

**VISION 2020**

**TRANSPORT**

**Prepared for the Planning Commission by**

**Mahesh Kapoor**

**October 2002**

# TRANSPORT AND ECONOMIC DEVELOPMENT

## Introduction

20<sup>th</sup> century revolution in transport has made us aware of the relationship of immobility with poverty with transport innovations influencing most profoundly the pace and growth of economic development. Obstacles to movement restrict the market, increase production cost and raise prices beyond competitive reach of the consumer.

The total world of transportation is not only too large but of great scope, diversity and complexity. Transport comes into play for everything and remains an essential part of everything, remaining as various as life itself. The great difference between modes is obvious enough but the more subtle differences that exist between groups and classes can be even more important in their consequences.

## Modes of Transport

For nearly a hundred years, the railways remained the dominant mode for land transport and continues to remain the land carrier that can carry anything anywhere the rail tracks go and do it at a cost lower than other types of land or air transportation. Today, other modes have developed providing transport more effectively and efficiently. Pipelines for the movement of liquids, aircraft for high speed long distance travel and trucks offering speed, flexibility and door to door service for short and medium levels provide better alternatives. All these have effected the market share and role of different modes of transport.

The fluctuations in demand for transport services can be rapid, both in volume and in direction. There could be an almost chronic imbalance between supply and demand in many services, at any rate, over the short term. This causes both pricing and operating problems. It is sometimes a question of too little or too much. Unlike many other sectors of the economy, transport can neither be stored nor traded and to meet the peak demands of traffic extra capacity needs to be created, which necessarily idles in the non peak periods.

The shrinking of the world paradoxically increase transport volume and demand with more exchange of goods. Enterprises which are efficient and flexible, which move with the changing times and provide appropriate technologies and remain commercial in their attitude, will survive and continue to have an important role to play.

### Investment by State and Private Sector Participation

A transportation network makes the markets more competitive while the system widens the opportunities for suppliers and buyers and improves the allocation process of goods and services. The supply of transport is a mix bag of public and private entities. The highways are provided by the state while most of the vehicles using them are private. Airports, provided by the government with aircraft both in the private and public sector. Most ports have been developed by the state while ships using it could be public or private owned. Railways, is the only exception, which provides the way and the vehicles as one integrated entity.

Where profits can be made, responses of the private firms are high, subsidies on the other hand tend to continue with vested interest and through political pressure. Subsidized services pursue objectives that often differ from the aims of economic efficiency and transport services sometimes used for redistribution of income from the general tax payer to the user of subsidized transport operation.

Government comes a great deal into transport affairs and is inevitably closely involved in questions of infrastructure and space. Provision of transport infrastructure calls for state intervention to ensure long term economic development.

As there is no effective way of reducing risks in fixed infrastructure, only the state is in a position to cover the risks. Investments that require long term finance like building of roads, ports, railways, have a high degree of market failure in these activities and have to remain the responsibility of the state. To bring in private sector participation for investments in infrastructure presents the policy makers a task to create an entirely new system of incentives, risk and profit sharing.

## GROWTH OF TRANSPORT NETWORK AND DEMAND

### Transport network and systems

India's transport system is one of the largest in the world serving the land mass of 3.3 million square km and a population of over one billion. The network for the services comprise mainly of roads, railways and air services. The 6000 km coast line has 12 major and over 150 minor ports. While the ministry of Railways is responsible for running of the rail system, the highways are the joint responsibility of the Central Ministry of Road Transport and Highways (for National Highways) and the State Governments (State Highways, District and Rural roads). The Ministry of Civil Aviation looks after Airports and the Ministry of Urban Development responsible for Urban Transport.

The growth in the network of transport and the demand for transport services in the last 50 years has been quite significant as can be seen from the figures given in Table 1. Currently, about 800 billion tonne kms of freight and 2300 billion passenger kms<sup>1</sup> is handled by the transport system, with the total transport demand growing at around 10 percent a year in the last 10 years. The modal growth rates have varied with road transport and air services growing at a much higher rate than the railways.

Railways which had a market share of 88% of freight and 68% of the passenger business in land transport in 1950-51 has come down to about 40% of freight and about 20% of passenger market share in 1999-2000 while road transport has moved from 12% to 60% in freight and from 32% to 80% in the passenger business in the same period.<sup>2</sup>

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<sup>1</sup> Estimated by Planning Commission. World Bank Estimates (Report May 2002) mention 870 billion tkms and 2450 billion pkms.

<sup>2</sup> While Railway data is available for pkms and tkms those for the roads are estimates. Road data for example for the year 2000 varies from 540 to 1000 btkms and 2000 to 4000 pkms.



**TABLE 1: PROFILE OF TRANSPORT SECTOR**

S.No.	Item		1950-51	1960-61	1970-71	1980-81	1990-91	1995-96	1996-97	1997-98	1998-99	1999-2000
1	<b>RAILWAYS</b>											
1.1	Route Length	Kms.	53596	56247	59790	61240	62367	62915	62725	62495	62809	62759
1.2	Electrified Route Length	Kms.	388	748	3706	5345	9968	12306	13018	13490	13765	14261
1.3	<b>Throughout</b>											
1.3.1	Freight Traffic (Total)	M. Tonnes	93	156.2	196.5	220	341.4	405.5	409.02	429.4	420.9	478.2
1.3.2	Net Tonne (Kms.)	B.T.Kms.	44.12	87.68	127.36	158.47	242.7	273.52	279.99	286.77	284.27	308.04
1.3.3	Passenger Originating	Million	1284	1594	2431	3613	3858	4018	4153	4348	4411	4585
1.3.4	Passengers Kms.	Million	66517	77665	118120	208558	295644	341999	357013	379897	403884	430666
2	<b>ROADS</b>											
2.1	Total of which NHs.	000 Kms. 000 Kms.	400 22	525 24	915 24	1485 32	2350 33.7	3320 34.5	2466 34.6	2540 38.52	2616 49.58	2695 52.01
2.2	%age of village with 100 +population connected with all weather roads	Percent	NA	NA	NA	29	45.8	85.7				
2.3	Surfaced Length	000 Kms.	156	234	398	684	1113	1517	1394	1422	1450	1479
3	<b>ROAD TRANSPORT</b>											
3.1	No. of Goods vehicles	In'000	82	168	343	554	1356	1785	2260	2529	2858	3229
3.2	No. of Passengers Buses	In'000	34	57	94	162	331	449	488	535	594	659
4	<b>MAJOR PORTS</b>											
4.1	No. of major ports	Numbers	5	9	10	10	11	11	11	11	11	11
4.2	Traffic handled	M. Tonnes	19.38	33.12	55.58	80.27	151.67	215.34	227.26	251.66	251.72	271.87
5	<b>MINOR PORTS</b>											
5.1	Traffic handled	M. Tonnes	NA	NA	6.69	6.73	11.27	24.36	24.93	38.61	36.31	62.52
6	<b>CIVIL AVIATION</b>											
6.1	<b>Indian Airlines</b>											
(i)	Available tonnes Million	Km	NA	113	208	663	927	1046	1075	1094	1123	1121
(ii)	Revenue Tonne Million	Kms.	NA	83	161	420	699	723	698	701	709	740
6.2	<b>Air India</b>											
(i)	Available Tonne Million	Km	NA	NA	515	1623	2260	2610	2452	2294	2394	2238
(ii)	Revenue Tonne Million	Km	NA	NA	275	980	1381	1619	1485	1454	1474	1457
6.3	No. of Airports and Civil Enclaves	Number	NA	NA	NA	84	117	120	120	120	122	122
7.	<b>INLAND WATER TRANSPORT</b>											
7.1	Length of Navigable Waterways	Kms.	14544	14544	14544	14544	14544	14544	14544	14646	14646	14646

## Loss of Market Share by Railways

Over the years while rail freight traffic continued to increase albeit at a slower pace, the more disturbing feature was the continuous loss in the market share. In a situation of less supply of transport and a high priority to the bulk traffic, the more cumbersome 'smalls' and wagon load traffic was gradually discouraged and the railway's unit of movement became a train load. This improved productivity, and the wagon fleet reduced substantially despite an increase in traffic. (Wagon fleet came down from 400946 in 1980-81 to 222147 in 2000-01, while the freight went up from 196 mt to 474 mt in the same period) Bulk traffic also started moving on high capacity trucks while pipelines siphoned off the high tariff traffic petroleum products. Meanwhile to balance budgets and increase resources while keeping passenger fares low, the freight rates continued to be increased. Today on PPP terms, the tariff per tonne km on Indian Railways is about the highest in the world. If the Railways is to survive it must cut subsidies (including treating passenger fares as the holy cow), reduce freight rates and invest in capacity building activities and cut out non core activities and reduce its staff costs.

