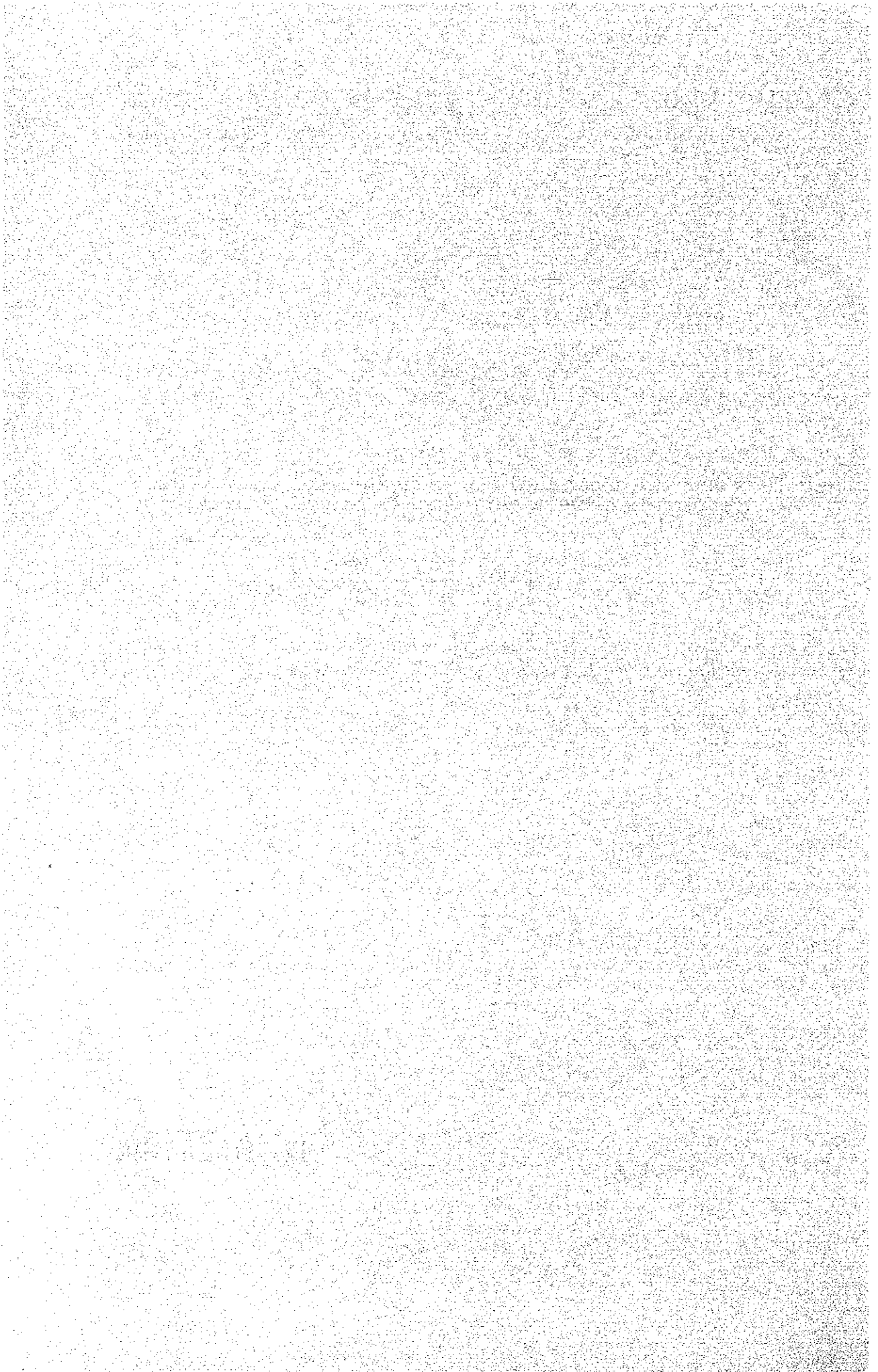


IX MALAYSIA



IX MALAYSIA

IX.1 General

The land area of Malaysia consisting of the Southern part of the Malayan Peninsular (West Malaysia) and northern part of Borneo Island (East Malaysia) is 330,000 km². Malaysia has a population of 16.6 million in 1987. Table IX.1 shows the land area and population in West Malaysia and East Malaysia.

Table IX.1 LAND AREA AND POPULATION IN WEST AND EAST MALAYSIA (1987)

	Total	West Malaysia	East Malaysia
Land Area (1,000 km ²)	330	132	198
Population (Million)	16.6	13.7	2.9

As for West Malaysia where the roads including motorways are well developed. Both of the land area and population of the whole country are about 0.625 and 0.303 times to those of Thailand respectively.

GNP of Malaysia reaches at 27,560 million Dollars in 1986 and Per Capita Income in 1986 is 1,711 Dollars which is 2.16 times to that of Thailand.

IX.2 Highway and Transport Conditions

IX.2.1 Road Network

Malaysia has a total road network of 42,668 km, comprising of

35,014 km of paved roads, 6,230 km of gravel roads and 1,424 km of earth roads as clarified in Table IX.2. Almost 63.06% of the roads are under the states government whilst 28.5% are under the Federal and 8.43% are under the municipality. About 73.50% of the total network (31,359 km) is in West Malaysia out of which about 68.93% of the total network (29,410 km) is in the west coast of peninsula.

Table IX.2 ROAD DISTRIBUTION BY TYPE AND JURISDICTION IN KM

Surface	(km)							
	Federal roads		State roads		Municipal roads		Total	
	1980	1986	1980	1986	1980	1986	1980	1986
Paved	4,940	8,655	15,550	22,763	-	3,595	20,490	35,014
Gravel	760	3,157	5,300	3,074	-	-	6,060	6,230
Earth	520	355	1,800	1,068	-	-	2,320	1,424
Total	6,200	12,167	22,650	26,905	-	3,595	28,870	42,668

IX.2.2 Transportation Modes

The share of transportation modes in the passenger and freight transport is shown in Table IX.3 and Table IX.4.

Table IX.3 SHARE OF TRANSPORTATION MODES IN PASSENGER TRANSPORT (Passenger-km in million)

Mode	1986		1990*		1995*	
	Total	Share (%)	Total	Share (%)	Total	Share (%)
Road	15.2	88.0	18.6	88.6	22.9	89.2
Rail	1.4	7.9	1.5	7.0	1.5	5.9
Air	0.7	4.1	0.9	4.4	1.2	4.9
	17.3		21.0		25.6	

* Estimated

**Table IX.4 SHARE OF TRANSPORTATION MODES IN FREIGHT
TRANSPORT (Ton-km in million)**

Mode	1986		1990*		1995*	
	Total	Share (%)	Total	Share (%)	Total	Share (%)
Road	9,563	74.1	11,840	77.0	14,996	77.1
Rail	1,042	8.1	1,267	8.2	1,617	8.3
Inland Water	2,282	17.7	2,264	14.7	2,821	14.5
Air	13	0.1	16	0.1	21	0.1
	12,900		15,387		19,455	

* Estimated

Road transport is the dominant mode for both the passenger, and freight movements with the private motorcars forming the major mode of conveyance for passengers. In 1986, 88% of the passenger-kilometer were by road while 7.9% by rail and 0.7 by air. Road transport will continue to be the major mode of transportation with an increase in the market share of passenger-kilometer. In terms of ton-kilometer, road freight traffic accounted for 74%.

