Comparison Study on Transportation Policies in Bangkok and Metro Manila

FIRST ANNUAL CONFERENCE

OF THE

TRANSPORTATION SCIENCE SOCIETY

OF THE PHILIPPINES

MANILA

30-31 JULY 1993

Dr. Shigeru Morichi
Visiting Professor, University of the Philippines
Professor, Tokyo Institute of Technology

1. INTRODUCTION

The purpose of this paper is to discuss the suitable kinds of financial institutions in a country's transportation system and to propose additional policies that will uplift the status of transport systems in the Philippines.

In Chapter 2, the world-wide trend of urbanization and characteristics of Asian metropolitan areas are described. Chapter 3 deals with the differing levels of transportation service in three selected Asian cities, namely Bangkok, Metro Manila and Jakarta. A detailed comparative study of policies between Bangkok and Metro Manila is presented in Chapter 4.

Chapter 5 stresses the need for additional efforts in the government's allotment of financial resources for transportation systems in the context of the Japanese experience. In Chapter 6, all the topics previously discussed are then summarized and analyzed in the light of the key issues pertaining to the improvement of transportation systems in the Philippines.

2. URBANIZATION IN ASIA

Asian countries have the highest economic growth rate in the world today, with much of the economy and transport operations concentrated in the metropolitan areas. Estimates show that 50% of the world's most populated cities are also found in Asia and that this mark will be surpassed by the year 2000 (see Table 1). In many of these metropolises where the area is wide and traffic volume is high, transportation for a rapidly increasing population is augmented by the construction of subway networks(see Table 2). Such railway networks coupled with urban expressways are needed in order that transportation in the cities can be managed effectively.

3. COMPARISON OF URBAN TRANSPORTATION STUDIES OF BANGKOK, MANILA AND JAKARTA

3.1 GENERAL OUTLINE OF BANGKOK, MANILA AND JAKARTA

Estimates made between 1970 and 1990 for the three cities under comparative study, namely, Bangkok, Manila and Jakarta (see Table 3), reveal high annual population growth rates with populations generally exceeding 8 million in the metropolitan level in 1990. These cities also registered high GRPs and GRP growth rates per annum with the largest values being in Bangkok. The high concentration rate of GDP in these metropolitan areas will accelerate the growth of population and introduces more serious transportation problems here.

3.2 MODAL SHARE

In Bangkok, Metro Manila and Jakarta, generally 40% of the transport mode is by private transport and 60% is by public transport (see Table 4). Of the 60% share of public transport, 80% is mainly by bus in Bangkok and Jakarta and by paratransit (jeepney) in Metro Manila. Aside from bus and paratransit, other but very minor modes of public transport are by railway, light rail and taxi. In comparison, the 50%-60% public transport in developed countries is largely supported by railway.

Table-1 Metropolitan Areas with Population over 8 million

1950		1960		1970		1980		1990		2000	
1.NewYork*	1230	1.NewYork*	1420	1.NewYork*	1620	1.Tokyo*	1690	1.Mexico*	2020	1.Mexico	2560
2.London*	870	2.Tokyo*	1070	2.Tokyo*	1490	2.NewYork*	1580	2.Tokyo*	1810	2.Sao Paulo	2210
		3.London*	910	3.Shanghai	1120	3.Mexico*	1450	3.SaoPaulo*	1740	3.Tokyo	1900
		4.Shanghai	880	4.Mexico*	940	4.SaoPaulo*	1210	4.NewYork*	1620	4.Shanghai	1700
				5.London*	860	5.Shanghai	1170	5.Shanghai	1340	5.New York	1680
				6.BuenosAires*	840	6.BuenosAires*	990	6.LosAngels	1190	6.Calcutta	1570
				7.LosAngels	840	7.LosAngels	950	7.Calcutta*	1180	7.Bombay	1540
				8.Paris*	830	8.Calcutta	900	8.BuenosAires*	1150	8.Beijing	1400
				9.Beijing*	810	9.SaoPaulo*	900	9.Bombay*	1120	9.Los Angels	1390
				10.Sao Paulo	810	10.RiodeJaneiro*	880	10.Seoul*	1100	10.Jakarta	1370
						11.Paris*	850	11.Beijing*	1080	11.Delhi	1320
						12.Osaka*	830	12.RiodeJaneiro*	1070	12.Buenos Aires	1290
						13.Seoul*	830	13.Tianjin*	940	13.Lagos	1290
						14.Moscow*	820	14.Jakarta	930	14.Tianjin	1270
						15.Bombay	810	15.Cairo	900	15.Seoul	1270
						16.(London)*	(770)	16.Mascow*	880	16.RiodeJaneiro*	1250
						17.Beijing*	?	17.Delhi*	880	17.Dacca	1220
								18.Osaka*	850	18.Cairo	1180
								19.Paris*	850	19.Manila	1180
								20.Manila	850	20.Karachi	1170
										21.Bangkok	1080
										22.Istanbul	950
										23.Moscow	900
										24.Paris	860
										25.Osaka	860
										26.Lima	820
0/2		2/4		3/10		7/15		10/20		13/26	

(10 thousand)

NOTE : Bold; Asian City
* ; Subway in Operation
In 1980, "Sao Paulo" was duplicated (4&9).

