribution of freight and passenger traffic on the two gauges (broad gauge and meter gauge) is not similar to each other. For broad gauge it is the freight traffic which leads whereas in metre gauge passenger traffic is more.

Traffic is concentrated in about 25 per cent of total network mainly on broad gauge trunk routes. These routes which connect the four metropolitan cities of Bombay, Calcutta, Delhi and Madras with the high mineral originating sections, are called 'hard core' of the system. The 'hard core' routes accounts for 75 per cent of freight and 55 per cent of passenger traffic and are almost in saturated conditions. The traffic pattern on MG is such that 15 main routes, which form only about 30 percent of total route kms. accounts for 70 per cent of MG freight traffic and 50 per cent of passenger traffic. This shows a similar pattern of network utilisation on BG and MG routes. There are 126 branch lines on all the three gauges of the Indian Railways system which has been identified as uneconomic lines.¹²

12. Ibid., p. 155.

In order to augment the line capacity on high density MG routes, the programme of gauge conversion has been implemented by Indian Railways. During thirty five years of planning, more than 1600 route kms have been converted from metre gauge to broad gauge. "The subject of gauge conversion was extensively examined by National Transport Policy Committee which came to the conclusion that with appropriate steps to optimise the metre gauge system it will be possible for the Railways to satisfy the increasing traffic demand on these sections. Therefore, the NTPC recommended to adopt a cautious approach in respect of gauge conversion, restricting the conversion only to serve as an alternative route in respect of saturated sections. The railways have in the past neglected their metre gauge network. Therefore, it is necessary to optimise the capacity on MG sections rather than undertaking more expensive gauge conversion.¹³

The number of railway stations by 1950-51 were 5976, which increased to 7066 in 1970-71 and to 7092 in 1985-86.¹⁴ It shows an increase of 18 per cent over the figure of 1950-51. Openings of new railway stations has facilitated the connectibility and accessibility of railways to more areas and population of the country.

13. Govt. of India, Seventh Five Year Plan, op. cit. p.214.

In 1950-51, the railways had only 8,209 locomotives, 2,05,596 wagons and 19,615 coaching vehicles. To meet the growing demand, particularly of freight traffic the targets for the first plan were fixed at 9,262 locomotives, 2,66,049 wagons and 23,779 coaching vehicles. Even with these it was not possible to meet the actual requirements. Passenger traffic was expected to remain overcrowded when the first plan ended, the railways could acquire only 9,172 locomotives, 2,40,756 wagons and 23,288 coaching vehicles thus leaving a deficit of 90; 25,293 and 491 respectively. The same position was in subsequent plans. Whatever targets were fixed for these rolling stock by anticipating the freight and passenger traffic, these targets were always ahead of achievements leaving a heavy deficit. The actual achievements in rolling stock at different points of time period are given in table 3.3. Though the total number of locomotives have been decreasing since 1970-71, yet the traction capacity of locomotives has increased substantially because steam locomotives are being replaced by diesel and electrical locomotives having greater efficiency and traction capacity.

14. Govt. of India, Indian Railways Accounts and Statistics : 1985-86, Ministry of Railways, New Delhi, p.VII.

Table : 3.3

Rolling Stock Position in Railways

Items	1950-51	1955-56	1956-61	1965-66	1970-71	1975-76	1980-81	1985-86
No. of locomotives	8209	9172	10624	11743	11158	11095	10908	9920
Steam	8120	9026	10312	10613	9387	8496	7469	5571
Diesel	17	67	181	727	1169	1803	2403	3047
Electric	72	79	131	403	602	796	1036	1302
No. of Coachings	19628	23288	28439	32922	35145	36821	38327	38184
No. of Wagons	205596	240756	307907	370019	383990	395250	400946	359614

Source : Government of India, Ministry of Railways - Indian Railways Year Book.1985-86.

Modernisation

Since 1950-51 the capacity of the existing Indian Railways network has increased through its modernisation. The main areas of modernisation are permanent way, traction, rolling stock and signalling and telecommunication systems.

Electrification on Indian Railways was started in 1925 but its pace was very slow till 1950. Owing to inherent advantages of electric traction over other modes, it has since been extended to busy main line sections to cater to the requirements of growing industrial infrastructure. With the rise in prices of imported mineral oils since the early 70s need has been felt to reduce oil consumption and use more and more electric energy generated by hydel and thermal power plants. Indian Railways have decided to increase the pace of electrification from the present level of energisation and to organise the infrastructure to finally achieve about 340 route kms per annum electrification during Seventh Five Year Plan. Priority has been given to electrify the trunk routes having highest density of traffic. Indian Railways have decided to electrify the routes connecting the four metropolitan cities Delhi, Bombay, Calcutta and Madras to each other. The progress of electrification on Indian Railways in various plan periods is given in Table 3.4.

TABLE 3.4

Progress of Railway Electrification:

<u>Plan</u>	<u>Route Kms electrified</u>
Prior to 1956	529
Second Five Year Plan (1956-61)	216
Third Five Year Plan (1961-66)	1678
Annual Plan (1966-69)	814
Fourth Five Year Plan (1969-74)	953
Fifth Five Year Plan (1974-78)	533
Rolling Plan (1978-80)	195
Sixth Five Year Plan (1980-85)	1522
Ist Year of Seventh Plan (1985-86)	461
<hr/>	
Total	6901
<hr/>	

Source: Indian Railway Year Book, 1985-86, Ministry of Railways, New Delhi.

Application of modern track technology using concrete sleepers has facilitated to run heavy load trains at higher speed. Improved signalling system has contributed to reduce the headway hence increasing the line capacity without endangering the safety.

Traffic Pattern

In the period since inception of planning, substantial changes have taken place in volume and composition of freight and passenger traffic carried by the railways. (Refer Table 3.5 & 3.6)

The freight traffic has increased at an average annual rate of 3.1 per cent in terms of originating tonnage, and a somewhat faster rate of 4.2 per cent in terms of tonne kilometres due to increase in average length of haulage. Freight traffic grew by 1.1 per cent (originating tonnes) and 2.3 per cent (tonne kilometres) over the 10 years ending in 1980. In the sixth plan, however, growth at 3.95 per cent and 3.0 per cent (tonne kilometres) has picked up again, with the total originating tonnage increasing from 217.8 million tonnes to 264.4 million tonnes. Among the commodities, carried by the railways, bulk goods have registered a higher growth rate. Major bulk goods which

Table 3.5

Growth of Traffic - Railways

Year	Passenger						Freight	
	Originating Passenger (Million)			Passenger Kilometres (Billion)			Originating (Million)	Net Tonnes (Billion)
	Suburban	Nonsub Urban	Total	Suburban	Nonsub Urban	Total		
1950-51	412	872	1284	6.5	60.0	66.5	93.0	44.1
1960-61	680	914	1494	11.8	65.9	77.7	156.2	87.8
1970-71	1219	1212	2431	23.0	95.1	118.1	196.5	127.4
1979-80	1903	1602	3505	38.7	159.9	198.6	217.8	156.0
1984-85	1908	1472	3380	44.2	184.5	228.7	264.4	182.5
Growth Rate Since 1950-51 in %age	-	1.6	2.89	-	3.4	3.70	3.12	4.27

Source: Govt. of India, Planning Commission, Seventh Five Year Plan 1985-90, vol.II.

Table No. 3.6

Indices of Growth of Traffic & Inputs of Indian Railways

Year	Net tonne Kms.	Wagon capacity	Nonsuburban Passenger Kms.	Passenger Coaches	Route Kms.	Running track Kms.	Tractive Effort
1950-51	100	100	100	100	100	100	100
1955-56	135	118	91	122	103	103	117
1960-61	199	152	110	154	105	107	144
1965-66	265	206	132	174	107	115	175
1970-71	289	226	159	188	112	121	179
1975-76	336	249	193	201	112	125	191
1976-77	355	256	211	200	113	126	193
1977-78	369	259	229	203	113	126	199

Source: Govt. of India, Planning Commission, NTPC Report 1980. NEW DELHI

constituted nearly 58 per cent of tonnage in 1950-51,¹⁵ account for around 89 per cent in 1983-84. The break-up of commodities carried by railways has been given in Appendix-I. The rail system being the principle carrier of freight, the growth of traffic has become five fold in tonne kms. between 1950-51 and 1984-85 and now two-thirds of railways earnings are being derived from freight traffic.

During 1950-51 to 1984-85 passenger originating has increased by an average of 2.9 per cent per annum and passenger kilometres by 3.7 per cent^{per} annum. Over a period of time the growth of passenger traffic too has been accompanied by significant shift in its composition. (Refer Table 3.5). Since 1950-51 non-sub urban passenger traffic has increased by 1.6 per cent per annum in terms of originating and 3.4 per cent in terms of passenger kilometres. The corresponding annual growth rates in the seventies were 3.1 per cent and 5.9 per cent. In the sixth plan, however, the position reversed, when an average annual decline of 1.6 per cent (passengers) was recorded. But traffic in terms of passenger kms. continued to increase though at a somewhat slow rate of 2.9 per cent. Yet long distance travel by fast mail and express trains on the

15. Govt. of India, NTPC Report, op. cit. p.147.

broad gauge continued to record the most rapid growth. Table 3.6 shows the indices of traffic growth. The decline in passenger traffic, both sub-urban and non-suburban in recent years is mainly attributable to rationalisation of fare structure designed, inter alia, to discourage short distance travel by rail.¹⁶

From above analysis of railways' progress three important features are clear: (i) The main emphasis of railway's development was on modernisation and intensive use of existing assets rather than expansion of the railways to new areas. (ii) Railway continue to carry the commodities which are of low value and have heavy volume. The high value and light freight has diverted to other modes of transport especially to road transport. (iii) In respect of passenger traffic railway carries a larger portion of long distance passengers.