IX.2.3 Number of Registered Vehicles

The growth in the number of registered vehicles between 1970 and 1988 is shown in Table IX.5.

The road expansion and improvement programmes undertaken since 1971 coupled with a rapid rate of urbanization has led to an accelerated growth of motor vehicular traffic. The number of registered motor vehicles grew at 13.4% per annum during the 1970's while for the period 1980-86 it grew at 9.2% per annum.

Table IX.5 NUMBER OF REGISTERED VEHICLES

Year	Four-plus wheels			Total	Tractors, Trailers and Semi-trailers	Motorcycles and Mopeds
	Cars	Buses and Coaches	Goods Vehicle and Vans			
1970	244,000		56,000	300,000	-	350,000
1975	416,000		92,000	508,000	-	722,000
1980	742,000		155,000	897,000	-	1,392,000
1984	1,075,328	16,944	212,628	1,388,856	22,717	2,132,791
1985	1,151,979	17,841	232,624	1,490,330	23,507	2,289,666
1986	1,206,000	18,703	246,828	1,471,531	23,833	2,396,679
1987	1,246,186	19,158	251,675	1,517,019	23,697	2,461,428
1988	1,426,828	20,906	276,300	1,724,034	23,728	-

IX.2.4 Accidents

The total number of accidents, number of injured and number of killed in the whole country is shown in Table IX.6.

Table IX.6 ACCIDENTS ON ROADS

Year	Total number of accidents involving injury to persons	Number of injured	Number of killed
1984	80,526	22,976	3,637
1985	82,059	21,545	3,603
1986	79,680	21,384	3,522
1987	76,882	15,627	3,320
1988	73,250	20,148	3,335

On the other hand, accident statistics on one of the express-ways (Kuala Lumpur - Seremban, 53 km) is presented in Table IX.7.

**Table IX.7 EXPRESSWAY TRAFFIC ACCIDENT STATISTICS
(KUALA LUMPUR-SEREMBAN EXPRESSWAY)**

Year	No. of Casualty			No. of Non-Casualty	Total No. of Accidents	Total Expressway Length in Operation in Kilometers
	Fatal	Major	Minor			
1979	18	67	67	128	280	53
1980	14	86	53	122	275	53
1981	9	66	72	121	268	53
1982	22	98	108	185	413	53
1983	14	39	79	142	274	53
1984	11	22	67	100	200	53
1985	36	96	222	233	587	53
1986	23	78	156	117	374	53

In this table, the total number of traffic accidents on Kuala Lumpur-Seremban Expressway increased from 280 in 1979 to 374 in 1986. However, the highest number of accidents during the eight years (1979 — 1986) was 587 cases in 1985. In terms of fatal cases, the number has increased from 18 in 1979 to 23 in 1986 while the number of injured persons has increased from 134 in 1979 to 234 in 1986.

In 1986, the accident rate was 110.9 per 100 million vehicle-km and fatality rate was 76.2 per 100 million vehicle-km.

IX.3 Motorway Development

IX.3.1 History

The rapid economic growth in the 1970's has had considerable impact on the transport sector, particularly the road sub-sector. There was a serious capacity constraint on various sections of the 842 km Federal Route 1 (designated as part of the Asian Highway Route Number 2 forming the north-south axis from the Thai border in the north down to Singapore in the south. In order to address the problem the Government decided to construct a new toll expressway running parallel to the Federal Route 1. To manage the toll expressway, a new authority, the Malaysian Highway Authority (MHA) was established by an

Act of parliament in 1980. Works on the planning, design and construction of the 928 km expressway commenced in 1981. In 1989, about 420 km of the expressways and toll highways were completed and operated, as clarified in Table IX.8 and Figure IX.1 in following section.

Pursuant to the privatisation policy of the government, a decision was made to privatise the remaining segments of the North-South expressway, estimated to cost some M\$3,400 million through competitive bidding. Accordingly, a private concessionaire won the bid and was given a concession for a period of 30 years to construct, manage, collect tolls and maintain the expressway and its related facilities. The facilities are scheduled to be completed within 7 years and are expected to be fully operational by 1995. Under this arrangement, the authority to manage, maintain and impose tolls on the North-South expressway (except for Penang Bridge and Kuala Lumpur-Karak Highway) was transferred to the concessionaire. The MHA, however, will remain as the regulatory authority over the toll highway.

In addition, a 15.2 km highway (the North-Klang Straits Bypass) branching off the Federal Route II to Port Klang was privatised in 1984 with a concession period of 25 years. Similarly, an intraurban facility comprising a grade-separated interchange and its related road approaches (Jalan Kuching/kepong Interchange) was privatised in 1987 with a 9 year concession period.

IX.3.2 Motorway Network

As shown in Table IX.8 and Figure IX.1, the total length of expressways and toll highways is 420 km in August, 1989. Among of them, about 310 km of The North-South Expressway, which is planned as a main interurban trunk route to run along the west coast of Peninsular Malaysia from the border of Thailand to Singapore with its total length of approximately 775 km, has been opened to traffic.

Table IX.8 ROUTE AND LENGTH OF EXPRESSWAYS AND TOLL HIGHWAYS IN OPERATION (1989)

Expressway or Highway	Length in km
North-South Expressway	310
Bukit Kayu Hitam - Gurun	
Changkat Jering - Ipoh	
Kuala Lumpur - Pagoh	
Other Toll Expressway	14
Penang Bridge	
Toll Highway	96
Kuala Lumpur - Karak	
Senai - Johor Bharu	
Total	420