Table-2 History of Subway Construction

-1949		1950-1959		1960-1969		1970-1979		1980-1989	
London	1863	Stockholm	1950	Kiev	1960	Munich	1971	Newcastle	1980
New York	1868	Toronto	1954	Mirano	1964	Sapporo	1971	Tianjin	1980
Chicago	1892	Sankt Peterburg	1955	Tbilisi	1965	Numberg	1972	Erivan	1981
Budapest	1896	Rome	1955	Montreal	1966	San Francisco	1972	Fukuoka	1981
Glasgow	1897	Nagoya	1957	Oslo	1966	Yokohama	1972	Kyoto	1981
Paris	1900	Lisbon	1959	Bàku	1967	P'yongyang	1973	Helsinki	1982
Boston	1901			Frankfurt	1968	Praha	1974	Baltimore	1983
Berlin	1902			Rotterdam	1968	Sao Paulo	1974	Caracas	1983
Athens	1904			Beijing	1969	Seoul	1974	Lille	1983
Philadelphia	1907			Mexico City	1969	Khar'kov	1975	Calcutta	1984
Hamburg	1912					Santiago	1975	Dnepropetrovsk	1984
Buenos Aires	1913					Brussels	1976	Minsk	1984
Madrid	1919					Washington	1976	Nizhni Noveorod	1984
Barcelona	1924					Wien	1976	Pusan	1985
Tokyo	1927					Amsterdam	1977	Sofia	1985
Osaka	1933					Kobe	1977	Novosibirsk	1986
Moscow	1935					Tashkent	1977	Samara	1987
						Lyon	1978	Sendai	1987
						Marseilles	1978	Singapore	1987
						Atlanta	1979		
						Bucharest	1979		
						Hong Kong	1979		
						Rio De Janeiro	1979		

Table-3 Comparison of General Outline of Bangkok, Jakarta and Manila

Municipality	Bangkok Metropolitan Administration (BMA)	DKI Jakarta	Metro Manila
Area(Km^2)	1,568	664	636
Population (thousands)	6,162 (1990)	6503 (1980) 12,000 (for.2000)	7,832 (est.1990)
Annual Average Growth Rate of Population(%)	3.0 (1970-1990)	4.1 (1980-1990)	3.5 (1970-1990)
GDP Share in each Country(%)	35.3	10.5	30.6
Annual Average Growth rate of GDP of each Country(%)	7.7 (1981-1989)	5 (1980-1990)	1.7 (1980-1989)
Per Capita GDP of each Country(US$)	1,250 (1989)	490 (1989)	698 (1989)
Metropolitan Area	**Bangkok Metropolitan Region(BMR)**	**Jabotabek**	**Metro Manila and Neighbor Area**
Area(Km^2)	7,760	6,364	753
Population (thousands)	8,539 (est.1990)	11,916 (1980)	7974 (1990)

Table-4 Comparison of Modal share of Urban Transport

Mode	Bangkok(1989)	Jakarta(1985)	Manila(1989)
Private Transport	39.5	43.0	35.2
Public Transport	60.5	57.0	64.8
-Bus	45.6	50.8	14.6
-Railway	0.2	0.3	-
-Light Rail	-	-	0.8
-Taxi	3.5	1.0	-
-Other*	11.2	4.9	49.4

*Bangkok : Silor, Tuktuk, Hired-motorcycle and boat
Jakarta : Bajaj and Helicak
Manila : Jeepney
Source : 1.JICA, The Study on Medium....., 1990
2.ARSDS Home Visit Survey, 1985
3.Department of Transport & Communication

