

Infrastructure

Introduction

The infrastructure sector covers the services of transportation (railways, roads and road transportation, ports, and civil aviation), communications (telecommunications and postal services), electricity and other services

such as water supply and sanitation, solid waste management, and urban transport. The lack of adequate infrastructure has been not only constraining the growth performance of the economy, but has also induced significant costs in terms of welfare loss (for example,

Table 9.1 : Trends in growth rates of infrastructure sectors (in per cent)

Items	Unit	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04*
I. Energy							
1 Coal Production	Mn.tonnes	-2.1	3.1	3.5	4.2	4.6	5.1
2 Electricity generated (Utilities only)	Bn. Kwh	6.6	7.2	3.9	3.1	3.6	4.5
(a) Hydel	„	11.1	-2.5	-7.6	-0.7	-13.8	15.6
(b) Thermal (incl.nuclear)	„	5.7	9.3	6.3	2.5	6.5	3.0
3 Petroleum							
(a) Crude oil production	Mn.tonnes	-3.4	-2.4	1.5	-1.2	3.2	1.0
(b) Refinery throughput	„	5.2	25.4	20.3	3.7	4.9	8.2
II. Steel	Mn.tonnes	1.4	15.0	6.4	3.6	10.1	6.9
III. Cement	Mn.tonnes	5.7	14.2	-0.9	7.4	8.8	6.1
Weighted Average growth I to III		2.8	9.1	5.1	3.5	5.6	5.4
IV. Transport and communications							
1. Railway revenue-earning	„						
Goods traffic		-2.0	8.4	3.7	4.0	5.3	7.5
2. Cargo handled at major ports	„	0.0	8.0	3.4	2.3	9.0	9.9
3. Telecommunications- new telephone connections Provided (Direct Exchange Lines)**	'000Nos.	16.4	29.7	27.2	23.9	21.5	40.0
4 Civil Aviation							
a. Export cargo handled	000 tonnes	-4.4	10.8	5.1	4.1	13.3	1.0
b. Import cargo handled	„	-2.4	16.2	3.6	-1.0	18.6	13.8
c. Passengers handled at International Terminals	Million	0.0	0.0	4.6	-5.0	4.8	6.5
d. Passengers handled at Domestic Terminals	„	0.3	7.4	7.7	-5.7	9.6	13.1

* Provisional.

**WLL, Fixed and Cellular

Source : Item no. I to III Ministry of Commerce & Industry, IV.1 Ministry of Railways, IV.2 Ministry of Shipping, IV.3 Ministry of Communication and IV.4 Ministry of Statistics & Programme Implementation.

morbidity and water-borne disease). It is widely recognized that a simple reliance on competitive markets is unlikely to produce efficient outcomes in infrastructure, a sector with pronounced 'public goods' characteristics of "non-rivalness" and "non-excludability". In the last decade, however, there has been a significant evolution of the nature of State-intervention in this sector. Government has significantly shifted away from the direct production of public goods to also focusing on the regulatory and policy framework and private-public partnership to generate adequate provision of these public goods.

9.2 In line with this evolving policy direction, Budget 2003-04 undertook to provide a major thrust to infrastructure, principally to roads, railways, airports, and seaports, through innovative funding mechanisms. The initiative covered: 48 new road projects at an estimated cost of around Rs.40, 000 crore; with a quarter of them being made of cement concrete; National Rail Vikas Yojana projects worth Rs. 8,000 crore; renovation/modernization of two airports, and two seaports at an estimated cost of Rs. 11,000 crore; and establishing two global standard international convention centres at an estimated cost of Rs. 1,000 crore. The total cost of the above projects was estimated at about Rs. 60,000 crore. In addition, the Budget also announced the funding of the North-South and East-West corridors through an additional levy of a cess of 50 paise per litre of diesel and motor spirit. This levy was expected to contribute a further Rs. 2,600 crore for highway development. The essence of the new funding mechanisms announced in Budget 2003-04 was to leverage public money through private sector partnership, wherever possible. The three critical components of the scheme are: release of public funds only when linked to specific and well-defined milestones in completion of the project, in physical terms; a sharing of the risks with the private promoters and financiers; but no open-ended Government guarantees at any stage. This important Budget announcement, along with some major initiatives in 2003-04 and April-May 2004 in infrastructure adequately reflected this change in the nature of State intervention (Box 9.1).

Box 9.1 : Major Initiatives for Infrastructure Development, 2003-04

Power

- Electricity Act notified in June 2003
- 28 States signed the tripartite agreement for one-time settlement of the dues of State Electricity Boards (SEBs) to Central Public Sector Undertakings (CPSUs), and, after securitizing the dues, 27 states issued bonds amounting to Rs. 28,983.85 crore, August 2003 onwards.
- 50,000 MW hydro electric initiative launched in May, 2003.

Telecom

- Unified Access Service License regime introduced in October 2003.
- Telecommunication Interconnection Usage Charges (IUC) Regulation, notified on October 29, 2003.
- Universal Service Obligation Fund set up as a separate non-lapsable fund in January 2004.

Roads

- Pradhan Mantri Bharat Jodo Project for development of 10,000 kms of roads connecting state capitals with National Highways launched in January 2004.

Railways

- Rail Vikas Nigam set up in January 2003.

9.3 In 2003-04, the infrastructure sector experienced mixed outcomes (Table 9.1). The growth rate in some key sectors showed acceleration from the previous year. In particular, strong growth rates have been observed for electricity, railways, ports and new telephone connections.

1. Hydel generation showed a sharp turnaround, reflecting the good monsoon, from a 13.8 per cent decline in 2002-03 to a 15.6 per cent increase in 2003-04. At the same time, thermal and nuclear generation growth slowed, from 6.5 per cent in 2002-03 to 3 per cent in 2003-04.

2. The goods traffic carried by the railways showed a strong acceleration from 5.3 per cent growth in 2002-03 to 7.5 per cent growth in 2003-04. The cargo handled at major ports also grew by 9.9 per cent in 2003-04, as compared with 9 per cent in 2002-03.

Table 9.4 : Percentage Transformation, Transmission & Distribution losses (including energy unaccounted for) in States/UTs

(Per cent)

Rank	State	1992-93	2001-02
1	Daman & Diu	15.67	7.52
2	Lakshadweep	18.72	10.94
3	Pondicherry	15.31	12.00
4	Tamil Nadu	17.3	16.06
5	Meghalaya	11.62	22.66
6	Chandigarh	26.21	24.97
7	Goa	21.85	25.18
8	Himachal Pradesh	19.98	25.55
9	Jharkhand	-	26.39
10	Andhra Pradesh	20.65	26.81
11	Gujarat	22.2	26.87
12	D&N Haveli	17.98	27.22
13	Punjab	19.61	27.70
14	A&N Island	23.62	29.20
15	West Bengal	17.53	31.67
16	Sikkim	22.55	31.73
17	Kerala	22.77	32.21
18	Uttaranchal	-	32.39
19	Chhattisgarh	-	33.75
All India		21.8	33.98
20	Karnataka	19.62	33.83
21	Maharashtra	18.51	37.28
22	Uttar Pradesh	24.68	37.62
23	Haryana	26.78	39.22
24	Tripura	30.64	40.38
25	Assam	21.41	42.78
26	Rajasthan	22.71	43.06
27	Delhi	24.02	43.97
28	Madhya Pradesh	22.52	44.55
29	Orissa	25.87	47.34
30	Jammu & Kashmir	48.13	48.85
31	Mizoram	29.04	49.77
32	Bihar	17.15	51.70
33	Nagaland	27.26	52.32
34	Arunachal Pradesh	32.32	53.58
35	Manipur	22.35	62.35

Source :- DMLF Division, CEA (General Review)

Transmission

9.6 The eastern region of the country has strengths in coal-fired generation and the north-eastern region has strengths in hydel generation. On the other hand there is strong demand for electricity in the northern, western and southern regions. These 'gains from trade' are being harnessed by strengthening inter-regional trade in electricity. The Electricity Act has already created the legislative framework through which buyers and sellers of electricity anywhere in the system can be brought together.

9.7 The national power grid has been strengthened to facilitate transfer the electricity from the surplus regions to the customers elsewhere in the country. From March 2003 onwards, the eastern region and north-eastern region are working in synchronized mode with the Western Regional Grid. Upto 1,500 MW flows into the Western Regional Grid. The present total Inter Regional Transmission capacity available across all regions is 8,100 MW. Another 2,500 MW capacity is under construction. As buyers and sellers of electricity fully exploit the opportunities that have unfolded after the Electricity Act, there will be heightened demand for transactions that span large distances.

Distribution

9.8 Transmission and distribution (T&D) losses in 2001-02 were as much as 34 per cent of generation (Table 9.4) for the country as a whole. Among major States, T&D losses were lowest in Tamil Nadu (16.1 per cent) and highest in Bihar (51.7) per cent. The level of all-India T&D losses in 1992-93 of 21.8 per cent gives the impression that such losses went up in the 1990s. However any such comparison should factor in the fact that the processes of measurement of T&D losses have improved over time and the earlier estimates are considered to be biased downwards. Nevertheless, the high T&D loss figures clearly indicate the enormous scope for improvements in transmission.

9.9 Along with T&D losses, one of the central problems faced in the electricity sector is the

poor cost recovery in distribution (Table 9.5). Cost recovery across States, measured by expressing revenues as per cent of costs, shows that in all States, revenues from selling electricity fell short of the cost of buying or producing it both in 1993 and 2003, the only exception being Chattisgarh in 2003. While this shortfall, which gets charged to the State exchequer, as a proportion of expenditure, narrowed in some States between 1993 and 2003, it widened in several others. The rate

of return of SEBs in 2003-04 worked out to -31 per cent. The resource flow owing to this problem is extremely large. For example, in 2003-04, the direct transfers from state governments to SEBs amounted to Rs. 11,427 crore. In addition, there was an uncovered subsidy of Rs.14,846 crore. These magnitudes suggest that modernizing the electricity sector alone could make a considerable impact upon the fiscal problems of State governments (Table 9.6).

Table 9.5 : Cost recovery in sale of electricity

Rank	States	Revenue/ Expen diture (%) 1993	Revenue/ Expen diture (%) 2003	Change
1	Chattisgarh	NA	104.3	NA
2	Karnataka	96.5	99.9	3.4
3	Haryana (HPGC)	53.4	99.9	46.5
4	Rajasthan (RRVPN)	NA	98.2	NA
5	West Bengal (WBPGDCL)	NA	79.5	NA
6	Haryana (HVPN)	NA	85	NA
7	Meghalaya	81.3	79.9	-1.4
8	West Bengal (WBSEB)	71.5	79.5	8.0
9	Tamil Nadu	86.0	78.5	-7.5
10	Haryana (DHVBN)	NA	77.6	NA
11	Rajasthan (JVVNL)	NA	77.2	NA
12	Jharkhand	NA	76.6	NA
13	Rajasthan (AVVNL)	NA	75	NA
14	Himachal Pradesh	88.4	73.4	-15.0
15	Gujarat	68.4	72.8	4.4
16	Rajasthan (JDVVNL)	NA	71.1	NA
17	Punjab	57.6	67.5	9.9
18	Madhya Pradesh	84.1	66.9	-17.2
19	Kerala	84.8	63.4	-21.4
20	Orissa (GRIDCO)	78.1	62.9	-15.2
21	Assam	47.4	61.8	14.4
22	Bihar	63.8	52.1	-11.7
23	Jammu & Kashmir	21.3	25.3	4.0
24	Andhra Pradesh	94.2	NA	NA
25	Delhi	81.7	NA	NA
26	Maharashtra	98.5	NA	NA
27	Uttar Pradesh (UPPCL)	70.7	NA	NA
28	Uttranchal	NA	NA	NA

* Included in the undivided States, NA: Not available
Sources: Financial Resources for Annual Plan.