## Investment in the Sector

Investments made in the transport sector in the last 50 years is given in Table 2. Public investment in transport as a percentage of total expenditure has been declining almost steadily since the early 1960s when transport investment was allocated about 23.1% of the total plan funds. It declined to 16% till the mid 1970s and has been close to 12% in the 1980s and 1990s. Considering the developing nature of the country and the state of its transport system plagued with deficiencies, it seems justified to devote a larger proportion of the total resources to the development of this basic infrastructure.

TABLE 2: EXPENDITURE IN THE TRANSPORT SECTOR 1951-2002

(Rs. Crore)

	Ist Plan (1951-56)	IInd Plan (1956-61)	IIIrd Plan (1961-66)	Annual Plan (1966-69)	IVth Plan (1969-74)	Vth Plan (1974-79)	Annual Plan (1979-84)	VIth Plan (1980-85)	VIIth Plan (1985-90)	Annual Plan (1990-92)	VIIIth Plan (1992-97)	Xth Plan (1997-2002)
Sector	Exp.	Exp.	Exp.	Exp.	Exp.	Exp.	Exp.	Exp.	Exp.	Exp.	Exp.	Anti. Exp
Railways	217	723	1326	509	934	2063	714	6585	16549	10208	32302	46405
Roads & Bridges	147	242	440	309	862	1701	467	3887	6335	3656	16095	47600
Road Transport			27	55	128	503	143	1276	2151	986	3538	5933
Ports	28	33	93	53	249	488	57	725	1513	668	2302	5331
Shipping	19	53	40	32	155	469	147	468	720	939	3033	2909
IWT			4	6	11	16	6	63	188	57	152	280
LH&LS			4	2	6	9	2	*	*	4	25	58
Civil Aviation	23	49	49	66	177	294	132	957	1948	1055	7249	6958
Other Transport									72	118	244	1851
Transport total	434	1100	1983	1032	2522	5543	1668	13961	29476	17691	64940	117325
Tpt as %age of total plan	22.05	23.54	23.12	15.58	15.98	14.06		13.00	13.51	14.12	12.88	

\* Included under Ports Sector

From V Plan, Rlys outlays and expenditure include outlays financed from depreciation reserve fund.

From IV plan, outlays for metro transport projects also included.

Road transport does not include investments by the private sector in road vehicles.

The shortage of funds affected the roads to an extent that almost the entire National Highway system was deficient in pavement thickness while over 17000 kms of the 52000 km National Highway Network continued to be single lane. Fortunately recent actions have given a fillip to the National Highways and both the central and some state governments have begun reversing the declining trend and the low level of funding for this sector. Funding for the two main road agencies MORTH (Ministry of Road Transport and Highways and NHAI has been consistently increased over the past few years, the most important development being the implementation of a Central Road Fund (CRF), fully adopted in 1999, giving the fund an annual income of Rs. 50 billion. The CRF brings a new resource through a tariff of one rupee on each litre of petrol and high-speed diesel.



Railways internal resource generation increased with the budgetary support coming down. In the III plan the budgetary support was as high as 75% but then it came down to 15% by the 1980s and in order to keep the out lays high, Railways resorted to market borrowings.

The experience with market borrowings through IRFC has landed Railways in a debt trap. The payments to IRFC on 10 years borrowing has over shot dividend payments to general exchequer. There is already a net outflow form IR to the general exchequer and a similar situation in respect of IRFC was reached during 1995-96 and repeats are imminent.

### Urbanization

India's urban population according to the 2001 census was 285 million or 27.8 percent of the country's total population of 1027 million. The growth since 1951 is given in Table 3.

Table 3 India's Rural/Urban Population Growth

Year	Population (in million)			Urban Population Share (%)
	Total	Rural	Urban	
1951	369.09	306.65	62.44	17.29
1961	439.23	360.29	78.94	17.57
1971	548.16	438.17	109.99	19.91
1981	685.18	526.18	159.00	23.31
1991	844.32	627.14	217.18	25.72
2001	1027.01	741.66	285.36	27.78

Growing urbanization is a natural phenomenon and despite all its implications has beneficial effects on economic growth. Measures proposed or taken to decelerate urbanization or decongest the existing metropolises have not had much success and therefore pragmatism suggests that urbanization be treated as a catalyst for economic development and efforts made to facilitate securing full benefits out of this inevitable process.

One of the most daunting problems faced by the cities in the developing world is that of urban transport and failure to provide facilities increases trip times and costs both for passenger and goods traffic. A transport plan cannot be sensibly conceived without a plan for land use. Planning of transport must go hand in hand with land use planning and each city must involve itself utilizing its resources for housing, sewerage, health, education and transport.

While the rate of urbanization in India compared to other countries in the world has been quite modest (see Annexure 1) the increase in absolute terms from 62 million in 1951 to 285 million in 2001 has been phenomenal. An unwelcome feature has been the concentration of population in metropolitan and cities having a population of more than a million. The number of cities with a million plus population increased from 5 in 1951 to 35 in 2001. (List of these cities with populations is given in Annexure 2). While three cities have population of over 12 million, ten others have populations varying from 2.1 to 5.4 million.

The growth of cities has been haphazard, growing around a compact central core with industrialization and migration bringing about rapid change in the peripheral land use resulting in urban sprawl. No organized, viable and significant public transport system is available in the cities, except the four jumbo cities of Mumbai, Kolkata, Chennai and Delhi. Buses and rail transport system are the main stay of public transport in

these cities. Kolkata is the first city to have a metro system and New Delhi is on its way to provide a metropolitan transport system with rail tracks on the surface, elevated and underground. By 2005, a network of 62 kms in Phase-I of the project would provide an extensive system of urban transport in the city.

Lack of adequate public transport has resulted in a rapid increase in private ownership of vehicles, particularly two wheelers with consequent effects on pollution both noise and air. In most cities two wheelers comprise more than 70% of total motor vehicles.

Many agencies, at the central, state and local levels are involved in providing urban transport infrastructure and services. Roads by PWDs and to an extent by Municipal Corporations, Bus Services a combination of Public and Private operators, while suburban rail services are run by IR.

Despite all the attention and actions, urban transport in Indian cities is in a bad shape. Increased vehicle population have led to congested roads, slower speeds, increased fuel consumption and accidents on roads.

There is a great potential to open the bus services through contracting or franchising arrangements for many cities in the country. The private buses is a major input to providing services in Delhi, with running of chartered buses meeting a specific demand for schools and office complexes. To encourage people to leave the private vehicles and move to public transport, there is also a great potential for providing air conditioned buses on many routes in major cities. Operated in the private sector these buses could levy fares based on the market potential and need not be forced to charge lower tariffs that often result in also poor service.

Over the years, the demand for traffic has outpaced the rate of investment in urban transport infrastructure. Both the Central and the State Government have been unable to mobilize resources required by increasing fares or reducing subsidies. Lack of funds have not only affected additional facilities but maintenance of existing assets.

