Chapter 11

Infrastructure and Utilities

11 INFRASTRUCTURE AND UTILITIES

I. INTRODUCTION

11.01 A well developed and integrated infrastructure and utilities network is an essential pre-condition for continued high economic growth. The provision of this network, covering the subsectors of transportation, telecommunications, postal, water supply and sewerage, has supported the accelerated economic development of the country. This rapid growth resulted in higher demands on the capacity, distribution and efficiency of this sector. During the Sixth Plan period, emphasis was placed on the further expansion, upgrading and improvement of the country's network of infrastructure and utilities. In addition, the expansion of infrastructure network into rural areas also provided the rural people with increasing opportunities to participate in the process of development. The active participation of the private sector complemented the public sector in accelerating the development of infrastructure and brought about improvements in accessibility and delivery of the services provided.

11.02 During the Seventh Plan period, emphasis will be given to increasing capacities and improving productivity and efficiency through more integrated and coordinated planning. The development of infrastructure and utilities will stress on the provision of reliable and safe services with continued active participation of the private sector as well as expanding and upgrading facilities in the rural areas, thereby, enhancing the mobility of goods and people.

II. PROGRESS, 1991-95

11.03 The thrust of infrastructure and utilities development under the Sixth Plan was to increase capacity and improve efficiency of infrastructure services. However, the higher than anticipated economic growth resulted in capacity

constraints requiring immediate measures, such as reducing processing time and faster construction methods. Consequently, several new major projects were launched while on-going projects were accelerated. The implementation of infrastructure projects led to additional capacity in roads, ports, airports, telecommunications, water supply and sewerage which provided the necessary support to the rapid growth of the economy.

Roads

11.04 During the Sixth Plan period, road development including bridges was based on a three-pronged strategy, namely, to increase road network particularly to improve interurban linkages, alleviate capacity constraints and increase road network to open up new growth centres and rural areas. Total road network increased by 19.2 per cent from 53,984 kilometres in 1990 to 64,328 kilometres in 1995, as shown in *Table 11-1*. Of this, 75.4 per cent were paved roads compared with 70 per cent in 1990.

11.05 In line with efforts to improve existing linkages and increase road network, several major projects were completed or were at various stages of construction. Construction of three major projects along the east-west corridor were initiated, namely, the western segment of the East-West Highway, the Simpang Pulai-Lojing-Kuala Berang Road and the upgrading of the Kuala Lumpur-Karak Highway to dual carriage expressway. In the Klang Valley, the construction of the Shah Alam Expressway, an important link between Kuala Lumpur and West Port of Port Klang, was accelerated while the construction of the North-South Central Link expressway, linking the Klang Valley to the new KL International Airport (KLIA) at Sepang, commenced during the Plan period. The First Trunk Road linking the major towns of Sematan, Kuching, Bintulu, Sibu and Miri in Sarawak was completed. Other major projects implemented during the Plan period are shown in *Table 11-2*.

11.06 The Sixth Plan period witnessed the early completion and opening of the 847-kilometre North-South Expressway, linking Bukit Kayu Hitam in Kedah to Johor Bahru, in early 1994. With this, travel time has been reduced by half with increased comfort and safety. In addition, there was a notable reduction in *perceived costs,* comprising vehicle operating cost and time saving cost. A study on *perceived costs* from Johor Bahru to Changkat Jering showed that, on average, there was a reduction in vehicle operating cost and time saving cost from RM418.80 to RM316.70 or 32 per cent per trip. After taking into account toll charges payable for cars using the North-South Expressway, there

TABLE 11-1

ROAD DISTRIBUTION BY TYPE AND JURISDICTION, 1990-95
(kilometres)

State	Federal Roads		State Roads		Total						Paved Roads (%)	
					1990			1995				
	1990	1995	1990	1995	Paved	Unpaved	Total	Paved	Unpaved	Total	1990	1995
Johor	2,003.1	2,463.0	2,913.6	4,021.0	3,973.6	943.1	4,916.7	5,404.0	1,080.0	6,484.0	*80.8*	*83.3*
Kedah	501.6	523.0	3,261.0	3,502.0	2,879.1	883.5	3,762.6	3,273.0	752.0	4,025.0	*76.5*	*81.3*
Kelantan	597.2	764.0	1,882.9	2,067.0	1,900.0	580.1	2,480.1	2,144.0	687.0	2,831.0	*76.6*	*75.7*
Melaka	152.6	165.0	1,113.4	1,218.0	904.2	361.8	1,266.0	1,098.0	285.0	1,383.0	*71.4*	*79.4*
Negeri Sembilan	1,296.4	1,457.0	1,985.6	2,378.0	2,691.1	590.9	3,282.0	3,485.0	350.0	3,835.0	*82.0*	*90.9*
Pahang	2,958.0	3,429.0	2,658.9	3,430.0	3,981.9	1,635.0	5,616.9	5,813.0	1,046.0	6,859.0	*70.9*	*84.7*
Perak	1,289.7	1,405.0	3,465.2	4,707.0	4,262.5	492.4	4,754.9	5,556.0	556.0	6,112.0	*89.6*	*90.9*
Perlis	144.5	148.0	372.9	470.0	477.0	40.4	517.4	567.0	51.0	618.0	*92.2*	*91.7*
Pulau Pinang	148.7	163.0	3,004.2	1,876.0	3,058.5	94.4	3,152.9	1,888.0	151.0	2,039.0	*97.0*	*22.6*
Sabah	1,066.7	1,084.0	7,441.0	9,756.0	2,553.2	5,954.5	8,507.7	3,689.0	7,151.0	10,840.0	*30.0*	*34.0*
Sarawak	1,317.5	1,330.0	3,137.6	3,788.0	1,349.7	3,105.4	4,455.1	2,988.0	2,130.0	5,118.0	*30.3*	*58.4*
Selangor	637.4	868.0	6,874.8	7,816.0	6,453.4	1,058.8	7,512.2	7,754.0	930.0	8,648.0	*85.9*	*89.3*
Terengganu	831.5	879.0	1,754.3	3,118.0	2,120.4	465.4	2,585.8	3,359.0	638.0	3,997.0	*82.0*	*84.0*
Wilayah Persekutuan Kuala Lumpur	0.0	1,336.0	1,007.1	0.0	1,007.1	0.0	1,007.1	1,336.0	0.0	1,336.0	*100.0*	*100.0*
Wilayah Persekutuan Labuan	116.0	167.0	51.0	0.0	167.0	0.0	167.0	167.0	0.0	167.0	*100.0*	*100.0*
Total	**13,060.9**	**16,181.0**	**40,923.5**	**48,147.0**	**37,778.7**	**16,205.7**	**53,984.4**	**48,521.0**	**15,807.0**	**64,328.0**	*70.0*	*75.4*

Note: Road lengths for 1995 are estimates.

TABLE 11-2

MAJOR ROAD PROJECTS IMPLEMENTED, 1991-95

Project	*Cost (RM million)*	*% Completed*
First Trunk Road	459	
Kuching-Batu Kawa-Bau-Lundu (RM158 million)		*Ready 1996*
Kuching-Sibu (RM115 million)		*Completed*
Sibu-Ulu Batang-Bintulu (RM105 million)		*Completed*
Miri-Bintulu (RM81 million)		*Completed*
23 Overhead crossings over KTM rail track	330	*Completed*
Access road to West Port of Port Klang	230	*Completed*
East-West Highway, Western Section	200	
Butterworth-Three-tier Interchange (RM74 million)		*65*
Three-tier Interchange (RM63 million)		*Completed*
Sungai Perai Bridge (RM36 million)		*65*
Lunas-Titi Karangan (RM27 million)		*Completed*
Simpang Pulai-Lojing-Kuala Berang Road	137	
Simpang Pulai-Lojing (RM90 million)		*Completed*
Pasir Pulau Bridge to Kampung Teris (RM47 million)		*Ready 1997*
Upgrading Johor Bahru-Kota Tinggi Road	135	*Completed*
Upgrading Kuantan-Gambang Road	120	*Completed*
Upgrading Telupid-Sandakan Road	73	*Completed*
Sungai Kuantan Bridge	72	*Completed*
Melaka Ring Road	54	*Completed*
Upgrading Beaufort-Sindumin Road	47	*Ready 1996*
Upgrading Ranau-Telupid Road	41	*Completed*
Upgrading of Port Dickson-Seremban Road (km 0-19)	36	*75*
Total	**1,934**	
Privatized Projects		
North-South Expressway	8,700	*Completed*
Second Link	1,600	*Ready 1997*
North-South Central Link	1,600	*Ready 1997*
Shah Alam Expressway	1,560	*Ready 1998*
Upgrading KL-Karak Highway	550	*Ready 1998*
New North Klang Straits By-pass	400	*Ready 1998*
Butterworth-Kulim Highway	280	*Ready 1996*
Upgrading Cheras-Kajang Road	275	*Ready 1998*
Seremban-Port Dickson Highway	210	*Ready 1998*
Total	**15,175**	

was still a reduction of 25 per cent in operating costs compared to those using the old route over the same distance. In addition, the North-South Expressway, with a total of 72 interchanges, facilitated development along its corridor with the emergence of new industrial zones, housing estates, recreational facilities and townships.