9.10 Early attempts at the introduction of private generation companies into India's electricity sector faced difficulties because of the poor financial health of the distribution monopolies owned by the States. Private companies embarking on power generation faced credit risk, i.e. fear of non-payment by SEBs. With SEBs as the sole transmission and distribution companies, Independent power producers, perceived some credit risk, for these reasons not enough private sector investments in independent power plants were forthcoming. The Electricity Act 2003 was partly a response in order to fill this important lacunae.

Electricity Act, 2003

9.11 The Electricity Act 2003 was enacted with the main objectives of providing a liberal and progressive framework for growth of power sector by introducing competition in different segments of generation, trading and distribution of electricity. It has removed barriers to entry of private sectors in these segments. This new legislation brings into effect many measures to ensure protection of interests of the consumers in terms of quality of service, price regulation, right to get service on demand and redressal of grievances. The Act also provides appropriate institutional mechanisms for achieving the goal of supply of electricity to all areas. It also lays down the framework for reorganisation of the State Electricity Boards in a time frame to be decided by the State Government with consent of the Central Government. The National Common Minimum Programme of the UPA Government envisages a review of the Electricity Act 2003 in view of the concern expressed by a number of States. The mandatory date for unbundling and replacing the State Electricity Boards will be extended.

Table 9.6 : Financial performance of the State power sector

(Rs. Crore)

	1991-92	2002-03*	2003-04 (RE)	2004-05 (AP)
A. Gross Subsidy involved				
(i) On account of sale of electricity to				
(a) Agriculture	5,938	21,845	22,793	24,012
(b) Domestic	1,310	8,534	8,210	8,967
(c) Inter-State Sales	201	189	938	818
Total	7,449	30,568	31,941	33,797
(ii) Subventions Received from State Govts.	2,045	12,996	11,427	11,141
(iii) Net Subsidy	5,404	17,572	20,514	22,656
(iv) Surplus Generated by sale to other sectors	2,173	4,797	5,668	6,424
(v) Uncovered Subsidy	3,231	12,775	14,846	16,232
B. Commercial Losses				
i) Commercial Losses (excluding subsidy)@	4,117	21,382	21,517	21,698
ii) Commercial Losses (including subsidy)	NA	8,386	10,090	10,556
C. Rate of Return (ROR %) #	-12.70	-31.64	-30.86	-28.80
D. Revenue Mobilisation				
Additional Revenue Mobilisation from achieving				
(a) 3% ROR	4,959	23,410	23,609	23,744
(b) From introducing 50 paise per unit from Agriculture/Irrigation	2,176	456	250	533

RE: Revised Estimates

* Provisional

AP: Annual Plan Projection # for losses without subsidy.

@ Commercial losses are different from uncovered subsidy because they include financial results of other activities undertaken by the SEBs.

Note : 1 The information relating to the subsidy for Agriculture, Domestic and Inter-state sales for the years 2002-03, 2003-04 and 2004-05 in respect of Orissa and Delhi is not available, as the distribution is entrusted to the Private Companies. The information regarding commercial losses pertains to GRIDCO of Orissa and Transmission Company of Delhi only.

2 Information in case of Andhra Pradesh, Haryana, Rajasthan, Uttar Pradesh, Uttaranchal, West Bengal and Karnataka states is relating to transmission and distribution companies set up after the reforms. In case of other states, the information pertains to SEBs.

3 The estimates for next fixed assets in respect of Uttaranchal Power Corporation have not been furnished and hence the over all ROR calculated for all the SEBs may not reflect the correct picture.

Source : Planning Commission.

9.12 Under the new statutory regime, generation of power is completely delicensed and captive power generation is freely allowed. It allows open access to transmission network under regulatory supervision. Any generating company is now free to seek distribution license and vice versa. The present opaque cross subsidies would be slowly phased out, and replaced by a transparent and explicit subsidy to meet the social objectives prioritized by the State Government. For rural and inaccessible areas, stand alone systems involving generation and distribution are allowed without the requirement of license, and decentralized system of local distribution would be allowed through Panchayats, user associations, cooperatives or franchises. In this liberalized framework, multiple players in

generation, supply and trading will compete in the marketplace under the oversight of the regulator.

9.13 A major consequence of the Electricity Act 2003 is a rise in trading in electricity. The Central Electricity Regulatory Commission (CERC) has implemented a key provision of the Act, and by issuing regulations for open access in inter-state transmission, heralded a new chapter in the electricity sector. The open access regulations enable generation companies, distribution companies, electricity traders and captive plant owners to access transmission networks across the country for the purpose of transporting electricity.

9.14 The CERC has implemented Availability Based Tariff (ABT) in all the five electrical

regions of the country at the inter-state level. The ABT facilitates merit order dispatch of various generating stations having different variable costs. The ABT has the unique feature of flexibility to cater to fluctuations in demand of power in the electricity grid through a commercial pricing mechanism known as the unscheduled energy inter-change rate (UI rate). The price for unscheduled inter-changes of energy is related to grid frequency in a manner to encourage grid discipline. As a result, the grid frequency has improved remarkably after the implementation of ABT in the country. The UI mechanism facilitates the spot sale or purchase of electricity into or out of the electricity grid and does not require the services of a trader. As UI mechanism is an alternative to formal trading, it provides a sort of benchmark price for the trading of electricity and does not allow the price of traded electricity to shoot up.

9.15 These developments take the market for electricity closer to other normal markets in the economy, such as markets for (say) garments or footwear, in that there is competition between multiple producers, and customers have choices. CERC is the regulator and licensing authority for firms that seek to engage in power trading. CERC issued regulations governing licensing for power trading in January 2004.

9.16 Power Trading Corporation (PTC) and Vidyut Vyapar Nigam (of NTPC) have been important players in this nascent area. The creation of inter-regional link lines of nearly 4,300 MW capacity, and online information available through five Regional Load Dispatch Centre (RLDCs), have also played a part. These initiatives have resulted in trading of 11 billion units of electricity, or roughly 2 per cent of the generation in the country.

9.17 As is the case with markets for other products, an extensive growth of trading will lead to a better utilisation of the country's energy production. Liquid and efficient markets for electricity will tend to link up the marginal unit of electricity generated at some location in the country, to a consumer located elsewhere in the country with the highest incremental output from this electricity.

9.18 A highly beneficial aspect of this new paradigm is the onset of price flexibility, i.e. the commencement of *price volatility*. Fluctuations in price in this market for electricity are required, to induce rational responses on the part of producers and consumers. For example, when electricity prices are high, a supply response would be induced in the form of captive plant owners switching on their generation equipment in order to sell to consumers, and a demand response would be induced in the form of reduced consumption. These dynamic responses were stifled in the erstwhile policy framework, where the policy framework prevented volatility in the price of electricity. This marks a milestone in the steady progress that has been made in India in moving towards price flexibility in the full range of markets.

9.19 A logical extension of the spot market for electricity is markets for futures and options on electricity, which will allow buyers and sellers to make contracts governing future dates, and to do risk management. These markets exist in several countries abroad. There is a possibility of some kinds of electricity derivatives coming about in India in 2004-05.

9.20 A key issue related, to the question of electricity trading, is that of a policy framework for tariffs. CERC has come out with a New Tariff Policy, covering the period 2004-2009. The main features of this policy are summarized in Box 9.2.

Accelerated Power Development Reforms Program (APDRP)

9.21 In addition to the Electricity Act, the central government created the Accelerated Power Development Reforms Program (APDRP). The budgetary allocation for 2003-04 for APDRP was Rs.3,500 crore. This offers fiscal support to State governments which undertake a reforms program which would bring down the aggregate technical and commercial (AT&C) losses from the conventional levels of around 50 per cent to a target of 15 per cent. APDRP, and other similar incentive-linked programs, are part of a new strategy of linking fiscal transfers from the centre to the States, to institutional reform

Box 9.2 : New Tariff Policy of Central Electricity Regulatory Commission (CERC) for 2004-09

CERC has emphasized that all future projects and new investment in generation, transmission and distribution both by public sector utilities as well as IPPs should be structured through a tariff-based transparent competitive bidding process. This should also obviate the need for detailed regulation based on the existing cost plus approach which leads to inefficiencies and lack of initiative for better performance.

During the period of transition to a competitive bidding regime, tariff regulation as far as practical, should move away from the cost plus actuals approach, to a new regime of light-handed regulation based on normative parameters. This would incentivise efficiency and streamline tariffs. The change-over from intrusive regulation involving detailed scrutiny of actual costs to a lighter regime of normative parameters is the distinctive feature of the new tariff regulation.

- In the new terms and conditions for regulating the tariff of projects set up on cost plus basis, CERC will adopt a normative debt equity ratio of 70:30 for all generation and transmission projects.
- The return on equity shall be 14 per cent post tax, uniformly applicable to CPSUs and IPPs.
- Advance against depreciation shall be allowed to meet debt service obligations by considering the repayment period of loan as 10 years. The development surcharge has been discontinued.
- The performance benchmarks of plant availability for hydro and thermal generating stations has been raised.
- Efficiency benchmarks for coal, lignite and gas based thermal generating stations have been raised.
- The norms for specific oil fuel consumption and auxiliary energy consumption within the power stations have been tightened.
- Normative benchmarks have been set for operation and maintenance expense payable to thermal generating stations and transmission licensees.
- The frequency linked unscheduled interchange (UI) rates for deviation from the generating or energy drawal schedules have been revised upward.

The Electricity Act prescribes that the State Electricity Regulatory Commissions shall be guided by the principles and methodologies prescribed by CERC. Accordingly, the new tariff regulations of CERC would lead to greater harmonization, uniformity and certainty in electricity regulation across the States. The new terms and conditions of tariff finalized by CERC are likely to result in reduction in bulk electricity tariff, since the norms for servicing capital investment have been fine tuned with the current financing scenario and the benchmarks of efficiency have been raised. It would enable the SERCs, who determine the retail electricity tariffs, to pass on the benefit to the ultimate consumer.

programs at the State level. So far, investment projects amounting to Rs.15,642 crore have been sanctioned under APDRP covering 466 towns in the country. An amount of Rs.882.5 crore has been released under the incentive component to the states of Gujarat, Haryana, Maharashtra, Andhra Pradesh and Rajasthan in the first two years.

Recent experiences in State-level reforms

9.22 Orissa: Orissa was the first State which embarked on structural reforms in the electricity sector. The reforms law was enacted in 1996. The SEB was replaced by four distribution companies in 1998. These companies were privatized in 1999, when a 51 per cent stake was sold by the government. Three of the four companies are controlled by BSES, and the fourth was by AES, which later abandoned this effort. The State Thermal Power Corporation was also privatized, with

AES taking up a 49 per cent stake and adopting management control.

Andhra Pradesh: The AP Electricity Reforms Bill was passed in April 1998 and became effective in February 1999. The AP SEB was unbundled into two companies in February 1999. In April 2000, the distribution business was segregated from the transmission business, and four distribution companies were setup. Through these reforms, the power sector losses have dropped from 2.1 per cent of the State domestic product in 1999 to a level of 1.16 per cent in 2003.