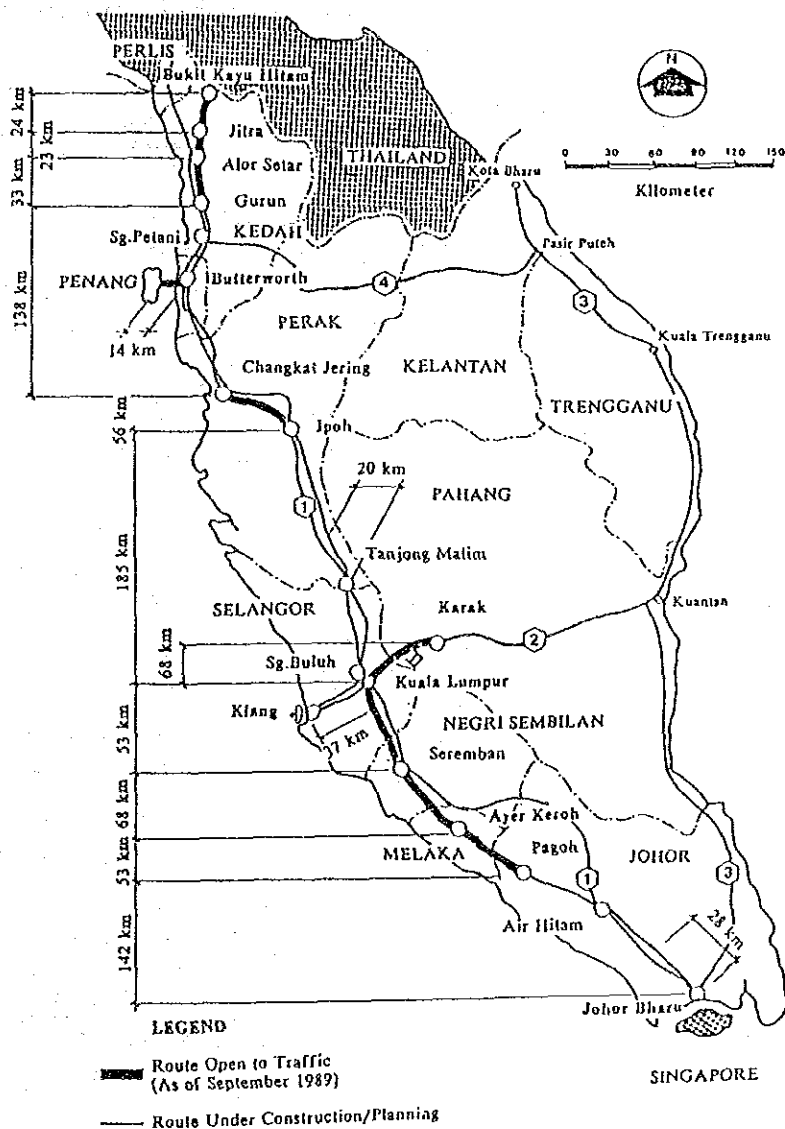


Figure IX.1 THE EXPRESSWAY AND TOLL HIGHWAY NETWORK IN PENINSULAR MALAYSIA

IX.3.3 Future Plan

By 1995, the expressway and highway network in Peninsular Malaysia will be as shown in Figure IX.2. The network will consist of the inter-urban North-South Expressway, Karak Highway linking Kuala Lumpur to Bentong and continues as Federal Route 2 to Kuantan on the east coast, New Klang Valley Expressway and Federal Highway; Senai-Johor Bharu Highway in the south and Penang Bridge in the north.

The total length of expressway and toll highways scheduled to be operational by 1995 will be 826 km and 111 km respectively.

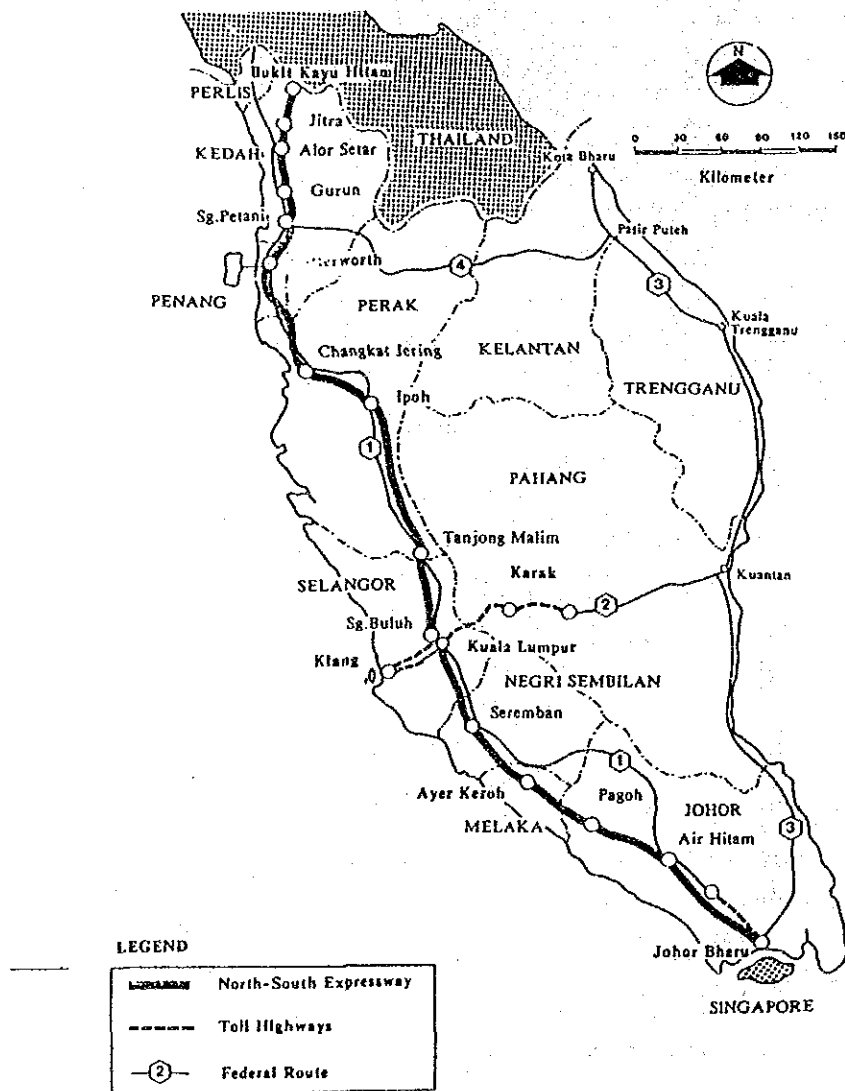


Figure IX.2 THE FUTURE EXPRESSWAY AND TOLL HIGHWAY NETWORK IN PENINSULAR MALAYSIA UP TO 1995.

IX.3.4 Motorway Administration

There are one government owned authority and three (3) private companies who are operating and managing the expressways and toll highways in Malaysia. The followings are briefing on them.

1) Malaysian Highway Authority (Government owned)

Through an Act of parliament in June, 1980, the Malaysian Government established its own statutory organisation empowering it to plan, design, construct, maintain and operate a network of expressways and highways in the country. It is also empowered to impose and collect toll from the users of the network of expressways and highways under its jurisdiction. That statutory organisation is the Malaysian Highway Authority.

The Malaysian Highway Authority is also empowered to set up its own traffic surveillance and enforcement units. It is also empowered to regulate the types of vehicles permitted to use the expressways and highways under its jurisdiction.

2) Concessions To Private Sector

Under its privatisation policy, the Malaysian government has granted to three (3) private companies the exclusive right to construct, maintain and operate certain highways and facilities. In return these three (3) private companies are given the right and authority to collect for their own benefit and retention, toll from the users of these aforesaid highway and facilities, for a concession period ranging from 9 years to 30 years, depending on the terms of the concession agreement signed between the government and the concession company.

Under these concession agreements, the government retains the right of overseeing the due performance of these concession companies. The government retains the prerogative over the issue of toll charges and the toll rate increase. The government also retains control over the traffic surveillance and enforcement of the highways and facilities involved under these concession agreements.

The control over the ingress and egress along the highways involved is also vested with the government.