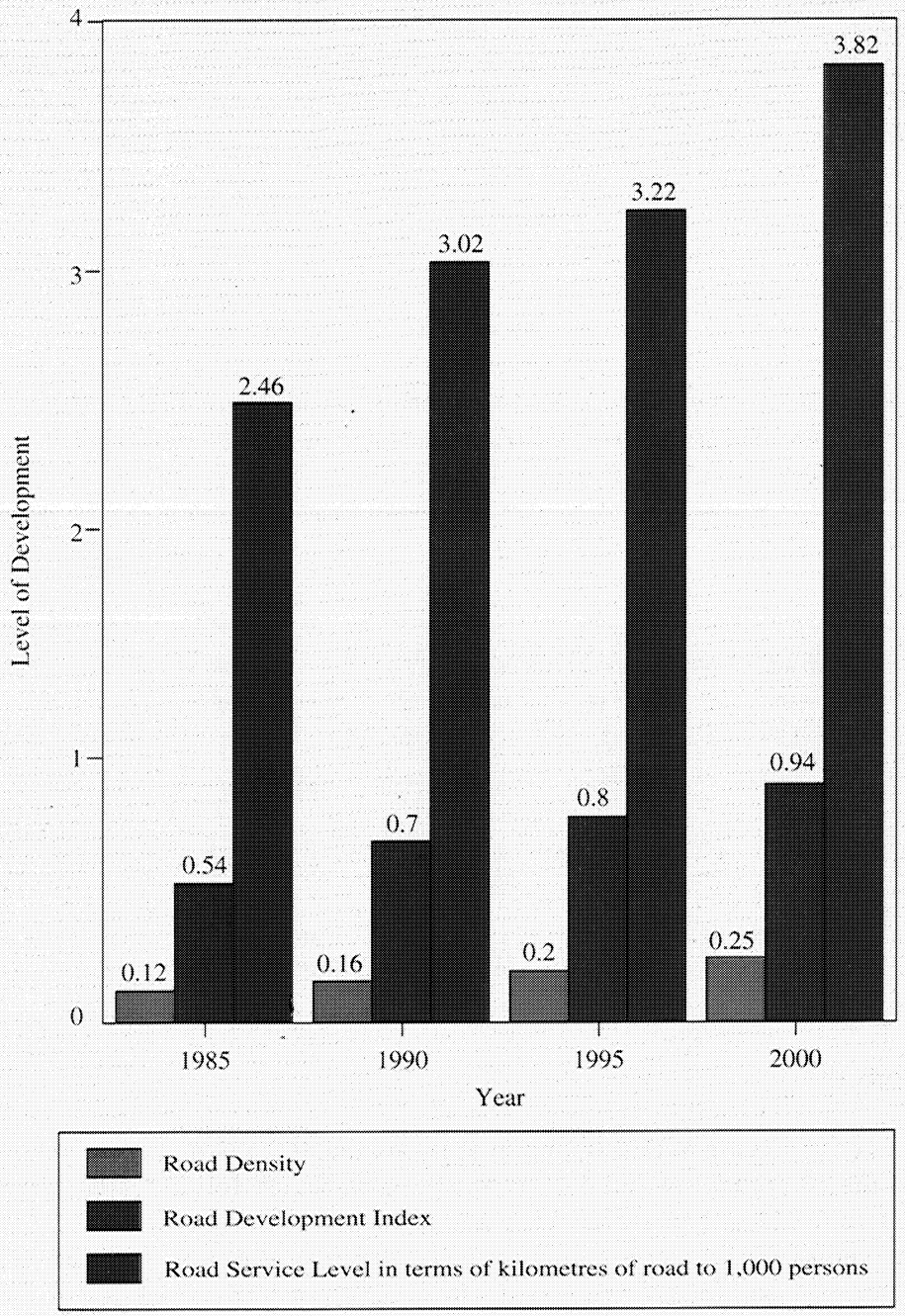
11.07 The strategy for reducing road congestion was implemented through the upgrading and widening of existing roads as well as the construction of new roads. Congestion along the existing north-south trunk road was reduced significantly with the completion of the North-South Expressway. The 1993 report on Road Traffic Volume Malaysia showed that the volume of traffic along certain stretches of the main trunk road had either been reduced, remained stagnant or increased marginally, despite the increasing number of vehicles. This indicated that the North-South Expressway has absorbed part of the normal north-south traffic. In addition, projects such as by-passes and road widening in Alor Setar, Johor Bahru, Kuching, Melaka and Sungai Petani helped to alleviate congestion. Furthermore, the construction of 43 weighbridge stations at selected points on existing highways and roads enabled better enforcement on overloading. Consequently, as a result of all these development the durability of road surfaces was enhanced, while road safety and comfort of travel were improved.

11.08 Emphasis was also given towards increasing the road network in the rural areas. Under the rural roads programme, a total of 5,445 kilometres of new roads was constructed, thereby, improving accessibility and enabling greater participation of the rural people in socio-economic development. Other projects such as the East-West Highway, Simpang Pulai-Lojing-Kuala Berang Road, First Trunk Road in Sarawak, Beaufort-Sindumin Road and Telupid-Sandakan Road in Sabah also contributed towards this objective. The quality of rural roads improved with the percentage of unpaved roads declining from 30 per cent to 25 per cent during the Plan period.

11.09 Road development of the country as reflected by Road Density, Road Development Index and Road Service Level over the last few Plans is shown in *Chart 11-1*. Over the decade of 1985-95, Road Density, which measures road length over total area, increased from 0.12 to 0.2 kilometre of road per square kilometre, thereby, increasing road coverage and accessibility in any given area by 67 per cent. The Road Development Index, which measures the level of road development, taking into account both area and population size of the country, also improved significantly from 0.54 in 1985 to 0.80 in 1995 or an increase of 48 per cent. The Road Service Level comprises three indicators which

CHART 11-1

ROAD DEVELOPMENT INDICATORS, 1985-2000



measures total road length to population, total vehicles and per RM100 million Gross Domestic Product (GDP), respectively. The Road Service Level in terms of road length to population increased by 31 per cent from 2.46 kilometres in 1985 to 3.22 kilometres of roads per 1,000 persons in 1995. In the case of road length per RM100 million GDP, it increased from 4.92 to 5.39 kilometres over the same period. On the other hand, there was a 15 per cent decrease in kilometres of road per 10,000 vehicles, over the 1990-95 period, due to the higher rate of increase in vehicles, which grew by 41 per cent compared to 19 per cent for roads.

Urban Transport

11.10 During the Sixth Plan period, increasing private vehicle usage leading to traffic congestion problems required measures to create an integrated, efficient and reliable urban transport system, particularly in the Klang Valley and other major urban centres such as Georgetown, Ipoh and Johor Bahru. While traffic congestion became apparent in many urban centres, including towns like Kuala Terengganu and Kuantan, the traffic situation in Wilayah Persekutuan Kuala Lumpur remained acute. In 1995, the estimated 1.4 million vehicles plying the city roads on a working day exceeded the city population of 1.3 million. The average number of vehicles entering the city, estimated at 740,000 daily, grew at an average annual rate of 17.5 per cent during the Sixth Plan period compared with 7.4 per cent during the Fifth Plan period. The tremendous growth of private vehicles in all major urban centres is attributable to increasing affluence and higher standards of living as well as lack of efficient public transportation systems.

11.11 An increasing number of urban road projects was undertaken to increase road capacities and improve traffic flow allowing quick traffic dispersal to alleviate traffic congestion. These included the construction of ring roads, interchanges, by-passes and the upgrading and expansion of radial roads in the major urban centres. Among the projects implemented or under implementation were the Johor Bahru Inner Ring Road and interchange projects, Sungai Petani Eastern By-pass and the Sungai Terengganu Bridge-Kuala Terengganu Airport road project.

11.12 In the Klang Valley, major projects implemented or under implementation included the Middle Ring Road II, Istana Negara-Salak Selatan Road, Puchong-Sungai Besi Road and five city interchanges under a privatization scheme. The dynamic vehicle-responsive traffic signal control system was installed at 98 intersections as part of an integrated effort together with other traffic demand management measures to alleviate congestion in Kuala Lumpur.

11.13 The Government embarked on the first phase of the construction of an integrated public transport system with emphasis on multimodal and environment-friendly features. In this regard, the implementation of the nation's first metropolitan rail commuter service, the privatized Light Rail Transit (LRT) system, was initiated. The construction of the LRT System I Phase I from Ampang to Jalan Sultan Ismail, a distance of 12 kilometres, is nearing completion. As for Phase II, the construction of an additional 15 kilometres from the city centre to Bukit Jalil and Sentul started in August 1995. To further extend the coverage of the LRT system as an effective public transport option, the Government approved the construction of the LRT System II covering a distance of 29 kilometres from Petaling Jaya to Gombak. Preliminary works for this project, which includes a 4.28-kilometre tunnel in the city centre, commenced in late 1994. Another fuel-efficient and environment-friendly rail-based interurban transport mode is the electrified double track commuter service by Keretapi Tanah Melayu Berhad (KTMB) which began its commercial service in August 1995.

11.14 To further promote multimodalism and attract more commuters to public transport, the amalgamation of the eight existing Kuala Lumpur-based bus companies into two consortia was completed in 1994. Measures to further improve the quality of bus services were also undertaken and these included route rationalization and improved bus designs for the ease and comfort of passengers. The two bus consortia have also initiated efforts to upgrade bus terminals and depots and these are at various stages of progress.

Rail Transport

11.15 The overall thrust of the railway development programme during the Sixth Plan period was aimed at increasing haulage capacity and enhancing operational safety for both freight and passenger services. Major projects undertaken during this period included the electrified double track project, track rehabilitation works, modernization of the signalling and communications systems, upgrading and construction of bridges, stations and halts and the purchase of additional rolling stock. In the north, the new railway station at Padang Besar was completed in 1994. With regard to track infrastructure, 327 kilometres of tracks between Paloh-Bukit Timah, Slim River-Seremban and another 113 kilometres between Ipoh-Bukit Merah were rehabilitated.

11.16 Rail passenger traffic averaged 1.6 billion passenger-kilometres per annum compared to 1.5 billion passenger-kilometres during the Fifth Plan period which resulted in an 18.3 per cent increase in revenue. Total freight traffic increased from 18.8 million tonnes during the Fifth Plan period to 22.3 million tonnes over the Sixth Plan period recording a growth of 18.6 per cent. In terms of container traffic, the volume increased by 27 per cent from 94,403 twenty-foot equivalent units (TEUs) in 1990 to 120,000 TEUs in 1995. Total freight revenue increased by 36.7 per cent from RM76.1 million to RM104 million over the same period.

11.17 To cater for the increasing volume in container movement, two inland container depots (ICDs) were built in Ipoh and Padang Besar during the Plan period. Container handling operations were also improved at the existing ICDs and terminals at Butterworth, Kuala Lumpur and Pasir Gudang through increased computerization and the use of specialized bogie container flat wagons (BCFs). The addition of 300 new BCFs enabled speedier, safer and more efficient rail container haulage services. KTMB also implemented its total logistics package programme with the provision of road container haulage services for door-to-door delivery, container storage, warehousing and packaging facilities, customs clearance and freight forwarding services. These measures helped to further promote multimodalism and improve freight services in terms of facilities, frequency and range. As shown by a productivity indicator for freight traffic, tonne-kilometre per worker increased by 30.3 per cent from 165,000 tonne-kilometre per worker in 1990 to 215,000 tonne-kilometre per worker in 1995. Sales per worker for both freight and passenger traffic also improved by 39.3 per cent from RM18,660 in 1990 to RM26,000 in 1995.