Table-5 Comparison of Transport Infrastructure in Manila, Bangkok, and Jakarta

Metropolitan Areas	Road		Railway	
	Urban Expressway	Other Road	National Railway	Urban Railway, LRT
Manila	North & South Exp-way Operating Urban Expressway Feasibility Study △	Arterial Network & Fly-over Projects; well Implemented ○	Modal Share less than 0.1% Improvement Plan ×	LRT R1: operating LRT R2, Plan LRT R3: on-going ○
Bangkok	27km Operating 32km Constructing ○	Arterial Network : low density Access Road 'Soy': structural problem ×	Modal Share 0.2% Hopewell Plan △	Tanayong Plan MRTA Plan △
Jakarta	Ring & 3 Radius Network ○	Arterial Network: Insufficient △	Modal Share 0.3% Jabotabek Project: operating ○	LRT, Subway: considering ×

3.3 COMPARISON OF TRANSPORT INFRASTRUCTURE

Road infrastructure for Bangkok, Metro Manila and Jakarta can be analyzed in terms of urban expressway and other road features (see Table 5). Of the three cities, Bangkok has the most developed urban expressway system with 27 km presently operating and 32 km now undergoing construction. Although Metro Manila is supported by a North and a South Expressway, the possibility of implementing urban expressway projects is still under study. As for Jakarta, the urban expressway system is satisfactorily carried out on a ring and three radius networks.

In terms of other road infrastructure, Metro Manila has well-implemented arterial network and flyover projects in contrast to the ineffective and insufficient arterial networks of Bangkok and Jakarta. Bangkok is furthermore punctuated by low density terminating access roads called "soy" which present problems to the improvement of road infrastructure in this city.

Railway infrastructure in Bangkok is being planned for upgrading with the Hopewell Plan for a national railway and to construct two additional projects, namely, the Tanayong and MRTA Plans for urban railway systems. However, the implementation of these projects is being delayed by negotiations between the government and private firms under the BOT scheme, an experience that Manila has to avoid. Metro Manila, on the other hand, has the best urban railway system with an operating LRT, a LRT Line 3 project underway, and a Line 2 in the planning stages. However, the national railway situation in this city is very much wanting in improvement. Jakarta has the best support from a national railway with the operation of the Jabotabek Project; it is still however contemplating on whether or not to build a subway and an LRT.

The simultaneous improvement of transport systems as shown in Table 5 are essential to these metropolitan areas in order to anticipate the expansion of urbanized area and motorization and to further hasten the growth of the economy and improvement of the quality of life. Also, the comparison of transportation policies in Table 5 emphasizes the need for Metro Manila to consider its problems regardless of its financial difficulties.

3.4 COMPARISON OF TRANSPORTATION FARE AND OTHER PRICES

Tables 6.1 and 6.2 show the comparative transportation costs for all modes of transport and other related prices in Bangkok, Manila and Jakarta. The most affordable rates are those of Manila except those for gas, taxi fare and parking. The toll fees of the North and South Expressway in Metro Manila, for example, is dramatically low (P2.25) compared to that of Bangkok (P15-P30) and Jakarta (P25.81) for a 5 km run. Naturally, the low prices are desirable only if the level of service is the same. Incidentally, a low level of service can be attributed to a lack of revenues of the transport operator or of the government. Transportation fares and other prices are affected by many socio-economic as well as political factors.

The long-term lack of investment in transportation presents problems to economic growth especially in the face of explosive population growth and resulting increase in motorization. In order to combat this and maintain an optimum status of transportation in any city, long-term strategies involving increase in fare and other prices to improve service should be implemented hand in hand with appropriate human welfare programs and economic policies against inflation.

Table-6.1 Comparison of Transportation Cost

Transportation Cost	Manila	Bangkok	Jakarta
National Railway Fare for a 5km Trip	(D) P 1.75	(D)P3-5.00	(Z) P 3.23
LRT for a 5km Trip	(F) P 6.00	——	——
Bus Fare (Highest Class) for a 3km Trip	(D) P 5.00	(D)P 6.00	(F)P 16.77
Bus Fare (Lowest Class) for a 3km Trip	(D) P 1.92	(F)P 2.50	(F) P 3.23
Taxi Fare for a 3km Trip of 1 Passenger	(D)P 28.00	(D)P 40.00	(D)P 27.74
Tricycle, Tuktuk, Bajaj Fare for 1km, 1 Passengar	(F)P2.5-10	(N)P 20.00	(N) P 2.23
Economy Car Price	P 250,000	P 300,000	P 348,387
Regular Gas Price per Litre	P 10.00	P 9.50	P 9.03
Parking Fee in Downtown for 1 Hour of Passenger Car	P 5.00	P 2.-20.00	P 3.87
Toll of Urban Expressway for a 5km Trip of Passenger Car	(D) 0-p2.25	(F)P 15.00	(F)P 25.81

