

CHAPTER 10

INFRASTRUCTURE

Availability of good quality infrastructure is a prerequisite for sustained economic growth. Infrastructure forms the foundation on which social, economic and industrial development is built

constitutes only 1.76 per cent of the total road length, it carries forty percent of road traffic. The total length of National Highways in the country is 65,569 kms.

Road Transport

10.2 India has a large network of roads, aggregating to 3.3 million kms, comprising of National Highways, State Highways, Major/ Other District Roads and Village/ Rural Roads.

National Highways in Kerala

10.4 The length of National Highways remained stagnant without any increase or decrease during 2003-04. National Highways in Kerala is only 2.3 percent of the National length spread over a length of 1523.954 km in eight stretches. Improvement and strengthening of 320 km of National Highways was carried out by providing Bituminous Macadam and Asphaltic concrete in the year 2003-04.

10.5 State wise allocation of funds from Ministry of Road Transport & Highways (MORTH) for development and maintenance of National Highways during 2003-04 is given in the Table 10.1

BOX-10.1

Largest Road Network in the World

India has one of the largest networks of Roads second only to United States of America, in the World. Structure and quality are however very poor for rest of the roads.

10.3 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, and self-financing revenue model comprising tolls and a cess on fuel. Roads in India carry 65 percent of the freight and 87 percent of the passenger traffic. Reports indicate that there is an annual growth rate of seven to ten percent in road traffic of the country. Even though the length of National Highways

Table 10.1
State wise allocation of funds from MORTH for development and maintenance of NH during 2003-04

Name of State	Development Allocation			Rs in Crore Maintenance Allocation
	NH (O)	P.B.F.F	Total	
Andhra Pradesh	103.00	7.51	110.51	37.42
Karnataka	146.37	3.98	150.35	38.73
Kerala	95.00	4.86	99.86	20.81
Tamil Nadu	87	2.04	89.04	41.36
All India	1774.00	86.00	1860.00	731.74

NH (O) - from plan fund

PBFF - Permanent Bridge Fee Fund

Source: Annual Report 2003-04 (MORTH)

State Road Network

10.6 The major development indicators of Transport and Communication sector in the State since 1998 are given in Appendix 10.1. Kerala

has a total road length of 1,45,704 kms of which 45,249 kms (31.05%) is surfaced. Road density in the state is 374.9 km/100 sq. km and it is far ahead of the national average of 74.9 km/100 sq km. The length of road per lakh population is 462.6 km much higher than the national average of 259.2 km.

10.7 The total road length in Kerala during 2003-04 increased to 1,45,704 km from 1,38,196 km in the previous year registering an increase of 5.15 per cent. The roads maintained by Panchayats increased by 3.62 percent in 2003-04. Roads maintained by different agencies is given in Table 10. 2. Category of road net work in Kerala is shown in figure.10.1

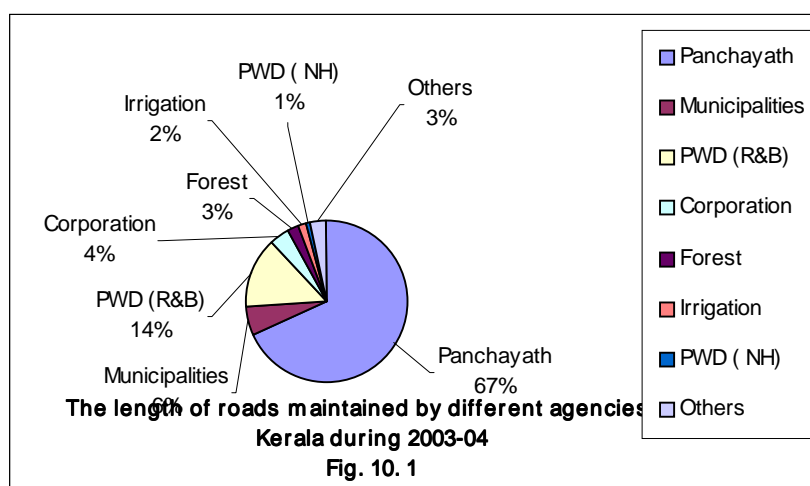
Table 10. 2
Agency wise Distribution of State Roads

Name of Department	Length (km)	Percentage
Panchayats	98973	67.92
Municipalities	7696	5.82
PWD (Roads & Bridges)	21467	14.73
Corporation	5882	4.03
Forest	3926	2.69
Irrigation	2359	1.62
PWD (NH)	1523	1.04
Others (Railways, KSEB)	3874	2.65
Total	1,45,704	100

roads with a length of 2173.427 km (10.12 %). Wayanad district has the lowest share with 515.897 (2.4%). Details of district-wise, category wise and surface wise length of road maintained by PWD (R&B) as on 31.3.2004 are given in Appendices 10.2 and 10.3. The district wise – and surface wise length of road maintained by PWD as on 31.3.2004 are given in appendices 10.4 to 10.6. Government has approved a proposal for conversion of 6000 kms of Other District Roads (ODR) to Major District Roads (MDR).

10.9 As on 31.3. 2004 there were 2024 Bridges and 47,605 culverts on the PWD roads. Of them, 182 bridges need reconstruction/renovation and 1,654 culverts are not in good condition.

10.10 Kerala envisages a significant role for the private sector in financing, the construction of highways. The State enacted the Kerala Road Fund Act 2001, which inter alia, provides for the setting up of the Kerala Road Fund with identified and dedicated revenue sources and sets out the framework for private sector participation in the development of highways.



Kerala State Transport Project (KSTP)

10.11 This is a World Bank assisted project. The project envisages upgradation of 584 kms of road and maintenance of 1143 km (993 km heavy maintenance and 150 km performance linked maintenance) covering State highways and Major District Roads. In addition the project envisages development of 93 km of Inland canals. The project

10.8 Out of the total road length of 98973.127 kms held by Panchayats, 73532.918 km (74.29%) are gravelled and 25440.209 (25.70%) km are black topped. Of the 14 districts in the State, Kottayam district has the major share of P W D

commenced on 6/2002 and it is expected to be completed by 12/2007. The total project cost is \$ 336 million (Rs.1632.00 Crores) and the sharing of cost between World Bank and Government of Kerala is in the ratio 70:30.

The key components of KSTP is given in table 10.3

Roads & Bridges Development Corporation (R B D C K)

10.12 The Roads and Bridges Development Corporation (R B D C K) acts as a nodal agency for executing Road Over Bridges in the State apart from other Road Projects. R B D C K has already completed construction of 50 RailwayOverbridges under various projects of Railways.

BOX-10.2

Projects undertaken by RBDCK during 2003-04

Road Projects

Airport-Seaport Highway Phase I.
Karingachira to Kalamassery Road

Railway Overbridges

Major Railway Over Bridges like Vellayil, Thirur, Vengali, Thripunithura etc are completed.

Bridge/Fly Overs

River bridge at Pulamanthole and Flyover at Arayadathupalam (Calicut) are completed

North South Express Way

10.13 Preliminary studies for a High Speed Corridor extending over 506.5 km connecting Kasaragod and Thiruvananthapuram are over. This project is proposed to be executed with private participation

Research and Development in Road Sector

10.14 Research and Development activities play a crucial role in meeting the challenges of modernising road system, technology upgradation and finding cost effective solution to infrastructure problems in general. Design, Research, Investigation and Quality Control (DRIQ) Board, Kerala Highway Research Institute (KHRI) and National Transportation Planning and Research Centre (NATPAC) are the agencies engaged in Research and Development of the Road sector.

10.15 In 2003-04 DRIQ Board completed detailed design of 34 and general design for 28 bridges. This included Mattor-Madakara Bridge in Kannur District having a length of 259 meters with an estimated cost of Rs 1038 lakhs and Kottappuram Bridge across Cannoli Canal in Thrissur District having a length of 259 m at an estimated cost of Rs 1192 lakhs.

10.16 The main function of KHRI is to make project reports including detailed design and cost estimation. Preparation of Detailed Project Report for Varkala Parippally road is the first full-fledged work of the Project Preparation Unit.

Table No. 10.3
Key Components of KSTP

Sl.No	Components	Amount in Million USD	Amount in Rupees Crores
1	Upgradation Component – (584 km of Roads and 93 km of Inland Canals)	199.58	967.97
2	Maintenance Component (1143 km)	55.39	268.64
3	Consultancy Services	19.20	90.41
4	Land acquisition & Utility Shifting	19.79	95.98
5	Resettlement & Rehabilitation	20.57	99.76
6	Road Safety Component	3.20	15.52
7	Performance based maintenance works	1.00	4.85
8	Institutional Development Study	8.38	40.64
9	Incremental Operating cost	6.28	30.46
10	Front end fee	2.55	12.37
	Total	336.00	1632.60

10.17 The Kerala Highway Research Institute also conducts sample studies and quality testing of construction materials used for buildings, roads and bridges and road safety studies, studies about accident prone areas, surveying, investigation and design of alignment, testing of tar sample. design of mixtures, soil testing etc. It conducts training programmes for PWD personnel. The KHRI works in partnership with National Transportation Planning and Research Centre (NATPAC).