11.18 As a departure from the current intercity passenger service, priority was given to the development of rail as an alternative regional commuter transport system. In this regard, the electrified commuter train services between Rawang-Kuala Lumpur-Seremban and Sentul-Port Klang, initiated during the end of the Fifth Plan period, were completed. The commuter train service project involved various components including the construction, rehabilitation and electrification of 400 kilometres of single track and the purchase of 18 electric multiple units (EMUs). The first commuter service between Rawang-Kuala Lumpur began on 14 August 1995, while the other sectors were gradually commissioned, with the last sector between Kajang-Seremban commencing service on 18 December 1995.

Ports

11.19 Under the Sixth Plan period, the existing port facilities were upgraded and new port facilities were developed to meet the accelerated increase in demand by trade and industry. Focus was also placed on improvements in efficiency and productivity of port operations through rationalization of processes and procedures for cargo clearance. In shipping, efforts were continuously made to increase the volume of Malaysian cargo carried by locally registered ships.

11.20 During the Plan period, major port expansion projects were undertaken at Port Klang, Penang Port and Johor Port. In addition, port facilities at Bintulu, Kemaman and Kuantan ports were upgraded. With the completion of additional berths and other facilities, port capacity increased by 7.6 per cent per annum from 120.5 million tonnes in 1990 to 174.1 million tonnes in 1995, as shown in *Table 11-3*.

11.21 More than 90 per cent of Malaysia's international trade was conducted through seaports and this greatly supported the growth and expansion of the seaborne trade. The total tonnage of cargo handled increased by 8.1 per cent per annum from 103.4 million tonnes in 1990 to 152.3 million tonnes in 1995 mainly attributable to containerized and liquid bulk cargo, as shown in *Table 11-4*. The volume of containers handled grew at 19.2 per cent per annum from 15.7 million tonnes in 1990 to 37.8 million tonnes in 1995.

11.22 The number of ships which called at Malaysian ports increased by 6.7 per cent per annum from 50,721 in 1990 to 70,098 vessels in 1995, as shown in *Table 11-4*. Increasingly larger vessels were calling at Malaysian ports, particularly Bintulu Port and Port Klang, with post-panamax vessels of more than 60,000 deadweight tonnes (dwt) calling at West Port of Port Klang.

11.23 Efforts to improve efficiency in the clearance of cargo and ships at ports were also undertaken during the Plan period. These measures included the implementation of the Electronic Data Interchange (EDI) in Port Klang, Advanced Immigration Clearance System (AICS) and pre customs clearance for container operation as well as the simplification of trade documentation procedures and clearance system at other ports.

11.24 Projects to upgrade cargo and passenger jetties in Kuala Kedah, Kuala Perlis and Lumut were completed. This led to greater accessibility for the users and facilitated greater development in the vicinity of these areas. The ferry terminals at Tanjung Belungkor, Johor and Changi Bay North, Singapore, which helped to promote tourism, were completed. In addition, launches and boats were

TABLE 11-3

NUMBER OF BERTHS, CRANES, PORT CAPACITY AND THROUGHPUT AT PORTS, 1990-2000

Port	1990				1995				2000			
	No. of Berths	*No. of Cranes* [1]	*Capacity (mil. tonnes)*	*Throughput (mil. tonnes)*	*No. of Berths*	*No. of Cranes* [1]	*Capacity (mil. tonnes)*	*Throughput (mil. tonnes)*	*No. of Berths*	*No. of Cranes* [1]	*Capacity (mil. tonnes)*	*Throughput (mil. tonnes)*
Port Klang	30	7	27.2	22.1	40	16	40.2	40.0	46	44	78.9	74.9
Pulau Pinang	12	6	10.1	10.9	16	9	23.2	16.7	20	15	28.2	27.4
Johor[2]	9	2	8.6	10.0	14	6	15.6	16.5	28	12	42.2	40.9
Kuantan	8	1	4.9	3.3	11	2	8.7	4.2	13	4	15.0	7.8
Kemaman	4	3	7.9	1.3	4	3	7.9	2.6	5	3	7.9	5.8
Bintulu	6	-	21.6	11.5	7	-	31.9	18.6	10	-	32.0	26.7
Sabah[3]	27	-	6.9	13.1	27	-	9.5	16.3	31	-	19.5	18.9
Sarawak[4]	21	8	10.3	12.6	23	7	11.0	14.5	33	12	17.8	17.6
Others[5]	27	4	23.0	18.6	31	8	26.1	22.9	34	9	280.4	34.5
Total	**144**	**31**	**120.5**	**103.4**	**173**	**51**	**174.1**	**152.3**	**220**	**99**	**280.4**	**254.5**

Notes:

[1] Includes gantry and multipurpose cranes

[2] Figure for the year 2000 includes Tanjung Pelepas Port

[3] Kota Kinabalu, Tawau, Lahad Datu and Sandakan

[4] Kuching, Miri and Rajang

[5] Includes Teluk Ewa, Kuala Perlis, Kuala Kedah, Tanjung Bruas, Lumut, Port Dickson and Labuan

TABLE 11-4

NUMBER OF SHIPS CALLING AND VOLUME OF CARGO HANDLED, 1990-2000

	1990	1995	2000	Average Annual Growth Rate (%) 6MP	7MP
No. of Ships Calling	**50,721**	**70,098**	**87,860**	*6.7*	*4.6*
Total Volume of Cargo (million tonnes)	**103.4**	**152.3**	**254.5**	*8.1*	*10.8*
General	25.3	30.1	36.2	*3.5*	*3.8*
Liquid Bulk	47.2	60.7	87.6	*5.2*	*7.6*
Dry Bulk	15.2	23.7	41.3	*9.3*	*11.7*
Container	15.7	37.8	89.4	*19.2*	*18.8*

purchased to enhance operational efficiency and improve productivity of the Marine Department. Besides dredging and maintenance programmes at Sabah ports, upgrading works for navigational aids were also undertaken in Sabah and Sarawak.

11.25 In line with the privatization policy, several ports including West Port of Port Klang and Johor Port were privatized, while Bintulu and Penang ports were corporatized. The ports of Kemaman, Kuantan and Labuan as well as the jetties at Teluk Ewa and Kuah in Langkawi are in the process of being privatized.

11.26 The number of Malaysian registered merchant ships increased by 14.8 per cent per annum from 301 in 1990 to 600 in 1995. The majority of these ships were small vessels except for those ships acquired by Malaysia International Shipping Corporation Berhad (MISC), *Perbadanan Nasional Shipping Line Berhad* (PNSL), *Petroliam Nasional Berhad (PETRONAS)* and the new private company, Global Maritime Ventures Berhad (GMVB), formed to manage part of the Shipping Fund. MISC's fleet size increased from 48 ships in 1990 to 60 ships in 1995, PNSL from 10 to 14 ships and PETRONAS and GMVB purchased three tankers each with a total combined capacity of 310,400 dwt. Consequently, total Malaysian fleet size increased from 2.9 million dwt in 1990 to 3.9 million dwt in 1995. However, the share of cargo handled by Malaysian ships increased marginally from 16.9 million tonnes or 16.4 per cent in 1990 to 28.6 million tonnes or 18.8 per cent in 1995. Thus, the participation of

Malaysian shipping companies in the carriage of national cargo was still below the agreed cargo sharing 40:40:20 formula set by the United Nations Conference on Trade and Development (UNCTAD) Liner Code in 1991 for liner trade.

Airports

11.27 During the Sixth Plan period, the development programme for airports was directed towards expanding airport capacity and upgrading facilities to meet the increase in passenger and cargo traffic. Passenger traffic increased by 47.7 per cent while cargo traffic increased by 63.5 per cent. This resulted in an increase of 43.2 per cent in commercial aircraft movements, as shown in *Table 11-5*. To handle the increase in traffic, works such as extension of runways, parking aprons and terminal buildings were undertaken in major airports at Subang, Kota Kinabalu, Kuching and Langkawi. New airports were built in Sibu and Mulu while several airstrips, including those in Bario, Belaga and Long Akah, were improved.

11.28 Realizing the physical constraints of the Kuala Lumpur International Airport at Subang, which has a capacity of handling a maximum of 16 million passengers per annum (mppa), the KLIA at Sepang was developed to meet long-term air transport needs. The KLIA, with an initial capacity of 25 mppa and one million tonnes of cargo per annum, is poised to play the role as the regional hub for Asia Pacific. Construction of the first phase began in 1994. Earthworks are 97 per cent completed while work on the main terminal building began in November 1995.

11.29 Priority was accorded to modernizing and improving air traffic services and flight safety. The first phase of this modernization project, which aimed at providing full radar coverage for the nation's air space, was undertaken. This consisted of the installation of new primary and secondary radar systems at Subang, Kota Kinabalu, Kuching and Johor Bahru, and the construction and operation of a new air traffic control centre at Subang.

11.30 The growth of passenger traffic and tourism was facilitated by the further expansion of the fully privatized national airline, Malaysia Airlines (MAS), which expanded its international network from 46 destinations in 1990 to 68 in 1995. The domestic network covered 36 destinations, the majority of which were located in the remote areas of Sabah and Sarawak. MAS also embarked on a major modernization programme, expanding its fleet from 62 aircraft in 1990 to 81 in 1995. The conversion of two wide-bodied passenger aircraft to full freighter configuration, bringing the total to four dedicated freighter aircraft, boosted air cargo capacity.

TABLE 11-5

TRAFFIC HANDLED AT MALAYSIAN AIRPORTS, 1990-2000

Traffic	*1990*			*1995*			*2000*		
	Domestic	*International*	***Total***	*Domestic*	*International*	***Total***	*Domestic*	*International*	***Total***
Passengers ('000)	11,259	6,064	**17,323**	16,350	9,234	**25,584**	23,307	14,285	**37,592**
Cargo (tonnes)	68,853	172,737	**241,590**	105,380	289,662	**395,042**	158,031	449,781	**607,812**
Aircraft Movements (no.)	235,463	51,688	**287,151**	321,717	89,606	**411,323**	454,680	142,014	**596,694**

11.31 Scheduled secondary carriers, which operate mainly domestic routes, also expanded their operations during the Sixth Plan period to complement and supplement MAS services. Flights were extended to Acheh, Medan, Padang, Palembang and Hat Yai which boosted regional tourism.