Table-6.2 Comparison of Transportation Cost

Transportation Cost	Manila	Bangkok	Jakarta
National Railway Fare for a 5km Trip	1.00	2.28	1.84
LRT for a 5km Trip	1.00	——	——
Bus Fare (Highest Class) for a 3km Trip	1.00	1.20	3.35
Bus Fare (Lowest Class) for a 3km Trip	1.00	1.30	1.68
Taxi Fare for a 3km Trip of 1 Passenger	1.00	1.43	0.99
Tricycle, Tuktuk, Bajaj Fare for 1km, 1 Passenger	1.00	2.00- 8.00	0.32- 1.20
Economy Car Price	1.00	1.20	1.39
Regular Gas Price per Litre	1.00	0.95	0.90
Parking Fee in Downtown for 1 Hour of Passenger Car	1.00	0.50- 4.00	0.77
Toll of Urban Expressway for a 5km Trip of Passenger Car	1.00	6.67	(F) 11.47

Note 1. (F) : Flat Fare
(D) : Distance Fare
(Z) : Zone or Block Fare
2. Taxi: Air-Con Taxi
3. B 1.00 = P 1.00 = Rp 77.5 = US$ 1/26.84

4. COMPARISON STUDY OF TRANSPORTATION POLICIES IN MANILA AND BANGKOK

4.1 PARATRANSIT

1). PARATRANSIT MODES OF BANGKOK

Paratransit modes provide a more personalized, convenient and door-to-door service. Out of a total of about 8.1 million passengers daily demand generated in Bangkok in 1989, approximately 1.7 million passengers or 21% were served by paratransit modes.

There are two major types of paratransit systems serving the needs of the Bangkokians. These types are the conventional and the untypical or unconventional paratransit modes. Under the first division are the taxis and tuk-tuks(samlors), while silor-leks and hired motorcycles belong to the second category. Conventional paratransit provides accessibility to all areas of Bangkok's domain. In contrast, the untypical modes are relegated to the service of commuters who live in the dead-end and narrow streets (locally known as "sois") where other forms of public transport are unavailable. It is interesting to point out that the Thai government phased out a system analogous to the Philippine jeepney, and thus a comparison between such transport is no longer possible.

REGULATION OF TYPICAL PARATRANSIT MODES

Similar to other countries' paratransit system, taxis generally cruise the streets of the metropolis. However, in Bangkok, the maximum number was set at a 13,500 taxis since 1971. In July of 1992, the Department of Land Transportation (DLT) implemented a new scheme requiring new taxis to install a metering system, previously unused in Bangkok. New licenses are issued only to these metered taxis and their fare rates controlled by the authority. This is the first time for the Government to regulate the fare structure of any paratransit mode. This new fare structure is shown in Table-7.

The introduction of this metered scheme aims to break up cartels by encouraging individual taxi ownerships. In order to attract more owners to the taxi industry, annual metered taxi license is set at 800 Baht only. Stricter requirements help to improve the quality of service - in terms of safety and comfort. The car must be less than 2 years old with no more than 20 thousand kilometers on the odometer. Moreover, the engine size must be 1500 cc or more. By mid-May 1992, 13,600 taxis were in the process of being registered. Due to difficulties in the registration processing, the number of metered taxis in operation remains below the abovementioned figure. Using a combination of liberalized entry and stricter safety requirements, the Thai government has succeeded in increasing the quantity as well as quality of taxi service. The response of the public to these metered taxis has been favorable.

Tuk-tuks are three wheeled vehicles with a centrally placed engine, wheels symmetrically arranged in triangular formation, and able to seat three passengers. The maximum number of tuk-tuks was limited to 7,500 in 1976. Due to license restriction, a number of illegal taxis and tuk-tuks are believed to be in operation. These illegal paratransit are simply using the same license plate numbers for two or more vehicles. The cost of forged taxi and tuk-tuk licenses were believed to be 500,000 and 700,000 Baht, respectively. For tuk-tuks, the cost is approximately twenty times higher than the cost of the samlor itself. Generally, the