In the Indian context, Railways have proved to be the principal mode of transport. The utilization of assets created, have improved over years, traffic densities have increased many-folds and most of the trunk routes are working at saturated level. There have been frequent

16. Govt. of India, Seventh Five Year Plan (1985-90), op. cit. p. 211.

shortage of rail services, with bottlenecks appearing in the system. There is, thus, a need to provide resilience in the rail system to meet changing patterns of traffic demand. This would call for an increased investment in the system to enable the Railways to meet the growing demand.

Roads and Road Transport

The extensibility and flexibility inherent in road transport have set it apart from all other modes of mechanised transportation. Its development over the years has brought about revolutionary changes in the economic structure of the country by narrowing down the gap separating producers and consumers and extending the limits of rail transport to outlying agricultural and industrial centres. The Road transport has played a key role in the agricultural and industrial development as well as in the assurance of national security.

Since the country's economy is still largely agrarian in character and the settlement pattern is rural oriented, roads constitute a critical element of the transportation infrastructure. In this context road transport assumes great importance in comparison to rail transport in India,

but to achieve a balanced regional development rail and road transport have to be complementary to each other. Due to its inherent characteristics road transport has changed the traffic pattern and gained popularity. The Committee on Transport Policy and Coordination (CTPC) has identified certain specific characteristics of road transport as follows:

Flexibility: It is an important factor in favour of road transport. Motor vehicles can generate services over public highways between any two points in the country, if necessary, from door to door, or even at difficult gradients or on poor roads. Road transport has been found suitable for certain special jobs, such as, pick up and delivery purposes, in handling small loads and carrying loads and traffic between places not directly connected by rails, to replace trains on unremunerative lines and providing services to rail off points.

Personal Services: Another important characteristic of road transport, primarily because of small size units is, that it gives personal service. This is very difficult to be developed by the railways since as a large public undertaking they necessarily suffer from an impersonal approach to business.

Speed and Delivery

Speedy delivery of certain kinds of commodities, especially the fruits, vegetables, semi-processed materials and other perishable goods is the important parameter in favour of road transport.¹⁷

Keeping in view all other advantages of road transport viz. small capital expenditure, feeder services and openness etc., it is wise to develop an efficient road and road transport system in the country at all levels viz. village, districts, city and national.

Road Development

The origin of roads and road transport in India is lost in antiquity. It was only first world war that the mechanised road transport started assuming importance in the country's economy. Since then it has made rapid strides both in terms of road kilometerage and the number of vehicles plying on the roads. The planned development of roads started in 1927 when a committee was appointed with Mr M.R. Jaykar as Chairman by Government to examine and report on the question of road development in India, which submitted its report in 1928.

17. Govt. of India, Committee on Transport Policy and Coordination, Preliminary Report 1961, Planning Commission, New Delhi, p. 62.

The Committee emphasised the inadequacy of the Indian road system and urged that further developments are desirable for the general welfare of the country and in particular (a) for the social and political progress of rural population which would be advanced by the increased use of motor transport; (b) for the better marketing of the produce and (c) as a compliment to railway development. Some of the major recommendations are as under:

1. The road development in the country should be considered as a national interest as it has been beyond the capacities of the provincial government.
2. An extra tax should be levied on petrol from the road users to develop a road development fund to be called as central road fund.
3. A semi-official technical body should be formed to pool technical know-how from various countries and to act as an advisory body on various aspects of roads.
4. A research organisation should be instituted to carry out research and development work and to be available for consultation.¹⁸

These recommendations were accepted immediately and some of the major items were implemented. A Central Road Fund (1929) and Indian Road Congress (1934) were established on the recommendations of the Committee.

18. Khanna, S.K. and Justo CEG: Highway Engineering, Roorkee, Nem Chand and Bros., Roorkee 1973, pp. 20-21.

Nagpur Plan (1943)

At the initiative of the Indian Road Congress a Conference of PWD Chief Engineers incharge of roads was convened at Nagpur in December 1943 to finalise a plan of road development. It was the first ever attempt to prepare a coordinated road development programme in planned manner. The plan proceeded on the basis that in highly developed agricultural area no village should be more than two miles (3.2 km) from a road, not more than 5 miles (8.00 km) from the main road, the average distance from a metalled road being generally less than 2 miles (3.2 km). In non-agricultural and less developed area, no village should be more than 5 miles (8.0 km) from a road, not more than 20 miles (32.0 km) from the metalled road, the average distance being 6 or 7 miles (9.5 to 11.2 km) from roads in most of the cases.

Two plan formulae assumed the star and Grid pattern of road network. Four types of roads (National highway, state, district and village) were visualised. This was the first scientific attempt to plan the highways in India. Nagpur plan was a 20-year plan intended to provide 19,800 kms. of surfaced roads and 3,33,600 kms. of unsurfaced roads. The first category of roads were meant to provide main grids bringing the farthest point in development and agricultural

area within 8.00 km. of metalled roads. The second category of roads were meant to provide internal road system linking small villages with first category of roads.

20-Year Road Development Plan (1961-81)

20-year plan was chalked out to decide the further road development programme in the country towards the end of the Second Five Year Plan. The Chief Engineers of PWDs met in 1959 at Hyderabad. The plan proceeded on the basis that in developed agricultural area no village should remain 1.5 miles (2.4 kms.) from any type of road and 4 miles (6.4 kms.) from metalled road. In working out specific proposals factors such as area, population, regional level of development needs were taken into consideration. This plan intended to provide 32 kms. of road length per 100 sq. kms. of area. 20-year plan included the provision of establishing missing road links, bridges, strengthening of roads, besides the extensive development programme. The cost for completing the plan was estimated at Rs.5,200 crores, which included an expenditure of Rs.630 crores for village roads. To find the length of various road categories, five formulae were evolved instead of two, as in the Nagpur plan. In addition to these five categories of roads, provision for 1,600 kms. of express way was also made in this plan.

The Nagpur plan and the 20-year plan can be said to have given a new dimension to the road development programme and the guidelines for future development has been obtained from them. The 20-year plan took into consideration the following important factors in addition to future trends in traffic:

- (i) The needs of semi-developed and underdeveloped area, including forest areas, in addition to the needs of highly developed and agricultural areas;
- (ii) Location of administrative headquarters, places of pilgrimages, health resorts, tourist centres, universities and cultural centres;
- (iii) Location of industries, important commercial centres, big railway junctions and ports; and
- (iv) The strategic needs of the country.¹⁹

These factors were not considered while formulating the Nagpur plan. In addition to these factors, Nagpur plan had other shortcomings such as lack of consideration for standards of road surface, types and nature of bridges and other physical characteristics of roads. In the perspective of changing priorities and requirements a fresh look at the Road Development Programme is essential.

The road development programmes in the first two Five Year Plans were formulated in the perspective of the post

19. Govt. of India, Chief Engineer's Report on Road Development Plan for India 1961-81, Ministry of Transport and Communication, New Delhi (1959), p.5

war road development plan, commonly known as the 'Nagpur Plan'. The plan as applied to the post partition India envisaged completion of a total length of 1,23,000 miles of surfaced roads and 2,08,000 miles of unsurfaced roads. These targets envisaged were exceeded and by the end of the second plan the mileage of surfaced roads was 1,44,000 miles and that of unsurfaced roads well above 2,50,000 miles. In spite of these significant achievements, the road network was deficient in certain respects, such as unbridged river crossings, sub-standard surface, narrow carriageway and 60 per cent of the total mileage in the form of earth roads etc. Moreover, only 15.3 percent of national highways had two lane carriageway, the rest was all one lane.²⁰

The road development programme for the Third Five Year Plan was formulated in accordance with the broad objectives of 20-year Road Development Plan, according to which it was proposed to achieve the mileage of 2,52,000 miles of surfaced roads and 4,05,000 miles of unsurfaced roads by 1981. In more specific terms third plan aimed at the completion of important road and bridge works carried forward from the second plan, improvement of the existing roads with a view to enabling them to meet the requirements

20. Govt. of India, Third Five Year Plan, op. cit., pp. 549-50.

of increasing heavy vehicular traffic, provision of missing links and bridges. Special attention was given to road development in rural and comparatively backward areas. The allocation of a part of road development programme for research during this plan reflected the concern of government to technologically upgrade the road and road transport.²¹

The Fourth Plan envisaged the completion of 16 major missing bridges out of the total number of 17 such bridges, the completion of all the missing road links, the improvement of all the low grade sections, the widening of all important sections of the national highways to two lanes, and reconstruction of weak bridges and culverts.²² Certain measures were also undertaken to accelerate progress on the central roads programme including streamlining of procedures, greater delegation of powers to the states, strengthening of organisation, providing funds to states in advance for project preparation etc. During this period 4,800 kms. of new national highway were added to the system and two lanes were completed on 90% of the total length of