Telecommunications

11.32 The objective of the telecommunications subsector during the Sixth Plan period was to accelerate its growth and modernization as well as improve efficiency and productivity to meet demand. In line with rapid technological developments, emphasis shifted from providing basic telephone to value-added services, including multi-media integration of voice, text, data, graphics and images. Licences were issued to new operators to provide basic network, international gateway, public land mobile radio, satellite and Very Small Aperture Terminal (VSAT) services. In addition, paging, cellular and other value-added services were further liberalized to enhance competition and efficiency in these services.

11.33 During the Plan period, the national penetration rate increased from 9.3 Direct Exchange Line telephones per 100 persons in 1990 to 16.6 in 1995. The urban penetration rate was higher at 16.6 in 1990 and 24.8 in 1995 while the rural penetration rate was 2.2 in 1990 and 5.5 in 1995. The further liberalization of cellular phone service resulted in the high subscriber rate, from a total of 78,000 in 1990 to 700,000 in 1995. Hence, the relatively more accessible cellular phone service complemented the basic line telephone service, particularly in urban areas. In 1995 there were 3.5 cellular phones per 100 persons, as shown in *Table 11-6*.

11.34 The increase in telephone penetration rate was brought about mainly by the upgrading of existing networks via new technologies such as digital, fibre optics, wireless and broadband including Asynchronous Transfer Mode, Synchronous Digital Hierarchy and Integrated Services Digital Network. In addition, new types of services were introduced like Personal Communications Network (PCN), video conferencing, EDI and telebanking.

11.35 To increase accessibility to telephone services, new technologies, such as Multi Access Radio System (MARS), Radio in Local Loop (RiLL) and fixed wireless, were introduced. As a result, the cost of telephone installation in rural areas, which ranged from RM7,000 to RM25,000 per line prior to 1994, was reduced to RM5,000 by the end of the Plan period. The first RiLL telephone service was introduced in Pendang, Kedah. At the end of 1995, there were 40,000 subscribers using RiLL telephones.

TABLE 11-6

TELEPHONE SERVICES AND PENETRATION RATE, 1990-2000

Type of Service	*1990 ('000)*	*1995 ('000)*	*2000 ('000)*
Direct Exchange Lines			
Total Subscribers	**1,586**	**3,320**	**5,578**
Business	450	861	1,259
Residential	1,136	2,459	4,319
Public Payphones			
Total Installed	**25**	**76**	**314**
Urban	17	55	279
Rural	8	21	35
Cellular Phones			
Total Subscribers	**78**	**700**	**3,723**
Penetration Rate[1]			
Fixed : National	**9.3**	**16.6**	**24.7**
Urban	16.6	24.8	32.7
Rural	2.2	5.5	9.5
Cellular : National	—	**3.5**	**16.5**

Note: [1] Telephones per 100 persons

11.36 Through digitalization of the network and upgrading of equipment, the capacity and quality of service improved. The number of telephone waiters decreased by 46 per cent from 81,780 in 1990 to 44,383 in 1995. There was a reduction in number of complaints from 31,600 in 1990 to 14,400 in 1995. About 97 per cent of faults were rectified within 24 hours in 1995 as against 92 per cent in 1990. Line congestion decreased from 15 per cent in 1990 to 3.0 per cent in 1995.

11.37 The convergence of telecommunications and information technologies resulted in the growth of new and sophisticated services using the basic telephone line. In line with these changes, the National Telecommunications

Policy (NTP) was launched in 1994 to set the direction for the development of the telecommunications sector as well as the objective of becoming a regional telecommunications and Information Technology (IT) hub. Among others, the NTP aimed at encouraging local manufacture of telecommunications equipment, promoting research and development as well as setting targets for the expansion of services, including IT.

Postal Services

11.38 Under the Sixth Plan, emphasis was given to the expansion and improvement of postal services as well as the extension of coverage. The Postal Department was corporatized on 1 January 1992 to increase its efficiency and enable autonomy in planning and implementation of projects. During the Plan period, 50 new post offices and 146 new mini post offices were set up. In addition, 55 of the existing 545 post offices were upgraded. Ten *Pos 2020* outlets, which provide a wider range of services including the sale of stationery, were initially set up in the Klang Valley. As a further move towards enhancing customer convenience, nine post offices in urban areas extended their operational hours to 10 p.m. and more than 2,500 stamp vendors were appointed. Six drive-in counters were also introduced. Counter services were expanded to include settlement of traffic compounds, renewal of driving licences, road tax and business registration, and sale of customs, immigration, university entrance and other Government forms. Efficiency of mail processing and counter services was improved through automation and computerization. At the end of 1995, about 95 per cent of post offices were computerized, thereby, significantly improving the efficiency of counter services.

11.39 The courier services industry expanded rapidly during the Plan period, handling approximately 56,000 domestic and 10,000 outbound international shipments per working day. Its shipments included documents, packages, specialized time-sensitive express freight for various companies which practise just-in-time manufacturing and global sourcing processes.

Meteorological Services

11.40 During the Sixth Plan period, the quality of weather forecasting and other weather-related services were improved in order to ensure the safety of land, sea and air operations. In this regard, data collection in six upper air stations and 15 principal meteorological stations were automated while the collection, dissemination and storage of data was upgraded through the

telecomputerization project. Radar stations in the peninsula were integrated to provide *real time* collection of data and the storm warning radars at Kota Bharu and Kuantan were replaced. The Satellite Receiving System was completed to link with the National Oceanic and Atmospheric Administration (NOAA) satellite to receive atmospheric data for cloud imagery. To monitor the air quality of the country, an Automatic Applied Meteorological Observation System was implemented in the Klang Valley. These efforts contributed towards improving weather forecast and increasing public usage of meteorological data, as shown by the eight-fold increase in number of requests for data in 1995 over a twenty-year period.

Water Supply

11.41 During the Sixth Plan period, various water resources projects were undertaken to meet domestic and industrial demand as well as irrigation requirements. Efforts were also made to improve management as well as to ensure better distribution of water resources among various river basins to match supply and demand. By the end of the Plan period, three new dams were completed, bringing the total dams in operation to 72, with a total capacity of 25 billion cubic metres while another three are under construction. Of these, about half were developed for water supply, 16 for multipurpose use while the remaining were for irrigation and hydro power.

11.42 In line with the need to provide safe drinking water, several *urban* and *rural water supply* programmes were implemented with emphasis on developing and upgrading source works, storage and treatment plants as well as rehabilitating the distribution system. Efforts were also taken to enhance interstate water transfer such as from the Sungai Muar in Johor to the Durian Tunggal Dam in Melaka, as well as from the Kelinchi Dam in the Muar River Basin to the Terip Dam in the Linggi River Basin in Negeri Sembilan.

11.43 Measures were taken to improve the efficiency of the water supply system as well as water quality by reducing the rate of non-revenue water (NRW) which ranged from 20 per cent to 61 per cent, as shown in *Table 11-7*. During the Plan period, a total of 32 districts were identified under the programme to rehabilitate and upgrade water treatment plants and distribution systems. The programme, which is at various stages of implementation in 12 districts, includes the replacement of water meters and pipelines as well as the refurbishment of treatment plants. Consequently, the national NRW rate decreased from 43 per cent in 1990 to 38 per cent in 1995.

TABLE 11-7

URBAN AND RURAL WATER SUPPLY COVERAGE AND NON-REVENUE WATER RATE, 1990-2000

('000 persons)

	1990							*1995*							*2000*						
State	*Urban*	*%*	*Rural*	*%*	***Total***	*%*	*NRW*	*Urban*	*%*	*Rural*	*%*	***Total***	*%*	*NRW*	*Urban*	*%*	*Rural*	*%*	***Total***	*%*	*NRW*
Johor	1,008.7	*96*	762.1	*67*	**1,770.7**	*80*	*47*	1,239.7	*98*	1,002.0	*85*	**2,241.7**	*93*	*36*	1,526.3	*99*	1,070.8	*90*	**2,597.1**	*99*	*20*
Kedah	444.4	*98*	633.3	*69*	**1,077.7**	*72*	*61*	542.0	*99*	719.6	*77*	**1,261.7**	*85*	*48*	675.0	*100*	855.8	*92*	**1,530.8**	*95*	*35*
Kelantan	289.1	*70*	325.6	*40*	**614.7**	*50*	*42*	417.4	*85*	451.5	*51*	**868.8**	*66*	*40*	584.4	*95*	567.8	*60*	**1,152.3**	*77*	*25*
Melaka	213.1	*100*	320.6	*98*	**533.7**	*93*	*38*	251.2	*100*	313.5	*98*	**564.7**	*99*	*35*	298.5	*100*	297.4	*99*	**595.9**	*99*	*25*
Negeri Sembilan	296.0	*96*	371.9	*89*	**667.9**	*88*	*52*	344.2	*98*	417.0	*96*	**761.2**	*97*	*42*	396.1	*98*	432.2	*97*	**828.3**	*97*	*25*
Pahang	323.3	*98*	524.8	*70*	**848.1**	*79*	*49*	372.5	*98*	639.6	*79*	**1,012.1**	*85*	*48*	440.6	*99*	716.8	*82*	**1,157.3**	*88*	*30*
Perak	1,072.7	*99*	702.2	*77*	**1,774.8**	*87*	*39*	1,241.1	*99*	679.3	*83*	**1,920.3**	*93*	*37*	1,445.0	*100*	664.5	*97*	**2,109.5**	*99*	*25*
Perlis	49.5	*97*	104.8	*75*	**154.2**	*69*	*51*	63.5	*100*	120.8	*83*	**184.3**	*88*	*38*	81.6	*100*	134.3	*90*	**215.9**	*94*	*26*
Pulau Pinang	844.6	*99*	269.3	*96*	**1,113.8**	*98*	*20*	985.7	*100*	227.6	*98*	**1,213.3**	*100*	*20*	1,083.8	*100*	173.9	*99*	**1,257.7**	*100*	*18*
Sabah[1]	613.1	*100*	652.2	*52*	**1,265.3**	*64*	*46*	840.2	*100*	944.8	*61*	**1,785.0**	*77*	*58*	1,198.9	*100*	1,356.5	*70*	**2,555.4**	*91*	*30*
Sarawak	641.6	*98*	502.5	*47*	**1,144.1**	*70*	*30*	818.9	*100*	650.4	*61*	**1,469.3**	*85*	*36*	1,043.4	*100*	817.2	*80*	**1,860.6**	*90*	*23*
Selangor	1,786.7	*98*	516.8	*85*	**2,303.5**	*93*	*45*	2,330.3	*100*	462.6	*94*	**2,792.9**	*99*	*40*	2,940.2	*100*	337.1	*97*	**3,277.3**	*100*	*25*
Terengganu	325.4	*90*	242.6	*54*	**567.9**	*72*	*33*	394.9	*95*	329.2	*65*	**724.1**	*80*	*36*	471.6	*97*	462.2	*80*	**933.9**	*88*	*20*
W. P. Kuala Lumpur	1,262.1	*100*	–	–	**1,262.1**	*100*	*45*	1,343.5	*100*	–	–	**1,343.5**	*100*	*40*	1,423.9	*100*	–	–	**1,423.9**	*100*	*25*
Malaysia	**9,170.2**	*96*	**5,928.5**	*67*	**15,098.7**	*80*	*43*	**11,185.0**	*99*	**6,957.7**	*77*	**18,142.8**	*89*	*38*	**13,609.3**	*99*	**7,886.6**	*83*	**21,495.9**	*95*	*28*

Note: [1] Including Wilayah Persekutuan Labuan

11.44 The *rural water supply* programme was further expanded to provide access to safe drinking water to a large segment of the rural population especially in the remote areas. About 1,300 schemes were implemented, mainly in Sabah, Sarawak and Terengganu. These schemes included the laying of reticulation systems and extension of pipe connections to existing and new trunk mains.