Among of the administration authorities, 2 organizations are

introduced in detail as follows:

(1) Government Owned

1. Name : Malaysian Highway Authority (MHA)
2. Date of establishment : June, 1980
3. Nature : To plan, design, construct, operate and maintain a network of toll expressways and highways
4. Structure : As shown in the Organization Chart, Figure IX.3
5. Total number of personnel: 1,108
 - a) No. of Engineers : 24
 - b) No. of other professionals : 29
(Accountants, Quantity Surveyors, Lawyers, Police Officers)
 - c) No. of Senior Administrative Officers : 11
 - d) No. of Toll Plaza Managers : 9
 - e) No. of Toll Collectors : 737
 - f) No. of Sub-professionals : 18
 - g) No. of Clerical Staff : 280

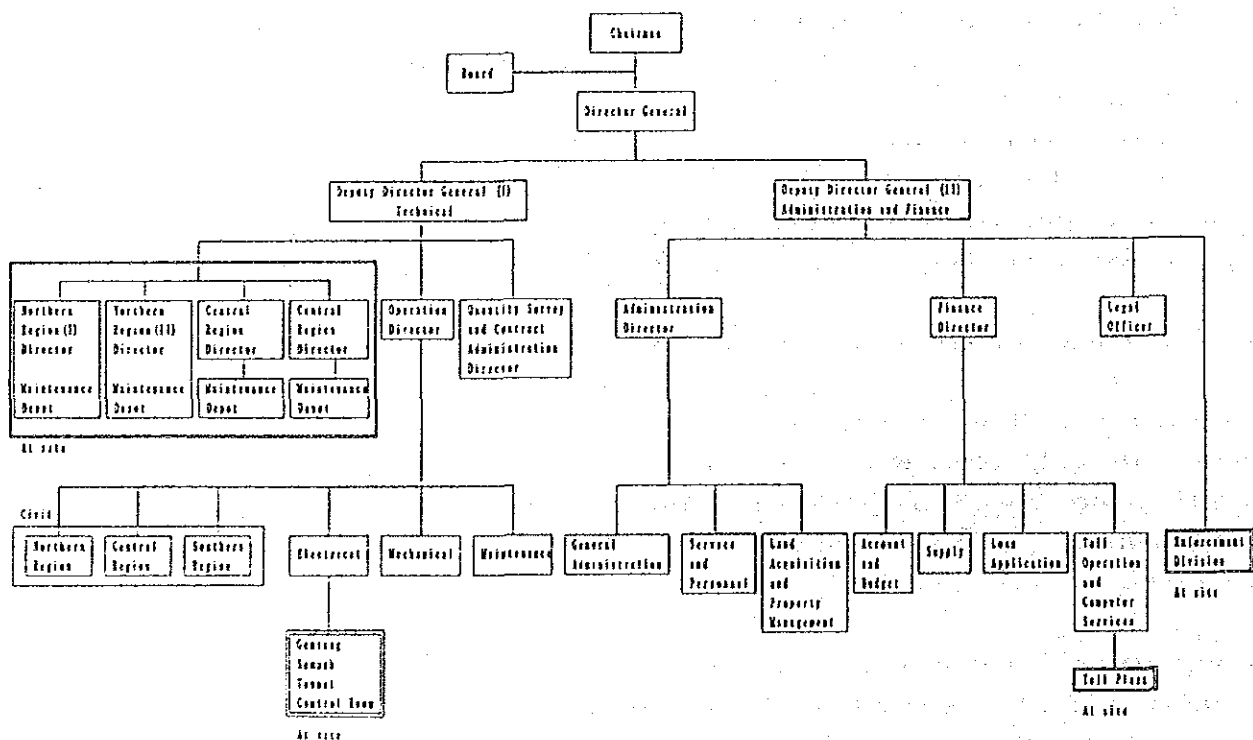


Figure IX.3 ORGANIZATION CHART OF MALAYSIAN HIGHWAY AUTHORITY

(2) Private Toll Road Concession Companies

1. Name : PLUS
2. Date of Establishment : July, 1988
3. Nature : i) To construct, maintain and operate 504 km of new expressways for a concession period of 30 years
ii) To take over, maintain and operate an existing network of 334 km of expressways and 46 km of highways for a concession period of 30 years
4. Structure : As shown in Figure IX.4
5. Number of Personnel : No figures are available as the concession company is in the process of recruiting staff.

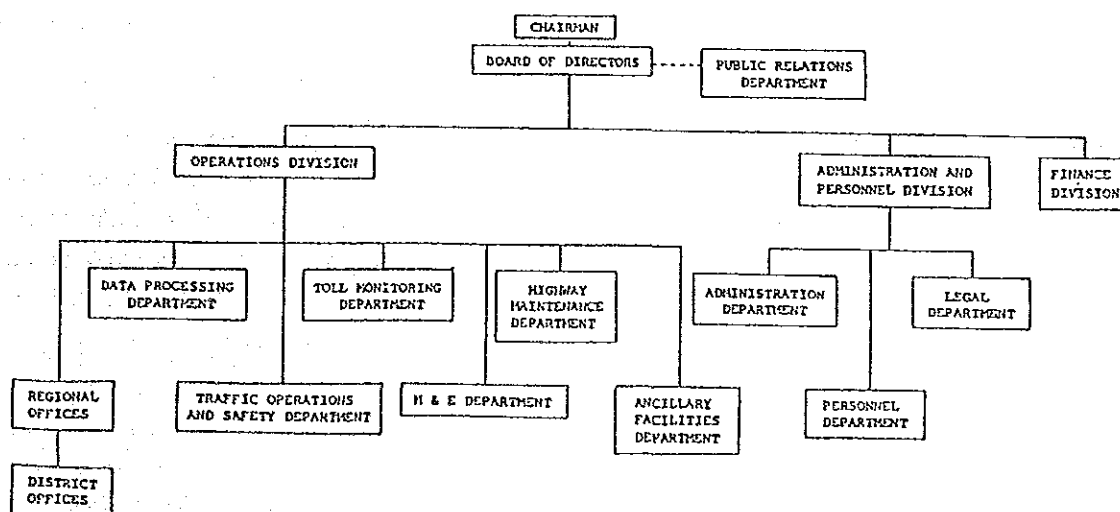


Figure IX.4 PLUS - CONCESSION COMPANY ORGANIZATION STRUCTURE

IX.3.5 Financing

The financial resources of MHA in 1987 was as follows:

Government grants	:	US\$189.76 million
Government loans	:	US\$430.75 "
Commercial loans	:	US\$504.60 "
Toll Revenue	:	US\$ 74.94 "

On the other hand, borrowings of PLUS are mainly from local and international financial institutions.

IX.3.6 Motorway Operation

The revenue and expenses in 1987 of MHA was as follows:

<u>Revenue (1987)</u>		<u>In Percentage</u>
(i) Toll income	:	96.8 % (US\$24.86 million)
(ii) Others	:	3.2% (US\$ 0.80 million)

<u>Expenditure (1987)</u>		<u>In Percentage</u>
Personnel	:	1.45%
Tax	:	—
Construction cost	:	54.69%
Repair and maintenance	:	1.18%
Interest payments	:	28.68%
Repayment of credits	:	2.0%
Others	:	11.96%

With the taking over of the construction, maintenance and operations of the North-South Expressway by the new Concession Company PLUS, the toll income for the Malaysian Highway Authority will be very much reduced. Actual expenditure on maintenance will correspondingly decrease. However, the level of interest payments will still continue to be the same.

IX.3.7 Toll System

Basically, the toll collection system adopted for the North-South Expressway is a closed toll system although open system is also adopted.

a) Closed Toll System

The closed toll system has been employed on 286 km of the

North-South Expressway, i.e. the sections of Jitra-Gurun (56 km), Changkat Jering-Ipoh (56 km), Kuala Lumpur-Ayer Keroh (121 km) and Ayer Keroh-Pagoh (53 km). Under the closed toll system, the user pays the amount of toll based on the distance travelled. Besides, the toll charge levied is also depended on the type of vehicles used. For the purpose of toll collection, the vehicles are classified into six (6) types.

b) Open Toll System

Open toll system is adopted on the 24 km of Bukit Kayu Hitam-Jitra, 14 km of Penang Bridge, 68 km of Karak Highway and 28 km of Senai-Johor Bharu Highway, giving a total of 134 km of toll expressways and highways in Malaysia.