21. Ibid., pp. 550-551.

22. Govt. of India, Fourth Five Year Plan (1969-74), op. cit. pp. 344-345.

the national highways existing at the beginning of the fourth plan.²³

The fifth plan gave first priority to the completion of works spilling over from the fourth plan. Apart from the spill over schemes, the most important new scheme in the national highway programme was the widening of certain section of the national highways to four-lanes totalling about 1000 kilometres. Other schemes included the strengthening of pavements, the construction of bypasses around congested towns, the widening to two lanes of certain remaining single lane sections, replacing railway level crossings with over/under bridges etc.²⁴

The Sixth plan envisaged the importance of roads as -
'Despite the energy crisis and the difficult position in regard to cost and the availability of diesel, the role of road transport in moving certain types of commodities including export oriented goods and its role in carrying the distributary traffic for reaching the interior of the country are some of the functions which are irreplaceable by any other mode of transport. There is also a need for developing additional capacity on the road system for

23. Govt. of India, Fifth Five Year Plan, op. cit. p.175.

24. Ibid., p. 176.

meeting the needs in the short term, till railways can develop capacity to clear all the types and levels of traffic desirable from the energy point of view.²⁵ In step with the above-mentioned objectives during the sixth five year plan 2,687 kms. of roads were upgraded as national highways and 5.77 lakh kms. of different types of roads were added to the road grid. About 18,000 villages were connected with roads under Minimum Needs Programme as against the target of 20,000. The work on upgradation of National Highways, which was continued, comprised construction of 166 kms. of missing links, 4,224 kms widening to two lanes, 90 kms. of four laning, 50 bypasses, 7 missing major bridges and 467 minor bridges.²⁶

The major thrust of road development programme in the Seventh Five Year Plan is to consolidate the gains so far achieved, properly maintain existing assets and initiate steps for upgradation and modernisation of the road systems. Emphasis has been given to upgradation and rehabilitation of road system to achieve greater productivity, faster travel and energy conservation; construction of missing links and

25. Govt. of India, Sixth Five Year Plan (1980-85), op. cit. p. 302.

26. Govt. of India, Seventh Five Year Plan, op. cit., p. 216.

structures to avoid the longer travel hence fuel conservation. Road construction programme has been also accorded importance due to its employment generating potential.

The outcome of entire effort in Road development programme through Nagpur Plan, 20-Year Road Development Programme and different five years plan is a stock of knit network of National highways, state highways, district roads, and rural roads. This network of national highways and rural roads has really changed the face of the country's transport system. Since the inception of planning the road network has expanded from about 4 lakh kms. in 1950-51 to 17.7 lakh kms. in 1984-85, showing an annual increase of 4.49 per cent. The surfaced roads have registered a higher growth of 5.05 per cent in comparison to unsurfaced road having growth rate of 4.08 per cent (Refer Table 3.7).

The National highway system, the primary road grid constitutes only two percent of the length of the total road system, but carries about a third of the total traffic. Its total length has increased from 19,700 kms. in 1950-51 to 31,710 kms. in 1984-85 at an annual growth rate of 1.41 per cent forming an integrated and continuous network of roads. Out of a total of 56 National highways, 14 has been

Table 3.7

Progress of Roads

Year	Total Length in ,000 Kms.	Surfaced Length in ,000 Kms.	Unsurfaced Length in , 000 Kms.	National Highways in Kms.
1950-51	397.6	156.1	241.5	19700
1960-61	705.0	234.4	470.6	23769
1970-71	917.0	397.1	520.0	24000
1979-80	1534.3	658.9	876.2	29000
1984-85	1772.2	833.0	939.8	31710
Growth Rate in %age	4.49	5.05	4.08	1.41

Source: Govt. of India, Planning Commission, Seventh Five Year Plan 1985-90, Vol.II.

identified as heavy density traffic corridors for the year 1985. (Fig. 3.5.).

Rural Roads, comprising of classified village roads and some of the other district roads serve as feeders linking villages with each other as well as with the nearest district roads, state or national highways, railway stations and market centres.

Development of rural roads received encouragement during the Fifth Plan period as a part of Minimum Needs Programme with the object of linking all villages having a population of 1500 and above with an all weather road and 50 per cent of villages having a population 1000 to 1500.²⁷ In hilly, coastal, tribal and desert areas the objective was to connect a cluster of villages of matching population. Number of village connected with all weather roads were 1,67,376 in 1979-80 which increased to 2,08,938 in 1984-85 registering an average annual growth rate of 4.53 per cent. As on 1984-85 only 35 per cent of total villages were connected with all weather roads²⁸ which shows the grim picture of development of rural roads.

27. Ibid., p. 217.

28. Ibid., p. 205.

Road Density

The density of road is an index of accessibility of inhabitants through roads, which is defined as the length in kilometres of road - per sq. km. of area. The higher the density the greater is the accessibility. Road density in India is 0.46, which is much below than that in some developed countries - Japan, U.K., France, USA, etc. Although it is much higher than that in most of the countries of Africa, Latin America, Middle East and some of the countries of Europe (Ref. Table 3.8).

TABLE 3.8
Road Density in Selected Countries

Country	Road Density (Km/Sq.km.of area)	Year
France	1.46	1981
East Germany	1.95	1980
U.K.	1.53	1981
Egypt	0.03	1978
Nigeria	0.12	1980
South Africa	0.16	1981
Tanzania	0.05	1980
Brazil	0.16	1981
USA	0.68	1980

contd....

India	0.46	1981
Japan	2.96	1981
Pakistan	0.05	1981
Sri Lanka	0.48	1981

Source: C. Sinha and I.K. Jha, 'Road Transport and Economic Development - A case study of Bihar,' paper presented in 'National Seminar-cum-Workshop on Intermodal Transport Coordination system for 2001 AD with special reference to developing countries, April 14-15, 1985, Patna, pp.16-17.

One thing is important to note that quality of roads in India is poor not because roads are mostly unsurfaced but even the surfaced roads are not upto the mark. There are also a number of unbridged crossings, weak bridges and missing links and maintenance is poor.

The road density per sq. km. of area and per lakh of population for different states and union territories is given in Table 3.9. It is evident from the table that road density is highest in Delhi (9.38) followed by Pondicherry, Kerala and Goa, Daman and Diu while it is lowest in Jammu and Kashmir and Mizoram (0.05) followed by Andaman and Nicobar Islands, Sikkim, and Arunachal Pradesh.

The road length per lakh of population is also not evenly distributed over various states. Average road length per lakh of population in India was (219.75) kms. in 1981.

Table 3.9

Road Density in Different States

States/UTs	Road (Kms/Sq. Km of Area)		Road (Km. Per lakh of population)	
	Surfaced	Total	Surfaced	Total
1	2	3	4	5
Andhra Pradesh	0.23	0.46	118.6	234.8
Arunachal Pd.	0.03	0.16	350.1	2076.9
Assam	0.07	0.49	45.3	299.8
Bihar	0.16	0.48	40.9	119.5
Gujarat	0.21	0.29	119.1	170.4
Haryana	0.45	0.52	153.2	177.8
H.P.	0.08	0.35	99.6	459.7
J & K	0.03	0.05	114.0	193.6
Karnataka	0.28	0.57	145.7	295.9
Kerala	0.60	2.68	91.6	409.6
M.P.	0.12	0.24	101.4	200.7
Maharashtra	0.26	0.58	129.3	282.5
Manipur	0.09	0.26	138.6	410.1
Meghalays	0.12	0.21	198.1	356.9
Mizoram	0.01	0.05	51.3	228.7
Nagaland	0.05	0.35	98.9	753.1
Orissa	0.11	0.73	62.5	433.6
Punjab	0.70	0.91	210.2	273.5

1	2	3	4	5
Rajasthan	0.10	0.19	103.4	186.7
Sikkim	0.14	0.15	319.8	335.3
Taminadu	0.71	0.95	191.5	255.9
Tripura	0.12	1.70	62.0	868.4
U.P.	0.24	0.51	63.2	136.1
West Bengal	0.28	0.64	46.4	104.1
Andaman & Nicobar Islands	0.07	0.05	317.9	350.2
Chandigarh	1.12	1.13	28.1	28.6
Dadra & Nagar Haveli	0.37	0.44	177.6	210.4
Delhi	4.78	9.38	114.2	223.7
Goa, Daman & Deu	0.84	1.98	295.7	694.7
Lakshadweep	-	-	-	-
Pondicherry	2.28	4.32	185.8	351.3

Source: C. Sinha and I.K. Jha, Road Transport and Economic Development - A case Study of Bihar', paper presented in 'National Seminar-cum-Workshop on Intermodal Transport Coordination System for 2001 AD with special reference to developing countries, April 14-15, 1985, Patna.

It varies from 104.12 kms. in West Bengal to 2076.92 kms. in Arunachal Pradesh. The main reasons for such a variation are the uneven distribution of population and road length over states. One thing is clear from Table 3.9 that the road density is comparatively higher in relatively advanced states and lower in backward or under developed states. Therefore, there appears to be a positive correlation between availability of road length and economic development of a state. The higher the road length the higher is the rate of economic growth and vice versa.