11.45 In meeting the increasing demand for *water from urban centres*, particularly the Klang Valley and Johor Bahru, various water supply projects were completed. These included the Sungai Terip Phase II, Sungai Selangor Stage I Phase I and Johor Bahru Phase II water supply projects. With the completion of these projects, production capacity increased by 54.7 per cent from 6,103 million litres per day (mld) in 1990 to 9,442 mld in 1995, which was more than sufficient to meet demand.

11.46 The national water supply coverage increased from 80 per cent of total population in 1990 to 89 per cent in 1995, as shown in *Table 11-7*. The urban coverage in most states exceeded or were the same as the national urban coverage, which increased from 96 per cent in 1990 to 99 per cent in 1995. The national rural coverage also increased from 67 per cent in 1990 to 77 per cent in 1995. However, the rural areas of Kelantan, Sabah, Sarawak and Terengganu are still below the national rural coverage.

11.47 During the Sixth Plan period, several water resources studies were completed including the Pahang Water Resources Study and Sabah Water Resources Masterplan. These studies identified new sources for future development in Pahang while in Sabah it led to the implementation of a fast-track water supply programme. In addition, river management studies, such as the Comprehensive Management Plan of Muda River Basin and National River Mouths Study, were carried out. Some recommendations of these studies, such as the improvement of river channels and beautification of rivers, were implemented.

11.48 Several water supply projects were privatized during the Sixth Plan period. The construction of the Greater Ipoh Phase II and Krian, Larut and Matang Phase II projects on Build-Operate-Transfer (BOT) basis were completed, while several treatment plants in Kedah, Negeri Sembilan and Selangor were privatized. These programmes reduced capital investment by the Government and improved efficiency in the operation and maintenance of treatment plants. In 1994, the Johor State Water Department became the first state water authority to be corporatized in the country.

Sewerage

11.49 The Government continued to provide basic sewerage facilities to improve the health and well-being of the population. In this regard, various systems were adopted including centralized sewerage systems, individual septic tanks and pour-flush latrines. By the end of the Plan period, the proportion of households covered increased from 42.3 per cent in 1990 to 52.7 per cent in 1995.

11.50 To further accelerate the provision of sewerage services as well as reduce river pollution by domestic and animal waste, the sewerage system was privatized in 1993. This privatization project, with total investments of about RM6.27 billion spread over a period of 18 years and involving works such as the construction of new multipoint sewerage system as well as upgrading and refurbishing of existing sewerage systems, is expected to contribute to the modernization and centralization of the sewerage system throughout the country. By the end of the Plan period, the management of the sewerage system in 82 out of 143 local authorities throughout the country were handed over to the privatized company.

III. PROSPECTS, 1996-2000

11.51 The development of the infrastructure and utilities sector will be further intensified in order to sustain the growth momentum of the economy. With the economy anticipated to grow at 8.0 per cent per annum during the Seventh Plan period, the supporting role of infrastructure and utilities remains vital. In order to effectively respond to this challenge, it is imperative that continuous upgrading and rehabilitation programmes of existing capacities as well as investments in new capacities be undertaken. In addition, the current focus towards improvement in efficiency and productivity to enhance existing capacities and the nation's competitiveness will be accorded higher level of urgency within the sector. The development thrust of the sector during the Seventh Plan period, will be guided by the following strategies:

- *Supply-driven approach will form the basis for the expansion of infrastructure capacities taking into consideration long-term demand, development projects and economic growth in order to ensure the availability of supply upon demand. This approach will be applied particularly to large infrastructure projects that are indivisible and require long lead time;*

- *Long-term integrated planning that incorporate a total approach will be adopted in infrastructure planning to enhance coordination and ensure a more orderly, systematic and comprehensive development and implementation of infrastructure;*

- *The promotion of multimodalism in the transport sector will be actively pursued to enhance the interfacing of all modes of transport as well as related services in order to increase the efficiency of infrastructure facilities and supporting services;*

- *Further expansion of infrastructure facilities to rural areas in order to enhance accessibility in line with a more balanced and equitable distributive policy; and*

- *Continuous review and stricter enforcement of performance standards and technical specifications for infrastructure projects in order to enhance productivity, efficiency and quality of life.*

Roads

11.52 The road expansion programme will be undertaken in a pragmatic and judicious manner in combining both the construction of new roads and the upgrading and rehabilitation of existing alignments. In this regard, planning and implementation of projects during the Plan period will be guided by the need to expand capacity as well as upgrade the quality of road travel. Towards this end, emphasis will be placed on adapting and employing new technologies in construction, improving road service level, road safety and expanding further the rural road network.

11.53 Road construction will be further accelerated through fast-track approaches, particularly through privatization. The Road Development Index will form the basis for the development of new road capacities. In this regard, continuous large investments in road development will be undertaken in order for Malaysia to achieve a higher Road Development Index commensurate with its developed status. Towards this end, it is envisaged that an additional 16,100 kilometres of roads will be constructed by both the public sector and private sector through the privatization programme during the Plan period, will increase the Road Development Index to 0.94. This does not include the continuous programme of upgrading and sealing of unpaved roads in rural areas.

11.54 In improving the Road Service Level, efforts will be taken to ensure that the volume to capacity of roads does not exceed the *level of service C*[1]. In line with this, congestion on roads can be minimized and limited to exceptional peak periods only. Such efforts will also reduce vehicle operation and transport costs, thereby, enhancing Malaysia's competitive edge. In this regard, road planning and design will take into cognizance the level of service. Consequently, it is envisaged that the Road Service Level will be improved from 3.22 kilometres in 1995 to 3.82 kilometres in the year 2000 and Road Density from 0.20 to 0.25 kilometres of road per square kilometre over the same period, as shown in *Chart 11-1*.

11.55 Besides the construction of new roads, emphasis will also be given to the upgrading of existing roads, dualling and improving road alignment, pavement and geometrics to enhance road safety and quality. Of the national total of 272 stretches which have been identified as accident prone, a total of 147 stretches will be improved and upgraded. To ensure the quality of road travel, existing minimum geometric standards will be more stringently enforced for expressways and new roads, including privately constructed roads used by the general public. In addition, dual carriageways to major towns, by-passes and ring roads will be implemented. With the completion of the weighbridge stations, regulations on loading will be more effectively enforced to reduce the rate of road damage as well as ensure the safety of road users.

11.56 The construction of the North-South Expressway, which provided invaluable lessons and experiences on road construction and project implementation methodology, will guide future road development, especially those earmarked for privatization. Where appropriate, more environment-friendly construction methods, such as tunnels and viaducts for major roads in highlands and hilly terrains as well as the *cakar ayam* method, suitable for local conditions like mangrove swamps, will be adopted. In addition, efforts will be directed towards adopting, adapting and developing new technologies that will reduce time and cost, while improving quality in the construction of roads. Among these technologies are the utilization of fast-drying bitumen and precast concrete structures, which are particularly suitable for elevated highways, interchanges and tunnels. The use of such technologies will enable faster construction and completion of road projects and reduce inconvenience to road users during the construction period. At the same time, such expertise and services can be exported to other developing countries.

---

[1] Level of service (LOS) relates to traffic flow at six levels from A to F. At LOS of A there is free flow with little or no delay, while at the extreme end LOS of F indicates forced flow and queues of vehicles. At LOS of C there is stable flow with restricted speed and acceptable delay. Quantitatively, LOS of a road refers to the Volume to Capacity ratio of that road. At LOS of C, this ratio ranges between 0.7 to 0.8 with traffic volume ranging from 1,400-1,600 passenger car unit per hour per lane for dual carriageway and between 2,000-2,200 passenger car unit per hour for both directions for single carriageway.

11.57 In order to further improve and expand the transportation system in the rural areas, efforts will continue to be undertaken towards increasing road coverage and improving road network in these areas. In this regard, new rural roads will be built to higher design, pavement and geometric standards that ensure longer durability and lower maintenance costs while existing ones will also be upgraded to similar standards. The higher standards will help contribute to the expansion of new industrial activities in rural areas and facilitate the movement of larger commercial and heavy vehicles serving these industries, thereby, accelerating rural and regional development. Apart from the construction of new coastal roads, the focus of road development projects will include the completion of the Pan Borneo Highway linking Miri and Limbang and the Simpang Pulai-Lojing-Kuala Berang Road as well as the construction of the east-west section of the East Coast Expressway, linking Karak and Kuantan. These projects, traversing through new corridors, will open up new areas as well as enhance accessibility to rural areas.

11.58 The overall development of roads during the Seventh Plan period will be guided by the Highway Network Development Plan, 1993. Among the major projects to be completed are the Titi Karangan-Grik section of the East-West Highway, the upgrading of the Bentong-Kuala Lipis Road and the Kuala Kangsar-Grik Highway in Peninsular Malaysia. The construction of the Butterworth Outer Ring Road, the New North Klang Straits By-pass and the Elevated Highway over Sungai Gombak through privatization will also be completed during the Plan period. Other roads, in which construction will commence during the Seventh Plan, include the Beaufort-Mempakul Road, Merotai-Kalabakan Road, Tamparuli-Ranau-Telupid Road in Sabah as well as the Matu-Igan-Oya Coastal Road in Sarawak, as shown in *Table 11-8*. The total estimated investment in privatized highway projects amounts to RM17.5 billion, representing indirect savings to the Government.