Delhi: Electricity distribution was privatized in Delhi in July 2002. The focus in the transaction structure was a set of targets for reduction in theft. Prior to privatisation, the AT&C loss level was 50.7 per cent. A loss reduction path of 17 percentage points has been charted for the private distribution

Table 9.7 : Thermal Plant Load Factor						
	<i>(per cent)</i>					
	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04*
I State Electricity Boards	60.7	64.3	64.3	67.0	68.7	68.4
II Central Sector	71.1	72.5	72.2	74.3	77.1	78.7
III Private Sector	68.3	68.9	76.4	74.7	78.9	80.4
IV Region						
Northern	67.2	71.0	72.0	75.1	75.4	76.3
Western	70.5	72.3	72.1	74.1	75.8	75.1
Southern	75.4	79.6	79.7	82.4	86.4	83.4
Eastern	44.3	46.1	47.0	48.7	52.1	56.9
North Eastern	18.7	18.3	18.2	16.8	14.8	14
All India	64.6	67.3	67.7	69.9	72.2	72.7
* Provisional	Source Ministry of Power					

companies over a period of five years. These private companies have strong incentives to outperform these targets, since the revenue gains beyond the targeted loss reduction would be equally shared between consumers and the distribution companies. Early statistics about the impact of these reforms will be seen in 2004-05.

9.23 The Plant Load Factor (PLF) is an important metric of the operational efficiency of thermal power plants. The PLF of the overall system has improved significantly from 64.6 per cent in 1998-99 to 72.7 per cent in 2003-04, implying a secular improvement in the efficiency of generation. This table 9.7 shows two systematic regularities. The PLF of central power plants was higher than that of SEBs, put together and the PLF of private plants is higher (80.4 per cent) than that in the public sector. The average for SEBs as a whole masks substantial variation across States. If the eastern States are excluded, the PLF of SEBs is not substantially different from that of central utilities.

Hydel and wind power

9.24 Hydel and wind generation are both particularly attractive renewable and non-polluting forms of electricity generation. These two technologies now account for 30 per cent of the total generation capacity. Significant progress has been made in hydel projects during 2003-04. Satelej Jal Vidyut Nigam Limited

(SJVNL) is a central sector undertaking in charge of a 1,500 MW hydel project on the Satelej river in Himachal Pradesh. This project features some remarkable engineering achievements, including the longest power tunnel (27 km.) in the world. In 2003-04, SJVNL commissioned 500 MW of capacity. NHPC also commissioned a 300 MW hydel plant at Chamer on the Ravi river in Himachal Pradesh.

Rural electrification

9.25 During the year 2003-04, 4,267 inhabited villages were electrified and 1.9 lakh pumpsets/ tubewells were energised. Cumulatively 4.9 lakh villages have been electrified, and 140 lakh irrigation pumpsets have been energised as on March 31, 2004. As regards the electrification of tribal villages, 82,976 villages are reported to have been electrified as on March 31, 2004. Similarly, 3 lakh Harijan bastis have been electrified as of the same date.

9.26 The Government has recently decided to amend the definition of an electrified village to the village where the number of households electrified is at least 10 per cent of the total number of households in the village, electricity is provided to public places like schools, panchayat office, health centres, dispensaries, and community centres, and basic infrastructure such as distribution transformer and distribution lines are provided in the inhabited locality as well as the Dalit Basti/hamlet where it exists. Earlier, a village

was considered to be electrified if the electricity is being used within its revenue area for any purpose whatsoever which could include a single electric connection also. Using this new definition, apart from electrifying 1.4 to 1.5 lakh of un-electrified villages, a few more with less than 10 per cent intensity of household connection will have to be connected for improvement of supply.

9.27 Recently, the government has approved a new scheme for “Accelerated Electrification of One Lakh villages and One Crore Households”. This new scheme replaces the existing Accelerated Rural Electrification Programme (AREP) and Kutir Jyoti Programme being administered by the Ministry of Power. According to the scheme, electrification of the un-electrified villages as on March 31, 2004 will be taken up. In addition, de-electrified villages are also to be taken upon on a case-to-case basis. In the already electrified, use and intensity of household electric connection will be improved to at least 10 per cent of the total households, where it is lower than the threshold, apart from electrifying important public places of the village.

Telecommunications

9.28 The effort at creating a new framework for infrastructure policy, consisting of *competition* between multiple players, under a *regulatory framework* defined by the State, has made much headway in the area of telecom, a sector high on the reforms agenda. The successful implementation of reforms since 1991 has resulted in unprecedented growth of the sector. It has enabled the adoption of latest available technologies.

9.29 The perception about telecom services, until recently considered an elitist luxury, has changed to a preferred good of mass consumption with increasing usage of telecom and IT services. The benefits from increased market access for the masses, improved productivity and market efficiency, and unprecedented innovation in business models and organizational structures are now widely recognised. There is a consensus that the country needs a much higher volume of voice

Table 9.8 : International comparison of Teledensity (2003)

Countries	Teledensity
Australia	126.18
Bangladesh	1.56
Brazil	42.38
China	42.32
India	6.60
Indonesia	9.17
Nepal	1.70
Pakistan	4.42
Sri Lanka	9.57
U.K.	143.13
U.S.A.	116.43

Source : ITU December, 2003.

Note : India's teledensity as on March 31, 2004 was 7.02.

telephony and Internet connectivity, and teledensity, i.e. the number of telephones per hundred persons, needs to go up from existing levels of 7 per cent eventually to developed country levels of over 100 per cent (Table 9.8). In fact countries like China and Brazil are already much ahead of India. The cost per minute of placing phone calls is expected to go down further through improvements in technology and their wider usage. The market should offer a range of reliable fixed line and wireless technologies to suit the heterogeneous needs of the people. Furthermore, progress is needed in 'broadband' connectivity to homes, to high speed lines for firms for the efficient computer networking.

9.30 Rapid expansion in the telecom sector has been accompanied by a simultaneous significant technological change. The total number of lines grew by about 40 per cent in 2003-04, to cross 76 million at end-March 2004 (Table 9.9). At the same time, there was a continuing massive shift in the technology of access from fixed line to mobile telephony. In 2003-04, fixed lines grew by less than 3 per cent, while mobile telephones grew by 159.2 per cent. The growth of mobile phones during the year was accelerated by the introduction of the Calling Party Pays (CPP) regime also introduced in May 2003.

Table 9.9 : Telephone connections*(million lines)*

	Public	Private	Overall
Telephone connections as on March 31, 2003			
Mobile	2.64 (4.83)	10.36 (18.97)	13.00 (23.80)
Fixed	40.53 (74.20)	1.09 (2.00)	41.62 (76.20)
Overall	43.17 (79.04)	11.45 (20.96)	54.62 (100)
Telephone connections as on March 31, 2004			
Mobile	6.00 (7.84)	27.70 (36.19)	33.70 (44.03)
Fixed	40.48 (52.89)	2.36 (3.08)	42.84 (55.97)
Overall	46.48 (60.73)	30.06 (39.27)	76.54 (100)
Growth (per cent) during 2003-04			
Mobile	127.27	167.37	159.20
Fixed	-0.12	116.51	2.93
Overall	7.67	162.53	40.10
Source: DOT.			
Figures in brackets indicate the share in the total number.			

9.31 For a large section of the populace without a telephone, 1.76 million public call offices (PCOs) working in the country at end-March 2004 provided a great convenience in terms of dependable connectivity. Of these, more than 2 lakh PCOs were in rural areas. Of the 6 lakh villages identified in the 1991 census, 5.22 lakh had a Village Public Telephone (VPT) as of March 2004. In the same period, the number of Internet subscribers grew by 15 per cent from 3.6 million to 4.2 million. Internet access for the masses is primarily taking place through cybercafes. Their number grew from 4,600 in 2002-03 to 8,800 on December 31, 2003. To reach the semi-urban and rural areas out of 6,332 block headquarters in the country, 3,617 have been provided with Sanchar Dhabas by BSNL by the end of March 2004.

9.32 India has emerged as one of the few markets in the world where there is active competition between the two major standards for achieving mobile telephony, i.e. Global

System for Mobile (GSM) and Code Division Multiple Access (CDMA). Consumers have benefited from this competition. In four telecom circles - Delhi, Bombay, Madras and Punjab - the number of mobile subscribers has already exceeded the number subscribing to fixed lines. Table 9.9 also highlights the break up of the recent growth in telephony between private and public. In the area of fixed lines, the public sector has actually witnessed a decline in the number of phones, while the private sector has experienced growth in excess of 100 per cent. In the area of mobile phones, while the public sector has seen sharp growth from 2.64 million to 6 million, the private sector continues to dominate, with growth from 10.36 million to 27.70 million during 2003-04.

9.33 A high bandwidth connecting a country to the world, for both voice and data traffic is increasingly seen as one of the barometers of progress in integration into the world economy. In India's case, this is particularly critical, since this connectivity is the foundation

underlying the growth of services exports from the country. India now has a total of 20.5 Gigabits per second of international connectivity (as of 2003-04).

9.34 The introduction of competition in the telecom sector has led to a dramatic drop in tariffs (Table 9.10). In particular, GSM tariffs have dropped from Rs.14.5/minute in March 1998 to Rs.0.77/minute in March 2004. National Long Distance (NLD) and International Long Distance (ILD) rates have also dropped dramatically by the shift away from a monopolistic market to a competitive market. These declines in prices of telephony are even more drastic when adjusted for inflation - prices of other goods have risen while the prices of telephone calls have come down. Within the country, long-distance telephone calls were once a rarity, but they have increasingly become affordable.

Policy issues

9.35 One major development in the policy frame work has been the move towards a 'unified licensing regime'. The focus of this effort is on technological advancement driving the policy framework. A Unified Access Service License regime for basic and cellular services was introduced in October 2003. Unified Service License regime will be able to offer any or all services using technologies chosen by the provider. This phase is presently under discussion.

9.36 The Communication Convergence Bill, which was introduced in the Lok Sabha on 31st August 2001, aims at the creation of the "Communications Commission of India (CCI)" which would oversee the national infrastructure for an information-based society. On 20th November 2002, the Standing

Committee on Communications and IT submitted its report on this Bill in Parliament.

9.37 A concern for policy is the stagnation of Internet use, both dialup and broadband. One problem inhibiting dialup Internet use is the lack of flat fee unlimited access tariff plans for fixed line telephony. While the growth of broadband has been a vexing problem for many countries, some countries, such as South Korea, have achieved remarkable penetration of broadband internet access at homes. TRAI has issued a consultation paper on the problem of broadband and an effort is being made to find a suitable solution.

9.38 The National Internet Exchange of India (NIXI) has setup operations in Noida, Mumbai, Kolkata and Chennai. This would ensure switching of Internet traffic within the country.

9.39 With a view to providing termination charge for cellular services and enable introduction of Calling Party Pays regime the Interconnection Usage Charge regime was introduced during 2003-04. This is expected to result in lower tariff environment in voice telephony.

9.40 After a growth in the number of lines of roughly 40 per cent in 2003-04, continued growth at the same rate in 2004-05 and 2005-06 will take the total number of lines to almost 150 million by the end of 2005-06. Yet, the tele-density will be only about 14 by end-March 2006. Many observers have argued that given the extremely high growth rates that are presently being observed in mobile telephony, there is a good possibility of obtaining faster growth over the period 2004-05 and 2005-06, to achieve a teledensity of 17 by the end of 2005-06.