India is a vast country with second largest population in the world having an area of 3.27 million square kilometres with more than 580 thousand villages and towns scattered all over. It has a distance of 3,129 kms. from north to south and about 2,977 kilometres from east to west, its coastline measures 6,689 kms. and frontier measures 15,168 kms. Against such a vastness, India possesses 17,72,200 kms. of total road length comprising of 8,33,000 km of surfaced roads and rest of unsurfaced roads.²⁹

The initiative for development of roads in India did not take place in a planned manner. Lack of comprehensive

29. Ibid., p. 205

and integrated policies of the state government and the central government, have been responsible for the present state of affairs.

State governments had the responsibility of all sorts of roads in their states prior to 1956 but they passed on their responsibilities on to the poor local bodies like Zila Parishads, Village Panchayats, Municipalities etc. for development of roads. In 1956, the National highway Act gave new dimension to the road development policies. Besides this, Nagpur Plan and 20-Year Plan (1961-81) ushered a new era in the development of roads in India. The Government of India is now giving them priorities as they are the life-line of the nation.

Road Transport

Road Transport is usually divided into two categories - traditional (or non-mechanised) and modern (or mechanised). Bullock carts, camel carts, rickshaws, thelas, tongas, etc., fall under the former category while scooters, cars, trucks, buses, etc. fall under the latter category.

Non-mechanised road transport in India is important as it caters to the requirements of the rural areas of the country. Even today a large proportion of India's trade is

Table 3.10

Number of Motor Vehicles Registered in India

(In '000)

Year	Two Wheelers	Auto-Rikshaws	Jeeps	Cars	Taxis	Buses	Goods Vehicles	Others	Total
1950-51	26	-	-	147	11	34	82	3	303
1955-56	41	-	-	187	15	46	119	15	423
1960-61	88	6	31	256	21	56	167	35	660
1965-66	225	16	61	359	35	27	259	69	1051
1970-71	575	36	82	539	60	94	342	133	1861
1975-76	1045	59	94	601	80	114	364	309	2666
1980-81	2528	142	18	898	100	154	565	667	5072
1984-85	4960	276	201	1178	161	213	847	948	8784

Source: Govt. of India, Ministry of Planning, 'Statistical Abstract; India 1986.' CSO, New Delhi.

carried through bullock carts. This form of transport provides employment to 2 crore people. There are nearly 15 million bullock carts in the country carrying an estimated 900 million tonnes of originating traffic with a lead of 10 kms.³⁰ NTPC has recommended bullock cart expansion for satisfying the rural and semi-urban transport needs mainly on energy considerations and due to its advantage of convenience and flexibility of operation.³¹ In the grim energy situation in which the country finds itself today, bullock-cart has assumed added significance and the sixth plan spoke of the 'urgent need for modernising the area of transport, including the allied sector of the bullock cart industry.'³²

The development of mechanised transport has taken place at a rapid pace. (Ref. Table 3.10). For instance the number of motor vehicles registered in India had more than doubled in the decade 1950-51 to 1960-61. The number of registered vehicles have increased 28 times, from 306,313 in 1950-51 to 8,796,134 in 1984-85 registering an average annual growth of 5.4%. This is a natural phenomenon in a developing economy

30. Govt. of India, Seventh Five Year Plan, op. cit. p.220.

31. Govt. of India, NTPC Report, op. cit. p.205.

32. Govt. of India, Sixth Five Year Plan, op. cit. p.303.

since the processes of industrialisation and modernisation are accompanied by a large scale increase in the demand for (and production of) motor vehicles of all types like buses, trucks, cars, two wheelers, etc. The distribution of different types of motor vehicles over different states is not uniform. Most of the vehicles are concentrated in some states such as Andhra Pradesh, Kerala, Maharashtra, Tamilnadu, Uttar Pradesh and West Bengal, which are relatively developed.

The goods traffic by road has increased from 6 billion tonne kms (BTKM) in 1951 to 210 BTKM in 1987. At the same time passenger traffic has increased from a mere 31 billion passenger kms. (BPKM) in 1951 to 893 BPKM in 1987 (Ref. Appendix III).

To provide efficient and adequate passenger services as well as goods transport to meet, particularly, the needs of hilly and underdeveloped areas, state participation in road transport commenced in 1950. Most of the state/union territories have nationalised passenger transport in varying degrees. At present 40 per cent buses are being run by the Public sector undertakings (Refer Table 3.11). Fifty seven State Road Transport undertakings comprising a fleet

Table No. 3.11

Ownership Patter of Road Transport

(in %age)

Year	buses		Trucks	
	Public	Private	Public	Private
1960-61	31.6	68.4	0.7	99.3
1965-66	36.2	63.8	0.7	99.3
1970-71	39.5	60.5	0.9	99.1
1975-76	49.0	51.0	0.6	99.4
1980-81	45.2	54.8	0.6	99.4
1983-84	40.0	60.0	0.3	99.7
1984-85	38.6	61.4	0.25	99.75

Source: Govt. of India, Planning Commission, Seventh Five Year Plan 1985-90, Vol.II
NEW DELHI.

strength of 86,156 vehicles are catering to the needs of 4.86 crore passengers everyday.³³

To cater the growing road freight traffic, the number of trucks have increased from 82,000 in 1950-51 to 7,63,000 in 1984-85 at an annual rate of 6.8 per cent per annum. The actual pattern of ownership of buses and trucks, as shown by Table 3.11, indicates that private sector runs almost the entire trucking industry and operates about 60 per cent of passenger services. One interesting thing, which is indicated by the table is that up to 1975-76 percentage ownership of buses by public sector has an increasing trend but afterwards its share in ownership is showing a declining trend.

Traffic Pattern of Rail and Road

The traffic carried by two principal modes of transport, namely, rail and road transport, have shown a marked increase both in passenger and freight traffic (Ref. Appendix III). The passenger traffic, during the period 1950-51 to 1984-85 increased from 98 billion passenger-kms

33. Govt. of India, INDIA - 1987; op. cit. p.534

to 1149 billion passenger-kms. and freight traffic from 49.6 billion tonne-kms. to 433 billion tonne-kms.³⁴

The most significant development in the growth of the traffic is the marked shift in the relative share of rail and road transport in total traffic carried over the period. The share of road transport in both passenger and goods traffic has increased at a much faster rate than that of the railways, although in absolute terms, traffic increased substantially in both modes of transport. A comprehensive commodity wise list of relative share of rail and road in freight traffic is given in Appendix II. It is evident that the share of road transport in overall traffic has been continuously increasing and there has been substantial shift from rail to roads over the years. Constraints in capacity on the railways combined with the inherent advantage of road transport and expansion of road network have contributed to the shift.

Thus it is clear from above analysis that Road transport is getting an important place in transport map of the country.

34. Govt. of India, Report of Steering Committee, "Perspective Planning for Transport Development", Planning Commission, Aug. 1988, pp. 282-283.

Shipping and Ports

In ancient period when the modes of road transport were traditional and railways did not exist, shipping used to be the best means of transporting heavy goods from one place to another. It is the most energy efficient and cheapest mode of transport for carriage of bulky goods over long distances.

In a country like India, which has extensive coastline of nearly 7,000 kms. and a large maritime trade, the importance of shipping does not need elaboration. Coastal shipping plays an important role in the integrated transport network of the country, particularly when inland modes are in strain.

In 1947 the government of India appointed a shipping policy committee which recommended a national shipping policy. The Committee recommended that (i) the gross registered tonnage (GRT) should increase to 9 lakh by 1950 and 20 lakh by 1955-56; (ii) India should secure hundred per cent of her coastal trade and (iii) She should secure 75 per cent of her overseas trade. By 1950 the government accepted the policy of reservation of coastal trade for Indian tonnage. The growth of Indian tonnage was extremely slow and the country could not avail the opportunity offered for building up her tonnage.

In 1947, India hardly had a merchant marine worth the name and its total fleet comprised a few old and antiquated vessels aggregating about 0.2 million gross registered tonnes (GRT). Over the years, the Indian fleet expanded rapidly and reached a level of 5.9 million GRT in April 1986. However, from 1980 onwards the expansion of Indian fleet has been rather slow. As on April 1, 1987, the Indian fleet comprised 392 ships aggregating 9.7 million dead weight tonnes (DWT) and India ranked 16th amongst the maritime nations of the world.³⁵ Growth in strength of fleet of Indian merchant shipping is given in Table 3.12.

India has a large number of shipping companies, numbering 52 as on April 1987. The largest shipping company in India, the Shipping Corporation of India Ltd. (SCI), is in public sector. It has 143 ships aggregating 5.3 million DWT. The remaining 4.4 million DWT was distributed amongst the companies in the private sector, two companies in the public sector and several government departments. However, most of the private companies are operating with small levels.