Urban Transport

11.59 During the Seventh Plan period, urban transport strategy will focus on the further development of an efficient, integrated, multimodal and environment-friendly public transport system to attract more commuters and thereby reduce traffic congestion caused by private vehicle usage. The completion of major transport infrastructure projects and complementary measures to encourage the integration of the various transport modes will result in an improvement in the modal split with increased bias towards public transport modes.

TABLE 11-8

MAJOR ROAD PROJECTS, 1996–2000

	Project	*Expenditure/Investment* (RM million)*
I.	**Continuation from 6MP**	**1,785**
	Middle Ring Road II	500
	Access Road to Bakun Hydroelectric Dam	403
	Simpang Pulai-Lojing-Gua Musang-Kuala Berang Road	280
	Kuala Kangsar-Grik Road	200
	Johor Bahru Inner Ring Road	118
	Upgrading Beaufort-Mempakul Road	84
	Upgrading Bentong-Kuala Lipis Road	80
	Western Section, East-West Highway	70
	Upgrading Alor Setar-Kuala Kedah Road	50
II.	**New Projects 7MP**	**657**
	Batang Rejang Bridge	100
	Upgrading Betong-Kayu Malam Road	80
	Slope and Road Repairs of Tamparuli-Ranau-Telupid Road	60
	Rehabilitation of Kuala Terengganu-Kota Baru Road	50
	Upgrading Route 7 from Alor Setar to Kangar	50
	New Lingau-Sebuyau Coastal Road	50
	Upgrading Route 98 from Temerloh to Jerantut	48
	Upgrading Merotai-Kalabakan Road	48
	Melaka Ring Road Interchange	45
	New Lundu-Sempadi-Selang Coastal Road	44
	New Matu-Igan-Oya Coastal Road	42
	Upgrading Papar-Beaufort Road	40
III.	**Privatized Roads**	**17,505**
	Continuation from 6MP	
	Second Link	1,120
	North South Central Link	960
	Shah Alam Expressway	624
	New North Klang Straits By-pass	400
	KL-Karak Highway	390
	Upgrading Cheras-Kajang Road	275
	Seremban-Port Dickson Highway	120
	Butterworth-Kulim Highway	84
	New Projects 7MP	
	West Coast Expressway	3,800
	East Coast Expressway	2,000
	Dedicated Highway KL-Putrajaya-KLIA	1,800
	Damansara-Puchong-Putrajaya Highway	881
	Elevated Highway	592
	New Pantai Highway/Old Klang Road	545
	Upgrading Sungai Besi Road	514
	Butterworth Outer Ring Road	400
	Others	3,000
	Total	**19,947**

Note: *Estimated

11.60 The first phase of the LRT System I in Kuala Lumpur is scheduled to be completed in mid 1996 and the second phase by 1998. Phase II will provide an efficient and convenient commuter service to the Bukit Jalil Games Complex, venue of the 1998 Commonwealth Games. The LRT System II is expected to be fully operational by mid 1999. By the end of the Plan period, the LRT system would cover a total route length of 56 kilometres in the Klang Valley. In addition, new LRT corridors in the Klang Valley will be identified for implementation. The implementation of similar LRT systems in other urban areas, such as Johor Bahru and Pulau Pinang, will also be studied.

11.61 In order to encourage multimodalism and the greater use of public transport for efficiency and convenience, the Government will implement several major measures that will lead to the systematic integration of transport infrastructure, systems and operations. Physical integration will ensure that major bus and taxi pick-up and drop-off points and car parks are located close to rail stations. Route integration will be achieved through the provision of feeder bus services for the LRT and commuter train services. Fares integration will be implemented through the introduction of an integrated ticketing system covering both the rail and bus services.

11.62 The amalgamation of the Kuala Lumpur-based bus companies will improve the efficiency, reliability and quality of bus services. Concomitant improvements will be forthcoming in the provision of upgraded terminals and depots, improved bus designs for greater comfort and safety, as well as improved signages and route information systems. Similar measures, largely based on private sector initiatives, will be considered for other major urban centres.

11.63 Road infrastructure improvements that assist in traffic flow will continue to be implemented on a priority basis. Thus, the construction of ring roads, interchanges, and the upgrading and expansion of radial roads in major urban centres will be undertaken. The dynamic vehicle-responsive traffic signal control system in Kuala Lumpur will be fully implemented over the Plan period with installations at 150 intersections in addition to the existing installations at 98 intersections. As part of an integrated effort to improve urban transportation, traffic demand management measures will be studied. These include the creation of more one-way streets, reduction of on-street parking, higher parking charges and scheduling the entry and exit of heavy commercial vehicles into and from the city centre to optimize the usage of road space. Other steps which will be considered include the introduction of bus priority measures, such as bus lanes and exclusive right-of-way and turnings.

11.64 In order to ensure a more integrated and coordinated development in urban transportation, local authorities will have to integrate transport strategies and road network development, incorporating environmental and flood mitigation measures, as required under the Street, Drainage and Building Act 1974 (Act 133), with structure plans during the planning stage. In this regard, the 1995 Urban Transport Study involving the three towns of Ipoh, Johor Bahru and Sungai Petani, which developed a manual of procedures, will guide local authorities in the preparation of comprehensive urban transport plans and specific strategies to reduce traffic congestion in these towns. The recommendations considered for implementation include the construction of roads based on the hierarchy principle, such as ring roads for traffic dispersal, identification of main arterial and radial roads and relocation of public transport terminals away from city centres. The Study will, therefore, provide a useful guide for local authorities to improve the quality of urban roads, traffic planning and management and public transport services.

Rail Transport

11.65 The thrust for rail development during the Plan period will be on enhancing the quality and efficiency of rail services and operational safety to improve the competitiveness of rail as a transport mode for both passengers and freight. The competitive edge of rail transportation in providing an efficient and low-cost complementary service will be given emphasis.

11.66 To enhance the capacity of the commuter transport service, an additional 44 EMUs to the existing 18 will be purchased for increasing service capacity and frequency to cater for the expected daily ridership of 150,000 passengers on the electrified commuter train service in the Klang Valley. With regards to inter-state passenger traffic, efforts will be taken to increase the reliability and speed of rail travel to be more competitive with road and air transport. This will be attained through selective doubling, strengthening and electrification of tracks, modernizing signalling and communication systems and investing in high-speed rolling stock. In this regard, the segment from Kulai to Johor Bahru will be given priority and implemented during the Plan period. This would also involve the purchase of another 21 EMUs. In addition, studies on tilting train technologies, initiated in 1995, will identify various options for the implementation of faster and more comfortable interstate passenger rail travel. To enhance operational safety, more grade separated crossings like road and pedestrian bridges and underpasses will be constructed to replace existing railway level crossings.

11.67 The role of KTMB in promoting intermodalism will continue to be enhanced with the rising volume of container traffic, requiring a simultaneous increase in carrying capacity through double tracking. As part of its strategy, KTMB will continue to shift its market towards general cargo containers as well as enhance the productivity levels and operational performance of its yard and terminal facilities. Where feasible, more ICDs and terminals will be built jointly with the private sector to increase capacity, efficiency and quality of freight services, while a study on the cost effectiveness of developing rail haulage on a large scale as an alternative land transport mode for goods will be carried out.

11.68 The expansion of the Padang Besar container yard as well as the improvement of its logistics and operational efficiency will be geared towards increasing container haulage between Southern Thailand and Pulau Pinang arising from the development of the Indonesia-Malaysia-Thailand Growth Triangle (IMT-GT). Freight transportation will be further enhanced with the construction of rail links to the North Butterworth Container Terminal (NBCT) at Penang Port, West Port of Port Klang and Tanjung Pelepas Port in Johor.

11.69 Another major development during the Plan period will be the privatized construction of Kuala Lumpur Central, an integrated railway complex in Brickfields with state-of-the-art facilities and a bigger capacity than the existing Kuala Lumpur Railway Station. The proposed rail complex is an integrated public transport terminal, interfacing the KTMB commuter service, LRT, buses, taxis and privatized Express Rail Link (ERL) which provides direct rail services to the new KLIA. The Kuala Lumpur Central will also include a city air terminal to provide check-in facilities for air passengers.

Ports

11.70 Port development will continue to focus on expanding capacity, upgrading and increasing equipment and facilities as well as enhancing the efficiency of port and port-related services. In terms of new port capacities, an integrated planning approach with a view to promoting multimodalism and developing a comprehensive range of landside facilities and services will be adopted. A mechanism to encourage the development of multimodal operators that offer door-to-door transport services will be looked into. The privatization of port facilities and services will be further accelerated to improve the operational and managerial efficiency of these facilities. In addition, measures will continue to be taken to promote the expansion of the domestic merchant fleet and further increase the participation and utilization of Malaysian shipping lines in domestic and international trade.

11.71 For the purpose of port expansion, including at Port Klang, identification of port sites will have to support the load centre concept to reduce wastage and duplication of capital infrastructure, as well as ensure operational and managerial effectiveness. Greater attention will be placed on the land space available to ensure the proper development of landside facilities and support services such as road transportation, ICDs, distriparks, warehousing facilities, free commercial zones, shipbuilding and repair, bunkering and water supplies as well as banking and insurance services. The planned supply and layout of all these port-related activities will lend support to the full implementation of intermodalism, enhance logistics, administrative and managerial efficiency as well as contribute to a less congested visual appearance. Access by road and rail to NBCT, West Port of Port Klang and Tanjung Pelepas Port such as the Butterworth-Kulim Highway and the Shah Alam Expressway will complete the network of infrastructure for these ports.

11.72 Various port projects, particularly in West Port of Port Klang, will be undertaken using expeditious and cheaper construction methods, such as concrete piles, in order to accelerate the expansion of port capacities as well as to contain project costs. These include the construction of the new port at Ranca-Ranca, Labuan, five berths at the privatized Tanjung Pelepas Port, the third liquefied natural gas (LNG) jetty in Bintulu Port, a dangerous cargo jetty in Kemaman Port, development of additional three berths at West Port of Port Klang as well as Phase II of the NBCT project. In anticipation of the growing demand in seaborne passenger traffic, terminals for leisure and cruise ships will be constructed at Port Klang and at popular tourist destinations such as Langkawi and Penang.