### Roads

The growth of road transport has arisen from the proliferation of the road network in the last 50 years, from 400,000 kms in 1951 to 3,300,000 by 2000 as detailed below

National Highways	52000 kms
State Highways	1,28,000 kms
District Roads, Other Roads and Village Roads	29,20,000* kms
Urban Roads	200,000 kms

\* Including about 900000 kms of earth tracks constructed under Jawahar Rozgar Yojana programme.

However, only 4% of the National Highways have four lane (or more) 66% are two lane while 30% is still one lane and the state highways have 1% four lane, 19% two lane and 80%, single lane.

National highway running through the length and breadth of the country connect ports, state capitals, industrial and tourist centres while the State Highways link district headquarters and important cities within the state.

The growth of traffic has been far greater than the growth of the Highways as a result the main arteries face capacity saturation. About 40% of the road traffic moves on the National Highways and another 40%

on the state highways. These Highways constitute about 6% of the total road length and call for capacity argumentation on an urgent basis.

Recent initiatives by the government has increased activity in this area and under the National Highway Development Programme, the Golden Quadrangle, 6000 kms in length connecting Delhi-Mumbai-Chennai-Kolkata-Delhi and the 7300 kms north-south and east-west corridors, connecting Srinagar to Kanyakumari and Silchar to Porbandar have been taken up on priority.

The National Highways are planned to grow to about 75,000 kms in the next 20 years, with four laning (or more) of all lengths where the passenger car units are more than 350,000 and two lanes for the remaining stretches.

For the high density routes around metro and other cities the need for expressways has been identified. Several sections of the National Highways are riddled with encroachments and ribbon development where widening of roads may not be a cost effective solution. 10,000 kms of Expressways are proposed to be constructed by the year 2020. Some Expressways like Mumbai-Pune, Bangalore-Mysore are already operational.

The Highways under the NHAI have brought in fast clearances of projects and are developing rapidly. It has also led to mechanization in road building to match the targets of completion. The funding for the National Highways has been put on a firm footing and the NHAI itself is looking at various other ways to add resources including laying a network of telecom along its route as the work goes on of upgrading the Highways.

## Road Transport

Road freight and passenger traffic have had a tremendous growth in the last 50 years. Although no reliable data is available of the actual traffic carried, several estimates have been made by different agencies often revealing wide variations. This is one of the major gaps in the transport data compilation and with road transport being the predominant mode, a system to compile data needs early consideration. The Indian Road Congress in their report have indicated data for road traffic and modal share as given in Table 4.

**Table 4: Growth of Road Traffic and Modal Shares'**

	1950-51	1960-61	1970-71	1980-81	1990-91	1999-00
<b>Passenger kms (Billion)</b>						
Rail	66	78	118	209	296	428
Road	23	57	169	407	859	1659
Total	89	135	287	616	1155	2087
<b>Freight kms (Billion)</b>						
Rail	44	88	127	159	243	302
Road	5	27	77	145	503	800
Total	49	115	204	304	746	1102

These are quite different from estimates of Planning Commission given at page 3. Some other estimates of road traffic are also given in Anenxures 3 & 4.

The population of goods vehicles has grown from 9,63,000 in 1985-86 to 26,00,000 in 1999-2000. Light commercial vehicles increased at a faster rate than the heavy goods vehicles.

An over all growth of all motor vehicles is detailed in Table 5.

**Table 5: Motor Vehicles Population Increase**

(000)

Category of Vehicles	1951	1998
Car, jeeps, taxies	160	5,000
Two wheelers	30	255,000
Buses	30	520

Trucks	8	2,050
Other vehicles	@	4,930

@ Included in Trucks.

Freight movement on roads is almost entirely in the private sector with more than 75% of the truck operators having less than 5 trucks. Only 6% of the transport companies have 20 trucks or more (CIRT Pune 1998). Even large transport companies resort to hiring of trucks from the small truck operators.

Road passenger transport originally started in the private sector and later through nationalization of passenger transport in varying degrees by States, public sector was introduced. In 1980-81 the private sector had 55% of the total number of buses, which through a deliberate policy of several state governments has now increased to 77% of the bus fleet at present.

The State Road Transport Undertaking (SRTUs) had a fleet of 1,16,000 vehicles on 31.3.1999. While the physical performance of the SRTUs have shown a consistent improvement, the revenues and expenditure have been such as to report losses consistently. Annexures 5 & 6 detail the financial and physical performance of SRTUs in the country. The losses on SRTUs will gradually make more and more private operators come in this area and the States may get out of this business in future.

### Rural Roads

A key component of rural development is the provision of roads for connectivity, access being important for social and economic well being. Families residing on road side enjoy better standards of health, have higher education opportunities, smaller sized families and higher ownership of assets, compared to those families living in remote villages.



Policy makers have given rural roads an important place in the planning process and several schemes at different times, including the Minimum Needs Programme, National Rural Employment Programme, Command Area Agency, Employment Assurance Scheme etc. have all contributed towards development of rural roads. Some of the schemes have been merged into the Jawahar Rozgar Yojana (JRY).

The concentration under these schemes was to provide earth tracks within the village while connectivity through all weather roads has still a long way to go.

Present status of accessibility of villages by all weather roads is given in Table 6.

**Table 6: Connectivity of Villages with Roads**

Population category	Total No. of villages	Number of villages connected by 1980	Number of villages connected by 1985	Number of villages connected by 1990	Number of villages connected by 1995	Number of villages connected by 2000
1500 and above	71623	37950 (53%)	49495 (69%)	59722 (83%)	65704 (92%)	71000 (99%)
1000-1500	58229	21970 (38%)	28732 (49%)	35362 (61%)	44120 (76%)	52000 (89%)
Less than 1000	459465	107324 (23%)	142020 (31%)	166311 (36%)	173837 (38%)	200000 (43%)
Total	589317	167244 (28%)	220247 (37%)	261395 (44%)	283661 (48%)	323000 (55%)

Note: Figures within brackets give the percentage of villages in each population category to the total number of villages in that category. The basis for population is 1981 census.

Source: Planning Commission. Last column gives quick estimates.

There are however, regional imbalances in the connectivity of villages. States like U.P., MP, Bihar, Orissa and Rajasthan and many hill States have low levels of village connectivity. Another issue is that of maintenance of these roads. A neglect in maintenance is self defeating as assets fall into disuse. One of the reasons for the slow progress in

connectivity was the insistence to provide all weather roads, rather than having roads that get washed every year (if they were ever constructed in the first place).

The Government has given a further push to rural road development by allocating 50% of the additional duty of Rs. 1.00 per litre on diesel exclusively for village connectivity. The Pradhan Mantri Gram Sadak Yojana (PMGSY) has been launched in December 2000 by the Ministry of Rural Development to achieve an all weather road access to villages with population above 1000 by 2003 and for villages with population between 500 and 1000 by 2007.

Of the 825647 habitations requiring connection under the PMGSY, those still unconnected are 162576. (Source Ministry of Rural Development)

#### INLAND WATER TRANSPORT (IWT)

The economic advantage of Inland Water Transport is well established, being a cheaper mode for transportation of bulk commodities particularly on longer hauls and between pairs of points located on the water front. However, despite 14500 kms of rivers and canals and three major waterways, the Ganga, the Brahmaputra and the West Coast Canal, totaling 2716 km, being declared National Waterways, the traffic carried on this subsector is only 1.5 billion tonne km a year (less than 0.2 percent of the total inland cargo market) At present, only about 5200 kms of major rivers and 485 kms of canals are suitable for mechanized crafts with bulk of the rivers and canals suitable only for country boats.

## LOOKING AHEAD

### Concerns

While the progress made in the transport sector has been significant, it has not been able to meet the growing demand, particularly in the last decade when the economic reforms triggered an unprecedented growth of Gross Domestic Product (GDP) by 6 - 6.5 percent. The coming years may have higher growth rates of 8 to 10 percent and with it the consequent increase in transport demand. The tackling of the existing deficiencies coupled with those coming with a higher economic growth rate, will bring a new dimension.

The existing issues and concerns, the unfinished tasks, the congestion and constraints in movement leading to higher transport costs will be some of the challenges to face as we look at transport requirements by 2020.