Despite the fact that coastal shipping is the most efficient and cheapest mode of transport to carry bulk

35. Govt. of India, INDIA - 1987, op. cit. p. 537

Table No. 3.12

Growth of Shipping Traffic

Year	Coastal Shipping		Overseas Shipping	
	Shipping tonnes(MGRT)	Traffic carried (MT)	Shipping tonnage (MGRT)	Traffic carried (MT)
1950-51	0.22	3.6	0.17	1.2
1960-61	0.31	5.4	0.54	2.2
1970-71	0.23	4.3	2.20	10.4
1979-80	0.25	4.4	5.30	20.0
1984-85	0.36	5.5	5.96	31.0
Growth Rate in %age	1.37	1.25	11.03	10.04

Source: Govt. of India, Planning Commission, Seventh Five Year Plan, 1985-90, vol.2,

Table 3.13

Strength of Indian Merchant Shipping Fleet
(No. of Vessels)

Year	Coastal Trade	Overseas Trade	Total
1951	79	24	103
1956	85	30	115
1961	104	70	174
1966	95	136	231
1971	62	193	255
1976	80	279	359
1981	65	338	403
1984	96	337	433
1985	95	273	368
1986	116	243	359

Source: Govt. of India, Planning Commission, A Statistical Abstract
INDIA - 1986. CSO, NEW DELHI

traffic over long distance and also that the coastal shipping has been reserved exclusively for Indian ships after independence, there has been a sharp decline in coastal shipping operations. (Refer Tables 3.12 and 3.13). For instance, the number of ships fell from 104 in 1961 to only 65 in 1981 while GRT fell from 0.31 million to 0.25 over the same period. The main factors affecting the growth of coastal shipping adversely are poor turnaround time of coastal ships and their fuel inefficiency on account of overaged vessels, lack of mechanical handling facilities, imbalance in coastal traffic movement as traffic is not equally available in both directions etc.³⁶ This makes it necessary for coastal ships to sail in ballast, at times, on return journey. Moreover, slow handling of the cargo at ports and undue ports delay inflict heavy losses on shipping companies. It is estimated that at present 70 per cent of ship time is spent at ports and only 30 per cent on voyage.³⁷

Because of the importance of overseas shipping in international trade, considerable attention has been paid to

36. Govt. of India, Sixth Five Year Plan, op. cit. p. 307.

37. Pradyumna, D.M., 'Perspective Shipping Policy in Developing Countries' (with special reference to Indian Shipping) paper presented at the International Conference on Transportation, Nov. 16-18, 1980, New Delhi.

increase the shipping tonnage in the planning period. As a result, the share of Indian shipping in the transportation of India's overseas trade has consistently increased though slowly, in the planning period. The overseas shipping tonnage has increased from 0.17 million GRT in 1950-51 to 5.96 MGRT in 1984-85, registering an annual growth rate of 11.03 per cent (Refer Table 3.12).

A technological revolution of extraordinary significance i.e. Containerisation, has taken place over the last 15 years in sea cargo transport. This innovation was due to rising operational and handling cost. This development has several implications to India. Firstly, the ports have to be provided with facilities to handle container ships. Secondly, container ships have to be acquired from foreign yards. Both of these developments would require huge expenditure in addition to making commensurate arrangements in the inland transport system. If India fails to catch up with this revolution in international cargo transport, its efforts will be frustrated and its ports will lose direct trade links in the international trade route system. Thus there is a need to modernise shipping industry.

India has initiated to handle such traffic by providing handling facilities at some ports, acquiring special wagons to transfer them in different parts of country by establishing three handling yards at Delhi, Bangalaores and Coimbatore.

Ports are of great importance for coastal and overseas shipping. That is why special efforts have been made for the development and modernisation of existing ports and establishment of new ports during plan period. The operation and administration of major ports is governed by Major Ports Act, 1963, with the Ministry of Surface Transport exercising overall control on their working. The minor/intermediate ports are administered by the governments of the concerned maritime states directly. At the time of independence, India had five major ports. Calcutta, Bombay and Madras were old ports while Cochin and Vishakhapatnam had been developed during the inter-war period. Since then six more ports - five major and one satellite - have been added namely Kandla (1959) Mormugao (1963), Paradeep (1966), New Mangalore (1975), Tuticorin (1975) and Haldia (1977). At present there are 11 major ports (including Nhava Sheva which has been commissioned in May 1989) and 139 operational intermediate/minor sea ports.

Growth of Traffic at Ports

In 1986-87, the total traffic handled by major ports in the country was 124.22 MT in comparison to only 39.5 MT in 1960-61. It constitutes more than 90 per cent of total traffic handled by all the ports. Port-wise break up is given in Table 3.14.

It is clear from the table that Bombay continues to be the premier port although its share in the total traffic has come down from 36.2 per cent in 1960-61 to 20.2 per cent in 1986-87. Madras and Kandla have emerged as the other front line ports while Calcutta (including Haldia) has come down from second position in 1960-61 to sixth in 1986-87.

Commoditywise composition of traffic has also undergone a radical change over the years as shown by Table 3.15. During 1960-61 and 1986-87 the share of POL, iron ore, coal and fertilisers has increased. These four items make a share of more than 75 per cent of total traffic.

Capacity of a port is the aggregate capacity of individual berths and depends on the type of commodity handled and the facilities provided. It is generally accepted that port capacity should be created ahead of demand because the cost, in terms of delays to ships, for outweighs any savings due to delayed investment. At the

Table No. 3.14

Traffic Handled at Major Ports

Port	Traffic (MT)		Share (Per cent)	
	1960-61	1986-87	1960-61	1986-87
Calcutta/ Haldia	9.40	12.01	23.8	9.7
Paradip	-	4.85	-	3.9
Vishakapatnam	2.80	15.04	7.1	12.1
Madras	3.00	19.77	7.6	15.9
Tuticōrn	-	4.15	-	3.3
Cochin	2.00	6.80	5.1	5.5
New Mangalore	-	5.43	-	4.4
Mormugao	6.40	14.92	16.2	12.0
Bombay	14.30	25.06	36.2	20.2
Kandla	1.60	16.19	4.0	13.0
Total	39.50	124.22	100.0	100.0

Source: Govt. of India, Planning Commission, Seventh Five Year Plan (1985-90) Vol.II & a Hand book of Management Information 1987. By Ministry of Surface Transport.

Table 3.15

Commoditywise Composition of Shipping Traffic

Commodity	Traffic Handled (MT)			Share (Per cent)	
	1960-61	1979-80	1986-87	1960-61	1986-87
POL	10.90	28.78	55.51	27.6	44.6
Iron Ore	6.30	23.18	30.60	15.9	24.5
Coal	2.10	2.05	9.42	5.3	7.5
Fertilizers	0.60	6.36	4.99	1.5	4.0
Foodgrains	5.10	1.20	0.60	12.9	0.5
Other cargo	14.50	16.90	23.70	36.8	19.0
Total	39.50	78.49	124.82	100.0	100.0

Source: Govt. of India, Planning Commission, Seventh Five Year Plan, (1985-90), & Ministry of Surface Transport, Hand Book of Management Information, 1987.

same time, it is necessary ^{to} safeguard against under utilisation of facilities to protect the financial viability of a port. At the end of the sixth five year plan, the total handling capacity of the major ports was 133 MT against the total traffic handled of 107 MT. Hence the overall capacity was more than the traffic handled, however, while there was surplus capacity in handling iron ore and break bulk traffic, the capacity for handling POL and containers was not adequate.

The seventh plan envisages the modernisation of port and cargo handling facilities, especially to handle container traffic on priority basis. The plan will also provide for establishment of container freight stations as well as Inland container depots and standardisation of equipments and facilities to facilitate smooth transshipment of containers.³⁸

Regarding modernisation of port facilities and matching them with the emerging shipping technology, the ports of Kandla, Cochine, Nhava-Sheva, Madras, Paradip and Haldia will be provided with fully mechanised handling facilities. Further selective deepening of ports will enable them to receive larger sized vessels.

38. Govt. of India, Seventh Five Year Plan, op. cit. p. 223.

Air Transport

Air Transport is the most modern, the quickest and the latest addition to the modes of transport. Due to its inherent qualities of saving of travel time and comfort while travelling, air transport is becoming increasingly popular. As far as world trade is concerned, it is still dominated by sea transport because air transport is very expensive and is also unsuitable for carrying heavy and bulky goods. However, transportation of very high valued and light goods and perishable goods is increasingly being done by air transport.

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It was in 1920 that the Government for the first time decided to prepare air routes between Bombay and Calcutta and Rangoon, and to undertake the responsibility of constructing the necessary aerodroms, providing them with equipments and other facilities. Till the commencement of the first five year plan the major part of civil aviation was conducted by different private companies. In 1950 the Government appointed the Air Transport Enquiry Committee with justice G.S. Rajadhayaksha as Chairman. The Committee examined the conditions of the various airline companies operating in the country and found that there was a good case for air transport service being owned and operated by the state on the ground that a unit incharge of all



operations could use the available resources to maximum advantage; that operation by a state organisation would be an advantage from the point of view of defence; that state management would tend to give better and cheaper service to the public; that a unified organisation could take full advantage of technical development in air transport equipment and operational techniques; and that as private airlines would require financial assistance from the government to be placed on their feet, it would be preferable for government itself to run it in its own way.³⁹

The government decided to nationalise air transport and accordingly the Air Corporation Act was passed in 1953. In accordance with the act, two state Corporations namely, the Air India International and the Indian Airlines were established.

At present domestic services and services to seven neighbouring countries are being provided by Indian Airlines (IA) with Vayudoot providing some short haul services to inaccessible areas. Air India operates international services. Pawan Hans formed in 1985 has main function to provide helicopter services to the oil industry.

39. Govt. of India, 'The Gadgeteer of India', p. 791

The National Airport Authority manages 86 airports and the civilian enclaves at 26 defence air ports and provides the air traffic services throughout the country. The International Airport Authority of India (IAAI) operates the four major metropolitan airports namely, Bombay, Delhi, Calcutta and Madras. The regulatory and licensing functions, bilateral issues, approval of tariffs/schedules etc., has been entrusted to the Director General of Civil Aviation. Since nationalisation, Air Transport industry has registered a tremendous growth. The first priority in developing the industry was accorded to fleet upgradation of the airlines. Improvement of four major airports and airline support facilities were accorded second priority. The improvements to the other airports and the navigation and communication facilities were accorded a lower priority.