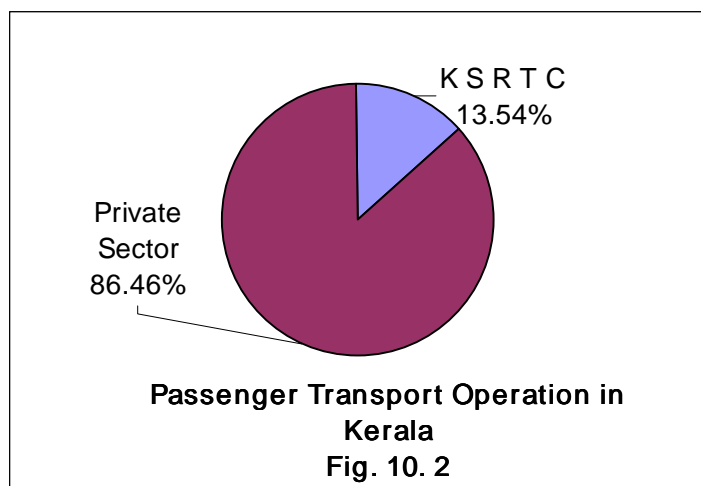
10.18 NATPAC taken up studies on all modes of transportation covering road, rail, water, seaport and airport. NATPAC undertook 13 research studies under Plan programme in the year 2003-04.

Road Transport Services

10.19 Road transport acts as the feeder service to rail traffic, air traffic and ports and harbours. Total number of stage carriages in the State comes to 31,889. Lion share of the passenger transport operations

is vested in the hands of private operators. Kerala State Road Transport Corporation (KSRTC) holds only 13.54 per cent of the Stage carriages in the State as can be seen in the figure 10. 2

10.20 Out of 4319 buses of K S R T C 545 buses (12.62%) are aged ten years. The age wise details of KSRTC buses are given in Appendix 10.15. The number of schedules operated increased from 3,651 to 3,768. About 11,453.97 lakh passengers travelled in the KSRTC buses during 2003-04 as against 11,096.76 lakh passengers in the previous year. The average km run by a bus in a day was 333 km during the period under review while it was 335 km in the previous year showing a marginal decrease of 0.20 per cent. The major indicators showing the operational parameters of KSRTC are given in Appendix 10.10. Inter-unit analysis of KSRTC reveals that about 30 percent of units exhibit poor performance. The unit wise details of operational statistics are given in Appendix 10.17.



10.21 The fares charged by KSRTC ranged from 35 paise per km in ordinary and city buses, 63 paise in Super Deluxe Service to 75 paise in High Tech Luxury (Volvo) buses. The fare structure of KSRTC is given in Appendix 10.18.

10.22 One hundred and seventeen new schedules were operated during the year 2003-04. The major performance indicators (Operational ratios) of KSRTC such as average kms run per day per bus, average route

Table 10. 4
Category wise staff position of KSRTC

Sl. No	Category	As on 31.3.2003	As on 31.3.2004	As on 31.10.2004
1	Administrative Staff	2893	2721	2535
2	Traffic Personnel	18450	15946	15199
3	Maintenance Personnel	4221	3607	3348
	Total	25564	22274	21082

length, average earning per passenger, average earnings per vehicle on road per day, earnings per km of buses operated etc, during the year 2003-04 are shown in Appendix 10.19. The total number of employees of the Corporation decreased from 25,564 in 2002-03 to 22,274 in 2003-04. It further came down to 21,082 as on 31.10.2004. Details of employees in KSRTC are given in Table 10. 4

10.23 The availability of staff per operatable bus has come down to 5.52. The category wise staff position of KSRTC is given in Appendix 10.20

10.24 Financial performance of K S R T C is not in tune with its physical achievements. The reason attributed to this is increase in operating expenditure, hike in pension commitments, increase in interest payments etc. Operation in uneconomic routes and granting concessional travel add loss to the Corporation.

BOX - 10.3

Damage to KSRTC Buses

Six hundred and sixty two buses have been damaged in hartal-related incidents in the State for the period from June 1, 2000 to August 31, 2004. The losses suffered add up to more than Rs 1.5 crore. More than 17 percent of buses suffered damage in one hartal or the other during the period.

Source : Economic News Digest Dec 15, 2004

The performance of the Corporation is given in the Table 10.5. KSRTC happen to be the major victim of hatals and strikes.

10.25 Following measures were taken for revamping Administration and improving utilisation of fleets.

- Periodic review was undertaken regarding routes, which do not even fetch Rs.10 per kilometer. Such unremunerative routes measuring a total distance of 48,500 km was done away with and instead new remunerative routes were located and fleet was effectively and profitably utilised.
- The operating distance for a pair of conductor and driver which was 104 km earlier could be enhanced to 120 km
- Electronic ticketing machines were acquired and introduced in 13 depots. This has resulted in substantial savings of manpower and stationery cost. It increased efficiency of the conductors and ticket and cash accounting system. It totally avoids chances for pilferage in revenue
- Implemented computerised pay roll system and monthly pension roll preparation Introduced 730 Hi-tech buses during the period providing betting travelling facilities to passengers
- 800 speed governors were purchased and installed in long distance buses. The installation of speed governors resulted in savings of fuel, in addition to reduction in rate of accidents and consumption of spares.
- All units of KSRTC have been connected with the Chief office through an online system

Table 10.5

Performance of K S R T C

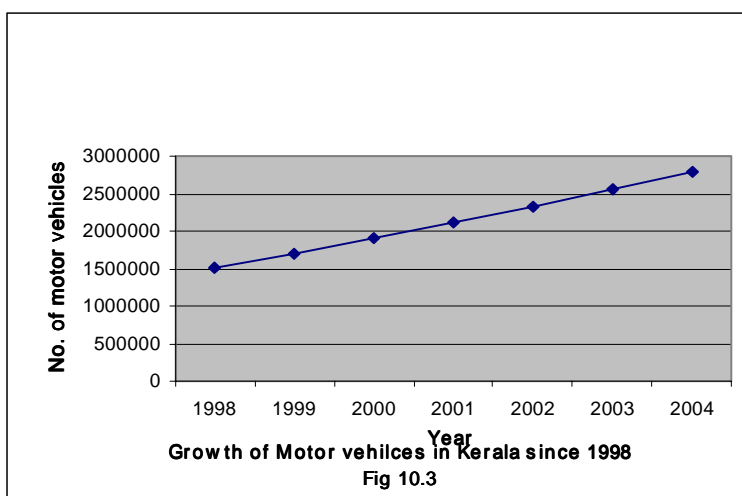
	2001-02	2002-03	2003-04 *
Net loss (Rs. Crore)	160.87	146.60	117.10
No. of buses at the end of the year	4155	4155	4319
Fleet utilisation (%)	76.78	85.00	90.00
Vehicles productivity (km) per bus per day	345.00	345.00	345.00
Load factor (%)	80.50	81.50	82.00
Bus Staff Ratio	7.90	5.95	5.52

* provisional

- A modern engine-overhauling workshop is being set up at the Central Works, Thiruvananthapuram.
- The ratio of 7.4 persons per bus could be brought down to 5.52 due to the efforts made by optimising utilisation of staff.
- Earnings per kilometer per bus increased from Rs. 15.70 in 2002-03 to Rs. 16.61 in 2003-04 due to rationalisation of staff strength and improvement in management procedures.

10.27 The number of motor vehicles having valid registration as on 31.3. 2004 stood at 27,92,074 as against 25,52,171 in the previous year. The vehicles newly registered during 2003-04 being 2,39,903 or 8.59 percent. Personal vehicles recorded a faster growth. The percentage of category wise motor vehicles newly registered during 2003-04 is shown in figure 10. 4

10.28 The District wise details of vehicles newly registered, vehicles with valid registration and growth of vehicles in Kerala are given in Appendices 10.7 and 10.8. An analysis of growth of motor vehicles and road development in the State during the last six years reveals that the vehicle population has increased from 1.51 lakh in 1998 to 27.92 lakh in 2004, while only a marginal increase has been achieved in the case of augmentation of road length during the same period.