Table 9.10 : Trends in tariffs					
<i>(Rs. per minute)</i>					
	1998-1999	1999-2000	2001	2002	March 2003 onwards
NLD (Beyond 1000 km.)	30.0	30.0	24.0	9.6	4.8
ISD (United States)	61.2	61.2	49.2	40.8	24.0
Mobile	14.5	6.1	2.4	1.9	1.6
Source: TRAI					

Table 9.11 : Postal network – International Comparisons

Country	Permanent post office	Population served by a post office on a average	Average area served (sq.km) by a post office	Employee per thousand population
China	76,358	16,851	125.68	0.38
India	1,55,618	6,602	21.13	0.56
Indonesia	19,881	10,806	95.80	0.12
Malaysia	1,207	19,085	273.20	0.62
Sri Lanka	4,638	4,158	14.15	1.17
U.K.	17,243	3,460	14.16	3.55
USA	37,683	7,657	248.72	2.96

Source : Dept. of Posts.

9.41 The Universal Service Obligation (USO) fund is an innovative mechanism for transparent cross-subsidisation of universal access in the telecom sector. A 5 per cent universal levy has been imposed on the adjusted gross revenue of all telecom operators. A substantial sum of Rs. 1,653 crore and Rs. 2,143 crore was collected as levy in 2002-03 and 2003-04 respectively. The USO Fund (USOF) was established as a separate non-lapsable fund through a Bill passed by the Parliament in December 2003. A sum of Rs. 300 crore and Rs. 200 crore was allotted to USOF for the year 2002-03 and 2003-04 respectively which has been utilized for extending the Universal Service subsidy for more than 5 lakh Village Public Telephones (VPTs), uneconomic rural DELs and replacement of 1.8 lakh MARR based VPTs to improve the quality of service.

9.42 The Government policy on spectrum allocation is going to be a major factor which will shape the future of the telecom industry as the trend in telecom services is towards mobility with high data rates. The electromagnetic spectrum which is a scarce natural resource, essential for mobile communication needs to be allocated in ways that maximize its utilization and economic value. There has been an ongoing policy process to address bottlenecks in spectrum availability.

Posts

9.43 The Indian postal network is among the largest network in the world in terms of area covered and population served, and constitutes an important mechanism of achieving transportation and communication.

The Indian postal system currently provides 38 services which can be broadly divided into four categories: Communication services (letters and postcards), Transportation services (parcel), Financial services (Saving Bank, Money order, Postal Life Insurance) and Premium Value added services (like Speed post, and Business Post). The Post Office Savings Bank is the largest bank in India in terms of network, accounts and annual deposits.

9.44 As of March 31, 2003, there were roughly 1.56 lakh post offices or outlets, of which roughly 89 per cent outside cities. On an average, a post office serves an area of 21.13 Sq. kms. and a population of 6,602. Table 9.11 shows some international comparisons in this regard.

9.45 User charges in the postal system only cover roughly 78.3 per cent of costs, and there is a significant subsidy element. The financial position of the postal department has marginally improved over the last three years. The deficit dropped from Rs.1,550 crore in 2000-01 to Rs.1,364 crore in 2002-03 and is projected to be Rs 1,204 crore in 2003-04. All services of the post office are presently subsidized (Table 9.12). Clarifying the rationale, the mechanism and the size of the subsidy constitutes an important policy question at this juncture

9.46 The advent of computers and communications has had profound implications for the postal system. Telegrams have lost ground to faxes, long-distance telephony and email. In some countries, more letters are sent by email than by post. In its

Service	Subsidy per unit (Rs.)	Traffic (in million)	Total deficit (Rs. crore)
Post Card	6.1	255.1	156.6
Printed Post Card	0.7	43.6	2.9
Letter Cards	4.1	327.5	135.4
Registration	16.0	223.3	357.9
Money Order	28.5	116.5	331.5
Reg. Newspaper (Single)	7.9	59.3	46.6
Reg. Newspaper (Bundle)	12.2	3.6	4.4
Printed books	9.2	2.5	2.3
Parcel	12.1	5.3	6.5
Others	NA	NA	160.0
Total	NA	NA	1,203.0
Source: Dept. of Posts.			

program for upgradation of the services offered, the department has worked on induction of new technology, modernizing processes, and improving the customer experience. A VSAT network with 150 High Speed VSAT stations which are further connected to 1,300 Extended Satellite Money Order (ESMO) stations located in the Post Offices have been set up, for quick commission of money orders across the country. At the end of the Ninth Five Year Plan, 506 Head offices and 1,266 other Departmental Sub-post Offices were computerized and provided with multi-purpose counter machines which can carry out all public transactions. Computers have also been deployed for back office functions like supervisory duties, and record management. Process enhancements using IT is being continued on a large scale during the Tenth Five Year Plan.

9.47 Two internet-based initiatives of the department are 'e-post' and 'e-bill post'. Under e-post, email messages are downloaded and printed at the post office, and physically delivered to the recipient. Under e-Bill Post, customers are able to pay multiple utility bills at post offices.

9.48 Several measures have been introduced to optimize retailing capacity and outreach to provide services that are relevant to the needs of the customers. Retail Post services offering sale of applications forms for entrance examinations, facility to collect fees

are now widely available in post offices. Financial products and services are an important part of services provided by post offices in urban and rural areas. New initiatives have been taken up for facilitating fund transfer through its network for those customers who do not have the benefit of a vast retailing network. A strategic alliance with Western Union Financial Services has helped to strengthen the payment business by providing facilities for processing of in-bound international money transfers. The post office commands 19 per cent of the total market share for the international money transfer undertaken through Western Union Financial Services.

Road and road transport

9.49 Roads now carry 85 per cent of passenger traffic and 70 per cent of freight traffic. While highways make up only 2 per cent of the overall road network by length, they account for around 40 per cent of this traffic. A series of initiatives have been undertaken in recent years, to set the stage for a quantum leap in India's road system. These initiatives combine new institutional arrangements, highway engineering of international standards, founded on a self-financing revenue model comprising tolls and a cess on fuel. Three initiatives in the road sector were begun in recent years: The National Highway Development Project (NHDP), Pradhan Mantri Bharat Jodo Pariyojana (PMBJP) and Pradhan Mantri Gram Sadak Yojana (PMGSY). NHDP

dealt with building high quality highways. The PMBJP dealt with linking up major cities to the NHDP Highways. The PMGSY addressed rural roads.

9.50 Owing to the delays of project construction, the full economic impact of these projects are yet to come. However, the revolutionary improvements in velocity and safety on India's roads, owing to the early stretches that have been modernised under these initiatives, are already manifestly visible. Under NHDP, 13,146 km of National Highways will be converted to high quality 4-lane or 6-lane highways, at an estimated cost of Rs.54,000 crore at 1999 prices. These highways are generally designed to support velocities of roughly 100 kph. The NHDP consists of two components. The Golden Quadrilateral (GQ), of 5,846 km, connecting the four major cities of Chennai, Delhi, Kolkata and Mumbai. The North-South and East-West Corridors (NS-EW), of 7,300 km, connect Srinagar to Kanyakumari and Silchar to Porbandar. NHDP constitutes one of the largest single highway projects in the world, and stipulates one of the shortest times to completion. Apart from NHDP, 10 major ports are being connected to the National Highways with 4-lane roads (356 km). In addition, 777 km of other important stretches spread over various States are being 4-laned.

9.51 The implementation of NHDP included important innovations in the institutional mechanisms, in the form of the agency National Highway Authority of India (NHAI), an autonomous statutory organisation operating under the Ministry of Road Transport and Highways. Road construction is capital intensive. Current estimates suggest that the

cost of a four-lane highway works out to roughly Rs. 4.5 crore per kilometer, and the cost of a protected access, six-lane expressway works out to roughly Rs.8.5 crore per kilometre. Hence, great care is required in designing a framework for investment which avoids unnecessary strain on government finances. The funding of NHDP is based on a fuel tax and on tolls. A cess of Rs.1.5 per litre is charged on the sale of petrol and diesel. A part of this (Rs.0.43 per litre against sale of high speed diesel oil and Rs. 0.86 per litre against sale of petrol) goes to fund the NHDP.

9.52 As Table 9.13 shows, as of March 31, 2004, 3,200 km of NHDP has been completed, the bulk of which lie on the GQ. The expenditure so far has amounted to Rs.18,638 crore. There were 3,709 km. under construction. Contracts for 6,211 km. were yet to be given out. It is expected that the GQ would be substantially completed by December 2004, and the NS&EW corridors would be completed by December, 2007.

9.53 The first 2,000 km of NHDP have generated significant learning for engineering firms and government, in terms of technology, contractual structures, etc. This learning will be beneficial in the next steps of highway construction in the country. This learning may also lead to fresh opportunities for Indian firms to compete in international markets in road construction projects.

9.54 NHAI has exploited a variety of contractual structures in moving towards 'public-private partnerships'. Projects costing over Rs.5,669 crore are being implemented through such contracts, which include Rs.2,354 crore in BOT-annuity projects and

Table 9.13 : Progress of NHDP

(As on March 31, 2004)

(in kilometers)

LENGTH	GQ	NS-EW	Total
Total	5,846	7,300	13,146
Completed	2,612	588	3,200
Under implementation	3,234	475	3,709
Balance length to be awarded	Nil	6,211	6,211
Cumulative expenditure (in Crores)	16,617	2,021	18,638
Source : NHAI			

Year	Capital expenditure (Rs. crores)	Per cent to GDP
1999-00	746	0.04
2000-01	1,261	0.06
2001-02	3,997	0.18
2002-03	6,584	0.21
2003-04	9,525	0.33
2004-05 (Projected)	12,322	NA
2005-06 (Projected)	13,358	NA

Source: NHAH NA : Not available

Rs.3,314 crore in toll-based annuity projects. In Phase II of NHDP, public-private partnership projects would account for around Rs.7,000 crore.

9.55 If we treat 1998-99 as the first year of the project, then capital expenditures by NHAH had built up to 0.33 per cent of GDP by year 6 (Table 9.14). This illustrates the lags that may separate policy decisions to create new institutional mechanisms, and their full impact on the investment/GDP ratio. The table also shows projections of roughly Rs.25,000 crore of capital expenditure over the period 2004-05 and 2005-06 at NHAH. While NHAH led to a rise in the investment/GDP ratio in 2001-02 and 2003-04, and thus played an expansionary role in those years, a comparable impact on investment is unlikely in 2004-05 and 2005-06.

9.56 NHAH revenues are derived from the fuel cess and from tolls (Table 9.15). There was a rapid growth in tolls, from Rs.85 crore in 1999-2000 to Rs.371 crore in 2003-04. The funding

model of NHAH was once viewed as being dominated by the fuel cess. However, in 2003-04, tolls were roughly one-fifth of the income from the fuel cess.

9.57 The outlook for further growth in user charges in the form of tolls is bright, given the steady completion of NHDP, and the nationwide acceptance of the principle of tolling as the necessary price of high quality roads. These developments mark an important new phase in Indian infrastructure. The road sector demonstrates that significant revenues can be obtained through user charges to improve infrastructure and benefit the consumer.