Civil Aviation has made significant progress since the inception of planning. Apart from investing Rs.6.6 crores before commencement of the first plan, Rs.24 crores were spent during the first two plans. The programme in the first plan aimed mainly at making good the deficiencies in aerodromes, communication facilities, equipments, etc. The second plan provided for the development of facilities to meet the growing needs of domestic and international traffic and in particular the new demands which had arisen

from recent technical advances and from obligations under the convention on international civil aviation to provide facilities at aerodromes in conformity with the standards laid down by the conventions. Four new aerodromes were also added during this plan.

Priority was given to the programmes for extension and strengthening of existing runways during the third five year plan. Provision was also made for construction of taxi tracks, aprons, terminals and permanent ground lighting facilities. Improved types of navigational aids were also commissioned at selected aerodromes.⁴⁰

The fourth plan emphasised the improvement of runway, terminal and communication facilities at the four international airports to make them suitable for the operation of heavier and larger capacity aircrafts.

During the fifth plan emphasis was laid on the improvement of safety oriented aeronautical communication services and the installation of modern equipments at aerodromes for improving the standard of service provided by them.⁴¹

40. Govt. of India, Third Five Year Plan, op. cit. pp.562-3.

41. Govt. of India, Fifth Five Year Plan, op. cit. p.182.

In the sixth five year plan efforts were accorded to provide additional capacities at major airports to relieve heavy congestion during peak hours, additional workshop and maintenance facilities to improve the utilization of existing resources and extension of safety oriented equipments at other airports.

The objectives of the seventh five year plan are to add additional capacity in view of growing traffic, replacement of aging air crafts and efforts to reduce the fuel consumption per revenue passenger kilometre by wise planning of routes to be operated.

Traffic Growth

Indian Airlines utilises over 80 per cent of its capacity to carry passengers. The table 3.16 shows the trend in total capacity offered in Available Tonne Kilometres (ATKms) and the capacity utilised in Revenue Tonne Kilometres (RTKms) over the years.

During 1970-71 to 1985-86 the number of embarking passengers on Indian Airlines grew at an average rate of 10.9 per cent per year. In the first half of the 1980's Indian Airlines capacity increased at 9.3 per cent per year,

Table 3.16

Capacity Creation & Utilization of Indian Airlines

Year	Capacity created AT Kms	Capacity utilised RT Kms	Load factor %age	Passenger Share RT Kms %age
1970-71	208.2	161.5	77.6	84.8
1975-76	352.8	248.9	70.5	85.9
1980-81	663.9	420.2	63.3	83.2
1985-86	1037.8	720.0	69.4	82.3

Source: Report of the Working Group of Planning Group
on Civil Aviation & IA's Annual Report, 1985-86.

while utilisation grew at 11.4 per cent per year.⁴² Indian Airlines has experienced capacity constraints on many of its trunk routes round the year and on its tourist route in seasons. The passengers carried and the RTKms performed by Vayudoot in 1985-86 accounted for about 0.25 per cent of the total civil aviation traffic. It had a load factor of 61.6 percent. Between the same period, domestic cargo grew at an average annual growth rate of 14.1 per cent. The spurt in growth took place after the Airbus A300B was introduced in 1975-76. The ten years thereafter saw an average annual growth rate of about 17.1 per cent.

The average annual growth rate of international passenger traffic from/to India on all carriers in the period 1974 to 1984 was about 16 per cent. During the period Air India achieved an average growth rate of 13.2 per cent for passenger traffic and 12.4 per cent for total RTKms. In 1984-85, Air India's systemwise capacity was 1964.167 million ATKms and the utilisation was 1241.265 million RTKms i.e. a load factor of 63.2 per cent performed. The share of cargo has been about one third. The fleet size of Indian Airlines, Vayudoot, and Air India in 1985-86 is given below:

42. Govt. of India, Seventh Five Year Plan, Op.cit. p.205

(i)	<u>Indian Airlines</u>		
	A	300	- 10
	B	737	- 25
	Turbo Prop		- 15

	Total No.		- 50

(ii)	<u>Vayudoot</u>		
	Do 228		- 10
	Turbo Prop		- 4

	Total No.		- 14

(iii)	<u>Air India</u>		
	B	747	- 10
	A	300	- 3
	A	3k0	- 5

	Total No.		- 18

Source: Report of Planning Group on Civil Aviation 1986.

Thus it is clear from above analysis that air transport industry has made a rapid progress. However, Planning Group on Civil Aviation (PGCA) has indicated that there are reasons for restructuring the Civil Aviation industry viz. to involve a mechanism to monitor and ensure coordination amongst the constituent organisations, to raise finance for its growth and improve customer orientation.

CHAPTER IV

CONCLUSION

Transportation has been basic and important element in human activity since the beginning of civilization. Transport facilities support and promote economic and social activities by providing accessibility to places, spatially apart. Transport plays a crucial role in ensuring sustained economic growth and is vital for the development of various segments of the economy. The role of transport in the country like India is more important because of the size of the country and the geographical dispersal of national resources.

It can be concluded from chapter I, that transport is very sensitive organ of an economy as it can change the entire course of economy. Thus the planning for transport should be an integrated exercise with other core sectors of economy and should not be undertaken in isolation of other sectors. There is a need for a comprehensive attempt to prepare a long term transportation plan for the country as an integrated part of the national Macro-economic plan. The need for taking a long term view of transport requirement is reinforced by the fact that these tend to grow much faster and to a greater degree than the growth of other segments of economy viz. industry, agriculture and trade etc.

Moreover, it takes time to build transport capacities and therefore, planning for transport investment has to be undertaken in anticipation of demand, so that transport

congestion and bottlenecks do not seriously impede the economic progress.

Apart from a comprehensive and long term planning, an integrated approach to planning is also essential as demand for transport arises due to basic social requirements and development requirements which is a function of the rate and pattern of economic growth. Moreover, in a topographically diverse country like India transport requirements cannot be fulfilled by a single mode of transport hence an integrated approach to transport planning is essential.

This comprehensive and integrated approach must be an integral part of our National Transport Policy which should be based on three distinct aspects:

- i. National Objectives
- ii. Quantum of Investment
- iii. Intermodal allocation.

National objectives in perspective of transport systems are of economic and non-economic nature. Exploitation of natural resources, increase in agricultural productivity and industrial output, enhancement of consumption levels and diversification of the economy belongs to the former category and promotion of political cohesions, reinforcement of national security and encouragement to socially desirable settlement pattern belong to the later category.

From our study regarding efforts made by government to develop the transport system for achieving national objectives, one thing is crystal clear that lack of an effective coordination between various modes of transport at different levels has given rise to the development of various modes in isolation. Hence a machinery for coordination is an essential requirement for the development of transport system to fulfill the mobility requirements of the country effectively.

Coordination of transport services should aim at organising the transport systems in such a way as to allow each mode 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 transport resources for the transport sector as a whole and satisfy total transport needs of the economy.

At present, except Planning Commission for coordination of investment decisions, there is hardly any mechanism coordinating transport activities. Procedures for approval of investment projects are different for different modes and these are applicable to only public investment. There is no mechanism for coordinating transport pricing policy, nor is there any effective administration or licensing framework to bring about coordination between various modes of transport at the centre or state level.

The central issue of National transport Policy is to determine the share of transport investment and allocate it rationally between various modes of transport to match with the growing requirements of the economy at minimum resource cost.

However, minimisation of resources cost is not the sole objective of a nation's transport development policy, because investment in it always requires a large amount of capital expenditure, which becomes a critical and crucial issue, particularly when capital is scarce and attracts competing demands. Thus other consideration such as generation of employment, energy conservation, providing minimum transport facilities to all places, especially building of rural roads to provide accessibility to villages not connected to a road system till now and dispersal of industrial location to optimise land use and location planning to cut down travel cost of both man and materials must kept in mind while taking decision on transport investment.

After going through the whole situation prevailing in transport sector in our country some questions eventually arises. Is investment made in transport has played the role of a lead sector? Is it conducive to further economic development of the country? Is the progress made in Indian

transport adequate to meet the demands generated within the economy as well as the society? and so on.

It is quite clear from discussion in first chapter that the role of transport should be that of a leading and that transport should not, in any case, be developed through pressures and bottlenecks, especially in developing countries. But the experience of India was not so as we have find as a conclusion in chapter two. In India, investments were made during various plan periods only for general expansion of transport facilities so that pressure of transport demand and bottlenecks caused by inadequate transport facilities, could be removed. Transport investments were decided only on ad-hoc basis because there was no long term perspective plan for transport investment. The statement of M.Q.Dalvi that 'Transportation was not made to act as a leading role'¹ seems to be correct in this regard.

The direction of the change of proportion of investment in public and private sector is also a matter of great concern. In principal, to achieve the socialist objectives of planned economic development, increasing participation of public sector has been considered. --

1. Dalvi, M.Q., 'Social Overhead of Economic Development' in J.C. Sandesara (ed.) 'The Indian Economy and Prospects', Department of Economics, University of Bombay (1974), p.733.

important. But in case of Indian transport it has been noticed that the sphere of private sector is increasing, which is motivated by only short term profits, thus objective of socialist pattern is being ignored.