10.29 About 657 vehicles are newly added to vehicle population every day. Of this 402 are two wheelers. The details of category wise growth of Motor Vehicles in Kerala since 1998 are given in appendix 10.10 The highest vehicle population was recorded

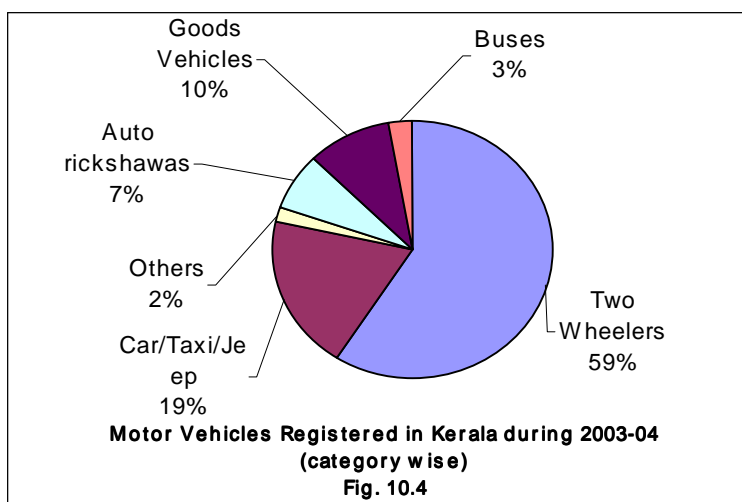
in Ernakulam district 4,64,922 (16.65%) followed by Thiruvananthapuram with 3,88,763 (13.92%) vehicles. Wayanad has the lowest number of vehicles ie. 36026 (1.29 %). The tremendous increase in the volume of road traffic in recent years has caused increase of road accidents.

Motor Vehicle Population

10.26 Kerala has 71.84 vehicles per sq. km of area and 8,769 vehicles per lakh population. The growth of vehicle population in Kerala is at a rate of 10 percent per annum. The growth of Motor Vehicles since 1998 is shown in figure 10.3

Road Accidents

10.30 Despite several initiatives taken by the police to enforce road discipline and enforcement of rules by Motor Vehicle Department road accidents are increasing. Statistics on road accidents in the State in 2002-03 and 2003-04 is shown in the Table 10. 6.



10.31 The details of accidents reported in Thiruvananthapuram district from January to June 2004 are shown below.

Table 10. 6
Daily Statistics of Accidents

Description	Year	
	2002-03	2003-04
No. of accidents	107	110
No. of persons killed/injured	143	137
Accidents involving Two wheelers	34	36

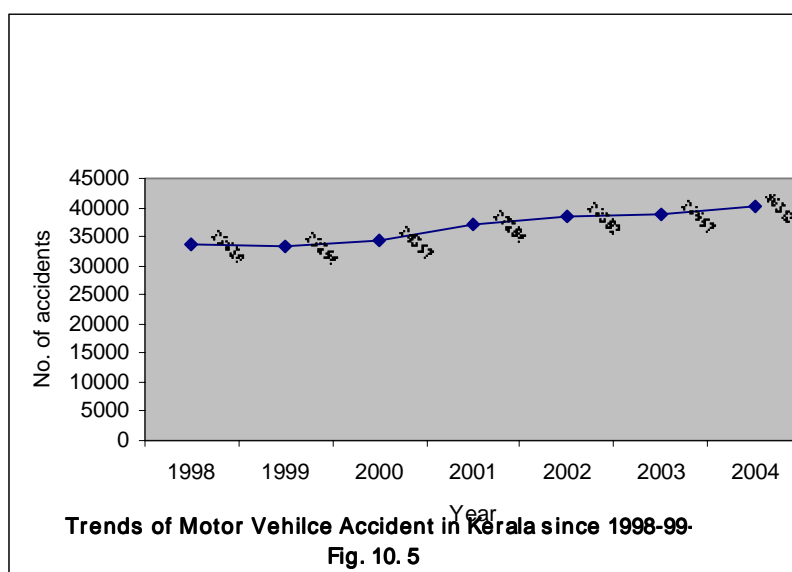
BOX - 10.4

Accident scene in Thiruvananthapuram District during January-June 2004

(No. of cases reported)

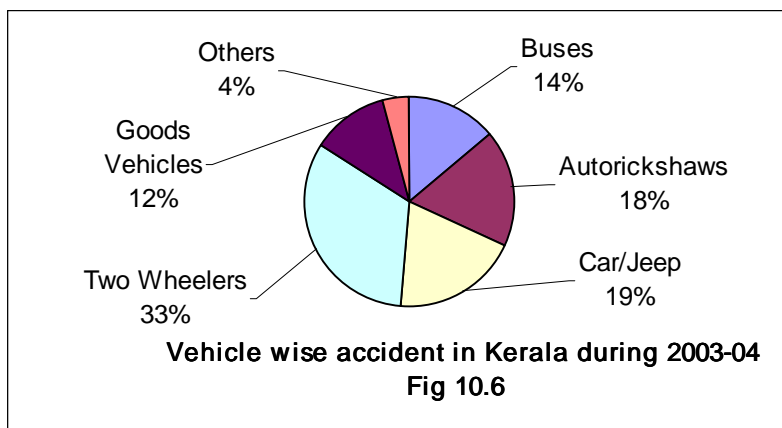
	City	Rural
◆ Accidents	1,021	1,600
◆ Persons killed	60	100
◆ Persons injured	1145	2,010
◆ Accidents due to rash driving	990	1681
◆ Accidents on NH 47	202	409
◆ Accidents on other roads	901	1,281
◆ Accidents during night time	323	661
◆ Accidents during daytime	698	1,029
Accidents involving		
◆ Two wheelers	731	844
◆ Autorickshaws	226	299
◆ Cars	191	244
◆ Buses	58	256
◆ Mini buses	49	155

Source : Kerala Police



10.32 In the year 2003-04 Kerala registered 40,312 accidents (110 per day) in which 2,943 persons were killed and 49,502 persons were

crores. The total deposits outstanding as on 31.3.2004 is Rs. 94.60 crores. In the year 2003-04, the Company launched a special vehicle loan scheme for MLA's and Officers for the purchase of four wheelers. Rs. 96.87 lakhs and Rs. 168.02 lakhs have been disbursed under these schemes respectively.



Railways

10.36 Indian Railways is the backbone of the national transport infrastructure. It is the World's second largest system under a single management. It has an extensive route length of over

injured. KSRTC buses were involved in 1,158 accidents (3 per day) and private buses in 4,468. The trend in road accident in Kerala since 1998 is shown in figure 10.5

62,800 kms with 16 lakh employees operating 8049 passenger trains and 5500 goods trains every day, carrying 1.36 crore passengers and 12 lakh tonnes goods daily.

10.33 The percentage of category wise and vehicle wise accident in Kerala as on 2003-4 is shown in figure 10.6

10.37 The freight earnings came down from Rs. 252.29 crores in 2000-01 to Rs. 126.93 crores in 2003-04. The main reason for the sharp fall in the freight earnings is the shift from the rail transport to pipeline transport by oil refineries. The earnings from passenger and miscellaneous traffic is Rs. 274.39 crores. Freight traffic is expected to have quantum jump once transshipment hubs get commissioned.

Transport Finance

10.34 K T D F C continued to finance individuals, firms, KSRTC and other transport organisations for procurement of vehicles. The Company also grant loans to Small Road Transport Operators (SRTO) for the purchase of Commercial Vehicles. In addition the Corporation has granted institutional loans to the following agencies during 2003-04.

10.38 The total route length of Railways in Thiruvananthapuram Division is 625 kms. The railway network in Kerala has been expanding over the years to accommodate the growth in passenger traffic.. The electrification of Shoranur-

10.35 As on 31.3.2004 KTDFC mobilised Fixed Deposits from the Public amounting to Rs. 143.88

Table 10.7

Name of Institution/ Agency	Amount Rs. (lakhs)
1. Kerala Tourism Development corporation (KTDC)	85.00
2. Kerala State Film Development Corporation (KSFDC)	25.00
3. Kerala State Audio visual and Reprographic Centre (KSAV & RC)	33.06
4. Aluva Municipality	33.06
5. Tropical Botanic Garden and Research Institute	10.96
6. Kerala State Horti Culture Development Corporation	5.80
7. Kelpalm	4.27
Total	171.97

Ernakulam section was completed in 2000 and further extension up to Kollam is targeted to be completed by March 2005. The indicators of

directly linked to the overseas trade of a country. Trend in shipping industry is towards containerization. Hong Kong stands at the top in container traffic followed by Singapore, Shanghai and Shenzhen. The container traffic could be seen growing as evident from the Table 10.9.