9.58 The PMGSY, which was launched in December 2000, seeks to provide road connectivity to about 1.6 lakh rural unconnected habitations with a population of 500 persons or more (250 in case of hilly, desert and tribal areas) by the end of the Tenth Plan period. It is being executed in all the States and six UTs. Although initial estimates indicated a requirement of Rs. 60,000 crore

Year	Cash flow		Expenses Including Maintenance Highways	Bonds/ Loans	
	Fuel Cess	Tolls		Issuance (Receipts) U/s 54 EC of Income tax Act, 1961	Service (Outgo) Repayment of Loan to GOI
1999-00	1,032.00	84.97	870.86	nil	nil
2000-01	1,800.00	133.82	1,404.34	656.62	nil
2001-02	2,100.00	192.20	4,189.16	804.44	nil
2002-03	2,000.00	252.00	6,785.03	5,592.94	4.50
2003-04	1,993.00	371.00	9,799.82	nil	115.60

Source : NHAH

for the program, present indications are that about Rs.1,32,000 crore will be needed for achieving the intended connectivity. Since the inception of the program, project proposals for Rs. 14,417 crore have been cleared and about 88,685 km of rural roads benefiting about 30,269 habitations have been taken up under the program. Of these, 20,740 road works have been completed till March 2004, and an expenditure of over Rs.6,457 crore has been incurred. The National Rural Roads Development Agency (NRRDA) provides Operations and Management support for the program.

9.59 The Asian Development Bank (ADB) has agreed to support the development of rural roads in Madhya Pradesh and Chhattisgarh through a loan of \$400 million which helps fund projects worth \$571 million. The States of Assam, Orissa and West Bengal have been identified for the second tranche of ADB assistance. World Bank is likely to provide funding for projects in Jharkhand, Himachal Pradesh, Rajasthan and Uttar Pradesh. In addition, domestic financial institutions, like Life Insurance Corporation (LIC) have agreed to lend funds for the PMGSY to the tune of approximately Rs.10,000 crore.

9.60 The recent Pradhan Mantri Bharat Jodo Pariyojana involves development of 10,000 kms of roads. Under this program 10,000 km of National Highways are to be widened to 4 lane essentially through Public Partnership. It also includes connecting such State capitals to the NHDP as were not otherwise getting connected. It will address the problem of cities like Thiruvananthapuram or Dehra Dun, which are important high-traffic destinations in their own right, but not reached by the NHDP. The estimated total project cost is around Rs. 55,000 crore. Of these, preliminary project work has taken place for seven stretches covering 622 km.

9.61 In an important and pioneering recent development, the Mumbai-Pune section of National Highway 4 was privatised in February 2004. Maharashtra State Road Development Corporation (MSRDC) had been servicing the debt incurred for the Rs.1,630 crore expressway, while only earning toll of Rs.85

crore a year. MSRDC received 4 bids for the transfer of control of the Mumbai-Pune expressway. The bidding was aimed at handing over operations and maintenance for the expressway, and for the previous NH-4 highway, for a 15-year period. As an outcome of the auction, Ideal Road Builders (IRB) is to pay MSRDC Rs.918 crore as an upfront payment. IRB is required to complete the upgradation of NH-4 by March 2006, when the entire length of the highway is required to have four lanes.

9.62 In terms of policy issues, the major questions that need to be addressed in the roads sector are about a shift in focus from inaugurating roads to comprehensive 'corridor management', which can maximise the velocity and throughput of the highways. The economic return for the country from a given system of roads is controlled by (a) the effective sustained velocity obtained, and (b) the number of vehicles which are able to exploit the channel in this fashion. The impact of new roads upon India's GDP is obtained when high sustained velocities are obtained for a large number of vehicles.

9.63 This motivates a shift in focus from road construction to high sustained velocities. It brings up a new set of issues including: high efficiency in tolling, maintenance, continual performance analysis and incremental highway engineering work, enforcement against encroachment on shoulders or service roads, enforcement against illegal alterations, law and order, accidents, customer facilities on the road, etc. The goal must be to get up to *sustained* performance of 100 kmph, so that the drive from Mumbai to Delhi can be realistically achieved within 13 hours of continuous driving. This may require a fresh set of institutional innovations, and organisational structures, as compared with the existing efforts, which are focused on pre-inauguration activities.

Ports

9.64 Ports are a crucial part of the transportation infrastructure of the country. Transportation by ship is highly energy efficient, can be increasingly used for intra-India traffic, and for international trade. Inland

water transport today accounts for only 0.15 per cent of domestic transportation, and there are opportunities for considerable growth. Intra-India shipping on the coastline and along rivers can become important alternatives in the Indian transportation scenario.

9.65 In 2003-04, cargo handled by major ports registered a 9.9 per cent increase, from 9.0 per cent in 2002-03. About 80 per cent of total volume of port traffic handled was in the form of dry and liquid bulk, while the remaining 20 per cent consisted of general cargo including containers. There has been an impressive growth of container traffic of over 15 per cent per annum over the last five years. The highest growth during 2003-04 was observed in respect of vegetable oil followed by iron ore, and containerized cargo (Table 9.16).

9.66 While container traffic has grown well in India, there is still a considerable lag when compared with the largest international ports. The largest port in the world in 2002, Hong Kong, processed 19.1 million Twenty-foot-equivalent units (TEUs). The 10th largest port, Antwerp, processed 4.8 million TEUs. In contrast, JNPT handled roughly 2 million TEUs in 2002-03.

9.67 At an administrative level, ports are divided into "major ports" (where the central

government plays policy and regulatory functions) and "minor ports" (which are guided by state governments). As of today, the 12 major ports handle about 76 per cent of the traffic. They are Chennai, Cochin, Ennore, Jawaharlal Nehru, Kandla, Kolkata, Marmagao, Mumbai, New Mangalore, Paradip, Tuticorin and Visakhapatnam. There are 185 minor and intermediate ports. The minor ports are located in Gujarat (40), Maharashtra (53), Goa (5), Daman & Diu (2), Karnataka (9), Kerala (13), Lakshadweep (10), Tamil Nadu (14), Pondicherry (1), Andhra Pradesh (12), Orissa (2), West Bengal (1) and Andaman & Nicobar (23).

9.68 Minor ports constitute an important competitive alternative to the centrally regulated 'major ports'. A small subset of the 185 'minor ports' is well developed, with all-weather berthing facilities. Cargo handling operations are undertaken in about 61 ports while the remaining are restricted to fishing and passenger traffic. States with a coastline are increasingly emphasising modernisation of these minor ports. Gujarat, Maharashtra, Andhra Pradesh and Tamil Nadu have constituted Maritime Boards, which are autonomous regulatory bodies. This has given a certain degree of competition within the country between various styles of regulation (Central and State). The latter half of the 90's

Table 9.16 : Trends in traffic at major ports

	2001-02	2002-03	2003-04*	Change over previous year	
				2002-03	2003-04*
1	2	3	4	6	7
	(Million Tonnes)			Per cent	
1 P.O.L.	103.2	109.6	122.3	6.2	11.6
2 Iron ore	45.8	50.6	59.4	10.5	17.4
3 Fertiliser & raw materials	9.6	8.6	7.5	-10.4	-12.8
4 Food grains	3.9	8.5	6.8	117.9	-20.0
5 Coal	45.6	48.4	48.9	6.1	1.0
6 Vegetable oil	3.4	3.3	3.7	-2.9	21.1
7 Other liquids	8.1	8.7	8.7	7.4	0.0
8 Containerised cargo	37.2	43.7	51.0	17.5	16.0
9 Others	30.8	32.1	36.2	4.2	12.8
Total	287.6	313.5	344.5	9.0	9.9
* Provisional					
Source : Ministry of Shipping					

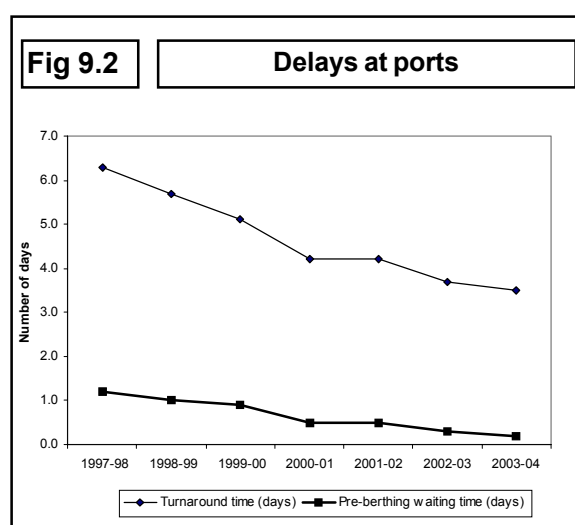
Table 9.17 : Average turnaround time for major ports

Sl. Name of the Port	Average pre-berthing time (hours) – on Port A/c			Average turnaround time (days) – on Port A/c		
	2001-02	2002-03	2003-04	2001-02	2002-03	2003-04
	1(a) Kolkata (Kolkata Dock Systems)	0.24	0.07	0.07	4.71	4.47
(b) Kolkata (Haldia Dock Complex)	3.84	3.60	3.43	4.01	3.02	2.84
2 Mumbai	7.68	3.60	4.64	5.47	5.06	4.07
3 Jawaharlal Nehru	10.08	11.76	8.24	4.34	2.28	1.85
4 Chennai	26.00	4.30	0.91	5.30	3.70	4.85
5 Cochin	4.20	1.67	4.02	2.37	2.19	2.22
6 Vizag	5.76	3.12	1.18	3.51	3.72	3.33
7 Kandla	21.36	16.80	11.06	6.55	5.94	5.06
8 Mormugao	32.16	19.92	26.71	2.04	1.94	4.47
9 Paradip	11.04	10.32	5.14	3.99	3.37	3.43
10 New Mangalore	5.99	4.41	3.07	2.73	2.37	2.35
11 Tuticorin	10.56	7.20	1.60	4.11	3.59	2.52
12 Ennore	9.98	1.56	1.66	3.62	2.22	2.11

Source: Ministry of Shipping.

has witnessed the emergence of these minor ports as major players in cargo handling as is evidenced from their increasing share in cargo handled. Compared to traffic of 27.83 million tonnes in 1996-97 which accounted for about 10 per cent of total maritime traffic handled in the country's ports, it has increased phenomenally to about 108 million tonnes in 2003-04 accounting for about 24 per cent of the total maritime traffic in the country.

9.69 Through a series of path-breaking institutional innovations, India has obtained substantial progress in the major ports sector. The turnaround time came down further from 3.7 days in 2002-03 to 3.5 days in 2003-04. The average output per ship-berth-day went up from 8,455 tonnes in 2002-03 to 8,978 tonnes in 2003-04. The pre-berthing time at major ports dropped from 6.9 hours in 2002-03 to 5 hours in 2003-04 (Figure 9.2).



9.70 At the same time, there continues to be a high degree of cross-sectional heterogeneity between the performance characteristics of various ports (Table 9.18).

Table 9.18 : Performance indicators of ports in India: for containers (2003-04) (Provisional)

	JNPT	Chennai	Kandla	Kolkata
Average pre-berthing time on port account (hours)	8.44	0.68	1.98	0.08
Average turnaround (days)	1.62	1.36	2.18	3.03

Source: Ministry of Shipping

The pre-berth waiting time at JNPT is a particularly important problem, given the fact that JNPT accounts for over half of India's container traffic.

9.71 Box 9.3 shows the JNPT experience with bringing in specialised firms which operate port services. A series of similar contracts are either under negotiation or under implementation at many ports across the country. There is also a new phenomenon of private ports, such as Pipavav and Mundra.