That the volumes of demand will be very high with a increase for both railways and road transport requiring not only massive investments but other actions, covering pricing policies, customer focus, terminal management, safety, transit times, organizational and other changes to provide adequate and efficient services for meeting the demand will be a main concern.

### Expectations

- Improvement in the transport networks
- Increase in productivity and economic efficiency in the field of transport
- Improvement in quality of transport

- Better frequency of services
- Enhancement of comfort levels and provision of facilities for the disadvantaged persons
- Control of environmental pollution and improving quality of the environment
- Control of noise nuisance and limiting degradation of the landscape.
- Increase in mobility – for the commuter, for work journeys and for recreation.
- Improvement of rural transport and providing accessibility
- Reducing transport transit times in general and at initial loading and terminal points
- Better use of energy
- Better and more humane cities with adequate urban transport
- Reduction in accidents and improved safety
- Improved customer service
- Diminution of trade obstructions

#### Issues for transport planning and thinking

- The increased transport demand for passenger and freight services.
- Increase in transport of finished products rather than bulk movement of unfinished goods.

- Customized transportation requirements with 'made to order' products increasing.
- Own vehicle travel .
- More transportation of long distances by Air, faster and bigger ships.
- Multi modal transport and supply chain management.
- Terminal Management
- Logistic service providers to manage supply chains.
- Increased containerization.
- Better roads, express ways, heavy-haul vehicles.
- Globalisation, regional links, global trade and economy.
- A web based society that may reduce travel for business and work.
- Borderless transport across states with less or no proper work aided by IT.
- Maintenance of assets
- Changes in technology.
- Increased Financial Resources.
- Cost based pricing, reduction if not elimination of subsidies. A framework for integrated transport policy.

## Transport Demand in 2020

Given the past rate of growth and anticipated GDP growth of 8%, the freight traffic growing at an annual rate of 8% is likely to reach 5490 billion tonne kms in the year 2020. The World Bank in their recent report have indicated a growth rate of 10 percent in the coming years. If a 10% growth is visualized the traffic demand would reach 10,056 billion tonne kms. It may be safe to assume that freight traffic is likely to be in the range of 5000 to 7000 billion tonne kms against 1100 bt kms in 2000. At the lower end of the range and assuming Railways have a market share of 20 percent in 2020 the rail freight traffic will be 1000 billion tkms against 308 btkms in 1999-2000, a more than three fold increase in freight traffic.

Similarly, the passenger traffic is likely to grow to 11,763 billion pkms in 2020 when projected on the basis of past trends and to 10,082 billion pkms when correlated with population growth. The passenger traffic demand thus is likely to grow more than 4 times in the next 20 years. The different segments in passenger traffic and the distribution between different modes is discussed separately for long distance, medium distance, short distance and commuter traffic.

## Freight Traffic

Some of the main trends in freight traffic would be the change in the energy industry and in heavy production. The total of manufactured products to bulk cargo will rise, with liquid bulk suitable for pipelines. General merchandise will have a much wider spread of points of origin and ultimate delivery and in much smaller consignments favouring smaller carrying units. Increased value of consignments will put a higher premium on speed of transit also to reduce inventories. A continuous and a close control on the transit will become essential. General merchandise

will need to be integrated with the manufacturer's other problems of marketing and distribution. The chain of distribution grouped together and called logistics of business will call for a higher degree of focus on customer services.

These changes together with the impact of other factors like energy efficiency, environmental pollution technological changes in each mode will require relooking at the market to identify the strengths that a mode may have and then provide matching services to meet the demand and increase its market share.

The main segments of freight traffic have movement of bulk goods and finished products for both long and short distances, and distributional traffic. Railways have a strength in the movement of bulk goods including for very short distance where merry go round services are brought in play. Finished goods requiring higher flexibility and better transit times have gradually been moving to the roads, more particularly, as Railways moved towards making train load as the unit of movement with continued increase in freight tariffs. As a consequence, even long distance freight traffic of finished goods started moving by roads. The high tariffs on rail also made investments in pipelines for movement of petroleum products more attractive.

### Passenger Traffic

Long distance passenger traffic in the country is presently served by railways and air services. The demand for air services may grow at a faster rate, with speeds being an important criteria in favour of air travel. Even today, between the two cities of Mumbai and Delhi, there are more people who travel by air than those on railways (all classes of rail travel put together) See Annexure 7. The big competition for this segment of the market between air and rail travel will bring in many changes. There will

be no point in increasing speeds on railways to attract this traffic as the cost of high speeds will make rail traffic reach levels when it will be not competitive. Overnight sleeper class travel would continue to be railways strength. So long as booking, reservations, comfort and other customer services are kept at satisfactory levels, railways would have a sizeable share of the total long distance passenger market.

In the range of medium distances, say upto 500 kms, with 4 lane Highways, connecting the country and with Expressways coming up close to the main metro cities and ownership of cars increasing, the bulk of the passenger travel may start moving towards 'own vehicle travel'. This is a phenomenon noticed all over the world. The railways with their fast inter city services will have an edge over air travel for this segment of traffic. The advantage of the high speed in the air may be offset by time consuming and off-centre terminals, making the medium distance passenger transport a big market for the railways, so long as it is safe, has a good frequency of service and reasonable comfort, penetrating into the city centres. Larger number of inter city services on frequent fixed time intervals between pairs of points will need to be the pattern. The future train sets would have higher levels of comfort, audio visual entertainment, telephone connections and developed to provide facilities like in aircrafts. This segment of the market will have a big role for bus services, particularly for such places where there are no rail connections. This market would also have luxury, deluxe buses plying between cities giving railways a stiff competition.

Short distance traffic is best suited by road transport save at places when volumes increase to very high levels and rail based mass rapid transport is the best alternative. Suburban rail services and urban transport services are akin in its operation and need, except that the intra



city services is the concern of the city specific while suburban services are run by Railways. These have been dealt under Urban Transport.

### Globalisation

Radical changes in the realm of transport and communications has sandwiched time and distance, shrinking the world into a global village. Stimulated by the best means of information, flows of trade, investment and finance, have broken the barriers of state policies to gain admission to different countries and participate in global economic activities. With the forces of science and technology moving ahead, the distances of time and space would shrink further. Satellites, computers and fibre optics would create the reality of a global electronic village, reducing business and travel for work, perhaps even reduce the shift from the rural to urban areas.

Borders between the countries would become more porous and differences between domestic and international issues would get blurred. Capital would move around the world much faster and technology and technical know how would become more easily available without waiting for governments to sanction or permit then.

Movement in the region will grow with a concerted effort made to develop highways and railways of international importance and to facilitate crossing of goods and vehicles at borders. Large emerging markets of countries like China, India, Indonesia is already attracting the interest of international business and manufacturing processes distributed over several countries making transport, of the final packaged product at the consuming point a major logistic exercise, helped by computerized information on markets and costs.

Globalisation of economies, a universal phenomenon has resulted in the integration of national economies at the regional and sub-regional

levels. The production system increasingly characterized by a new division of labour spread across national boundaries, making economies interdependent. A liberalized regime of trade and transport helped by electronic documentation and streamlined custom procedures have expanded the scope for international trade in goods and services, increasing demand for movement within and across national boundaries.

All this implies increased competition, which in turn calls for a more efficient means of transportation to reduce travel time and cost. Global trade demands 'just-in-time' and reliable delivery ensuring quality of cargo. While hitherto maritime transport has been the main facilitator of globalisation, land transport has started to play an important role.

The Asian Highways and the Trans Asian Railways has commitments of all the countries in the region to open up routes that would facilitate intra-Asian trade and link and integrate with the markets in Central Asia, CIS Countries, Europe and North America through land-cum sea links. Some studies have shown that transit times using land-cum sea routes could be 7 to 10 days shorter compared to the sea route.