Table 10.8

Performance of Railway Division – Thiruvananthapuram

Route Length	625 km
Daily Number of Express Trains (in pairs)	57
Daily Number of passenger Trains (in pairs)	58
Passenger carried daily	1.65 lakh
Annual Earnings from passengers and miscellaneous (Rs Crores)	274.39
Goods (Tonnes)	126.93

performance of Thiruvananthapuram Railway division are given in Table 10.8

WATER TRANSPORT

Port Sector

10.39 Growth and development of Port sector is

surging growth rates among other container ports. The top hundred container ports in the World are known as the Century Club. The representation of various countries in the club are given in Table 10.10

Table 10.9
Container Handled in Top Ten Ports in the World

Country	Port	Cargo handled (TEUs)		Increase %	Rank
		2003	2004		
China	Hongkong	19144000	20450000	7	1
Singapore	Singapore	16941000	18100000	7	2
China	Shanghai	8611890	11370000	32	3
China	Shenzen	7613754	10650000	40	4
South Korea	Pusan	9453356	10368000	10	5
Taiwan	Kaohsiung	8493000	8844000	4	6
US	Los Angles	6105864	7148940	17	7
Netherlands	Rotterdam	6515449	7118000	9	8
Germany	Hamburg	5373999	6138000	14	9
Belgium	Antwerp	4777151	5445437	14	10

Source: Indian Express Ist Nov 2004

Table – 10.10
Country-wise Distribution of Ports in Century Club

Country	No. of Ports
United States	14
China	11
Japan	5
Italy	5
Malasia	4
Spain	4
UK	4
South Korea	3
Thaiwan	3
Australia	3
Ten Countries	2 each
Other 24 countries	1 each
Total 44 countries	100

Source: Indian Express Ist Nov 2004

10.41 India is represented in the club by Jawaharlal Nehru Port (JNP), placed in the 30th position. Though JNP registered a growth rate of 17 per cent, its position in the club is down from 29th to 30th due to the leap of Chinese Ports.

BOX -10.5

Port Salalah of Oman recorded the highest growth of 65 per cent in container handling.

10.42 In the context of rising global trade, Indian ports have a long way to go. So far as Kerala is concerned, the final approval for the Vallarpadam container terminal, marks a major step forward.

Performance of Indian Ports

10.43 India with a coastline of 5600 km has 12 major and 185 minor/intermediate ports. The major ports in India handled a total traffic of 344.52 MT in the year 2003-04 as against 313.53 MT in 2002-03. Ports in India accounted for 95 per cent of the country’s international trade in terms

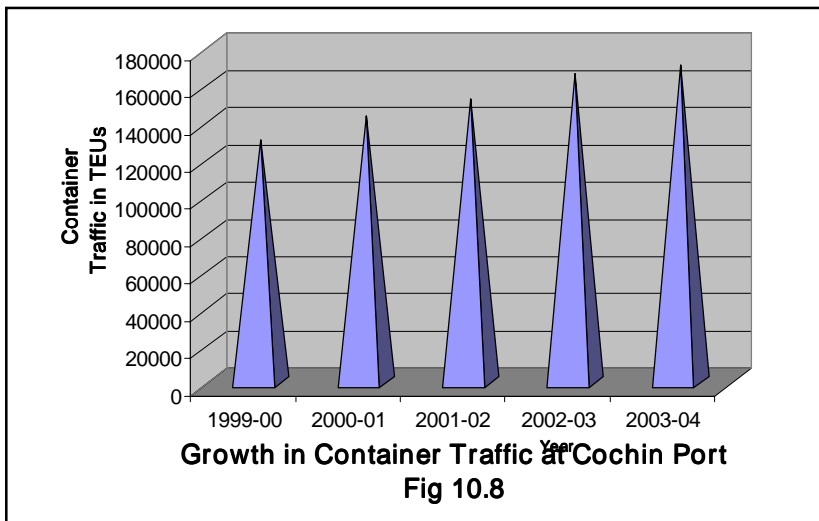
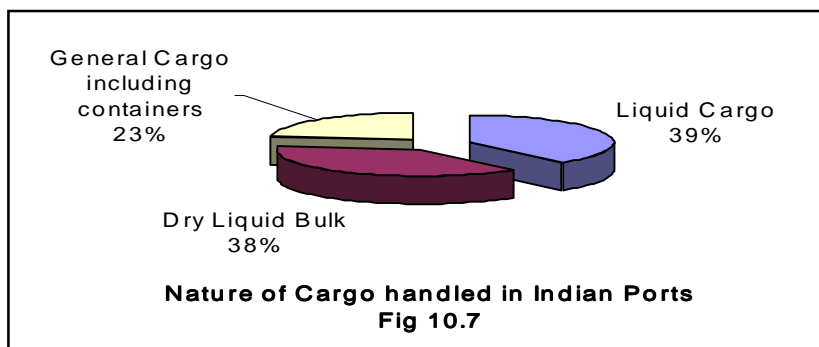
of its volume and 75 per cent in terms of its value. The type of Cargo handled in terms of its volume is depicted in Figure 10.7 . In the year 2003-04 the aggregate capacity of the Major Ports was 390 million tonnes per annum whereas the traffic handled was 313.53 showing the head for modernisation and speedover handling to attract larger traffic.

Kerala Port Sector

10.44 Along its coastal line of 585 kms Kerala has one major, three intermediate and 10 minor ports. Four more minor ports also have been declared but not have yet started functioning.

Cochin Port

10.45 It is the only major port in Kerala. It is an ISO 9001-2000 port. Even though the hinterland of this port spreads to parts of Tamil Nadu and Karnataka States apart from the whole of Kerala State, a study shows that 97 per cent of the total volume of traffic from this port is accounted for by Kerala. Major share of (73.38 per cent) the Cargo handled at Cochin port during the year 2003-04 relates to Petroleum and Allied Products. The growth in container traffic is shown in figure 10.8



BOX-10.6

Performance of Cochin Port at a Glance

Parameters	2002-03	2003-04
No. of Ships called at the Port	1174	1133
Net Registered Tonnage	7815244	7943909
Total Traffic in lakh tonnes		
(a) Import	108.99	111.19
(b) Export	21.25	24.53
Total	130.24	135.74
Container Traffic in TEUs	165687	169965
No. of Container vessels handled at the Port	433	381
Average turn round time in Days	2.19	2.22
Average pre-berthing time in hours	1.67	4.02
No. of Employees as on 31 st March	4375 persons	4353
Net surplus in Rs. Crores	19.40	21.34

Source: Cochin Port Trust

Non Major Ports

10.46 Non major ports are under the control of State Government. The Government agencies involved in port development activities in the State are Port Department, Harbour Engineering Department, Hydrographic Survey Wing and Kerala State Maritime Development Corporation.

10.47 Cargo handling was mainly confined to Beypore Port except a small volume of Cargo in Vizhinjam Port (Appendix 10.22). The number of steamers and sailing vessels that called at non-major ports were 361 with a net registered tonnage 109701 (Appendix 10.23). The earning to the exchequer through Port department in the year 2003-04 was Rs. 79.17 lakhs. The activities of other Ports are limited to registration and licensing of harbour crafts, maintenance of local light houses, display of water warning signals for sea rescue operations and collection of revenue. During the year 2003-04, 2180 harbour crafts were registered (Appendix 10.24).

Private Sector Participation.

10.48 An MOU was signed with M/s EECO Environmental and Consultancy Private Limited,

Mumbai on 9.7.2004 for the development of a Marina Port at Alappuzha. M/s Parison Group of Companies has been identified as an investor for Development of Beypore Port. M/s Universal Lubricant Sharjah has been selected as an investor for development of Alappuzha Port.

Transshipment Hub at Vizhinjam

10.49 Considering the geographical advantage of Vizhinjam, which is within 10 nautical miles from International Shipping route and have a natural draft of 20 meters within one Kilometre of the seashore, initiatives are on the way for establishing transshipment facilities at Vizhinjam. The Project is proposed to be implemented with private sector participation. A special purpose vehicle has already been established for the purpose. The project is proposed to be completed in three stages with a total investment of Rs. 4207 crores. The investment in the three phases are Rs. 1728 crores, Rs. 971 crores and Rs. 1508 crores respectively for three phases. The fructification of the project will give a boost to the development of the area around it.

Vallarpadam Container Terminal

10.50 Government of India has finally approved the establishment of International Container Transshipment Terminal (ICTT), Vallarpadam project. The total cost of the project is estimated at Rs. 2118 crores. Dubai Ports International is entrusted with this project for implementation on Build–Operate–Transfer (BOT) basis. The license period allowed is 30 years. With the establishment of the terminal, there would be facilities to handle 3 million TEUs vessels up to a size of 8000 TEUs. It would be up to the Government to ensure infrastructure facilities like rail and road connectivity.