9.72 Investments in the ports sector which continue to take place at a substantial scale will be further spurred by institutional reforms in coming years. As at present, 11 private or captive projects, with a capacity addition of about 38.2 MTPA and an investment of about Rs.2,053 crore have been completed/operationalised while 25 others with a capacity addition of around 85.3 MTPA and an investment of Rs. 5,479 crore are at various stages of evaluation and implementation.

9.73 A key area of future reform is the corporatisation of major ports in a phased manner, starting with JNPT. Their functioning today, which takes place under the Major Ports Trust Act (1963), has been inhibited by inflexibility in decision making. A pioneering effort

in this area is the Ennore port, which has been registered under the Companies Act (1956).

9.74 The central focus of policy in the ports area must remain maximisation of intra-port and inter-port competition. We may be increasingly shifting towards a model where the port is a landlord, with multiple competing port operators in place within the port. As highlighted above, the ports sector already has significant heterogeneity in institutional mechanisms. Ennore is a major port under the Companies Act that operates in tandem with other major ports under the Major Ports Trust Act. Minor ports complement major ports, within which there are many differences between states. Multiple berths are run by various port operators. Some ports are private. This heterogeneity is a major strength of India's ports sector. It improves the extent to which policy innovations are attempted, and the learning that comes from varied experience.

9.75 In terms of technical parameters, the rate of progress in India's ports sector appears to be impressive. The All-India average turnaround time has dropped from 5.7 days in 1998-99 to 3.5 days in 2003-04. However, considerable effort is still needed in order to get up to world standards. Going beyond technical parameters is the question of cost. There is a need to continually benchmark Indian ports against the best ports worldwide, such as Colombo, Singapore or Hong Kong, and continue to engage in policy efforts so as to attain prices per container of port services which are the lowest in the world.

Civil Aviation

9.76 Air traffic trends in both domestic and international sectors have been encouraging. Domestic traffic grew by 9.3 per cent in the period January to December, 2003 over the same period in the previous year. Demand for travel to India from other countries in the winter of 2003 increased by nearly 23 per cent.

9.77 In the airline industry, Indian Airlines along with three private airlines provide regular domestic air services. In addition, there are 37 non-scheduled operators providing air taxi/non-scheduled air transport services. The private sector now accounts for 60.1 per cent

Box 9.3 : Jawaharlal Nehru Port Trust – P&O Australia Experience

- Jawaharlal Nehru Port Trust, Navi Mumbai, signed an agreement with P&O Australia, for development of a two berth container terminal of 600 meter quay length on "Build, operate and transfer" (BOT) basis for a period of 30 years in July 1997. M/s P&O completed the project ahead of schedule and commenced operations in April 1999. the total investment on this project was about Rs. 900 crores. The new terminal was named as Nhava Sheva international Container Terminal (NSICT).
- The private terminal was expected to handle a minimum of 1.75 lakh (TEUs) of containers in the first year of operations, reaching a minimum of 5 lakh TEUs in the sixth year. However, NSICT surpassed this figure and handled 3.43 lakh TEUs of containers during the first year of operations (April 1999 to March 2000). The container traffic handled by NSICT during 2003-04 was 12.3 lakh TEUs compared to 12.01 TEUs in 2002-03.

of the domestic air traffic. The Airports Authority of India (AAI) earned a profit after tax of Rs.282 crore in 2002-03 as compared to Rs.267 crore in 2001-02. The higher profit is due to growth in traffic. The estimated profit after tax for 2003-04 is Rs. 294 crore.

9.78 AAI is currently in the process of setting up two separate companies for Delhi and Mumbai airports. It has been decided to restructure and modernize the Mumbai and Delhi airports through the Joint Venture route. To assist in the restructuring process, M/s ABN-AMRO Asia corporate Finance (I) Pvt. Limited have been appointed as the Financial Consultant. An Empowered Group of Ministers has been constituted to oversee the process of restructuring.

9.79 Two new greenfield airports with private sector participation are proposed to be set up at Bangalore and Hyderabad. These airports are to be set up as joint ventures where the private partners will hold 74 per cent equity and State Governments and AAI will together hold the balance 26 per cent. The State Governments of Andhra Pradesh and Karnataka have selected the private sector partners for Hyderabad and Bangalore airports respectively. The Bangalore and Hyderabad International Airports and Airports Authority of India have signed the shareholders agreements.

9.80 The project of the new greenfield airport at Devanahalli near Bangalore is to be implemented on a Build Own and Operate (BOO) basis. The Government of Karnataka, through Karnataka State Investment and Industries Development Corporation (KSIIDC), and AAI will together hold 26 per cent equity (AAI's investment in the equity to be capped at Rs.50 crores) and the strategic joint venture partner will hold the balance 74 per cent. Financial closure is expected to be achieved shortly after the Concession Agreement is finalized. The target opening date for the airport is 33 months from the date of financial close.

9.81 In August 2003, a Committee was setup under the Chairmanship of Shri Naresh

Chandra, to prepare a road map for the Civil Aviation Sector that would provide a basis for the National Civil Aviation Policy. The Committee has since submitted first part of its recommendations in December 2003. The Committee has made wide-ranging recommendations which would be used as inputs to draw up a comprehensive Civil Aviation Policy.

Railways

9.82 Railroads are an extremely efficient form of transportation. For example, the energy consumption for freight movement on railroads is 440 Joules/KgKm, about a quarter of 1,836 Joules/KgKm required for trucks. In addition, the railways generate less pollution, and involve fewer accidents.

9.83 The network of Indian Railways (IR) is spread over 63,122 route kilometre (Rkm), comprising broad gauge (45,622 Rkm), metre gauge (14,364 Rkm) and narrow gauge (3,136 Rkm). Roughly 26 per cent of this network is electrified. Railways have taken certain proactive measures to face the challenges from other modes.

9.84 In 2002-03, IR achieved originating revenue earning freight loading of 518.7 million tonnes – an increase of 26.2 million tonnes over 2001-02. The freight loading performance of railways in 2003-04 stood at 557.4 million tonnes, i.e. 38.7 million tonnes more than that achieved during 2002-03. The overall increase in revenue earning freight traffic in terms of Net Tonne Kilometers (NTKM) during 2002-03 works out to 6 per cent over the performance of 2001-02. During 2003-04, the increase in NTKMs over 2002-03 was 7.9 per cent. During the year 2003-04, the representative index of wagon utilisation expressed in terms of Net Tonne Kilometre per wagon per day increased from 2,468 in 2002-03 to 2,554 in 2003-04 (Table 9.19).

9.85 During the year 2003-04, the number of passenger carried by the Railways was 5,112 million, an increase of 2.85 per cent over 2002-03. Transportation services measured in passenger kms, which is the product of the number of passengers carried and the average distance traversed, were 533 billion

Table 9.19 : Performance of the Railways

	2001-02	2002-03	2003-04*	Change over previous year	
				2002-03	2003-04
1	2	3	4	5	6
				(per cent)	
1 Total revenue earning freight traffic (million tonnes)	492.5	518.7	557.4	5.3	7.5
(i) Coal	229.8	235.9	251.7	2.7	6.7
(ii) Raw Materials for steel plants (excl.coal)	39.4	41.0	44.0	4.1	7.3
(iii) Pig iron & finished steel from steel plants	12.4	13.6	14.3	9.7	5.1
(iv) Iron ore for export	15.7	16.7	26.7	6.4	59.9
(v) Cement	44.0	46.2	49.5	5.0	7.1
(vi) Foodgrains	32.8	45.6	45.4	39.0	-0.4
(vii) Fertilizers	27.2	26.5	25.8	-2.6	-2.6
(viii) POL	35.6	34.0	32.0	-4.5	-5.9
(ix) Balance (other goods)	55.6	59.2	68.0	6.5	14.9
2 Net tonne kilometers (billion)	333.2	353.2	381.2	6.0	7.0
3 Net tonne kilometers per wagon per day (broad gauge)	2,223	2,468	2,554	11.0	3.5
4 Passenger traffic originating (million)	5,093	4,971	5112	-2.4	2.8
5 Passenger kilometers (billion)	491#	515	533	4.9	3.5
* Provisional.		# Revised			
Source : Ministry of Railways					

during 2003-04, up by 3.4 per cent from the level of 515 billion in 2002-03.

9.86 There has been significant effort at 'tariff rebalancing' and rationalisation of fare and freight structures in the Railways Budgets 2002-03 and 2003-04. These include reducing the number of classes for freight tariff from 59 to 27, and reducing the ratio between the highest and the lowest freight rates from 8.0 to 2.8 and reduction in freight rates for certain high-rated commodities such as Petroleum products, iron, steel and cement.

9.87 Rail Vikas Nigam Limited (RVNL) was setup in January 2003, as an effort to create new institutional mechanisms for implementing railway projects through a blend of budgetary support and non-budgetary initiatives. It is implementing a part of the National Rail Vikas Yojana. An outlay of Rs. 717 crores has been

provided for RVNL, during the year 2004-05, to execute 38 projects which form part of the Golden Quadrilateral.

9.88 IR has entered into a range of Memorandum of Understanding/Agreements with the State governments of Andhra Pradesh, Jharkhand, Karnataka, Maharashtra, Tamil Nadu and West Bengal. These cost-sharing/public private agreements with the State governments and other agencies are for the purpose of executing various projects. A Special Purpose Vehicle (SPV) named PRCL (Pipavav Railway Corporation Limited) was formed with equal equity participation from the Ministry of Railways and GPPL (Gujarat Pipavav Port Limited) for construction, operation and maintenance of Surendrangar-Pipavav board gauge line. It has implemented Surendrangar-Papavav Gauge Conversion/

New Line Project. The construction of this line has been completed and thrown open for goods traffic since March 2003.

9.89 Under public-private partnership scheme, an SPV named HMRDC (Hassan-Mangalore Rail Development Company) has been formed for construction (Gauge Conversion), operations and maintenance of a broad gauge railway track between Hassan and Mangalore connecting the New Mangalore Port, with participation of Government of Karnataka, K-RIDE (Karnataka Rail Infrastructure Development Company) and other strategic investors. Similarly an SPV named KRCL (Kutch Railway Company Limited), has taken over the gauge conversion work between Palanpur and Gandhidham providing a short route to the Ports of Mundra and Kandla from northern hinterland.

9.90 During 2003-04, the fare structure for Rajdhani Express and Shatabdi Express trains was rationalised. The basic fares for each class of Jan Shatabdi Express trains were reduced from the earlier mark-up of 10 per cent to 5 per cent over the fares of corresponding class of Super fast Mail/Express trains. The concept of reduced fares during non-peak periods was introduced in the railways. As an experimental measure, the basic fares of AC First Class and AC 2-Tier in all Rajdhani Express trains were reduced by 10 per cent for journeys performed between the period July 15 to September 15, 2003. This experiment has been successful and has resulted in a significant increase in the number of passengers and earnings during this period for various trains. The number of passengers went up by 27 per cent and earnings recorded an increase of 15 per cent in 2003 as compared to 2002 for the same period. Internet Ticketing System which was initiated in 2002 at Delhi has been extended to more than 100 major cities so far in India.