With the advent of the container, multi-modal transport will play a greater role with logistic service providers, all the time looking at the time and cost advantage in the supply chain. One of the main benefits of looking at systems to meet international quality is the big rub off effect it has on the movement of domestic transport.

### Terminal Management

The total volumes of freight traffic would need a new concept in terminal management. The terminals of the future would need to have both rail and road interface as well the facilities to deal with containers. The clubbing of small consignments for dispatch and on receipt for distribution, will be of paramount importance. Even the heavy duty trucks

will not be able to go to the city centres and collection and distribution of truck traffic (contemplated at present through Transport Nagars) will be through these terminals with smaller and light vehicles doing the distribution in the city. These terminals could be operated by the public sector, or as a joint venture or by the private sector. The establishment of Container Corporation (CONCOR) has shown the way for moving piece meal traffic efficiently and providing customer satisfaction. Aided by information technology to give an account of the location of the cargo in real time, with simple and reduced documentation, these new terminals will be managed as independent entities and run on commercial principles to bring both efficiency and profits. Already railways have floated the idea of inviting private sector in the setting up of privately owned and operated goods terminals. The new terminals will have facilities to handle multi modal transport with rail and road links, adequate warehousing, state of the art handling systems and IT backup for logistic services.

The role of multi-modal transport will increase as it combines the strength of the various modes of transport. Containerization is the most important element in multi-modal transport as it combines the flexibility of road, the reliability of rail, the economy of shipping and the speed of air transport.

The future terminals would need to be developed using the hub and spokes concept to consolidate and distribute traffic.

### Technology

Notwithstanding the fundamental importance of users and markets, and of service regulation, in the development of individual transport enterprises, it is the wonders of transport technology that catch the public interest. It is the fascinations of actual operations that absorb many of the providers. The periodical technical revolutions over the years has been of

vast importance in the development of transport, with the big break through coming often from the industries outside transport. While railways have been responsible for a good measure of development, in other modes, there is little technological development by the carrier. The supply industries has produced the ideas and the equipment. The suppliers of airfields, roads and ports have found the greatest reduction in “unit costs per movement”.

Transport technology is of special significance in transport planning both for logistics and usage. The changes in technology by upgrading and uprating meet the fast increasing requirements of transportation bringing economy and efficiency, energy conservation and expedition in mobility.

The main concerns will be to have maintenance free equipment, providing safety on railways and highways, in handling systems, in reducing pollution, using IT for processing data and computers for improved designs.

The progress in transport technology during the last several decades all over the world has been both startling and phenomenal. In many of the worlds systems, in view of the enormous strides taken by both road motor transport and civil aviation, railways have lost a significant share of the market while a mode like inland water transport has become un-economic and non profitable.

The future technology changes would have software and logistical improvements and system changes to improve productivity. Advance information and communications technologies and tailoring new materials to meet prescribed requirements will have a major impact.

The Highways will show much technological change on the next two decades by way of a new generation of express ways, modernization of construction practices and better traffic management. The need is also to

catch up on years of under maintenance, especially in view of the heavier loads anticipated and for adoption of new technologies in maintenance.

### Integrated Transport Policy

Transport planning cannot be a disjointed effort and has to view the totality of demand, cost, supply, return and in each mode, the relative levels of efficiency and productivity. This would involve economic costing and physical planning in the context of the overall systems requirements. A choice between different modes of transport with its quantitative and qualitative limitations are often not entirely interchangeable. The liberalization of the economy recognizes the need for an efficient transport system providing an adequate and reliable transport infrastructure. An overall and integrated policy therefore needs to be in place to encourage competitive pricing and coordination between different modes.

The Planning Commission has recently (October 2001) provided such a policy framework detailing objectives, direction of growth, expansion of the network, modernization and technology upgradation role of the private sector, improving financial resources and capability, defining areas of concern in each mode of transport. This framework would be of great relevance in developing the transport needs for the future.

### Maintenance of Assets

With the transport network increasing significantly particularly the roads, maintenance will be the biggest challenge. It will be necessary to maintain these assets by adequate and timely maintenance. At present the maintenance of the highways suffer from under funding and outdated maintenance methods and organization. As maintenance of the roads go down, vehicle operating cost go up. A very important factor is the overloading of vehicles. Studies have revealed that the damaging effect of an overloaded vehicle to the pavement increases exponentially to the power

of four when the axle load exceed the load for which it is designed. Overloading of vehicle will need close monitoring. The construction of the highways has presently brought in new equipment through the contractors who are building the National Highways and Expressways using mechanized means which will be available for better maintenance. Whether National Highways, State Highways or Rural roads, an organization for systematic maintenance will have to be brought in position.

The maintenance of roads would require a coordinated institutional framework involving the government institutions, the contracting industry, the equipment industry and the consulting organizations.

Likewise for the Railways adequate funding must be provided to the Depreciation Reserve Fund which caters to renewals and replacement of overaged assets. Presently a sum of Rs. 15,000 crores as a special funding for safety works on Railways has been provided to wipe off the arrears of track renewals, upgrading and rebuilding of bridges and replacement of rolling stock. It should not be necessary for special funds but a regular inflow of adequate funds for this purpose must be provided on a year to year basis.

#### ENERGY AND ENVIRONMENT

The importance of an adequate transportation and communication network has been appreciated afresh. However, creation and continued utilization required substantial recurrent use and absorption of natural resources of land and various kinds of energy. The use and abuse of the transport infrastructure leads to severe pollution of air, land and water causing degeneration of the environment. Transport planning must strive for an ecological balance.

The Transport sector is one of the major consumers of energy and the road transport sector fully dependent on liquid fuel. The massive increase in the number of vehicles will not only consume more fuel but also cause pollution. Both technology and regulation will be necessary to have more fuel efficient engines which are less polluting. Transport also involves broader environmental issues. Land intrusion and congestion are some of the areas of conflict between transport and environment. It would be essential to cover environmental concerns at the planning stage itself to reduce the negative impact of the growth in the transport sector.

There are several organizations campaigning for the protection of environment, ecology etc. and a growing public awareness on these issues. The long term consequences for the development of transport enterprises will not be negligible and the transport sector will have to pay far more regard to subject of noise, fumes, spoiling the landscape in future.

On this count the more energy efficient and less polluting mode, railways, will have an edge and a scoring point to improve its market share in the transport business.

### Data Base

Despite recommendations of various committees, the traffic flow and cost data is not collected in a systematic and regular way. There is no reliable information on the quantum of traffic carried by road transport either for freight or for passengers. Several estimates have been made by different agencies and the variations between them often as high as 100%. For the most dominant mode of transport lack of this important data affects the planning process adversely. With the growing use of computers and advancement in information technology, a concerted drive would be necessary in this direction. The check posts and barriers in some cases are inevitable, and these could be used for capturing the data on a regular

and systematic basis. Help from several institutes of transport training and research could be sought in developing such a system.

Also lack of good processed data leads to inadequate maintenance management and costly decisions.

There is need to improve the costing information on railways, which would help in concentrating on the market segments that are profitable and also to identify clearly the loss making services and the quantum of loss, so that the decision to retain, or the price to be paid by the agency wanting the services to run or to contract it to enterprises who could run it better by reducing losses or predetermined terms for running of such services, could be taken.

### Financial Investments and Pricing

To meet the transport needs of the future, investment requirements will increase to levels three to four times higher in real terms from the present levels. The financing of this level will be a massive task. While the government will continue to be a major source of funds for infrastructure, internal generation of resources by the sector itself will have to increase. Pricing of transport services and reduction in the costs will have to play a much bigger role than in the past. A larger role of the private sector is also visualized.

In a maze of subsidies and social service obligations public sector transport has lost the importance of commercial operations. Subsidies must be direct and explicit and a redistribution of income through the transport sector not attempted<sup>1</sup>.

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<sup>1</sup> More than 20 years ago the National Transport Policy Committee said “we do not visualize in our scheme of things any need for a general subsidy for transport”.