11.73 As part of the capacity expansion and development of riverine transportation, a number of port-related projects in Sabah and Sarawak, which commenced in the Sixth Plan, is expected to be completed by the end of the Seventh Plan period. These include the construction of a new deep-water port at Kampung Senari, Kuching, Tanjung Manis Port, Rajang and a 390-metre berth at the multipurpose terminal at Miri Port, Sarawak as well as the expansion of the Lahad Datu Port and reclamation works at the Kota Kinabalu and Sandakan ports in Sabah.

11.74 By the end of the Plan period, the total planned capacity at all Malaysian ports is expected to increase to about 280 million tonnes as compared with 174.1 million tonnes in 1995, as shown in *Table 11-3*. The volume of cargo handled is estimated to increase from 152.3 million tonnes in 1995 to about

255 million tonnes in the year 2000, representing an average annual growth of 10.8 per cent. The number of ship calls is expected to increase by 4.6 per cent per annum from 70,098 vessels in 1995 to about 87,900 vessels in the year 2000, as shown in *Table 11-4*. The growth and the development of the shipping industry will be monitored more closely in order to better anticipate increased demand for port and shipping services. In addition, measures will be taken to expand capacity and improve the efficiency of port-related services in order to cater for this shipping development and expected growth in seaborne traffic.

11.75 Further efforts will be made to improve the efficiency and productivity of port operations through increased automation and computerization to upgrade management processes and procedures, especially in the clearance of cargo. Measures will also be taken to review the existing practices, processes and procedures, including that of providing pilotage and tug boat services, in order to improve ship turnaround time. The Berth Appropriation Scheme, AICS, pre customs clearance for container operations and the EDI programme will be expanded to cover all major ports. All ports will undertake proper maintenance programmes as well as develop contingency plans with back-up facilities to ensure sufficient availability of equipment at all times. In addition, computerization of container terminals and purchase of additional multipurpose and post-panamax container cranes will be undertaken by the relevant ports. To further improve cargo clearance, the implementation of some of the recommendations of the study on container haulage is expected to improve the transportation system.

11.76 More concerted efforts will be undertaken to promote Port Klang as a hub port. Cargo from all other Malaysian ports which act as feeder ports will be consolidated, where possible through Port Klang where shipping services are more frequent and expedient. In this regard, close linkages with regional ports, as well as those ports in Sabah and Sarawak, will be established through the provision of feeder services at competitive rates. In addition, the supply of efficient support facilities and the gazetting of a free commercial zone at West Port of Port Klang will be implemented. Other promotional strategies to enhance the attractiveness of Port Klang as a transhipment centre, such as rebates, tariff restructuring, maximum back-up equipment facilities, volume discounts as well as allowing foreign equity participation in the Terminal Dedicated Berth Scheme, will be considered.

11.77 The corporatization as well as privatization of more ports, which had resulted in a number of port authorities becoming regulatory authorities, is

expected to continue with the privatization of the Kemaman and Kuantan ports. To inject greater focus in port development policy and strategy, as well as enhance professionalism in the maritime sector, a National Port Authority, with the requisite expertise, will be established to replace these numerous regulatory authorities. With the strengthened single regulatory authority to monitor developments in the maritime sector, the efficiency and quality of port-related services are expected to improve in line with predetermined performance standards.

11.78 In the shipping subsector, greater emphasis will be given to the expansion of the domestic merchant fleet through better utilization of the RM1.1 billion Shipping Fund, comprising the Shipping Venture Facility of RM500 million and the Shipping Finance Facility of RM600 million. In addition, the Government will look into various measures to expand the carriage of national cargo by Malaysian merchant fleet with a view to improving the balance of payments. One of the measures considered is the development of specialized multipurpose vessels capable of carrying both containerized and non-containerized cargo to serve Malaysian exports and imports.

11.79 During the Plan period, the number of Malaysian registered merchant ships is expected to increase with MISC and PNSL expected to purchase 22 and nine ships, respectively. The new ships will be used mainly for the carriage of specialized cargo such as LNG and other liquid bulk cargo. PETRONAS is expected to purchase two more tankers with a combined capacity of 313,600 dwt. In addition, GMVB will expand its fleet of ships, especially bulk carriers through joint ventures. The total Malaysian merchant fleet is, therefore, expected to increase from 600 ships, or 3.9 million dwt, in 1995 to about 900 ships, or seven million dwt, in the year 2000. With this increase in domestic shipping capacity, the share of cargo handled by Malaysian registered ships is expected to increase from 28.6 million tonnes, or 18.8 per cent, in 1995 to about 56 million tonnes, or 22 per cent, in the year 2000.

11.80 Attention will also be focussed on overcoming the shortage of skilled and trained maritime manpower. The present practice of ports and related maritime industry conducting their own training programmes on an ad hoc basis and sending their employees for short-term courses locally and abroad will be rationalized in order to improve skills and professionalism in the sector. In this regard, *Akademi Laut Malaysia* (ALAM), which will be privatized, is expected to play a critical role as the centre of excellence for maritime training requirements of the nation.

Airports

11.81 Passenger and cargo traffic is expected to grow by 8.0 and 9.0 per cent per annum, respectively, during the Plan period. An estimated 37 million passengers will use Malaysian airports in the year 2000 with about 38 per cent comprising international passengers. Air cargo traffic is also expected to increase to about 608,000 tonnes, of which 74 per cent will be international cargo. Therefore, efforts to expand capacity and upgrade facilities will be continued to meet the rising demand for air travel and freight services. At the same time, the management of air traffic will emphasize modernization and safety.

11.82 With the completion of the first phase of KLIA in 1997, there will be two staggered four-kilometre runways, a mega passenger terminal building connecting the satellite building by a tracked transit system with a total of 80 aircraft contact piers and various other essential infrastructure facilities. In addition, support facilities, such as advanced baggage handling system which will enable quick transfer of baggage from aircraft to arrival hall, *real time* Total Airport Management System (TAMS) and state-of-the-art Information Technology, will ensure operational precision. The KLIA will be built in symbiosis with man and environment. Hence, KLIA will be constructed as an *Airport In The Forest* with forest in the airport. Other measures that will be undertaken to emplace KLIA as a regional air hub are competitive fuelling and landing rates as well as food catering services to encourage more airlines to utilize KLIA as the centre of their operations. Located along the Multimedia Super Corridor (MSC), KLIA will be developed as a global information, entertainment and shopping hub to attract air travellers. To enhance accessibility to the airport, three expressways, one of which is a direct dedicated highway, and an ERL will link KLIA to Kuala Lumpur and the new administrative centre at Putrajaya. These will enable travellers from Kuala Lumpur to reach the airport within 30 minutes.

11.83 In order to meet the increasing demand for air freight, air cargo capacity will be expanded through acquisition of more freighter aircraft and securing more landing rights. Various measures will be taken to upgrade ground handling efficiency, including the installation of EDI service in all airports to reduce paper transactions and red tape. The reorganisation and restructuring of local freight forwarders and cargo agents will be encouraged to provide integrated door-to-door service to users. A free trade zone will also be established around KLIA to develop it into a major cargo transhipment centre. The existing cargo complex at the Penang Airport will also be upgraded.

11.84 The upgrading of airports in Labuan and Langkawi to cater for wide-bodied aircraft will be completed during the Plan period. This will further assist in the development of Labuan as an International Offshore Financial Centre (IOFC) as well as the promotion of Langkawi as a major tourist destination. The upgrading of airports at Pulau Tioman and Mulu, and the accelerated construction of new airports at Bintulu and Tawau, will also contribute towards the growth of the travel and tour industry.

11.85 With the expected increase in demand for fast and efficient transport services, particularly by the business and tourist sectors arising from regional cooperation, demand for executive and air charter services will increase with the gradual liberalization of the domestic air sector. In addition to airports, rural airstrips will also be maintained and upgraded to support the increased demand for general aviation.

11.86 Safety aspects of air travel will be given priority during the Plan period. The air traffic control system, navigational and communication aids will continue to be upgraded and extended to the smaller domestic airports. By the year 2000, Malaysian air space will be fully covered by radar to cater for flight safety and protect national air space sovereignty with the installation and integration of new radars in Bukit Larut, Kota Bharu and Miri. A new college will be established during the Plan period to train air traffic controllers in the use of the latest equipment and technologies.

Telecommunications

11.87 During the Plan period, the telecommunications subsector is expected to be one of the highest growth sectors of the economy with the advancement of telecommunications technology. The thrust of the subsector will be to increase capacity as well as introduce new services through new technologies and upgrading of existing networks. Investments in new technologies are expected to spur the growth of telecommunications infrastructure and services, thus enabling the nation to acquire a competitive edge in IT.

11.88 In developing Malaysia into an information-rich society, the development of the Information Superhighway in general and the MSC in particular, through the telecommunications infrastructure, will be given priority. Private operators are expected to invest a total of RM25.4 billion during the Plan period. Fibre optics, earth stations and satellites, land and submarine cables, wireless and cellular technologies as well as broadband and digital technologies, together forming the telecommunications infrastructure, will permit the transmission of

mass application of IT such as video, graphics, voice, multimedia, desk-top publishing, virtual business, distance learning, telemedicine and other IT applications. With the launching and operation of Malaysia's own satellites, Malaysia East Asia Satellite (MEASAT) 1 on 13 January 1996 and MEASAT 2 in October 1996, immediate and simultaneous point-to-point and point-to-multipoint telecommunications, broadcasting and IT services will be available throughout Malaysia, even to the most remote areas as well as most of East Asia. When all these are in place, it is anticipated that there will be sufficient capacity to meet the nation's telecommunications and IT needs.

11.89 To complement the NTP, a Telecommunications Masterplan will be developed to provide further direction for the orderly development of the industry including the policy on standards and location of transmission towers. With the liberalization of the telecommunications subsector and the existence of a number of operators, particularly for basic network, the Masterplan will prescribe the level of competition, as well as measures to rationalize the sector and provide guidelines for competition, interconnection charges, tariff rates, formula for sharing of social costs and obligations, network development and resource utilization. At the same time, the role and functions of the Regulatory Authority will be reviewed to meet the increasing challenges of a liberalized telecommunications regime.

11.90 The national penetration rate is expected to reach 24.7 per 100 persons by the year 2000 with the planned investments, especially in new technologies. In order to increase telephone penetration in the rural areas to 9.5, rationalization of service delivery to rural areas by operators will be undertaken. As technological innovations and competition bring down prices and improve services and capabilities, a wider usage of cellular phones by the household sector is expected. The cellular phone penetration rate is expected to increase to 16.5 per 100 persons, registering a 74 per cent growth rate per annum, due to its convenience for the business and commercial sectors.