In the case of this open toll system, the user pays a fixed amount regardless of the distance travelled by him. Similar to the closed toll system, the toll charge levied depends also on the vehicles classes. On all sections except Penang Bridge, the number of vehicle classifications is five (5). On Penang Bridge, the vehicles are classified into seven (7) categories.

Penang Bridge is the only place where toll charges are levied on motorcycle. Table IX.9 shows the current toll system and rates.

Table IX.9 TOLL SYSTEM AND RATE

	Length of Section (km)	Number of Toll Gate and Toll Lane	Type of Toll Collection System	Number of Vehicle Classification	Type of Transit Ticket	Toll Rate (Ringgit)						
						Class*	0	1	2	3	4	5
North-South Expressway												
Bukit Kayu Hitam-Jitra	24	2 gates, 4 Lanes	open	8		Free	1.2	1.8	2.4	0.8	1.2	
Jitra-Gurun	80	4 gates, 15 Lanes	closed	8	magnetic card	cents/km						
Changkat Jering-Ipoh	55	3 gates, 25 Lanes	closed	8	magnetic card	Free	5.0	7.5	10.0	2.5	5.0	
Kuala Lumpur-Ayer Keroh	123	12 gates, 80 Lanes	closed	8	magnetic card							
Other Toll Expressway												
Penang Bridge	14	1 gate, 8 Lanes	open	7		Class**	2	3	4	5	6	7
						1.8	7.0	12.0	25.0	45.0	60.0	75.0
Toll Highway												
Kuala Lumpur-Karak	68	2 gates, 11 Lanes	open	8		Class*	0	1	2	3	4	5
						Gombak	Free	1.0	2.0	3.0	0.5	1.0
						Bentong	Free	0.5	1.0	1.5	0.3	0.5
Senai-Johor Bharu	28	2 gates, 23 Lanes	open	8		Free	1.0	2.0	3.0	0.5	1.0	
Silia River-Tanjung Malu *	20	1 gate, 3 Lanes	open	6		Free	1.0	1.5	2.0	0.5	1.0	

Note: Class* 0 - Vehicle with 2 axles & 2 wheels (motorcycle)
 1 - Vehicle with 2 axles & 3 or 4 wheels but excluding taxi
 2 - Vehicle with 2 axles & 6 wheels but excluding bus
 3 - Vehicle with 3 or more axles
 4 - Taxi
 5 - Bus

Class** 1 - Motorcycle
 2 - Passenger car, side-car, taxi, jeep, landcruiser with 2 axles & 3 or 4 wheels
 3 - Truck, van, bus with 2 axles & 4 wheels
 4 - Truck, van, bus with 2 axles & 6 wheels
 5 - Vehicle with 3 axles
 6 - Vehicle with 4 axles
 7 - Vehicle with 5 or more axles

* Toll collection will be discontinued after 1998

IX.3.8 Maintenance

The existing road maintenance centres are located in every 50 km — 75 km along the North-South Expressway.

Under the existing organization setup of Malaysian Highway Authority, there is a maintenance section under the Operation Division as well as maintenance depot under the Regional Division. The former, responsible for planning of maintenance, is located in the headquarters while the maintenance depots, concern with conducting or oversee the task of maintenance, are situated at site.

The maintenance works of Penang Bridge is under the responsibility of the Northern Regional Office in Penang while the maintenance tasks of Karak Highway is under the responsibility of Karak Highway Maintenance Depot of the Central Regional Office.

Both of Penang Bridge and Karak Highway are under the charge of MHA. In addition, MHA also supervises the works of the expressways in Malaysia which are, in fact, the responsibility of PLUS.

Presently, PLUS has just established an organization setup with two levels to carry out maintenance works on the North-South Expressways, i.e. site level (operational level) and headquarters level (functional level). The former is in charge of inspecting expressway and following up the works leading to maintenance activities. The latter is responsible in defining the maintenance methods, preparing, studying and programming the works related to the budget, liaison with other departments and contractors. For the initial phase, the site level is divided into seven (7) sections:

- Section 1 : Bukit Kayu Hitam-Alor Setar
- Section 2 : Alor Setar-Gurun
- Section 3 : Changkat Jering-Ipoh
- Section 4 : Slim River *
- Section 5 : Kuala Lumpur-Seremban
- Section 6 : Seremban-Ayer Keroh
- Section 7 : Senai-Johor Bharu *

(* not part of North-South Expressway)

The above-mentioned levels for maintenance tasks are set up by PLUS to cover those expressway sections in service. As such, it is highly probable that the setup may change with the addition of more sections in service or the completion of the entire expressway.

IX.3.9 Typical Design Standards

The typical cross section of the dual carriageway expressway constructed by MHA is shown in Figure IX.5.

The width of carriageway to be constructed by PLUS will be 7.3 m ($2 \times @3.65$ m).

Design speed for rural area is 120 km/h.

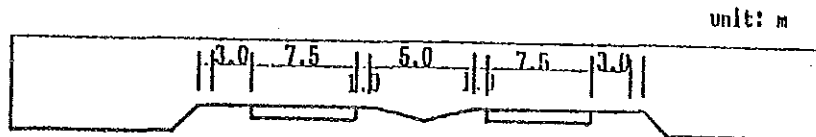
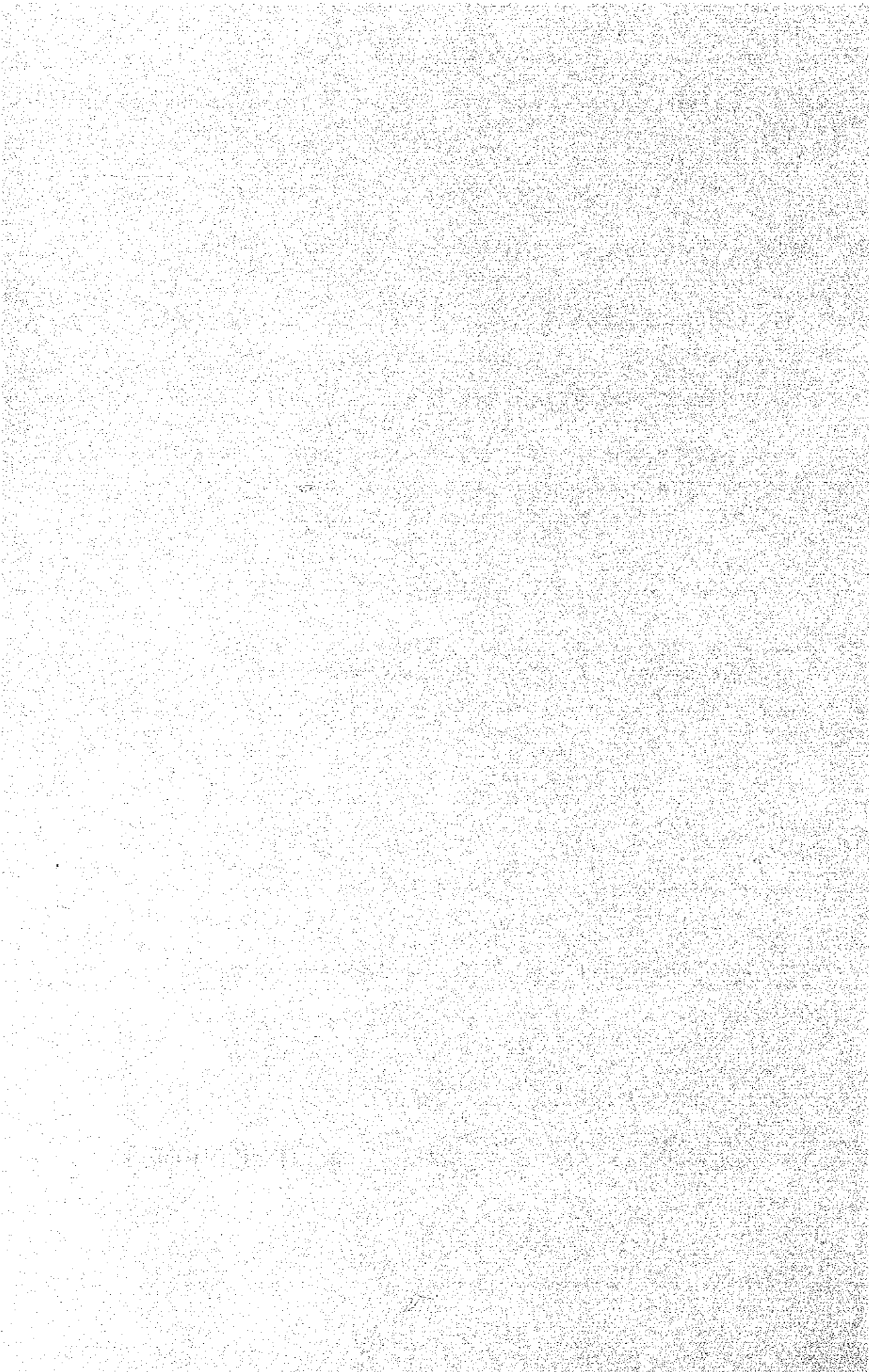