Quick and corrective action is required. Particularly in the case of railways where the decade of the 1990s has been a financial disaster. With an increasingly competitive environment in the world, and changes in government policy, railways will have to become a commercial entity, making investments only in such projects that give returns to cover the cost of funds in the market regardless of whether they are raised directly by the railways or through the Central Government. It is also not important whether a transport entity is a wing of the government, a public sector enterprise or a private venture, it must be commercial in its attitude and operations.

Public transport organizations have stayed too long with the cost plus tariff policies (although often not even covering costs) without much emphasis on reduction of costs. Cross subsidization by freight of losing passenger services on the railways for example has made IR's freight tariffs one of the highest in the world, driving out the business from rail to roads. With the 4 laning of the 'Golden quadrilateral' and the North South and East West connection, the roads will offer even a higher competition and unless Railways wake up to this reality, it will be in serious trouble.

While the Central Road Fund (CRF) has become the main lever for development of roads, making toll roads, private sector participation in Expressways and a rational user charge to the road user be necessary for the development and maintenance of roads. Investments in vehicles is mostly in the private sector except for State Road Transport undertakings which is fast coming down and being replaced by the private sector.

Development of new Airports must be taken up with private sector participation and while some of the minor ports have been developed by the private sector there is need to involve the user and the private sector in providing handling systems at the major ports.

Innovative methods would be required in each sub sector of transport to find ways and means of increasing resources for investment and to reduce costs and increase profitability to plow back the resources for growth and improvements in the services.

### Roads and Road Transport

Road transport will continue to be the dominant mode in the sector. By 2020 the Golden Quadrilateral of Delhi-Mumbai-Chennai-Kolkata-Delhi and the link from Srinagar to Kanyakumari and Silchar to Porbandar will have 4 (or more) lanes of the National Highways and close to the metro cities some 5000-10000 kms of Expressways. The volume of traffic would have grown 5 times over present levels, with as much increase in the number of vehicles and HSD consumption. This will pose a serious challenge in the operations of movement.

The CRF will continue to be the main source of funding but other areas for increasing resources must be tapped, more importantly to tackle the problem of maintenance.

Action will have to be taken to reduce the time losses at borders/barriers/ check posts. Some of these are inevitable but through use of IT the flows could be smoothed.

Collection and compilation of data for road transport is another weakness which will have to be tackled.

Some of the other areas for attention would include:

Ribbon development and problem of encroachments.

The door to door service on road transport would under go a change with multi axle vehicles being used and its entry restricted in the cities. Long distance movement through Transport Nagars (new

terminals) and further distribution through light commercial vehicles.

Over loading of vehicles would need to be monitored closely.

With increased passenger travel on the Highways, there would be a need to develop road side amenities.

Improved safety on the roads, through technological inputs in vehicles, designs and traffic engineering and through education and training.

Encouraging private sector participation and toll roads.

Review road user taxes and charges for raising additional revenue.

Ensure adequate capacity for manufacturing Trucks and Buses and reducing the growth rate of population two wheeler in cities through better public transport.

### Urban Transport

Increased population and ongoing rapid urbanisation is likely to take India's urban population to around 540 million in the next two decades and the cities with population of a million plus close to 70. At the rate we have been going, the two wheeler ownership rate in Class I cities (population over 100,000) may grow from 102 per 1000 population to 393 per thousand population by 2021<sup>1</sup> and cars from 14 to 48 by the same year. To contain this explosion of personal vehicle movement in cities, a very heavy dose of investment in public transport services will become necessary.

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<sup>1</sup> Theme paper prepared by institute of Urban Transport (June 2002).

A policy framework supported by institutional arrangements to implement must accord explicit priority to mass transport over personalized motor transport with all new facilities in urban infrastructure created and designed to primarily meet this priority.

In the long term, rail based mass transport system would appear to be the only answer to the problems of urban transport in the metropolitan cities of India. Where the flexibility of land use is possible, electrified surface rail transport can be adopted. The technical options are however limited in case of highly developed and congested areas. A choice of underground or elevated systems will have to be considered in such situations. This system is also best suited from the point of view of conservation of liquid fuels and environmental preservation. On medium density corridors, systems like electric trolley buses or CNG operated buses may be best suited.

Since the task in Urban Transport in the coming years will be a major one with nearly 70 cities with population of a million plus, specific plans for each city would need to be taken up by the city authorities starting with the provision of bus services, developing intermediate public transport and identifying corridors for future growth, including reserving land for such activity.

No single solution will be applicable to all cities and each city will have to develop its own system taking the developmental characteristics and geography of the specific city. A judicious mix of two or more modes may need to be adopted, depending on the total transportation capacities required to meet the demand.

There is need for an integrated approach in land use planning and planning for infrastructure especially transport to tackle the problem of

urbanization. Transport can be a very effective tool to shape the growth of a city.

For the metropolitan cities, where specific urban development organizations exist, they should develop rail based mass transport systems. A plan should be drawn out to collect resources through property tax, from establishment owners, through special funds, from road users, including a levy on fuel for the specific purpose of developing urban transport and to this fund add assistance from the State and Centre. A scheme with all three contributing equally could be considered as a matter of policy.

The lack of financial resources is the single most important constraint in the way of undertaking any meaningful planning programme of metropolitan transport development, projects being highly capital intensive and have long gestation periods. Several schemes prepared for many cities continue to remain on paper. While in most countries, urban transport investments and operations are funded by the federal and local governments and through some private investments, it has not worked well so far in India. There is now a general acceptance that rail based urban transport facilities could be created on the basis of cost sharing between the Central and State Governments and projects in Mumbai and Chennai are examples of success. Delhi metro project has also developed on the concept of cost sharing.

Once funding is taken care of on principle, a corporate structure could be adopted and this could be achieved through special purpose vehicles. The Delhi metro model could well be used by other cities. Property likely to be developed as a consequence of the project itself could give commercial return and help in the investment for both building and running the metro. A constitutional amendment to shift rail based urban

transport system to the concurrent list would be necessary if state governments have to discharge their obligations.

The basic problem has been that urban transport is not yet recognized as the responsibility of the city and ends being the secondary responsibility of several agencies in the state and at the centre. City being the beneficiary as well as the victim (when there is no efficient transport system) must carry the primary responsibility. The city can involve itself at an early stage and integrate housing and other developmental plans keeping the transport plan in mind and more importantly reserve land for future traffic corridors which when available on surface can bring down cost of projects very significantly.

State governments and central government can assist through funding, providing technical guidance, and a joint dedicated and cooperative effort can deliver the goods.

There is an alternative to the growth of cities. With technological inputs in IT, it may well be possible to let office and office type jobs be done in and close to the villages and not requiring migration of population. This will also reduce the pressure on housing in cities. The suburban habitat will combine the transport and telecom connectivity of a city with the spaciousness of a village.

### Rural Roads

Several schemes, together with high priority accorded to this main idea of providing accessibility in the rural areas, to help improve the economy in backward areas and to reduce migration from the villages to the cities. With information technology developing fast, its inroads in the rural areas is likely to change the entire pattern of growth. Also with the plans already in place, by 2020, it would have achieved its objective of reaching the last man in the farthest village.

While the roads are likely to be in place the main area of concern will be the maintenance of these roads. Institutional arrangements will have to be put in place together with the regular funding for this activity. Unless this is done, the assets created may not last long.

### Railways

Even with a reduced market share, both in freight and passenger traffic, the demand for rail transport in 2020 will be more than three times the level of freight tariff carried now and more than double the passenger traffic. This massive increase will warrant a heavy investment in capacity building on the railways. Railways will continue to be a dominant mode for movement of bulk (pipelines may take the traffic of petroleum products) and must strive to retain and increase its share in the business of finished products atleast over long distances. A more energy efficient and less polluting mode than road transport, railways initiatives through a focus on the customer, offering reduced freight tariffs and custom built services to suit specific needs.