9.91 Safety on Indian Railways has been receiving the highest priority. The main index of rail safety, viz, train accidents per million passenger kms has dropped from 0.55 in 2001-02 to 0.44 in 2002-03. A White Paper on 'Safety' was tabled in both the Houses of

Parliament in April, 2003 which offered a review of the safety performance of the Indian Railways in terms of accidents which have occurred on the system during the last four decades and measures taken towards modernization of infrastructure such as track, bridges, rolling stock as also the relief and rescue system prevalent on the Indian Railways. The White Paper also examined the role of human element specially that of the failure of railway staff in accidents so as to provide appropriate managerial inputs for development of human resources. The Corporate Safety Plan of Indian Railways (2003-2013) was formulated and presented in both the Houses of Parliament in August, 2003. It lays down the safety related objectives, strategies and targets which the Indian Railways would be striving for in the next decade. It also lists out the various works and programmes to be undertaken to achieve its various goals, involving an investment of Rs. 31,385 crore over the period.

9.92 Out of Rs. 17,000 crore of non-lapsable Special Railway Safety Fund (SRSF) set up in 2001-02, to wipe out the arrears in renewal/replacement of overaged assets within a time frame of six years, the expenditure in first two years was Rs. 3,920.60 crore. For the year 2003-04 (RE) the outlay under SRSF was Rs. 2,350.66 crore.

Urban infrastructure

Importance of urban problems

9.93 In the 21st century, the first urban millennium in human history with over half the population of the globe now living in cities and towns, India faces an unprecedented challenge in throwing up sound institutions to cope with the rapid growth of cities. Roughly 30 per cent of India's population is in cities, but this number (30 crore) is already the second largest urban system in the world. It is expected that by 2025, half of the population will be urban. Roughly a third of the urban population today lives below the poverty line. Urban slums in some areas may have health indicators that are more adverse than rural ones.

9.94 Urban infrastructure consists of drinking water, sanitation, sewage systems, electricity and gas distribution, urban transport, primary health services, and environmental regulation. Many of these services are in the nature of 'local' public goods with the benefits from improved urban infrastructure in a given city limited to the citizens living in that city. Much of urban infrastructure is hence intimately linked to decentralisation of economic and political powers to sub-national tiers of government. In the light of the 74th amendment to the Constitution, there is a need to create fully empowered city governments to manage the urbanisation process, while having political accountability for it.

9.95 The urban shift has two important aspects, output and poverty. On one hand, large and small urban centres are disproportionately important to obtaining GDP growth. Roughly 50 per cent of India's GDP is presently estimated to come from the urban sector. Hence, growth of GDP and growth of the tax base depend on improving public goods in cities. At the same time, in the urbanisation process, poverty takes on an urban face. National policies on growth and poverty will increasingly have to focus on public goods and poverty alleviation in urban areas.

9.96 There is a close linkage between urban poverty alleviation and administrative and institutional reforms in the urban sector. Poverty reduction programs are intrinsically linked to efficient systems of service delivery and local government management. Efficiency gains from the restructuring process enables more resources in general to be diverted to specific social services and to subsidies for the poor. In addition, specific poverty programs such as slum-upgrading can be designed more systematically. For example, a slum-upgrading program will have a better chance to be scaled up to a city program if the delivery of municipal services and land tenure program is working more efficiently.

9.97 International experience suggests that without reforms in the institutional framework for urban infrastructure, central or state level government funds directed into the urban

sector will not have the expected economic and social returns. On the contrary, the urban sector could make larger fiscal claims when faced with acute problems of infrastructure or poverty, and thus exacerbate India's fiscal problem. The success of central or state fiscal reforms is thus dependent on the efficiency of the cities themselves.

Urban-rural linkages

9.98 While urban infrastructure is important in its own right and is in the nature of a local public good, there are important urban-rural linkages and externalities. The organisational capacity, and professional staff, that comes about for cities can take on additional functions in a significant 'footprint' of outlying rural areas. This would harness economies of scale and scope. For example, a regional water utility for a cluster of small towns can also serve neighbouring rural communities - either directly as a service provider, or indirectly through technical inputs for panchayat-led delivery systems.

9.99 Rural areas surrounding cities tend to indirectly derive significant income from the prosperity of the city, through sale of high value crops, through SMEs and through labour supply. Urban centres provide income diversification, as rural families often have some family members working in urban centres. Hence, improvements in local public goods in cities, which spur GDP growth in cities, help impact on rural incomes in surrounding areas.

Urban transportation

9.100 Urban transport is one of the most important elements of urban infrastructure. Of the two broad modes, viz., private and public transport, the latter empowers the poor, who may otherwise be constrained to pursue economic and personal activities within walking distance of their living quarters. Public transport improves energy efficiency of the economy in comparison with solutions with an accent on private transport and reduces the problems of environmental pollution. In addition, public transport systems help maximise urban-rural linkages and improve the access of the rural/semi-urban population in

the periphery to city centres for the purpose of labour supply, without proliferation of slums within and around cities. The major objective of urban transport initiatives is, therefore, to provide efficient and affordable public transport link between workplace and residence to all sections of the urban population. Towards this end, a draft National Urban Transport Policy has been drawn up and circulated to State governments and other stakeholders to elicit views and comments.

9.101 The Delhi Mass Rapid Transit System (MRTS), a joint venture between the Government of India and Government of National Capital Territory of Delhi is an important initiative in this regard. The project is being implemented by the Delhi Metro Rail Corporation (DMRC), a special purpose vehicle set up under the Companies Act for this purpose. Box 9.4 summarises the salient features of this project.

9.102 Another important initiative for the National Capital Region (NCR) is the Integrated Rail-cum-Bus Transit (IRBT) System, envisaging development of a commuter rail system connecting Delhi with towns in the NCR. It comprises three corridors, viz., (i) Shahdara-Ghaziabad (14.92 kms), (ii) Sahibabad-Shivaji Bridge (17.36 kms), and (iii)

Trinagar-Gurgaon (30.53 kms). The project is expected to be a joint venture between the Government of India (Ministry of Urban Development and Ministry of Railways), on the one hand, and the Government of National Capital Territory of Delhi, Haryana and Uttar Pradesh, on the other. The project proposal (estimated cost of Rs. 2239 crore) is being referred to the Planning Commission for 'in-principle' approval.

9.103 The Bangalore Mass Transit System (MRTS) envisages construction of a metro railway along East-West (18.1 kms) and North-South (14.9 kms) corridors in Bangalore. The Detailed Project Report (DPR) of the project estimates the completion cost at Rs. 4989 crore (including escalation and interest during construction). The proposal, submitted by the Government of Karnataka, has been accorded 'in-principle' approval by the Planning Commission and is being processed for further clearances.

Financing patterns

9.104 In terms of financing patterns, the foundation of urban infrastructure has to be user charges. It is possible for urban institutions to access resources from the capital markets to finance a large portion of

Box 9.4 : Delhi Metro Rail Transit System

- Phase I of the Delhi MRTS project consists of the following three corridors:

	Total length (kms.)	Underground (kms)
(i) Shahdara-Trinagar-Barwala	27.84	—
(ii) Vishwa Vidyalaya-Delhi Govt. Sectt.-ISBT-Connaught Place-Central Sectt.		
(iii) Barakhamba Road-Connaught Place-Dwarka	22.90	1.12
Total	60.58	11.96

- The Project (phase I) is scheduled to be completed by September, 2005. Shahdara-Tis Hazari section (7.92 kms.) of the Shahdara-Barwala corridor was commissioned on 24th December, 2002 and the Tis-Hazari-Inderlok Section (4.74 kms.) of this corridor on October 3, 2003. Commercial operation of the Inderlok to Rithala section (9.40 kms.) was commissioned on March 31, 2004.
- The remaining corridors are scheduled to be completed as under:

(i) Rithala-Barwala	31.12.2004	5.78 km.
(ii) Vishwa Vidyalaya-Kashmiri Gate	31.12.2004	3.94 km.
(iii) Kashmiri Gate-Central Secretariat	30.09.2005	6.90 km.
(iv) Barakhamba Road-Kirti Nagar	30.06.2005	8.41 km.
(v) Kirti Nagar-Dwarka	30.09.2005	14.49 km.
- The Detailed Project Report (DPR) for Phase II of the Delhi MRTS is under preparation.

urban capital expenditure, to be serviced by user charges in the future. This approach makes it possible to have a massive increase in capital expenditure on urban infrastructure without worsening the fiscal problem. In addition, the tariff restructuring or subsidy design in the context of a restructuring process allows for more efficient and targeted impact on the poor. In this context, Table 9.20 summarises India's experience with municipal bond issuance. While these bond issues have indeed taken place, the magnitude of resources involved is as yet insignificant.

Present problems in urban service

9.105 In terms of institutional structures, municipal functions are fragmented between different corporations, agencies, and local government bodies across state and local levels with conflicting lines of accountability. Existing agencies for municipal service delivery are structured along line-function systems with limited accountability, limited incentive for innovation in delivery of services, and limited use of private sector capacity to manage and finance services. There is a limited interface and accountability between political and administrative systems and communities. In particular, poor communities have a limited voice over city policies.

9.106 In terms of fiscal problems, there is persistent under-performance on revenue effort with unsustainable tariff structures and non-transparent subsidy schemes. The general property tax system requires

restructuring and modernisation. Low income households are often at the regressive end of the fiscal system. At the same time, improvements in tax revenues and user charges are likely to be most acceptable in the context of concurrent improvement in the institutions of service delivery. This is perhaps analogous to the political acceptance of tolling of highways after high quality highways came about.

9.107 In terms of financial aspects, urban bodies have limited creditworthiness, with opaque financial and accounting systems and limited treasury management systems. Cities depend on fiscal transfers from other tiers of government or central government intermediation, e.g. through HUDCO. The limited access to private finance in turn limits the targeting of public funds for broader social programs and safety nets for the poor. However, access to capital markets is dependent on the institutional and fiscal reforms.

9.108 There is a need of independent regulatory capacity to oversee the operations of private participation in infrastructure, enforce social obligations of governments in particular with regards to the poor, and ensure application of environmental standards. Urban infrastructure reforms therefore have dimensions of institutional, fiscal, financial and regulatory reforms with economic efficiency and poverty reduction as the core objectives of the program. Sector-focused reforms in service delivery - e.g. a program which focuses

Table 9.20 : Municipal bond issuance

Sl. No.	Name	Amount (Rs. in crores)
2001-02		
1.	Ahmedabad Municipal Corporation	100.00
2002-03		
2.	Hyderabad Municipal Corporation	82.50
3.	Nashik Municipal Corporation	50.00
2003-04		
4.	Visakhapatnam Municipal Corporation	50.00
5.	Hyderabad Metropolitan Water Supply and Sewerage Board (HMWS&S Board)	50.00
6.	Ahmedabad Municipal Corporation	58.00
7.	Chennai Metropolitan Water Supply and Sewerage Board	42.00

Source : Ministry of Urban Development.

only on water and sanitation and solid waste - need to incorporate such institutional, fiscal, financial and regulatory dimensions to the reform package.

9.109 One of the most important developments in this area was the 74th amendment to the Constitution. However, the implementation is as yet incomplete, leading to a fragmentation of local responsibilities between State and urban local governments, and a lack of accountability and performance in service delivery at the town and city level. In recent years, the Ministry of Urban Development and Poverty Alleviation has begun to complement its traditional spending approach on funding hardware to providing incentives for urban reform and institutional change in service delivery. It has initiated two important programs: the City Challenge Fund (CCF), and the Urban Reform Incentive Fund (URIF) scheme.