Figure IX.5 TYPICAL CROSS SECTION

Interval for existing toll road facilities are as follows:

Interchanges	every 12 km — 27 km
Service area	every 80 km — 100 km
Parking area	every 27 km — 32 km
Emergency telephones	every 2 km

X. PHILIPPINES



X. PHILIPPINES

X.1 General

The land of the Republic of The Philippines (hereinafter Philippines) is located in the east of the South China Sea, and consists of 10 main islands, i.e. Luzon, Mindoro, Leyte, Samar, Palawan, Visayas, Negros, Cebu, Bohol and Mindanao, and about 7,000 small islands. Its land area is 300,000 km² which is 58% to that of Thailand.

Philippines has a population of 57,360,000 in 1987 (55,576,000 in 1986), which is 107% to that of Thailand.

Gross National Product (GNP) of Philippines reaches 30,743 million Dollars in 1986 with a Per Capita Income of 549 Dollars, which is approximately 70% to that of the Thailand.

X.2 Highway and Transport Conditions

X.2.1 Road network

Growth of road network in the years of 1984 — 1988 is presented in Table X.1.

Table X.1 GROWTH OF ROAD NETWORK

Year	kilometres					Percentage paved	Density to total network per sq. km.	
	Motor-ways	Highways, main or national roads	Secondary regional roads	Other roads	Total			
1984	120	25,117	28,826	103,196	157,139	12.7	0.52	
1985	120	26,259	--	135,450	--	161,709	13.1	0.54
1986	120	26,229	28,334	107,762	162,325	13.1	0.53	
1987	120	26,082	28,928	102,800	157,930	14.0	0.53	
1988	120	26,070	29,174	102,203	157,567	14.2	0.52	

Road network in Philippines has been unchanged in length from 1984 to 1988. The percentage in length of motorways and national roads to total road network is 16.6%.

X.2.2 Transport Modes

Domestic passenger and freight traffic by modes are shown in Table X.2 and Table X.3 respectively.

Table X.2 DOMESTIC PASSENGER TRAFFIC BY MODES

Year	Passenger transport (million passenger-km)				
	Road	Rail	Inland Water	Air	Total
1985	46,000 (77.7)	3,050 (5.1)	5,080 (8.6)	5,085 (8.6)	59,215 (100)
() : Share %					

Table X.3 DOMESTIC FREIGHT TRAFFIC BY MODES

Year	Freight transport (million ton-km)				
	Road	Rail	Inland Water	Air	Total
1985	11,200 (46.5)	970 (4.0)	11,900 (49.4)	39 (0.1)	24,109 (100)
() : Share %					

Road traffic for freight, 11,200 million ton-km, is lower than inland water transport, while road traffic for passengers has a share of 77.7% to the total.

X.2.3 Number of Registered Vehicles

Table X.4 shows the number of registered vehicles between the years 1984 -- 1988.

Table X.4 NUMBER OF REGISTERED VEHICLES

Year	Four-plus wheels				Total	Tractors, trailers & semi-trailers	Motor- cycles
	Cars	Buses & coaches	Goods vehicles	Vans			
1984	360,722	15,279	102,071	416,721	894,793	17,431	253,333
1985	347,949	14,736	93,938	405,830	862,453	14,729	242,990
1986	356,688	14,974	95,218	416,554	883,434	13,773	288,625
1987	358,765	15,173	97,752	441,757	913,447	13,738	249,568
1988	376,646	15,083	108,027	475,099	974,855	14,726	280,902

Trend of the ratio between vehicles for passenger transport (cars and buses) and motorcycle is increasing as 1:0.54 in 1981 and 1:0.72 in 1988.

X.2.4 Accidents

The total number of accidents and casualties in the years from 1984 to 1988 is shown in Table X.5.

Table X.5 THE NUMBER OF ACCIDENTS AND CASUALITIES

Year	Total number of accidents involving injury to persons	Number of injured	Number of killed
1984	10,563	9,668	895
1985	10,246	9,378	868
1986	10,049	9,048	1,001
1987	9,678	8,930	748
1988	14,799	13,877	922

Although the growth of road network in the years from 1984 to 1988 is low as shown in Table X.1, and the average growth rate of population 1984 — 1988 is 1.10, the total number of accidents in 1988 is 1.4 times of that in 1984.

X.3 Motorway Development

X.3.1 History

The Expressways (North Luzon and South Luzon), the first limited access highways in the country, extend from Balintawak, Quezon City to Dau, Mabalacat, Pampanga, in the North, and from Magallanes in Pasay City to Calamba, Laguna, in the South. As limited accesses, they are fenced all the way on both sides.

The North Luzon Expressway is 73 kilometers long while the South Luzon Expressway has a total length of 42 kilometers. Since their operations in 1969, travelling to and from Manila from and to any points in Luzon has greatly improved not only in terms of travel time but also in point of economy, safety and convenience. To negotiate the 42 kilometers in the South, it takes only 25 minutes, and 45 minutes for the 75 kms in the North, with an average and uniform velocity.

The North Luzon Expressway (NLE) was started in 1962 with the construction of the Balinsawak to Canumay (Valenzuela portion) by local construction firm, Philrock. It was extended later to Guiguinto by the Philippine Army. Both activities were financed by the government.

The tollways concept was an off-shoot of Private Financing Act of 1966 as means of complementing the national infrastructure program with the use of private sector resources and expertise, where the Construction and Development Corporation of the Philippine (CDSP), now Philippine National Construction Corporation (PNCC), was engaged, as the contractors on the turn-key basis.