In the passenger business, railways will lose some share in the long distance travel to airlines and should deliberately curtail its loss making short distance commuter type traffic and traffic on branch lines. This will bring in sharp focus the Railways big role in medium distance intercity traffic with journeys upto 5-6 hrs, where the door to door timings for such distance would compare favourably with airtravel. The services are presently met by Shatabdi type train services which need to be increased with higher frequency between pairs of such points. In this segment of the market, however, the own vehicle travel is likely to have the biggest share with highways and expressways coming and the population of people owning vehicles growing.

Some of the areas of concerns and key issues for the railways would be:

### *Capacity*

Increase capacity on the quadrilateral by additional tracks making these corridors with quadruple lines and provide capacity ahead of demand.

Improve asset reliability, using technology to have maintenance free rolling stock.

Reduce speed differential between passenger and freight trains.

Run freight trains at 100 kmph acquire new rolling stock fit to run at 100 kmph and retrofit existing stock.

### *Increase market Share*

Innovate and increase market share with a focus on the customer through better customer service using freight operation information systems, make provision of siding attractive through user friendly rules and operations.

Reduce freight tariffs

Adjust passenger fares and make it cost based

Improve costing to charge realistic tariffs.

Improve customer services and focus on customers' needs. Railways must be run as a market driven commercial enterprise.

Have a proper pricing policy



Customer driven services integrated logistics, reliable and guaranteed transit times, tracking systems with customer friendly interface.

Increase market share through market research and offering new products and services.

Develop terminals on a hub and spokes concept to handle wagon load traffic and use IT for consolidation and efficiency

### *Investment and Costs*

Stop uneconomic investments

Reexamine and review all on going projects and stop those that are unrenumerative.

(The white paper on projects issued by the ministry of railways in July 1998 stated that for completing the already sanctioned projects Rs. 35,000 crores will be needed and of these, projects costing over Rs. 23,000 crores were non viable. These nonviable projects not only have unsustainable capital costs but when completed of having perpetual operating losses).

Concentrate on core business of running trains

Take off peripheral activities – booking, reservations, terminal management etc. from main stream – use public or joint venture or private entities (CONCOR experiment is a big success).

Review rate of electrification and gauge conversion projects.

Invest only on projects that give a return

Reduce man power

Upgrade skills of the manpower.

Introduce technology to reduce accidents caused by human error and to improve productivity restructure loss making branch liner operation by giving it to the agencies that want such services to be run and give it on contract at the lowest costs for operation.

Encourage private sector investment – make ‘own your wagons’ attractive for the investor.

Provide funds for renewals and replacements

### Airports and Air Services

Shipping once the main mode for movement between countries has now given way to airlines and perhaps by 2020, passenger traffic in space will get established. International travel to and from India, with the growth in economy and due to globalisation will increase at a very fast pace.

Long distance domestic travel by air has also been growing at a very fast rate and it has already made inroads in the market share of the domestic long distance travel. As mentioned earlier, even today, more people travel by air between Delhi and Mumbai than by all classes of rail travel. It is perhaps true of other long distance pairs of points in the country. With the entry of private air lines this mode is developing fast and will provide competition to the once dominant long distance rail travel.

Medium and short distance travel would have a market only in inaccessible areas like the north east. In other areas rail intercity services and travel by personal vehicles will be more dominant.

Airports for international travel have reached traffic at levels where augmentation is necessary. The four major airports need to be developed

to international standards which can be done with private sector participation.

With increased international travel more airports would need to cater to this traffic and more airports cleared for international flights.

### Ports

Traffic at the ports have been increasing rapidly and one major port of the standard of Singapore or Colombo will have to be developed to meet the growing needs particularly of traffic in containers. A modern port with the facilities to deal with large container ships, with fast clearance by rail and road transport to meet the needs of the inland container depots, and other main terminals will be one of the major tasks this sector. Existing ports would also need modernization and augmentation of capacity, while private sector participation in developing minor ports for coastal movements and special customer traffic could add to the overall port capacity.

### IWT

The development of waterway got an impetus with the setting up of the Inland Waterways Authority of India (IWAI) in 1986 and has been entrusted with the task of maintenance and regulation of national waterways in the country. There is a great potential to increase the cargo movement on the national and other waterways and reduce fuel consumption and costs. While the sector has been given a boost at the policy level on promotion of IWT, it needs a thrust at the operational and executive level. With the proposal to connect the rivers with a network of canals there will be an opportunity to plan and provide for channels that will enable the movement of cargo through inland water transport systems.

## VISION 2020

A well developed network of roads and railways, with adequate capacities to handle the transport demand.

A network of 70,000 kms of National Highways with the golden quadrangle of Delhi-Mumbai-Chennai-Kolkata-Delhi and the north-south link between Srinagar and Kanyakumari and the east-west link from Silchar to Porbandar with four or more lanes and the rest of the network on two lanes, the State Highways connecting districts with at least two way lanes would be in position. The rural roads providing accessibility to the last man in the farthest village for the growth of the economy and telecommunications available to avoid the villager having to move to the cities for work. Technological progress to provide vehicles which are pollution free and fuel efficient. Reduction in the two wheeler population in the cities with an efficient public transport system.

The railways provided with capacity ahead of demand on the system and on its main corridors to carry the three fold increase in traffic. A focus on the customer with better and customized service, a reduction in freight tariffs, elimination (atleast reduction) of the uneconomic services and subsidies. A reduction in costs and a commercial attitude to get return on the investments, and elimination of investments in non paying projects. Comfort and safety in travel. Generating resources to expand and improve services.

Adequate capacities at Airports and Harbours to provide efficient service. Airports of international standard for passenger and cargo handling and modern handling system on Ports to reduce delays in berthing. A gateway port of the type at Singapore and Colombo to deal with the growing traffic.

Having institutional arrangements in place with adequate funds for proper maintenance specially of roads, where an expanded network, will make the maintenance tasks important and big.

A reasonable urban transport service in all the major metropolises and in all cities with population of a million plus with systems to monitor and provide continued increase in services to meet the demand.

The envisaged connection of the tributaries of the rivers through a network of canals will provide an opportunity and an impetus to increase the potential and growth of IWT.

Modern terminals, with IT backup to provide a quick service and be an integral part of the logistics of reliable and guaranteed transit times.

Quick flow at barriers and borders, again IT aided, also to help in compiling reliable data on the flow of traffic.

Generation of internal sources in each mode, an effective system to collect user charges in conformity with costs, and a net return on the operations through cost based tariffs. Increased private sector participation.

Available routes on highways and railways in the region to promote international trade.

A coordinated growth in all modes of transport within the framework of an integrated transport policy with institutions and organisation in the sector where control and responsibility are at the working level and structures that have morale, elan, imagination and leadership.

**Share of Urban Population in Selected Countries  
(Percent of Total)**

Country	Year	
	1980	1999
Argentina	83	90
Australia	86	85
Belgium	95	97
Brazil	66	81
Canada	76	77
Chile	81	85
China	20	32
Egypt	44	45
Germany	83	87
India	23	28
Indonesia	22	40
Iran	50	61
Japan	76	79
Malaysia	42	57
Pakistan	28	36
Spain	73	77
Sweden	83	83
U.K.	89	89
U.S.A.	74	77
Zambia	40	40

Source: World Bank – World Development Report

## Annexure 2

## Urban Agglomerations/Cities having population of more than one million in 2001

Urban Agglomeration/City	Civic Status	Population in 2002 (in million)
1. Greater Mumbai	UA	16.37
2. Kolkata	UA	13.22
3. Delhi	UA	12.79
4. Chennai	UA	6.42
5. Bangalore	UA	5.69
6. Hyderabad	UA	5.53
7. Ahmedabad	UA	4.52
8. Pune	UA	3.75
9. Surat	UA	2.81
10. Kanpur	UA	2.69
11. Jaipur	M. Corp.	2.32
12. Lucknow	UA	2.27
13. Nagpur	UA	2.12
14. Patna	UA	1.71
15. Indore	UA	1.64
16. Vadodara	UA	1.49
17. Bhopal	UA	1.45
18. Coimbatore	UA	1.45
19. Ludhiana	M. Corp.	1.39
20. Kochi	UA	1.35
21. Visakhapatnam	UA	1.33
22. Agra	UA	1.32
23. Varanasi	UA	1.21
24. Madurai	UA	1.19
25. Meerut	UA	1.17
26. Nashik	UA	1.15
27. Jabalpur	UA	1.12
28. Jamshedpur	UA	1.10
29. Asansol	UA	1.09
30. Dhanbad	UA	1.06
31. Faridabad	M. Corp.	1.05
32. Allahabad	UA	1.05
33. Amritsar	UA	1.01
34. Vijayawada	UA	1.01
35. Rajkot	UA	1.00
TOTAL		107.88