9.110 City Challenge Fund (CCF) has been set up as an incentive based facility that will support cities to fund transitional costs of moving towards and creditworthy institutional systems of municipal management and service delivery. The CCF is an incentive-based grant facility to support projects with the involvement of the private sector in urban services. The CCF will support larger municipalities, with a population of 5 lakh State capitals and cities in the northeast. While CCF has much strength in terms of institutional design, it has (as yet) not been implemented.

9.111 Urban Reforms Incentive Fund (URIF) has been created with a corpus of Rs.500 crores per annum as (Additional Central Assistance) for reform linked incentive to State governments. Box 9.5 summarises features of URIF. Up to March 2004, 21 States and 3 Union Territories have signed Memorandum of Agreement (MOA) with the Department of Urban Employment & Poverty Alleviation to undertake the first generation urban reforms. URIF is a State level Incentivisation Programme. It seeks to incentivize State Government (not ULBs) to follow a certain reform programme decided by Government of India. Funds under URIF are untied and can be used for any urban development or housing

Box 9.5 : Salient features of Memorandum of Agreement with State Governments under Urban Reforms Incentive Fund (URIF)

The incentive under URIF is provided as 100 per cent Grant to the States/Union Territories entering into a Memorandum of Agreement with the Central Government addressing the first phase reform in the following areas.

- Repeal of the Urban Land Ceiling and Regulation Act.
- Rationalization of Stamp Duty in phases to bring it down to no more than 5 per cent by end of the Tenth Plan period.
- Reform of Rent Control Laws to remove rent control at lease prospectively.
- Introduction of computerized process of registration.
- Reform of Property Tax so that it may become a major source of Urban Local Bodies (ULBs), and arrangements for its effective implementation with collection efficiency of 85 per cent by the end of the Tenth plan period.
- Levy of reasonable user charges, with full cost of O&M being collected by end of the Tenth Plan period.
- Introduction of a double entry system of accounting.

The Empowered Committee under the Chairmanship of Secretary (Urban Employment & Poverty Alleviation) has been authorized to add the more areas of urban reforms in the second and subsequent phases of reforms.

or poverty alleviation project whereas CCF funds are tied and partly offset costs of transition/loss due to reform.

9.112 In response to these problems, has been an effort on creating a broader “guiding framework” for urban service delivery. A Model Municipal Law (MML) has been prepared and circulated to all States/UTs in October 2003. The MML provides the legislative framework to implement the provisions of the 74th Constitutional Amendment for empowerment of ULBs to enable them more effective and better service delivery. Guidelines on Private Sector Participation (PSP) in water and sanitation have also been issued. In order to maximise impact, both these need to be fully linked to the fiscal transfers.

Strategy for urban infrastructure reform

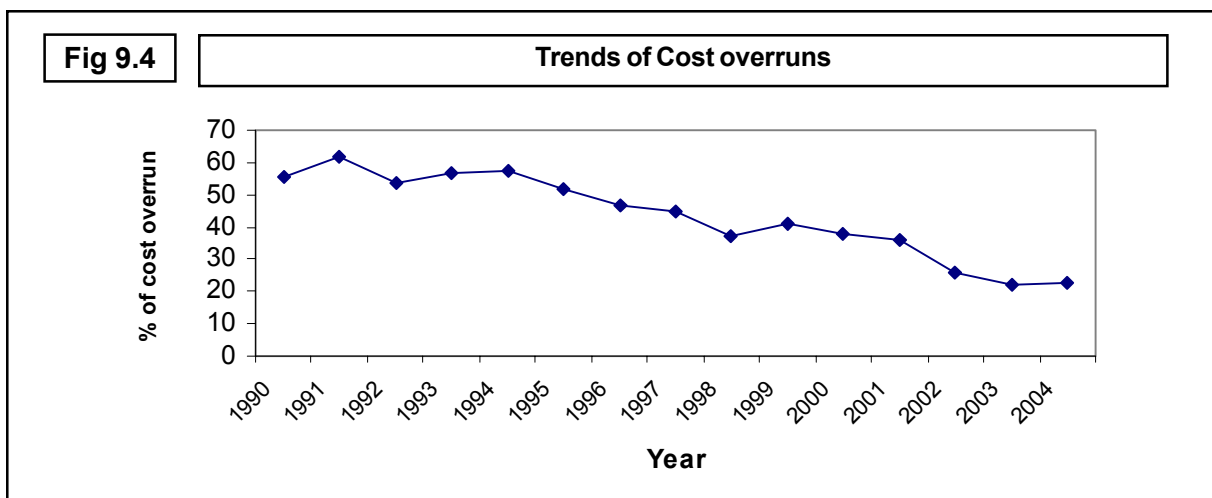
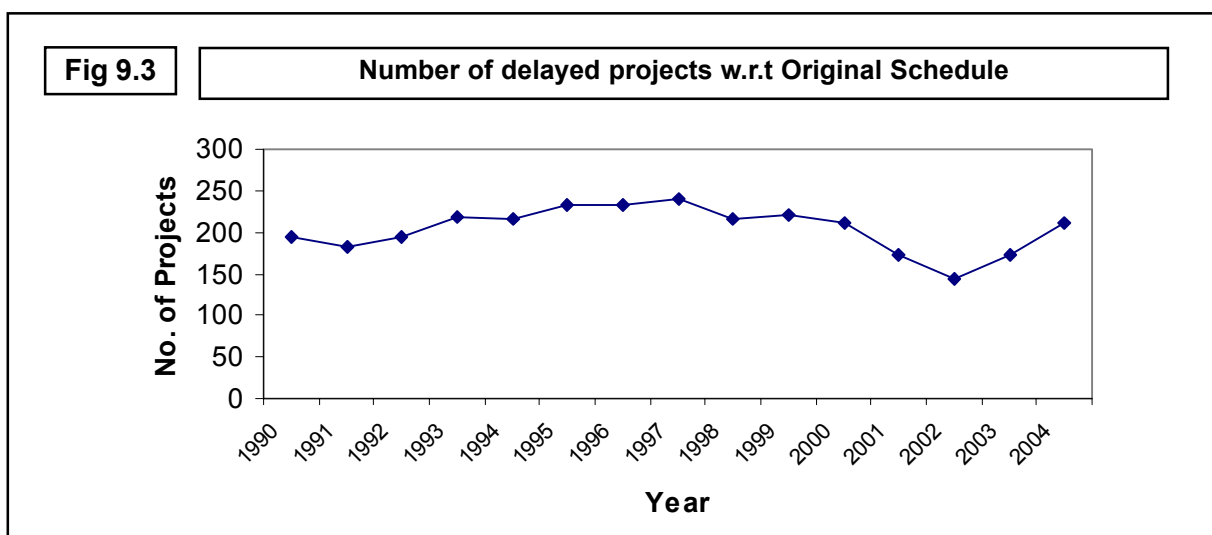
9.113 The central policy focus, as envisaged originally in the 74th amendment, hence, needs to be on the empowerment of local governments to take economic and service delivery decisions. This involves a new framework for urban expenditures that is driven through urban local governments. This needs to address the current fragmentation of authority between State and local government, support greater urban local government oversight and accountability for urban and municipal functions, and support control of service delivery investments, operations and financing to urban and municipal governments across functional urban areas.

9.114 Central government fiscal and regulatory incentives can catalyze institutional

change at the State and local level, support innovative institutional forms of effective service delivery at the local level, and support the development of credit worthy urban local governments. This requires extensive work on improving the Model Municipal Law (MML), extending the Private Sector Participation (PSP) guidelines to cover over services, and strengthening the statistical system so as to have better data about expenditures on producing public goods, and public outcomes. The existing schemes need to be consolidated and rationalised into a system of capital grants to local governments, to support institutional reform and poverty targeting.

Implementation of Central Sector Projects

9.115 At the end of March 2004, there were 568 projects with an estimated anticipated cost of Rs.2,47,039 crore. These 568 projects



are in the 16 sectors namely, Atomic Energy, Civil Aviation, Coal, Fertilizers, I&B, Mines, Steel, Petroleum, Power, Health & Family Welfare, Railways, Road Transport & Highways, Shipping & Ports, Telecommunications, Urban Development and Water Resources. Of these, 145 projects are faced with cost overruns summing up to 22.4 per cent with respect to their latest approved estimates. There are 202 projects which have a time overrun, ranging from 2 month to 156 months.

9.116 Time and cost overruns have been a major problem affecting the implementation of central sector projects. An analysis of cost overruns of 211 delayed projects shows that only 19 projects are responsible for about 90 per cent of the cumulative cost overrun. Out of these 19 projects, four hydro-electric power projects account for about 49 per cent of the total cost overrun. These four projects are now likely to be completed during the next one year. Similarly, the projects with large time overruns are a few in number. Most of these projects had serious problems which have been overcome and these are now in fairly advanced stage of completion. The number of delayed projects has drastically come down from 239 at the beginning of Ninth Plan to 144 by the end of Ninth Plan (Figure 9.3). However, the number of delayed projects has slightly increased to 211 during the year 2002-03, mainly due to increase in number of total projects of NHDP broken down into about 135

small packages and the number of total projects increasing more than hundred.

9.117 The decline in time and cost overrun has been possible due to close monitoring and systems improvement brought out by the Ministries concerned with the support from the Ministry of Statistics & Programme implementation. An analysis of the trend in the last 10 years shows that the cost overrun has come down from 62 per cent in March 1991 to 22.4 per cent in March 2004 (Figure 9.4).

Investment in infrastructure

9.118 Infrastructure investment can potentially have a strong impact on GDP growth, both through improved production of infrastructure services, and through its impact on the demand side of the economy.

9.119 As is well known, enormous financial investments are required to bring India's infrastructure up to world standards. For these investments to come about, a sound policy framework is required, which emphasises sound enforcement of user charges, transparency, and high quality regulation. Conversely, once sound policies fall into place, we may expect a sharp payoff in terms of an improvement in the flow of investment. To the extent that these investments are undertaken by the private sector, this is particularly beneficial given the fiscal constraints that limit the ability of the State to engage in those expenditures.

Table 9.21 : Gross Capital Formation in Infrastructure
(at current prices)

	1993-94	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03
Gross Capital Formation in Infrastructure	45940	62903	70762	75120	94226	91050	90890
1. Electricity, gas & water	23170	30756	36129	34255	36907	39180	42051
2. Transport, storage & communication	22770	32147	34633	40865	57319	51870	48839
2.1 Railways	5580	5069	5019	5307	5491	6981	9470
2.2 Transport by other means*	11304	16460	18153	21272	25802	21019	19028
2.3 Storage	136	456	599	353	1362	1525	1442
2.4 Communication	5750	10162	10862	13933	24664	22345	18899

* Includes roads, civil aviation, airports and inland water.

Source : CSO

Review of recent trends in investment in infrastructure

9.120 Gross Capital Formation (GCF) in infrastructure investment at current prices (Table 9.21) increased from Rs.45,940 crore in 1993-94 to Rs. 90,890 crore in 2002-03. However, expressed as a proportion of GDP, total investment in infrastructure declined from 5.4 per cent in 1993-94 to 3.7 per cent in 2002-03.

Conclusion

9.121 Policy makers have worked on problems of infrastructure policy for over a decade. There has been substantial progress in some areas. The broad outlines now appear to be falling into place. The key principles seem to involve well enforced user charges, exploiting new technologies, private sector production, and a regulatory framework that fosters competition.