11.91 The merging of telecommunications, broadcasting and computer technologies will improve the quality of telecommunications services as well as bring changes in lifestyle and the way business is conducted. International strategic alliances among telecommunications, cable and video, broadcasting and computer operators will enhance the benefits of synergy derived from the merging of these technologies. With interactive multimedia along the Information Superhighway, physical commuting will be reduced with teleconferencing, telemedicine, distance learning, video on demand, home banking and home shopping. Networking, facilitated through development in telecommunications infrastructure, will lead to improved quality of life.

Postal Services

11.92 Postal services will continue to be expanded and modernized to improve the quality of service. Pos Malaysia, which will be completely privatized during the Plan period, will upgrade its facilities. In this regard, high technology mail processing plants will be built in Johor, Kuala Lumpur, Pulau Pinang and Sepang, and the transport and delivery systems will be upgraded and expanded. Efforts will be taken to acquire the latest postal technologies as well as to set up an efficient information system to manage post offices.

11.93 Postal services in rural areas will be expanded to meet the target of providing one post office for every 6,000 people. Services provided by these post offices will also be expanded to include counter services such as cash transfers, payment of bills, courier services and transactions with government agencies.

11.94 The courier services industry is expected to grow rapidly and play an important role in facilitating Malaysia's participation in international trade in goods and services, especially in the area of high technology and time-sensitive global manufacturing. The target for the industry during the Plan period is to achieve next-business-day deliveries for member countries of the Association of South East Asian Nations (ASEAN) and selected Asian countries, and not more than two-business-day deliveries anywhere in the world. To achieve this target, courier service companies will have to improve processing procedures and increase productivity through greater automation and the use of innovative operations and human resource management techniques.

Meteorological Services

11.95 During the Plan period, the Malaysian Meteorological Service will continue to modernize its equipment to improve the quality, range, effectiveness and efficiency of meteorological services, such as the accuracy and timeliness of weather forecasts and warnings, as well as expand its services. An early warning system on weather conditions which affect crop production will be set up. Other projects that will be implemented include the integration of radars in Sabah and Sarawak, and the automation of weather stations and agrometeorological auxillary stations. Systems for collecting, processing and monitoring of data on air pollution, seismic occurrences, storm warnings and sea conditions will be upgraded through computerization and sophisticated equipment. The data collected will be integrated into the Geographical Information System. The exchange of data with neighbouring countries under the weather forecasting programme will be intensified through the Global Telecommunications System.

Water Supply

11.96 The thrust for the subsector will continue to be the provision of safe water for domestic users as well as to meet the needs of the industrial and agricultural sectors. Emphasis will be given to the protection and conservation of potential sources of fresh water to improve water quality as well as upgrading and rehabilitation of the existing water supply system to improve its efficiency. In addition, the development of interstate and interbasin water transfers will be further expanded in scope and coverage to address the problem of uneven distribution of water resources, particularly in water stress states, and to ensure long-term sustainability.

11.97 Water consumption for domestic and industrial use is expected to increase by 3.5 per cent annually during the Plan period. While existing and planned capacity will be sufficient to meet this increase, attention will be given to long-term water resources planning and development. This is important as the water stress states of Kedah, Pulau Pinang and Selangor are expected to face water shortages beyond the year 2000. In this respect, the National Water Resources Study, 1982 will be reviewed to provide updated information on water resources for the long-term planning and development of water resources in a comprehensive and integrated manner based on the overall national water resource balance.

11.98 Taking into account the accelerated growth of several states, a more systematic plan to coordinate the uneven distribution of water resources will be undertaken through interstate water transfer projects. Such projects, involving the construction of the Sungai Rui Dam in Perak to transfer raw water to Kedah, Pulau Pinang and Perlis and the Kelau and Telemong dams in Pahang for water transfer to Selangor and Negeri Sembilan, will be initiated as a long-term plan to meet future water requirements of the water stress states in the northern region and the Klang Valley.

11.99 In addition, various source works projects, such as Kelinchi, Pergau and Sungai Buloh dams, will be completed while the Gemencheh and Sungai Lembing dams will be initiated. These dams, with a storage capacity of about 350 million cubic metres, will contribute an additional yield of about 280 mld by the end of the Plan period.

11.100 Apart from the source works projects, several new water supply projects, such as the construction of treatment plants and reservoirs for Kuala Terengganu, Kuantan and Sungai Terip, will be initiated. These projects will

contribute an additional production capacity of about 1,616 mld. In line with the policy to increase accessibility of safe water in the rural areas, the installation of new reticulation systems to further distribute water to rural households will be undertaken. About 3,600 projects, covering mostly isolated rural areas and benefitting about 262,400 households, will be implemented.

11.101 The upgrading and rehabilitation programme will be extended to an additional 20 districts during the Plan period. By the end of the Plan period, the NRW level is targetted to be reduced to 28 per cent, as shown in *Table 11-7*. Consequently, the production and sale revenue from water will reflect more closely the design capacity, while annual savings of about 950 mld of water or an equivalent of about RM210 million will be achieved. This programme will also contribute towards greater financial viability of the operating entities and reduce the immediate need to develop massive new sources. In addition, there will be improvements in water quality due to reduced sedimentation and better water pressure.

11.102 The commissioning of new water supply projects will further improve supply to meet demand throughout the country. The production capacity is expected to increase from 9,442 mld in 1995 to about 11,800 mld in the year 2000, while the quantity supplied to consumers is expected to increase from 7,704 mld to about 9,160 mld during the same period. It is expected that about 95 per cent of the total population will enjoy piped water supply by the end of the Plan period. The urban coverage is expected to reach 100 per cent in most states, while the rural coverage is expected to increase from 77 per cent in 1995 to 83 per cent by the year 2000, as shown in *Table 11-7*.

11.103 The Government will establish the National Water Council to resolve legal, institutional and financial issues in order to improve and coordinate river basin development and management on a national basis to ensure long-term sustainability of water supply. This mechanism, among others, will address issues relating to water resources development and river management as well as maximizing river potential development with a view to protecting water catchment and watershed areas. In addition, a study will be undertaken to consider the provision of a separate water distribution and reticulation network for industrial and general purposes at reasonable tariff rates.

11.104 During the Plan period, it is anticipated that the supply of water will be increasingly developed and managed by private operators. In order to ensure the proper development of water supply, privatization will be conducted on a total and holistic approach, covering source works, treatment plants, distribution

systems and billing. In addition, the privatization of water supply in various states will consequently result in the establishment of many regulatory authorities, each acting independently with differing strengths and divergent standards. With the increasing number of privatized water supply projects, standards and guidelines on water supply, reliability and quality will be specified in the concession agreements to ensure that the interests of the general public are taken into consideration.

Sewerage

11.105 Programmes to rationalize, upgrade and refurbish the existing sewerage system and build new facilities to enhance the existing system will continue to be undertaken by the privatized company. During the Plan period, the multipoint sewerage system will be implemented in several phases throughout the country involving the laying of 15,000 kilometres of sewer pipelines and the maintenance of 2,000 sewerage treatment plants. Sewerage systems using individual septic tanks, as well as modern mechanical centralized sewerage treatment plants, will also be implemented. With these facilities in place, organic pollution from domestic and animal waste is expected to decline and water quality at rivers is expected to improve by the end of the Plan period. Through these efforts, 79 per cent of the population will be served with modern sanitary sewerage services.

IV. ALLOCATION

11.106 Recognizing that an efficient and reliable infrastructure and utilities network is critical to economic growth and enhancing the nation's competitive strength, substantial investments are required to finance the sector's development. As shown in *Table 11-9,* a total of RM19.2 billion will be allocated by the Government for the sector with the private sector investing a sizeable amount, mainly through privatization projects. Of the total allocation, RM9.8 billion is for road development. The allocations for the airports and ports subsectors are RM1.3 billion and RM486.8 million, respectively. For the rail and urban transport subsectors, RM3.4 billion and RM522.6 million, respectively will be allocated, while communications and utilities will be allocated RM3.7 billion. This sizeable infusion of public sector funds will also offer significant opportunities for private sector involvement in the construction, maintenance and management of transportation infrastructure and utilities. At the same time, private sector investments in privatized infrastructure projects are expected to total RM68.3 billion.

TABLE 11-9

DEVELOPMENT ALLOCATION FOR INFRASTRUCTURE AND UTILITIES, 1991-2000

(RM million)

Sector	*6MP*		*7MP*
	Allocation	*Expenditure*	*Allocation*
PUBLIC SECTOR			
Transport	**12,881.6**	**11,594.7**	**15,484.2**
Roads[1]	8,451.0	7,572.6	9,838.8
Rail	1,802.6	1,735.4	3,370.0
Ports	434.0	410.9	486.8
Airports	1,833.0	1,780.6	1,266.0
Urban	361.0	95.2	522.6
Utilities	**2,876.3**	**2,796.7**	**3,687.3**
Water Supply	2,749.5	2,671.9	3,575.3
Sewerage	126.8	124.8	112.0
Communications	**76.3**	**71.0**	**58.6**
Telecommunications & Posts	45.0	39.9	25.5
Meteorological Services	31.3	31.1	33.1
Total	**15,834.2**	**14,462.4**	**19,230.1**
PRIVATE SECTOR (PRIVATIZED PROJECTS)			*Investment*
Roads			17,505.0
Ports			4,241.7
Airports			5,956.0
Telecommunications			25,400.0
Postal Services			260.0
Water Supply			2,571.7
Sewerage			1,759.4
Rail			10,600.0
Total			**68,293.8**
Grand Total			**87,523.9**

Note: [1] Excludes localized roads in regional development areas, some local authorities and agricultural roads which have been allocated RM700 million.

V. CONCLUSION

11.107 The Sixth Plan period achieved impressive progress in infrastructure and utilities development with the completion and initiation of several major projects, especially in roads, airports and urban transport, many of which were undertaken through privatization. These projects contributed, or upon their completion will contribute, towards increasing the capacity and efficiency of the infrastructure network. The high economic growth expected during the Seventh Plan period will continue to exert pressure on the capacity and efficiency of the infrastructure and utilities network and its services. Hence, focus will be placed on the development of the sector on a supply-driven approach, emphasizing quality, reliability and improved efficiency in line with the Government's objective of improving productivity as the basis for sustaining the nation's economic growth.