Source: Census of India

## Estimated Road Traffic Movement in 2000

Study	Pass Traffic (Billion pkms)	Freight Traffic (billion tkms)
RITES Study 1998	1880	1136
Lucknow Plan 1984	2152	1004
MOST: Study on estimation of total Road Transport in the year 2000	3000-4000	600-1000
Vehicle Fleet Modernization Study (1988)	2300-3800	800-1030
Steering Committee on Respective Planning for Transport (1988)	2400-4000	540-900
India Infrastructure Report	3000	800



Annexure 4

Assessment of Freight and Passenger Traffic by Road

	Year 1995	Year 2000	Year 2005	Year 2010
A. Freight Traffic				
<i>Trucks</i>				
i. Vehicle km (billion)	72	108	154	215
ii. Tonne km (billion)	400	650	1000	1500
B. Passenger Traffic				
<i>Buses</i>				
i. Vehicle km (billion)	22	31	44	61
ii. Pass km (billion)	860	1248	1771	2440
<i>Cars</i>				
i. Vehicle km (billion)	27	42	69	106
ii. Pass km (billion)	41	64	103	159
<i>Two-wheelers</i>				
i. Vehicle km (billion)	69	108	167	250
ii. Pass km (billion)	83	130	200	300
Total Pass km (billion)	984	1442	2074	2899
Say	1000	1450	2100	2900

**ASSUMPTIONS**

A few modest assumptions have been made in arriving at a decadal traffic projection. These can be enumerated.

**Freight Traffic**

*Trucks*

- i. Average pay load 5.5 tonnes in 1995 and increasing by 0.1 tonne a year.
- ii. Average annual utilization in 1995 taken as 40,000 km and increasing by 400 km a year.
- iii. Average annual growth in truck population adopted as
  - 7.5% during 1995-2000
  - 6.5% during 2000-2005
  - 6.0% during 2005-2010

**Passenger Traffic**

*Buses*

- i. Average occupancy 40
- ii. Average annual utilization at 40,000 km per year in 1995 and increasing by 400 km a year
- iii. Average annual growth in number of buses adopted as
  - 7.0% during 1995-2000
  - 6.5% during 2000-2005
  - 6.0% during 2005-2010

*Cars*

- i. Average occupancy 1.5
- ii. Average annual utilization 7,000 km in 1995 and increasing by 100 km a year
- iii. Average annual growth in number of cars adopted as
  - 8.0% during 1995-2000
  - 8.5% during 2000-2005
  - 8.0% during 2005-2010

*Two-Wheelers*

- i. Average occupancy 1.2
- ii. Average utilization 3,500 km
- iii. Average annual growth in number of two-wheelers adopted as
  - 9.5% during 1995-2000
  - 9.0% during 2000-2005
  - 8.5% during 2005-2010

Source: Asian Transport Journal, December 1998

## Annexure 5

FINANCIAL PERFORMANCE OF STATE ROAD TRANSPORT  
UNDERTAKINGS

(Rs. Crore)								
Item	92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-2000
1. Gross Receipts	6643	7602	8221	9006	9494	11125	11984	13685
i) Operating Revenue	6202	7190	7805	8478	8909	10490	11351	12953
ii) Misc. Receipts	446	412	416	527	585	635	633	732
2. Total Expend.	7008	7914	8580	9607	10511	12495	13577	15571
i) Operating Expd.	4943	5594	6202	6967	7680	9278	10075	11809
ii) Dep. Res. Fund	756	616	624	699	705	821	877	871
iii) Taxes	916	1061	1113	1220	1308	1433	1558	1705
iv) Int.	308	317	287	313	365	441	479	567
v) Misc. Exp	265	321	370	402	485	522	588	618
3) Net Profit/Loss (1-2)	-344	-312	-375	-594	-1055	-1593	-1886	
4. Internal resources (3+2ii)	232	201	249	105	-342	-549	-716	-1015
5. Term loan re-payments/adjustments	302	362	308	403	315	526	317	473
6. Contribution to the Plan (4-5)	-70	-102	-59	-299	-665	-1075	-1033	-1488

## Annexure 6

**STATEWISE PHYSICAL PERFORMANCE OF: SRTUS  
(2001-2002)  
(Latest Estimates)**

name of SRTUs	Fleet Utilisation % of Buses on Road	Vehicle Prod. Revneue Earning KM per bus held per day	Bus Staff Ratio on fleet operated	Staff Prod. Revenue Earning KM per worker per day	Fuel Efficiency Km per litre.
Andhra Pradesh	99	315	6.8	44	5.07
Arunachal Pradesh	68	136	5.2	23.9	2.94
Assam	51	96	31.0	6	4.0
Bihar	12	29	29.4	8.3	4.1
D.T.C. (Delhi)	80	183	10.4	34.7	3.85
Goa (Kadamba)	77	203	6.7	40	4.2
Gujarat	88	327	7.0	51.7	5.3
Haryana	95	308	6.0	54.4	4.44
Himachal Pradesh	97	222	5.4	42.1	3.52
Jammu & Kashmir	65	76	4.1	17.9	3.9
Karnataka					
KSRTC	95	341	5.7	59	4.83
NWKRTC	95	333	6.0	52.5	5.01
BMTC	97	217	5.7	38.2	4.46
NEKRTC	92	325	5.5	53.7	4.87
Kerala	80	273	7.0	45	4.0
Madhya Pradesh	81	227	6.0	35.5	4.1
Maharashtra	94	292	6.8	44	4.67
Manipur	10	6	17.0	31	3.5
Meghalaya	39	60	17.1	9.1	3.5
Mizoram	54	60	5.0	6.2	3.15
Nagland	63	63	11.7	13.1	3.5
Orissa	32	253	7.7	37	4.1
Punjab Roadways	84	222	4.2	46.4	4.25
PEPSU RTC	95	262	5.0	52.2	4.37
Rajasthan	92	310	6.1	58.2	4.85
Sikkim	80	61	3.2	18.8	3.25
Tamil Nadu	92	376	8.0	50.1	4.29
Tripura	50	81	18.2	8.9	3.55
Uttar Pradesh	93	266	6.2	41.6	4.85
Calcutta STC	70	133	11.3	16.9	3.55
North Bengal STC	65	158	10.5	24.2	3.9
South Bengal STC	74	193	7.9	33.2	3.85
All India Average	90	290	7.2	45.4	4.61

## Passenger Travel by Rail and by Air between Delhi and Mumbai

## Rail Traffic

Train	No. of passengers carried (all classes) daily between Delhi-Mumbai (August 2002)
Rajdhani	546
August Kranti	353
Frontier Mail	258
Paschim Express	198
Swaraj Express	105
Janata Express and Dehradun Express	75
<b>Total</b>	<b>1535</b>

## Air Lines

	No. of Flights each way	Daily Passengers Carried	Logid factor
Indian Airlines	9	605	52%
Jet Airways	10	727	57%
Sahara	5	318	57%
<b>Total</b>		<b>1650</b>	

Note: (Excl. Passengers carried by Air India. Traffic on Jet & Sahara estimated on load factor of 57%)

Total Traffic = 1650 + 1535 = 3185

Airlines	52%
Railways	48%

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