Regarding Intermodal allocation it can be concluded from our study that in India investments have been made mostly on ad-hoc basis rather than on the basis of long term plan. No detailed idea about where, how and how much of transport is required, have been gathered before transport plan is prepared.

Detailed calculation of traffic forecasting has never been attempted except in case of railways. Even in railways also, the planning authorities failed to recognise different modes of transport as a part of an integrated transport system and therefore investment was made without considering the maximum benefits to the economy through unified transport development approach. Such investment decision is being taken due to the absence of any machinery assigned with the task of preparing transport plan in a coordinated way as has already been stated.

It is evident from the analysis in chapter three that despite the development over last thirty five years a short fall in supply of transport services practically of all modes of transport has been witnessed. Transport

operation under capacity constraints have frequently led to congestion and bottlenecks. The most sensitive segments of the transport sector where constraints of capacity have been greatly in evidence are railways, truck transport and civil aviation. There were also certain structural imbalances which had emerged in the transport system in the country.

These imbalances have not only caused suffering and inconvenience to the travelling public, but have retarded the economic development process. This fact was also realised by our planners during the fourth five year plan. All these facts emphasise on the need for creating adequate transport capacity much ahead of traffic demand. Further, each mode of transport needs to be integrated with national transport system so that each mode complement and supplement the other modes coherently.

Indian Railways are the biggest nationalized mode of transport in the country. Its importance as a public carrier is quite immense for the development of industries and agriculture. Certain obligations which it have to carry out on the directives of the central government as a public utility carrier make it more responsible towards society because such obligations are not binding upon any other mode of transport. Under such circumstances, it is quite obvious that railways must provide its services at an economically viable rate with maximum operational efficiency.

As a consequence of investment made in railways during various plans, a phenomenal expansion of rail services has taken place. Although the expansion of its route length is considerably less, from 54,000 kms. in 1950-51 to 62,000 kms. in 1984-85 (about 15 percent), freight traffic carried by railways increased to 196 BTKM, and passenger traffic increased more than three times - from 66 to 240 BPKM during the same period. This impressive growth has, however, not kept pace with the growing traffic demands of national economy. The result being that the growth of economy has frequently been impeded by the shortage of rail transport. The major inadequacies in the rail transport system, which have given rise to shortage of rail services are overdue renewal of track, and technologically overaged rolling stock. The railway network of some 20,000 kms. (Or 20 per cent) is over-due for renewal, and the available motive power and rolling stocks are not only numerically inadequate but also overaged and obsolete in design. The incidences of on-line failures of rolling stock, locomotives, and track and obsolete terminals and yards have prevented the optimum use of railway assets, hence, affecting their productivity adversely. In the prevailing circumstances as discussed, it is essential to correct the past mistakes of neglecting investment in the railways because railways has a strong

role to play in economic development and sharing the social burden of national objectives.

Road and road transport in India had a spurt only after the first world war. But very soon it acquired a prominent position in the transport scene of the country and with its quality of flexibility and low investment, it became an efficient and cheap mode of transport for short distances.

Since the beginning of the first five year plan, there has been a steady and significant expansion of roads and thus road transport. It has occupied a dominant position in the overall transport system of the country. During the period from 1950-51 to the end of the sixth pan, the road length of the country has increased four and a half times, from 4 lakh kms to 18 lakh kms., including more than five fold increase in the surfaced roads: 1.6 lakh kms to 8.3 lakh kms.; while there was a nine fold increase in the number of trucks and buses from 1.16 lakhs to 9.70 lakhs.

Road network of the country is deficient in several respects: about one third of the villages in the country are still without any road connection, while two thirds do not have all-weather roads which become unserviceable during the rainy season, causing a break in communication between the villages and the rest of the country. Only about one half of the total road network is surfaced. National Highways constitute only 2 percent of the total network and nearly

thirty percent of these have single lane. About 91 percent of the state highways are of single lane and sixty percent have poor riding quality and substandard geometrics. The prime weakness in the road sector are the missing links, weak bridges, unbridged crossings and poor or prolonged neglect of the maintenance. The inadequate capacity, insufficient pavement thickness and poor riding quality have given rise to reduced travel speed, increased cost to operation of vehicles, wastage of resources and traffic hazards like road accidents and degraded environment. There are numerous problems before road transport industry affecting its commercial and financial viability, especially trucking, being 99 percent in private sector. Policies affecting truck transport are opposite - restrictive rather than supportive. The National permit scheme limits the number of trucks that can operate in inter state services. The obsolete technology of vehicles, unhealthy regulatory practices, heavy and multiple incidence of taxation, scarcity of institutional finances and disorganised state of the industry pose serious difficulties in the way of development of road transport industry.

As already recommended by NTPC, a new comprehensive perspective plan for road development should take into account the road requirements of rural, hilly, tribal and backward areas to improve their accessibility to market

places. The road maintenance should be given priority in preference to new construction. The restrictive character of Motor Vehicles Act should be revised so that it becomes an instrument for promoting an efficient, adequate and safe road transport system. In the interest of smooth inter-state freight traffic the inter-state permits for trucking operations should be abolished.

The shipping industry in India which was having good potential for growth due to large coastal line is now not able to perform its expected role. The last decade has been difficult for the international shipping industry and so has been the case with Indian shipping industry. Uneconomic freight rates due to global recession, large number of overaged and fuel inefficient vessels with high operating costs and lack of diversified fleet have affected the fortune of shipping. Despite these odds, the performance of the Indian shipping during the last four-five years has shown some positive development. To make the shipping industry vibrant, Government has to adopt positive measures in the form of cargo support priority berthing and liberal tax benefits.

Port are intermediaries between ships and domestic transport. The importance of port lies in providing facilities for foreign trade and also in promoting industry and trade in the hinter-land. The cogestion at Indian ports

has adversely affected the competitiveness of country's exports and growth of its national output. Structural changes in shipping like increasing containerisation has forced the modernisation of ports as an urgent requirement. Ports and shipping in the country are not equipped to handle the growing bulk traffic at competitive cost and hence need technological upgradation as reflected in the seventh five year plan priorities.

Indian air transport system has significantly developed during planning period. It has been able to meet the rising pressure of passenger and freight traffic. Due to the constitution of Vayudoot and Pawan Hans, air transport services have become more specific and suitable for various purposes and conditions. Far-reaching structural changes have taken place in civil aviation after a massive acquisition programme, both for replacement of air crafts and for capacity build up. Most of the routes operated by Air India and Indian Airlines are incurring losses. Air transport being dependent mainly on import of aircraft and equipments from abroad and being also on fuel consumption puts a great strain on country's foreign exchange resources. Hence it is necessary that the rate of growth of domestic air services be moderated by appropriate pricing policy. It is important to ensure that civil aviation sector as a whole generates additional resources so as to be able to finance its

expansion programme without any allocation from the general exchequer.

In view of the past experience regarding investment and development pattern, the study concludes that transport investments and development policy should be guided by (i) sustaining economic growth; (ii) stimulating growth in less developed regions to achieve balanced development of the country; (iii) opening the country side so that it could be brought into the main stream of economic life and (iv) socialistic objectives of the country.

In addition a long term view of investment requirement should be taken due to very nature of transport system, i.e. - long gestation period, involved in building up transport capacity. It also requires that the scarce resources should be allocated among various modes of transport so judiciously, based on concrete study as to develop a coherent transport system to meet the aspirations of Indian Economy.

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in Transport Investment Appraisal, 1969.