Cochin Area Development Consequent on Port Development

10.51 Government of India has already agreed in principle for the establishment of a port based Special Economic Zone. Another major development is the permission granted for establishing LNG Terminal at Puthuvaipin. The construction of Goshree Bridges is over. The proposal submitted for the establishment of International Bunkering Terminal is under process. With the commissioning of ICTT at Vallarpadam the volume of Rail Traffic will increase drastically. For example a ship with 8000 TEUs needs 100 trains of 80 TEUs each. This requires strengthening of the railway infrastructure and establishment of container depots to transfer trucks from rollon-rolloff train. Planned efforts for completing doubling of Feroke-Shornnur section, electrification of Shornnur-Mangalore, providing rail linkages from Edapply or Kalamassery to connect the Port without passing through the city and enhancing the capacity of Konkan Railway are all necessary. For all them it is urgently necessary to establish an inter – governmental and inter disciplinary arrangement to prepare an integrated plan for the Kochi Region, work at projects in different sectors and explore financial avenues.

INLAND WATER TRANSPORT

10.52 Making Inland Canals navigable relieves the roads from getting into traffic jam to a great extent.

BOX- 10.7

Inland Water ways in India.

India has about 14500 kms of navigable water way comprising of rivers, lakes, canals, creeks, backwaters etc. About 18 million tonnes of Cargo is transported through the water ways.

10.53 The water transport operations in India are currently restricted to few stretches in the Ganga-Bhagirathi-Hoogly rivers, the Brahmaputra, the Barak River, the backwaters in Kerala and the deltaic region of Godavari, Krishna rivers. The major constraints facing the Inland water ways sector are lack of adequate infrastructure such as depth and width required for movement of vessels, lack of terminal facilities for loading and unloading and lack of navigational facilities aids for safe and unhindered navigation during day and night. Hence Central Government is giving thrust to developing infrastructure to make the Inland Waterways navigable.

10.54 Government agencies engaged in the development of Inland water transport in the State are Coastal Shipping and Navigation Department, State Water Transport Department and Kerala State Inland Navigation Corporation.

10.55 Coastal shipping and Navigation department carries out canal development activities. A project to develop 93 kms. of feeder canals is on the anvil as a component of the Kerala State Transport Project supported by the World Bank. Contrary to expectations, the Ministry of Shipping has turned down the request for extending National Waterway III at both sides, from Kollam to Kovalam in the south and Kottappuram to Kasaragod in the north but the proposal needs to be pursued. A study conducted by NATPAC projects that 16.6 per cent of total goods traffic through road is found to have potential for diversion to the water navigation system. At present inland water transport accounts for just 0.15 per cent of domestic transportation. The development of canals in Kochi - Kodungalloor stretch is being hampered due to the presence of fishing net.

10.56 State Water Transport Department operates passenger boats in the waterlogged areas of Alappuzha, Kollam, Kottayam, Ernakulam, Kannur and Kasaragod. State Water Transport Department has purchased one 50 passenger capacity fiber boat and one 150 pc wooden boat in 2002-03 and five steel boats in 2003-04 and put into operation. Even though the revenue receipts increased by six per cent in the year 2003-04, the revenue expenditure also increased by two per cent. The number of passengers handled recorded an increase of 13.83 per cent. Even though there

was only a nominal increase in loss compared to the previous year, State Water Transport Department has been incurring heavy loss for so many years.

10.57 Kerala State Inland Navigation Corporation recorded 49.19 per cent increase in its profit from Rs.31.31 lakhs in 2002-03 to Rs. 46.7 lakhs in 2003-04. The number of passengers handled decreased by five lakhs in 2003-04 compared to previous year, which is basically due to commissioning of Goshree bridges. Still it is able to run the organisation successfully due to diversification of its activities like operation of Luxury Cruise, Boat building, Construction of barges, Conversion/ Reconstruction of vessels and Cargo movement.

Air Transport

10.58 Kerala has three airports at Thiruvananthapuram, Kochi and Kozhikode. Of these, Thiruvananthapuram and Kochi (Nedumbassery) are International airports.

10.59 Although Thiruvananthapuram international airport ranks third in revenue among 120 airports in the country including five international airports managed by Airport Authority of India, the investment in the airport since 1991 is less than Rs 100.00 crores.

10.60 Cochin International Airport Ltd (CIAL) has handled 16590 aircraft movements during 2003-04 with an increase of 23 percent over the last year. During this period 13,32,601 passengers were handled reporting an increase of 48 percent over the last year. The duty free sales have recorded a turnover of US \$ 1.96 million (8.95 crores) as against US \$ 1.17 million in the previous year. This represents 58 per cent growth.

10.61 Taking into consideration the growth in passenger traffic, CIAL has already commenced expansion of the international terminal, aircraft parking bays, extension of taxiway etc.

10.62 From the Kozhikode Airport the number of flights per week increased from 170 in the previous year to 176 in the year under review after the introduction of Srilankan Airlines.

Air Cargo Traffic

10.63 Kerala State Industrial enterprise (KSIE) is operating the Air Cargo Complexes at Thiruvananthapuram and Kozhikode. Thiruvananthapuram Air Cargo Terminal (TACT) is the only ISO 2002 cargo complex in India.

Table 10.11
Details of Export & Import through Air Cargo Complexes at Thiruvananthapuram and Kozhikode

Year	Export		Import	
	Quantity (MT)	Value (Rs. lakhs)	Quantity (MT)	Value (Rs. lakhs)
2002-03	25088	125.80	10050	397.64
2003-04	25545	137.46	12177	433.67

10.64 The volume of cargo exported through the Thiruvananthapuram and Kozhikode airports has grown over the last few years. In 2003-04 the volume of cargo exported from the two airports was 25,545 tonnes, while in 2002-03 it was 25,088 tonnes .

10.65 In the first half of the current financial year, the volume of cargo exported from the Thiruvananthapuram and Kozhikode airports grew by 12.18 percent over the same period last year. The total volume of cargo exported from these two airports in the period April-September 2004-05 was 12,220 tonnes as against 10,875 tonnes in the same period last year. Of the 12,220 tonnes of cargo exported in the first half of the current fiscal year, Thiruvananthapuram airport accounted for 9,500 tonnes while contribution of Kozhikode was 2,720 tonnes. The cargo handled at Cochin International Airport Limited (CIAL) during 2003-04 was 12,826 tonnes, of which the volume of cargo exported is 9484 tonnes and volume of cargo imported is 3342 tonnes.

Passport and Emigration

10.66 The three passport offices at Thiruvananthapuram, Kochi and Kozhikode altogether received 4,97,814 passport applications in the year 2003-04. This is 22.49 per cent higher

than that in the previous year. The number of passports issued increased from 39,4,588 in 2002-03 to 4,47,552 in 2003-04 reporting an increase of 13.42 per cent.

COMMUNICATIONS

Postal Service

10.67 India has the largest postal network in the World. At the time of independence there were 23,344 post offices throughout the country. Of these 19,184 posts offices were in the rural areas and 4,160 in urban areas. Today, the country has 1,55,295 post offices of which 1,38,818 are in the rural areas and 16,477 are in urban areas. During the last 50 years it has grown almost seven times. On an average a post office serves an area of 21.13 sq.km and population of 6.602.