PNCC took portions left unfinished by the Philippine Army and constructed the southbound lane from Tabang to Canumay in 1967 after winning the bid for the project under the Private Financing Act of 1966. Within the year, PNCC began construction work on the South Luzon Expressway which originally started as a 15-kilometer stretch from Makati to Alabang, Muntinlupa. In 1974, PNCC simultaneously started working on the 30 kilometer SLE Extension from Muntinlupa to Calamba, Laguna and the extension of the North Luzon Expressway from Burol, Balagtas, Bulacar, up to its present limits in Dau, Mabalacat, Pampanga. The KLE was opened to traffic in 1968, and the South in 1969.

X.3.2 Motorways Network

As mentioned in previous section and shown in Figure X.1, the total length of toll expressways in 1988 is 120.15 km which consists of the North Luzon Expressway, 75 km, and the South Luzon Expressway, 45 km, lying in between Manila City.

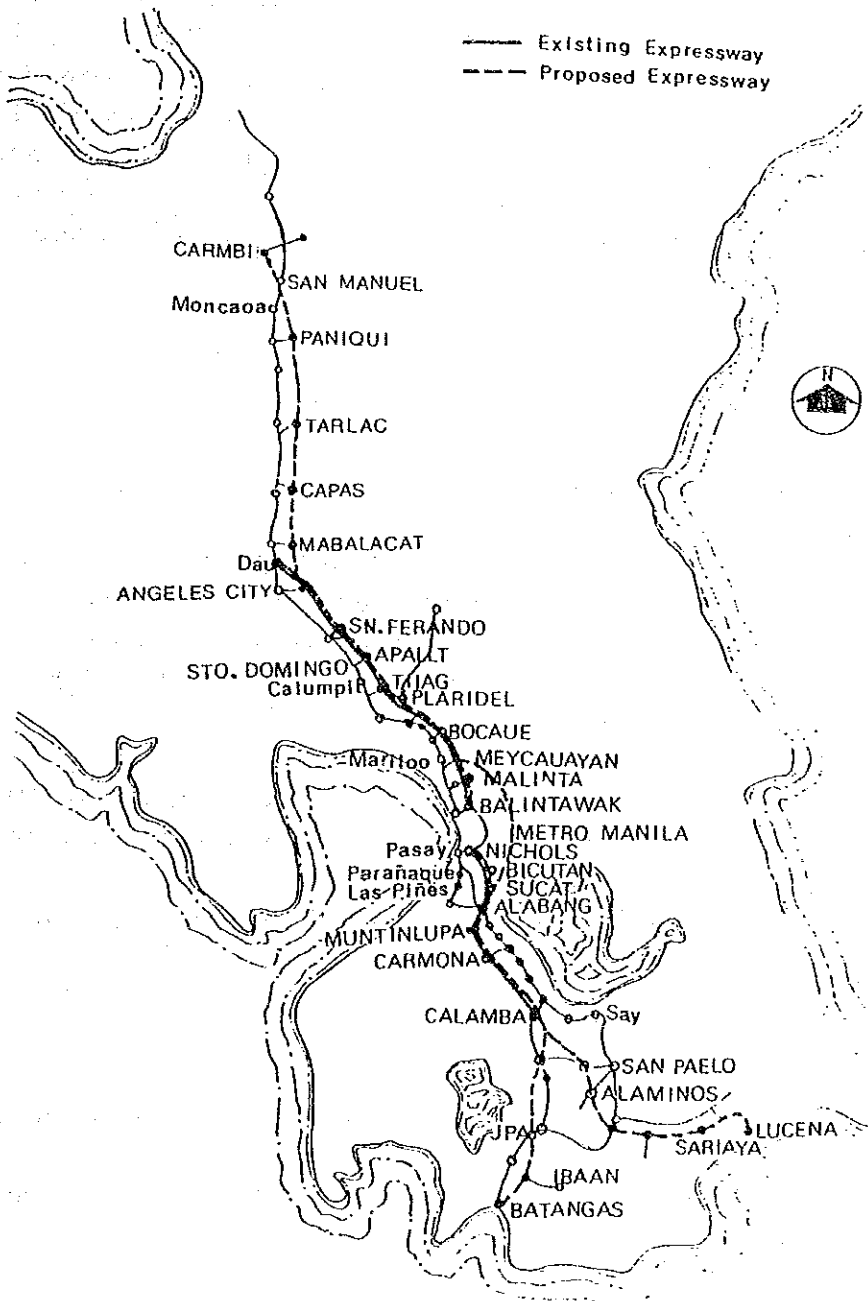


Figure X.1 LOCATION MAP OF EXISTING AND PROPOSED SECTIONS OF NORTH LUZON AND SOUTH LUZON EXPRESSWAYS

X.3.3 Future Development Plan

Presently, PNCC is constructing the NLE Extension from Dan, Mabalacat to Capas, Panlac, and thence to Tarlac in preparation for the final stretch to Carmen, Rosales, Pangasinan in the late 1990's. In addition, the parcellary survey and detailed engineering for the SLE extension from Calamba to Sto. Tomas is underway and construction work is scheduled to commence in 1989. From there the SLE will stretch to Piaong, thence to Candelaria and finally to Lucena City, all in Luzon Province. Over the same period, various sections of KLE and ELE from Nicholis to Calamba will be widened by constructing additional lanes in accordance with the traffic volume increases. The above future plan is illustrated in Figure X.1 of the previous section as a route.

X.3.4 Motorway Administration

— Related law and regulations

- PL 1112 : Establishment of toll facilities, creation of Toll Regulatory Board (TRB)
- PL 1113 : Granting of franchise to operate, construct and maintain the facilities to CDCP (now PNCC).
- Toll Operation Agreement: Franchise contract
- LCI 579 : Policies in the implementation of PL 1112
- LCI 1560 : Const. of improvements net all TOA for off set vs concession fee
- LCI 1314 : Jurisdiction of CDCP (now PNCC) on management of interchanges

— Administrative setup

1. Name : Philippine National Construction Corporation
Tollways Division
2. Date of Establishment: May 1, 1977
3. Nature : Franchise
4. Organization

The organization chart of the Tollways Division of PNCC is shown in Figure X.2.