A P P E N D I X

COMMODITY-WISE SHARES—TOTAL TRAFFIC

Sl. No.	Commodity	Commodity-wise Share (%) of Traffic in Terms of					
		Tonnes			Tonne-Kms		
		Railways	Highways	Total	Railways	Highways	Total
1	2	3	4	5	6	7	8
1.	Foodgrains	8.49	10.67	9.51	12.51	10.16	11.78
2.	Oilseeds	0.34	2.08	1.16	0.58	1.85	0.98
3.	Cotton raw	0.11	1.22	0.63	0.21	1.49	0.61
4.	Jute raw	0.04	0.22	0.12	0.05	0.31	0.13
5.	Sugarcane	0.16	0.38	0.26	0.03	0.20	0.08
6.	Tobacco	0.05	0.48	0.25	0.08	0.59	0.24
7.	Fodder	0.94	2.34	1.60	1.10	1.66	1.28
8.	Sugar & khandsari	1.33	2.86	2.04	1.82	2.56	2.05
9.	Fruits & vegetables	0.36	6.04	3.01	0.68	7.19	2.73
10.	Livestock	0.15	0.63	0.37	0.24	0.54	0.33
11.	Hides & skins	0.07	0.09	0.08	0.14	0.09	0.13
12.	Milk & milk products	0.0005	0.58	0.27	0.001	0.51	0.16
13.	Coal	40.72	7.36	25.13	37.58	8.34	28.39
14.	Iron ore	8.24	0.41	4.58	3.44	0.38	2.48
15.	Manganese ore	0.31	0.15	0.24	0.16	0.09	0.14
16.	Limestone & dolomite	2.63	1.13	1.93	1.84	0.84	1.53
17.	Gypsum	0.60	0.28	0.45	0.83	0.30	0.66
18.	Other stones	1.07	4.96	2.89	0.58	2.96	1.32
19.	Other ores	0.61	0.38	0.50	0.59	0.27	0.49
20.	Mineral oils	8.11	4.35	6.35	5.26	2.91	4.52
21.	Edible oils	0.35	1.21	0.75	0.63	1.54	0.91
22.	Iron & steel	3.60	4.90	4.21	5.51	5.87	5.63
23.	Non-ferrous metals	0.12	0.54	0.31	0.17	0.75	0.35
24.	Cement	7.55	5.33	6.51	6.58	3.62	5.65
25.	Building material	0.19	6.16	2.98	0.20	3.43	1.21
26.	Chemicals & drugs	0.23	2.35	1.22	0.40	2.92	1.19
27.	Chemical manures	5.47	4.25	4.90	6.96	3.06	5.74
28.	Paints & dyes	0.01	0.13	0.07	0.01	0.20	0.07
29.	Coaltar & bitumen	0.76	0.27	0.53	0.74	0.21	0.58
30.	Bamboo, timber, etc.	0.91	3.62	2.18	1.22	3.14	1.83
31.	Salt	1.57	1.02	1.31	2.80	0.89	2.20
32.	Tea, coffee, etc.	0.01	1.22	0.58	0.04	1.52	0.50
33.	Prov. & household goods	0.18	4.00	1.97	0.30	4.51	1.62
34.	Machinery & equipment	0.37	0.97	0.66	0.42	1.53	0.77
35.	Electrical equipment	0.13	0.66	0.38	0.21	0.90	0.43
36.	Tyres & tubes	0.02	0.25	0.13	0.03	0.41	0.15
37.	Leather manufactured	0.004	0.12	0.06	0.01	0.13	0.05
38.	Footwear	0.001	0.06	0.03	0.002	0.09	0.03
39.	Automobile & parts	0.002	0.18	0.08	0.003	0.36	0.11
40.	Cycle & cycle parts	0.004	0.11	0.05	0.007	0.23	0.07
41.	Cotton manufactured	0.02	1.25	0.59	0.04	1.70	0.56
42.	Jute manufactured	0.14	0.47	0.29	0.23	0.65	0.36
43.	Paper	0.31	1.10	0.68	0.53	1.36	0.79
44.	Other commodities	3.71	13.22	8.16	5.23	17.74	9.17
	Total	100.00	100.00	100.00	100.00	100.00	100.00

Source: GOI, Report of Steering Committee, Respective Planning for Transport Development, Planning

MODAL SHARES — RAILWAYS AND HIGHWAYS

Sl. No.	Commodity	Modal Share % Based on			
		Tonnes		Tonne-kms,	
		Railways	Highways	Railways	Highways
1.	2.	3.	4.	5.	6.
1.	Foodgrains	47.56	52.44	72.89	27.11
2.	Oilseeds	15.88	84.12	40.70	59.30
3.	Cotton raw	9.33	90.67	23.60	76.40
4.	Jute raw	16.60	83.40	23.96	76.04
5.	Sugarcane	31.97	68.03	23.12	76.88
6.	Tobacco	11.09	88.91	22.54	77.46
7.	Fodder	31.51	68.49	59.10	40.90
8.	Sugar & khandsari	34.58	65.42	60.84	39.16
	Agri.products (1 to 8)	39.22	60.78	65.51	34.49
9.	Fruits & vegetables	6.36	93.64	17.20	82.80
10.	Livestock	21.46	78.54	48.78	51.22
11.	Hides & skins	45.69	54.31	77.82	22.18
12.	Milk & milk products	1.10	99.90	0.49	99.51
13.	Coal	86.31	13.69	90.78	9.22
14.	Iron ore	95.79	4.21	95.20	4.80
15.	Manganese ore	70.22	29.78	79.67	20.33
16.	Limestone & dolomite	72.65	27.35	82.66	17.34
17.	Gypsum	71.16	28.84	85.86	14.14
18.	Other stones	19.78	80.22	29.88	70.11
19.	Other ores	64.65	35.35	82.62	17.38
20.	Mineral oils	68.01	31.99	79.79	20.21
21.	Edible oils	24.90	75.10	46.90	53.10
22.	Iron and steel	45.58	54.42	67.20	32.80
23.	Non-ferrous metals	19.54	80.46	32.93	67.07
24.	Cement	61.74	38.26	79.86	20.14
25.	Building material	3.48	96.52	11.05	88.95
26.	Chemicals and drugs	10.11	89.89	22.91	77.09
27.	Chemical manures	59.46	40.54	83.24	16.76
28.	Paints and dyes	8.42	91.58	11.87	88.13
29.	Coaltar and bitumen	76.13	23.87	88.58	11.42
30.	Bamboo, timber, etc	22.34	77.66	45.92	54.08
31.	Salt	63.65	36.35	87.29	12.71
32.	Tea, coffee, etc.	1.24	98.76	4.84	95.16
33.	Prov. & household goods	4.85	95.15	12.75	87.25
34.	Machinery & equipment	30.86	69.14	37.63	62.37
35.	Electrical equipment	18.24	81.76	33.98	66.02
36.	Tyres & tubes	8.54	91.46	15.79	84.21
37.	Leather manufactured	3.67	96.33	11.24	88.76
38.	Footwear	2.49	97.51	5.05	94.95
39.	Automobile & parts	1.26	98.74	2.09	97.91
40.	Cycle & cycle parts	4.20	95.80	5.94	94.06
41.	Cotton manufactured	1.61	98.39	4.36	95.64
42.	Jute manufactured	24.65	75.35	43.90	56.10
43.	Paper	24.14	75.86	46.04	53.96
44.	Other commodities	24.22	75.78	39.15	60.85
	All Commodities	53.27	46.73	68.58	31.42

Source: GOI, Report of Steering Committee, Respective Planning for Transport Development, Planning Commission, New Delhi, 1988

TRENDS OF RAIL AND ROAD TRAFFIC & RELATED VARIABLES

YEAR END MARCH	RLFRT BTKM	RLPAX BPKM	RDFRT BTKM	RDPAX BPKM	TLFRT BTKM	TLPAX BPKM	GNP BN.RS	IND INDEX	POP BN	UB. POP MN
1	2	3	4	5	6	7	8	9	10	11
1951	44	67	6	31	50	98	175	29	0.36	62
1952	47	63	6	31	53	94	178	31	0.37	64
1953	47	60	7	37	54	97	185	33	0.38	65
1954	48	60	7	40	56	100	197	36	0.38	67
1955	52	62	8	43	61	104	202	38	0.39	69
1956	60	62	9	51	69	113	209	39	0.40	70
1957	66	67	10	45	76	112	220	43	0.41	72
1958	75	69	12	41	86	110	216	46	0.41	74
1959	76	68	13	64	90	132	234	50	0.42	75
1960	82	74	15	71	97	144	238	50	0.43	77
1961	88	78	17	81	105	159	254	54	0.44	79
1962	91	82	21	87	112	169	263	60	0.45	81
1963	101	84	25	96	126	180	268	66	0.46	84
1964	107	89	27	106	134	195	282	72	0.47	87
1965	107	93	31	117	138	210	304	78	0.48	90
1966	117	96	35	124	152	220	288	83	0.49	93
1967	117	102	39	139	156	241	291	87	0.50	96
1968	119	107	43	158	162	265	316	91	0.51	99
1969	125	107	47	172	172	279	325	94	0.52	102
1970	128	113	52	189	180	302	345	98	0.54	105
1971	127	118	57	210	185	328	365	100	0.55	109
1972	133	125	62	225	195	351	370	106	0.56	112
1973	137	134	51	223	188	356	366	109	0.57	116
1974	122	136	54	257	176	392	385	112	0.59	120
1975	134	126	56	293	190	419	390	114	0.60	123
1976	148	149	59	308	207	457	428	120	0.61	127
1977	157	164	65	318	222	482	431	134	0.63	131
1978	163	177	68	397	230	573	468	140	0.64	137
1979	155	193	76	409	231	602	496	144	0.66	143
1980	156	199	84	421	240	620	472	148	0.67	151
1981	159	209	98	543	256	752	507	154	0.69	160
1982	174	221	113	595	287	815	535	167	0.70	166
1983	178	227	129	597	307	824	549	174	0.72	172
1984	178	223	145	674	323	897	593	183	0.73	178
1985	182	227	161	739	343	965	614	197	0.75	185
1986	206	241	193	850	399	1091	643	210	0.76	192
1987	223	257	210	893	433	1149	668	229	0.77	201

- Rlfrt = Rail Freight Traffic in Billion Tkm.
 Rlpax = Rail Passenger Traffic in Billion Pkm.
 Rdfrt = Road Freight Traffic in Billion Tkm.
 Rdpax = Road Passenger Traffic in Billion Pkm.
 Tlfrt = Total Freight = Rlfrt + Rdfrt.
 Tlpax = Total Passenger Traffic = Rlpax + Rdpax.
 Gnp = Gnp at Constant 1970/71 Prices.
 Ind = Index of Industrial Production (Base 1970/71).
 Pop = Total Population in Billion.
 Ub. Pop = Urban Population in Billion.

Source: GOI, Report of Steering Committee, Respective Planning for Transport Development, Planning Commission, New Delhi, 1988