BOX-10.8

Major Focus of the Postal system

- ◆ Ensure availability of basic postal services in all parts of the country, including tribal, hilly and remote areas
- ◆ Provide efficient, reliable and economic service
- ◆ Provide value added services according to market requirements
- ◆ Modernise the services to handle the growing volume of work with efficiency and thereby enhance customer and employee satisfaction
- ◆ Generate more resources and improve financial performance

10.68 A comparative study of postal network, and coverage in different countries is given in the Table 10.12

New initiatives in postal development are given in Box No. 10.9

BOX-10.9

New Initiatives in Postal Development

- ◆ Expansion of speed post network
- ◆ Mechanization of Delivery
- ◆ Computerisation of speed post centers
- ◆ Automation of Business Post Centers
- ◆ Outsourcing collection of speed post

10.69 Kerala Postal Circle has a postal network of 5083 post offices. The postal system in Kerala at a glance is given in Box 10.10

Tele Communication

10.70 India has the fifth largest telecom network in the World comprising of 61.09 million telephone connections and over 1.48 million public call offices. There are over 16 million cellular subscribers in the country and the cellular customer base is growing at the rate of about one million per month. The speedy growth is being achieved by encouraging competition in the sector. In the area of mobile telephony of the total 78 licences, 55 are in the private sector and 23 in the

Table 10.12
Postal Network in Different Countries

Country	Population	Area lakh (Sq.Km)	No. of Post Offices	People per Post Office	Service Area per post office
USA	284.8	93.72	38,123	7,471	245.85
UK	59.5	2.44	17,633	3,377	13.84
Germany	82.4	3.57	13,000	6,335	27.46
Brazil	172.4	85.12	12,520	13,769	679.87
South Africa	44.3	12.21	2,650	16,728	460.77
Nigeria	116.9	9.34	4,624	25,288	199.78
China	1284.9	95.96	57,135	22,490	167.97
Australia	19.4	77.13	3,872	5,008	1992.09
Egypt	67.9	10.01	5,399	12,575	185.49
Japan	127.3	3.78	24,760	5,143	15.26
India	1027.0	32.88	1,55,618	6,602	21.13

Source: International Telecommunication Union (ITU) December 2003

BOX-10.10**Postal System in Kerala at a glance**

◆ Post Offices functioned during 2003-04	: 5083
◆ Head Post Offices	: 51
◆ Sub Post Offices	: 1464
◆ Extra Departments Sub Post Offices	: 526
◆ Branch Offices	: 3042
◆ Speed Post Centre	: 44
◆ Other Postal Services	: 100
◆ Rural Post Offices	: 4204
◆ Urban Post Offices	: 879
◆ Area served by One Post Office	: 8.22
◆ Population served by one Post Office	: 6283

public sector. Of the total roll out of telephone connection (basic and cellular), private sector accounted for about 28 percent and public sector 72 percent.

BOX-10.11**Teledensity in different Countries 2002-03**

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
UK	143.13
USA	116.43

Source: Annual Report 2003-04, Ministry of Telecommunication & Information Technology

10.71 Kerala has an impressive record of performance in Telecom sector. All the telephone exchanges in Kerala were made automatic for the first time in the whole country, in 1990. Kerala is also the first State to provide public telephone facilities in all Panchayat Headquarters. Again it has the unique status of providing STD facility to all telephone exchanges.

10.72 Kerala has the highest telecom density among all States in India. In Kerala 99.2 percent of telephone exchanges are Electronic Exchanges. Five internet providers are there in the State and 8300 km of Optical Fibre Cable (OFC) has already been activated.

10.73 Kerala Telecom sector comprises 11 secondary switching areas (SSA). Total number of telephone exchanges in the circle is 1179. The equipped capacity has increased from 36,53,413 in 2002-03 to 40,36,782 in 2003-04. The number

Table 10.13**Telephone per 100 population – Urban /Rural (Total - density)2002-03 & 2003-04**

State	Total Density					
	Overall		Urban		Rural	
	2003	2004	2003	2004	2003	2004
1	2	3	4	5	6	7
Andhra Pradesh	5.66	7.85	15.42	22.7	2.03	2.33
Karnataka	6.67	9.46	14.78	22.58	2.37	2.41
Kerala	11.33	14.87	21.28	32.82	7.85	8.6
Tamil Nadu	6.22	8.54	12.28	17.21	2.12	2.35
Delhi	27.38	41.79	29.24	44.48	0	0
All India	5.11	7.02	14.32	20.74	1.49	1.57

Source : Annual Report 2003-04, Ministry of Telecommunication & Information Technology

BOX-10.12

Status of Telecom Sector in Kerala

- ◆ No. of Telephone Exchanges : 1195
- ◆ Equipped Capacity : 40.70 lakh
- ◆ Telephone Density as on 8/2004 : 10.54
- ◆ Telephone Density (Rural) : 9.19
- ◆ Telephone Density (Urban) : 14.38
- ◆ No. of applications in the waiting list till 30.09.2004 : 4.1 lakh
- ◆ No. of mobile connections (i) prepaid : 417279
- (ii)postpaid : 147133
- ◆ No. of connections proposed to be provided during 2004-05 : 4.28 lakh
- ◆ No. of internet customers as on 30.09.04 : 49225

of working connections in Kerala is 32.58 lakh.. For every 1000 persons under the circle there are 106 telephone connections. There are 84 telephone connections per sq.km. Ernakulam district has the maximum number of telephone exchanges (171) and Wayanad the least with 25 exchanges Interactive Voice Response System (IVRS) based trunk booking has been introduced round the clock in all Trunk Exchanges in Kerala. Answering Machine Service, popularly known as Voice Mail Service, was launched in Kerala Telecom Circle on 17.05.2004. The unique advantage of this service is that the subscribers need not have an answering machine in his residence. The service is offered free of cost. The usage charge is as per the normal tariff.

10.74 Mobile connections in Kerala continued to increase and have crossed the one million marks as on 31.3.2004. In Kerala Telecom Circle,

Internet nodes are at present functioning at all 14 district headquarters and at Kavarathy in Lakshadweep. Details of Agency wise mobile connections given in Box 10.13.

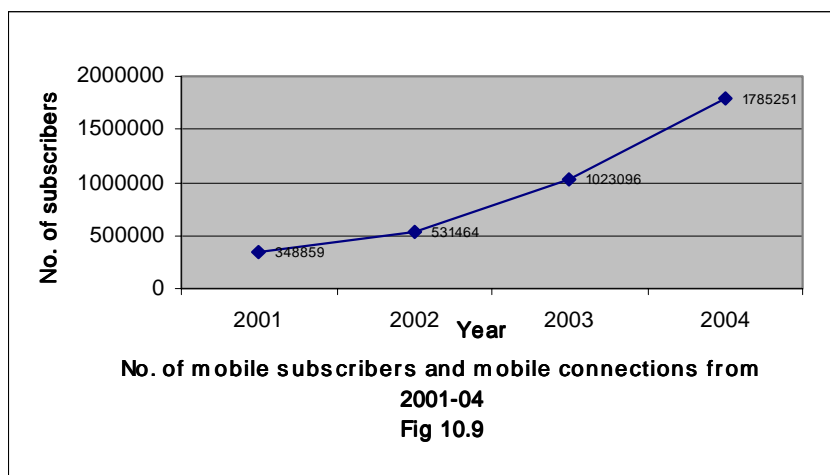
10.75 The total mobile subscribers and mobile connections issued per day during the last four years are given in figure 10. 9

BOX-10.13

Mobile subscribers in Kerala as

Agency	Connections (in lakh)
BSNL	5.76
Idea mobile	5.23
BPL cellular	3.61
Bharati (Airtel)	3.23

Source : Dhanakariam Mathubhoomi Daily Dec6, 2004



10.76 Kerala Telecom Circle is to start wireless Short Message Service (SMS) shortly. This will enable the subscribers to send messages using landline phones also by having their own Short Message Terminal Equipments (SMTE), an instrument similar to the ordinary telephone with additional facility for sending SMS. Arrangements are being done for the supply of these instruments through Customer Service Centres. To start with, the service is to be offered free of cost.

URBAN DEVELOPMENT

10.77 Urbanization is a continuing process, which are not merely a concomitant of industrialization, but a concomitant of the whole gamut of factors underlying the process of economic growth and social change. Urbanization in demographic sense, is an increase in the proportion of the urban population (U) to the total population (T) over a period of time. As long as U/T increases there is urbanization.

10.78 According to census 2001, 25.96 per cent of the state population live in the urban system, of which 62.75 per cent live in the Corporations and Municipalities. The urban system in Kerala comprises of 5 Municipal Corporations, 53 Municipalities and 40 urban agglomerations. Urbanization trend in this state shows slow progress and it is presented in Table 10.14 This table illustrates that the numbers of urban agglomerations/towns have increased over the period from 1901 to 2001, but the change from 1991 to 2001 is only marginal.

10.79 The share of urban population in Kerala increased steadily from 7.11 per cent in 1901 to 26.39 percent in 1991, but then declined to 25.96 per cent in 2001. Urban Population growth is due to the increase in number of urban areas and urbanization in the fringe areas.

Integrated Development Plan

10.80 The integrated development approach is aimed at making a direct attack on urban poverty and employment by integrating the developmental efforts at spatial, functional and social levels, is indeed a very comprehensive model for promoting productivity, effective peoples participation, trade and commercial activities and improving the quality of life in the urban system.

10.81 Kerala has three regions, such as Northern, Central and Southern, and these regions have City Corporations as their hub. It is interesting to note that all the sectors of the economy are functioning in all the Corporation areas too. Moreover, all the Corporations are linked with proper transportation network, which strengthen resource mobilization. Of the five Corporations, three major Corporations, such as, Thiruvananthapuram, Kochi, and Kozhikode are having special characteristic features. These Corporations have satellite towns and are functioning as nodal points for development. These satellite towns not only ease the pressure of the Corporations, but also provide functional links to the rural areas.