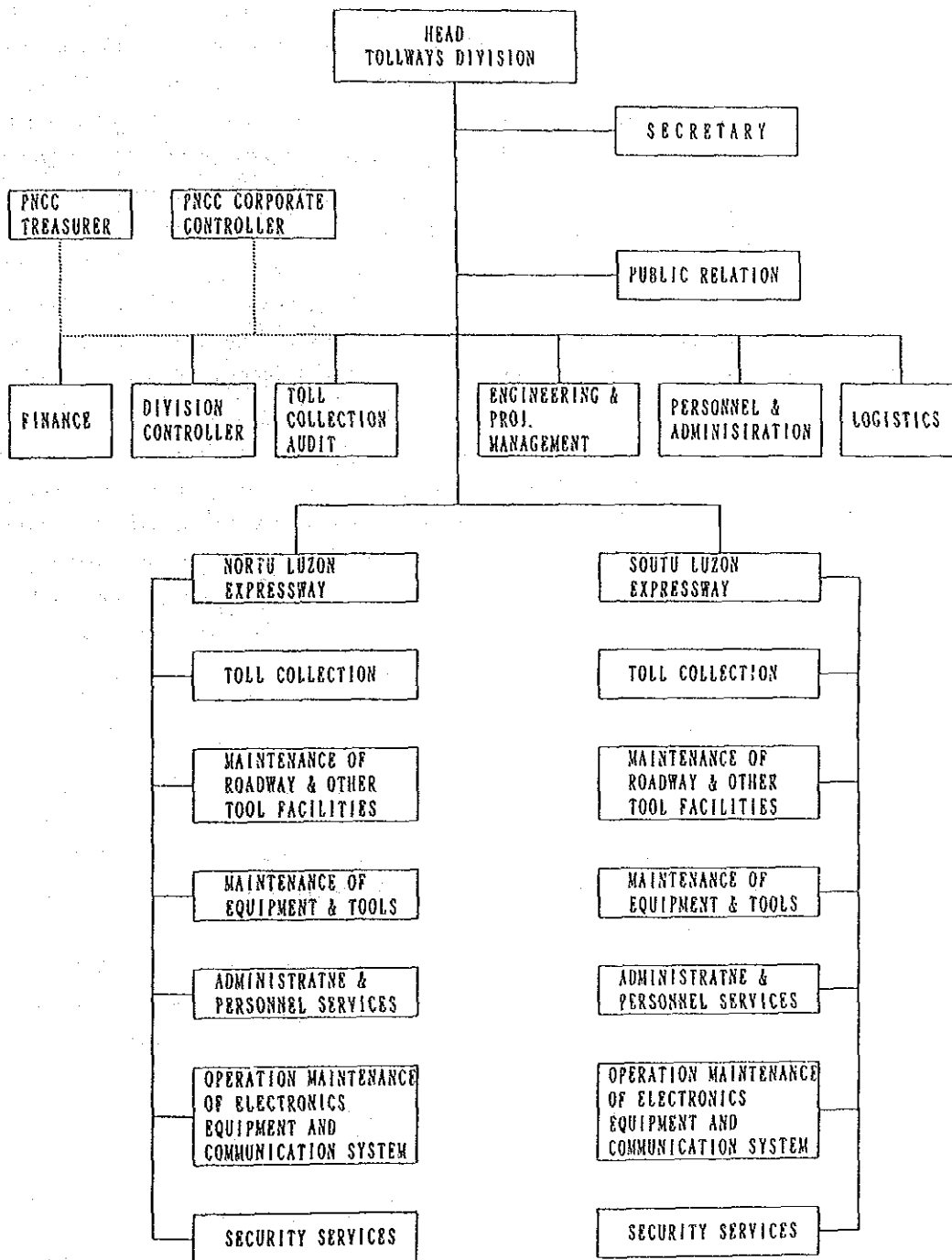


Figure X.2 ORGANIZATION - TOLLWAYS DIVISION OF PNCC

The number of personnel and breakdown are as follows:

BAN/Staff : 31

Supervisor : 144

Manila File: 1462

X.3.5 Financing

In 1977, PNCC was granted a 30 year franchise to collect toll fees as well as operate and maintain the expressways. With the end in view of closely supervising and monitoring the operations of the contractor, the Philippine Government organized the Toll Regulatory Board (TRB) that will also negotiate with PNCC on matters affecting the interests of both parties.

Under the franchise, PNCC shall pay the government an average of 30.4 M Peso per annum or a total of 912 M Peso for 30 year as concession fees. This includes recovery to the government of the investments it had for the construction of certain sections of the original NLE and SLE as well as the extensions to Angeles and Calamba. At the end of 30 years, PNCC shall turn over all facilities and equipment to the government in good operating condition without any cost to the government. Consequently, in addition to periodic upgrading of the roadways except the maintenance of the service roads over the franchise period to maintain levels of service, PNCC is to restore the roadways to the original conditions.

X.3.6 Operation

The percentage of breakdown on the revenue and expenditure of PNCC are as follows:

Revenue	in percentage
Toll income	99%
Road bonds Public placed	
Private placed	
Others	1

Expenditure	in percentage
Personnel	25%
Tax	6
Construction cost	30
Repair and maintenance	3
Interest payment	
Repayment of credits	11
Others	25

The growth of toll income for 1981 – 1985 is illustrated in Figure X.3, which shows that the total toll income in 1985 is about 225 million Pesos.

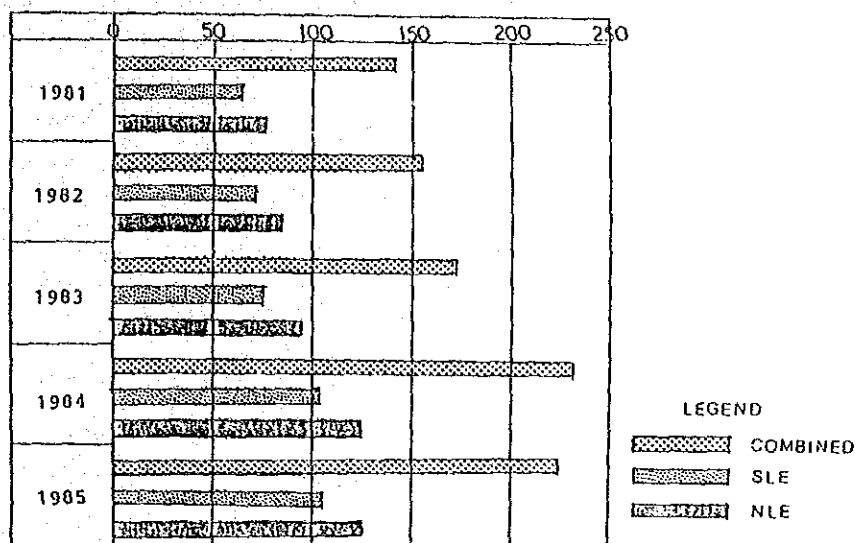


Figure X.3 TOLL REVENUE IN MILLION PESO

X.3.7 Toll System

Toll collection system is closed system (pay as you exit), and toll rates are as follows:

Categories	US\$/km
Passenger	0.0086
Buses, trucks	0.0162
Tractor, semi-trailers	0.0308

X.3.8 Typical Design Standards

The highway engineering design includes: the development of the expressway's horizontal and vertical alignments, access/side road's requirements, the determination of existing utility constrains and other project conflicts, number and type of interchanges and intersections, estimation of preliminary costs

and investment schedules, and identification of right-of-way requirements.

In general the expressway design conforms with the standards and methods set by the American Association of State Highway and Transportation Officials (AASHTO) and also with the accepted engineering practices adopted by the Ministry of Public Works and Highways. In determining loads, the MPWH practice in designing structures to resist earthquake forces was adopted. This method assumed forces stronger than those indicated in the AASHTO specifications.

The design mean elements of the toll expressway are shown below:

Design Speed	110 kph
Minimum Radius of Curvature	750 m
Carriageway	2 x 3.65 m
Shoulder Width, Outer	3.00 m
Shoulder Width, Inner	1.00 m
Median Width	12 m
Embankment Side Slope	
1.50	4:1
1.50	2:1 max.
Cut Slopes	
Common Earth Material	1-1/2:1 max.
Adobe/Other Equivalent	
Stable Material	1/4:1
Right-of-Way (Normal sections)	60.00 m

Figure X.4 illustrates a typical cross section of the toll expressway.

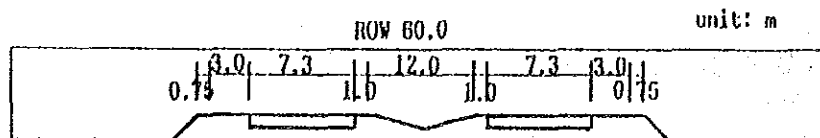


Figure X.4 TYPICAL CROSS SECTION

JICA