Table No.10.14
Trends in Urbanization of Kerala 1901-2001

Sl.No.	Census Year	Total number of UAs/Towns	Total Population	Total Urban Population	Percentage s of Urban Population	Decimal growth (%)
			(In Crores)			
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	1901	21	0.64	0.04	7.11	
2	1911	27	0.71	0.05	7.34	+15.44
3	1921	44	0.78	0.07	8.73	+29.78
4	1931	53	0.95	0.09	9.64	+34.58
5	1941	62	1.10	0.12	10.84	+30.47
6	1951	94	1.35	0.18	13.48	+52.72
7	1961	92	1.69	0.25	15.11	+39.89
8	1971	88	2.13	0.35	16.24	+35.72
9	1981	85	2.55	0.48	18.74	+37.64
10	1991	109	2.91	0.77	26.39	+60.97
11	2001	98	3.18	0.83	25.96	+7.64

Source: Census 2001 Government of India, New Delhi

10.82 This State has peculiar functional characteristic features, compared to rest of the States in India, i.e., houses and infrastructure facilities are spread across the State. Almost infrastructure facilities, which are functioning in the urban system, have spread over the rural system too. Therefore, the entire rural system of the State (except the interior hill tracks) can be considered as 'rurban areas' due to its functional characteristic features.

10.83 Growth center approach, which was devised as an alternative to the growth pole approach, advocated decentralised pattern of human activities. It postulated that the development of agriculture and primary activities in the fringe areas would lead to evolution of growth centres, which will become engines of economic growth.

10.84 To have spatial integration of the urban system, the Corporation like, Thiruvananthapuram, Cochin and Kozhikkode need to be linked and developed like knowledge based industrial corridor. In this corridor, technological and knowledge based industrial research institutions need to come up, which will be useful for secondary and tertiary sector of economic development. Besides these, the proposed Liquefied Natural Gas terminal, and Vallarpadam Container Terminal projects in Kochi would have more influence over this corridor pertaining to resource mobilization in particular and overall development in general.

10.85 To have functional integration, all the sectors of the economy need to be strengthened by employing appropriate technology at the grass roots level, introducing need based, resource based and demand based industries along with strengthening trade and commercial activities in this system.

10.86 To have social integration, effective peoples participation in all aspects, which include evolving policies, programme and programme implementation, monitoring, etc. are to be done irrespective of social and ethnic groups, and the benefits of the plan will be shared by all these groups.

10.87 It has been decided to evolve plausible

integrated development plans in all these three regions separately, and all these regional development plans are to be linked with State level integrated development plan. The proposed State integrated level development plan will focus on location specific problems, resource mobilization, employment generation, increase in income earning opportunities, trade and commercial activities, etc., at the grassroots level, which will led to total development in the system.

10.88 In this present attempt, to achieve integrated development in urban system, urban system concept is employed.

Urban System

10.89 An urban system functions as a whole with the interaction of several sub-systems. All the sub-systems of the urban system are interconnected, and inter-dependent to each other, and forming a system. If one of the sub-systems of the urban system defunct or functions with higher degree (taking a lead role) during its function, its effects can be visualized in the entire system. In an urban system, the following sub-systems are linked together:

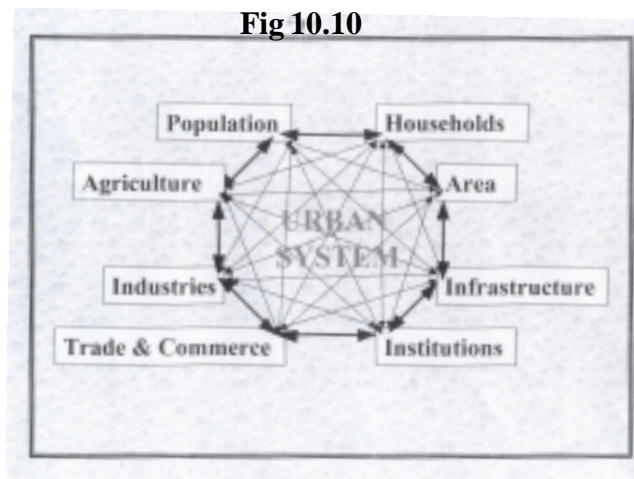
- Urban land.
- Population.
- Housing
- Industries.
- Trade and Commerce.
- Infrastructure facilities. (Both physical and social)
- Transportation, and
- Administration. (Control mechanism)

10.90 These all sub-systems are inter-linked and interdependent with each other, forming a system and functions as a whole. The function of this urban system is presented in Figure 10.10

10.91 The urban system is a complex social system, and it has the following characteristic features:

- It is not a mechanistic system, but rather an adaptive system.
- It is an open system, and thus cannot be studied or regulated apart from its contextual environments, which are defined by the nature of interactions.

Fig 10.10



- It is characterized by extreme interrelatedness of its part, calling forth the need for viewing the system in its entirety.
- It is also characterized by *substitutability* of parts and functions implying that the detection of new and independent trends is difficult as they are often masked by the apparent stability of the parts.

10.92 Each sub-system mentioned above may or may not have sub-systems within them. For example, population can be categorized into different types of households, such as, High Income Group, Middle Income Group, Low Income Group, Economically Weaker Section, Slums, Squatters, Pavement Dwelling Units, etc. Further, population in each segment would be classified into sub-systems like religion. These groups are also further divided into various other subgroups like illiterate, literate, professionally qualified, special professionally qualified, and so on.

10.93 Similarly, in urban land sub-system, urban land may be classified into various sub-systems based on its uses for different purposes, such as residential and non-residential, industries, infrastructure services, trade and commercial activities, urban agriculture, civic open spaces, etc. Like the above, other sub-systems of the urban system may also have different sub-system within their purview.

10.94 In Kerala, like other states in India, the problem of urban poverty; deficiencies in physical infrastructure like drinking water supply, solid waste management, sewerage and drainage

facilities, urban transport; issues relating to environment, housing, degradation in quality of life, rehabilitation of slum dwellers, etc. are the major areas of concern in urban development. Most of these problems in the urban system are to be addressed by the Local Government Institutions viz. Municipalities and Corporations. The present position of these housing stocks and physical infrastructure facilities are discussed below:

Urban Households

10.95 Despite, considerable private investment, remittances and efforts made over successive plan periods; the housing problem still persists. Given the growth of urban population and the unsustainable environment, the housing problem in urban areas may worsen unless concerted measures are taken.

10.96 In Kerala 25.06 per cent of the total households are in the urban system. Of the total urban housing stock, 64.90 per cent are good, 29.40 per cent are livable and 5.70 per cent are dilapidated. Of the total number of houses, 78.80 per cent of them are permanent, 14.48 per cent are semi-permanent and 6.62 per cent are temporary houses. Of the temporary houses, 52.79 per cent are serviceable (57723 houses) and 47.21 per cent are non-serviceable (51624 houses). As regards tenurial status, 87.50 per cent live in owned accommodation.

Sewerage

10.97 Sewerage treatment is essential to check environmental decay as well as to improve the living conditions. It is noted that the existing capacity of sewerage treatment system in all the Corporations in this State is inadequate, and about

Table No.10.15
Urban Household details of All India and Kerala

Sl. No		Kerala		All India	
		Number	% to total urban household	Number	% to total urban household
(1)	(2)	(3)	(4)	(5)	(6)
1	Households	1652656	100.00	53692376	100.00
2	Condition of Houses				
	Good	1071777	64.9	34446903	64.2
	Livable	486658	29.4	17312563	32.2
	Dilapidated	94221	5.7	1932910	3.6
3	Permanent Houses	1302681	78.8	42602249	79.3
4	Electrified Houses	1393823	84.3	47028369	87.6
5	Having bathroom facility	1304163	78.9	37802114	70.4
6	Toilet facility	1520747	92.0	39581440	73.7
7	Drainage	510564	30.9	41807664	77.9
8	Having Telephone	483606	29.3	12331107	23.0
9	Having Television	966336	58.5	34500360	64.3
10	Having Two Wheelers	294157	17.8	13262048	24.7
11	Having Four Wheelers	121394	7.3	3021406	5.6
12	Availing Banking Services	890735	53.9	26590693	49.5

Source: Census 2001, Government of India, New Delhi

90 per cent of the population does not have access to regular municipal sewerage. The increasing pollution in certain pockets of the cities is also a major indicator for lack of sewerage treatment.

10.98 At present, only the Thiruvananthapuram Corporation area is reasonably covered by the underground sewerage system. It is estimated that there are about 75,000 houses have sewer connections (40% coverage) in this city. The parallel sewer main has already been completed and the ban on new connections is a lifted. The underground sewerage system in Kochi City covers only a very limited area. It is reported that there are about 1000 houses have sewer connection in Kochi, i.e., just only 2% coverage.*

10.99 The existing sewerage schemes, both in Thiruvananthapuram and Kochi City need further expansion. Proper sewerage systems is required in all other Corporations, and Class II towns and I.

Other facilities

10.100 A comparison of facilities of urban households in Kerala with All India is presented in Table. 10.15 The table reveals that Kerala

lags behind in providing and drainage facilities, but is ahead in providing a few other facilities, such as, toilet facilities, telephone connections, having vehicles and banking services.

Solid Waste Management

10.101 Municipal Solid Waste (MSW) is a heterogeneous mixture of organic matter, demolition and construction debris, street sweepings, garden wastes, discarded parts of vehicles and appliances, and residues from small-scale industrial units. The organic degradable part is called garbage and the non-degradable part is called rubbish. The rubbish includes combustibles like paper, wood, rubber, leather, plastic, cloth, etc. and non-combustible waste like metals, glass, ceramics, etc. In Kerala, the per capita generation of solid waste is estimated to be varying from 150 – 500 g/day.

10.102 The management of solid waste is one of the essential services and important obligatory functions of the Urban Local Bodies (ULB). tackle it alone. But in most of the municipalities, more than half of the waste generated remains unattended. The practice of open air burning is increasing in most of the residential areas and waste dumping yards, leading to toxic emissions. The local governments with their limited human,

*Source : Kerala Water Authority

technical, financial and institutional capacity are strengthening to cope up with the multi dimensional problems of solid waste management. The dense population and lack of available space are also severe constraints for disposal of garbage and other forms of waste.

10.103 Considering the requirement of implementing an integrated solid waste management system comprising source segregation, prompt collection, careful transportation, environment friendly processing and sanitary disposal of rejects in all the 58 ULBs of the state, the government formulated an action plan known as 'Clean Kerala Project' in February 2003, and it is being implemented by the Clean Kerala Mission. This envisages the following components:

- segregated storage of biodegradable, non-biodegradable and harmful wastes in different bins at source,
- transportation of waste from source to the processing plant without littering on ground,
- processing of biodegradable waste using aerobic or vermin composting technology,
- reuse and recycling of glass, paper, plastic etc.,
- develop sanitary landfill on a long-term basis,
- establish common facility for disposal of biomedical waste near the landfill site,
- arrange better implements and vehicles for collection and transportation of solid waste,
- entrust the left-over cleaning tasks after

- deploying the sanitary workers to Community Development Society or other agencies, and
- organize awareness campaign programme

Involvement of Informal Sector in Waste Management

10.104 The limitations of technical and managerial solutions to waste management problems and their socio-cultural and economic aspects are now being recognized. The inextricable linkage of waste management, waste recycling and urban poverty are also being recognized. Accordingly, a positive approach was evolved towards the involvement of the urban poor as integral partners in solid waste management, considering the immense scope for participation based on waste to wealth concept. Women micro enterprise units have been formed and trained under Kudumbashree for house-to-house collection of wastes in 15 Municipalities. At present, these units in selected wards of Kannur, Kozhikkode, Palakkad, Ottappalam, Thrissur, Aluva, Kochi, Thrippunithura, Alappuzha, Attingal and Thiruvananthapuram carry out source collection of waste. An experience of Kudumbashree initiatives for Door-to-Door collection of solid waste in Thiruvananthapuram Corporation is given in Box No.10.14

Urban Development Programmes

10.105 The major urban development programmes implemented at the State-level are given below:

BOX-10.14

Kudumabshree initiative for Door-to-Door collection of solid waste in Thiruvananthapuram Corporation

Two of the major gaps in solid waste management in Thiruvananthapuram Corporation are lack of primary collection and source segregation. Seeing this as a potential opportunity for developing micro enterprise units, Kudumbasree, the State Poverty Eradication Mission, formed five units in five wards of Thiruvananthapuram Corporation namely, Medical College-East, Medical College-West, Gowreesapattom, Fort and PTP Nagar as pilot projects. Each micro enterprise unit was formed by 15 women under the centrally sponsored urban poverty eradication programme namely SJSRY at a total project cost of Rs.4.5 lakh each. Each unit was provided with three-tipper auto rickshaw at a total cost of Rs.3.9 lakh and working capital of Rs.60,000/- for items such as uniform, hand gloves etc. The project fund was mobilized through a one-time grant of Rs.1 lakh from the Corporation, Rs.2.025 lakh loan from the bank; Rs.22,500/- as beneficiary contribution and Rs.1.25 lakh as SJSRY linked subsidy. The project was launched in March 2003 and benefits about 75 women, who earn net income varying from Rs.3000 – 6000 per capita per month. Finding it as a sustainable micro enterprise venture, 14 more Urban Local Bodies have replicated this project.

a. Integrated Development of Small and Medium Towns

10.106 Integrated development of small and medium town's programme was initiated in 1979-80. The main objective of the programme is to slow down migration from rural areas and smaller towns to larger cities by developing selected small and medium towns, which are capable of generating economic growth and employment.

10.107 Integrated Development of Small and Medium Towns is a Centrally Sponsored Scheme being implemented in 45 urban local governments. The central allocation to the state during the first two years of the Tenth Five Year Plan was Rs.407.75 lakh and Rs.408 lakh respectively. The total amount released for this scheme including the State Share was Rs.600.44 lakh during 2002-03 and Rs.680.01 lakh during 2003-04. Ten towns selected for the years 2002-2004 were Angamali, Koyilandy, Kalamassery, Kunnankulam, Perumbavoor, Vaikom, Attingal, Thripunithura, Mavelikkara and Thaliparamba. Subsequently, eight new towns viz. Kanhangad, Payyannur, Chittoor-Thathamangalam, Paravur, Kuthuparamba, Adoor, Perinthalmanna and Mattannur were also selected under this scheme during the year 2004-05.

b. Capital City Development Project

10.108 The Capital City Development Project was initiated during 2003-04 in order to enhance the quality of life in the Capital City by improving the critical infrastructure. The components of the Project include improvements of roads, water supply augmentation, solid waste management, surface water drainage and city beautification including parking places.

- Water supply improvement scheme for water scarce areas in Thiruvananthapuram city has been initiated at a total cost of 13.10 crore and about 75 per cent of work has been completed.
- Under surface water drainage, prevention of floods at Thampanoor, Pazhavangadi, Karamana, Killippalam and Jagathi has been initiated at a total cost of Rs 4.83

crore. Desliting of Amayizhanjan thode is also proposed to be undertaken.

- Althara-Vellayambalam Road, Sanghumugham Palace renovation, Puthirikandam Maithanam Development, Kovalam Area Development are proposed to be undertaken for city beautification and for parking area construction.
- The work for the renovation of Tagore Theatre Complex has been awarded
- Under City Road Improvement Project twelve roads at an estimated cost of Rs 30.50 crore are proposed
- Construction of Palayam market and Commercial Complex has been started at an estimated cost of Rs 3.50 crore.

c. Kerala Sustainable Urban Development Project (KSUDP)

10.109 This project aims at sustainable growth and poverty reduction in the five Corporations and other District Head Quarters, and is being finalised with Technical Assistance from the Asian Development Bank.

10.110 Salient features of this KSUDP are given below:

- Promote good governance in Municipal Management
- Develop and strengthen urban infrastructure
- Formulate support programmes for improving urban social services for the elderly, destitute women and street children

10.111 The proposed Project City Infrastructure Components are:

- Water Supply
- Sewerage/Sanitation
- Urban Drainage
- Solid Waste Management
- Roads/Transport
- Poverty Alleviation

d. Urban Reforms Incentive Fund (URIF)

10.112 Urban Reforms Incentive Fund (URIF) has been created by the Government of India for reform linked incentive to States. It seeks

to incentives State Government to follow certain reform programmes. The reforms under URIF are summarized in Box No 10.15 . The funds under URIF are untied and can be used for any

development or housing or poverty alleviation project. During 2003-04, the State Government received Rs.725 lakh under this scheme and 24 Municipalities were selected to implement this scheme.

BOX-10.15**Urban Reforms Incentive Fund (URIF) –
Reforms suggested by GOI**

- 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 Five Year Plan period
- Introduction of Computerized process of registration
- Reform of Property Tax so that it may become a major source of Urban Local Bodies and arrangements for its effective implementation with collection efficiency of 85 per cent by the end of the Tenth Five Year Plan period
- Levy of reasonable user charges with full cost of O&M being collected by end of the Tenth Five Year Plan period.
- Introduction of a double entry system of accounting.