TABLE-7 TRANSPORTATION POLICY SUMMARY FOR BANGKOK

TRANSPORT POLICY ASPECT	PARATRANSIT MODE			
	Taxi	Tuk-Tuk (samlor)	Silor-Lek	Hired Motorcycle
1. ENTRY REGULATION				
a. Regulating Agency	DLT	DLT	DLT	
b. Regulation	Deregulated since 1992 previous ceiling set at 13,500 vehicles	restricted entry (since 1976) to new providers, ceiling set at 7,500 units	restricted entry to new providers, ceiling set at 8,000 units	
c. Entry Requirements & Restrictions	-1600 cc. or more < 2 years old car < 20,000 km on odometer			
2. FARE				
a. Regulating Agency	DLT	DLT	DLT	
b. Regulation	Requirement, meters introduced in1992	Deregulated	Deregulated	
c. Structure				
i. Initial	Flagdown : 35 Baht for the 1st two (2) km	Fares are negotiated	Fares are negotiated	Fares are negotiated
ii. Rate per KM	Bt 5 for 3rd km Bt 4.5 for 4th, 5th Bt 4 for 6th, 7th Bt 3 for every km after			
3.SERVICE				
a. Regulation	Regulated to BMA		Fixed, loop-type routes	
b. Area/Vicinity	Metropolitan Area	Soi	Main Road / Soi	Soi (?)
c. Passengers/day	468,000**	323,000**	351,000**	577,000**
d. Vehicle Capacity	4	3	8	1
4.FRANCHISE DISTRIBUTION				
a. Total Number of Vehicles	21,820*	7,406**	7,874**	16,588***
b. No. of Companies	136*			
c. No. of Single Operators	6,481*			

DLT - Dept. of Land Transportation
BMA - Bangkok Metropolitan Area
* 1992 figures
** 1989 figures
*** 1989 figure (33,642 is the 1991 unofficial figure)
(?) Unwritten agreement between Gov't and operators is that they will operate only in the sois

price of the tuk-tuk ranges between 30,000 to 40,000 Baht. In the case of the taxi, the illegal transfer of the license is also greater than the cost of the vehicle. The implementation of the new metered scheme is expected to reduce the number of illegal taxis.

Taxis and tuk-tuks are similarly available by street hail. Unlike for taxis, there is no concerned authority which regulates pricing for tuk-tuks; thus drivers have the freedom to establish their own fare scales. The minimum is somewhere near 10 Baht. The present fare collection is done through bargaining before any ride could take place. Such a practice causes delays in traffic; while passengers and driver haggle in the middle of the street, causing a jam in the flow of traffic. In addition, passengers tend to search for a fair price, thus more tuk-tuks and taxis are stopped, further delaying the flow of traffic. Moreover, the drivers have the tendency to become more aggressive, weaving in and out of traffic in the search for potential customers. this becomes more apparent for the tuk-tuks because of their greater flexibility, permitting impatient tuk-tuk operators to find their way into small gaps and congested roads, thus becoming unnecessarily aggressive and showing disregard for the public safety.

Coverage of the entire Bangkok metropolitan area is provided by taxi and tuk-tuk operations. However, they are prohibited from picking up passengers on their return trip from the outlying suburbs or provinces. Taxis are also prohibited from fetching passengers inside the Don Muang International Airport on their return trips, except for those with special license granted by airport authority. Since tuk-tuks have never been allowed to operate on the expressway, it is impossible for them to extend their service to the airport. These modes have provided Bangkokians with 24 hour, door-to-door service.

Regulation of Untypical Paratransit Modes

Untypical paratransit provides service that is different from that offered by the so-called conventional systems. Usually, untypical paratransit systems provide a loop-type kind of service can be found on dead-end streets, operating on a flexible schedule depending upon the passenger demand. They travel fixed routes with no fixed stops, so that passengers can board and alight anywhere along the route. However, their operation has been restricted to the "sois". They basically provide a supplementary means of transport to the public. Presently, we identify two major untypical paratransit modes in Bangkok: silor-leks and hired motorcycles.

The silor-lek {Thai for four-small wheels} derives its name not only from the fact that its wheels are smaller than that of standard vehicles, but also because the vehicle itself is a small pick-up with a 550 cc engine capacity. Typically, the Daihatsu or Suzuki pick-up is simply covered on top with a canvas roofing and provides two parallel upholstered seats. The entrance to the passenger seats is at the left side of the pick-up in between the two seats. Usually, six passengers can be accommodated in the passenger compartment, and two passengers up front with the driver. According to the DLT, there were a total of 8,150 silor-leks registered in Bangkok in 1990.

On the other hand, hired motorcycles as the name implies refer to any motorcycle service utilized by anyone who agrees to the negotiated fees. Usually, these motorcycles, with 80 to 150 cc engine capacity, can accommodate one passenger just behind the driver, though it has been observed that some operators allow two passengers. Surveys conducted by the DLT in 1989 revealed that there were 16,588 hired motorcycles in operation, serving 829 sois throughout Bangkok. However, latest unofficial figures indicated that there were 33,654 hired

motorcycles at the end of 1991. Presently, this mode remains unrecognized yet as paratransit mode, thus the fact that it is not regulated. An informal agreement between operators and the Government has been made, such that they may only operate on the sois. However, in contradiction to the informal agreement, some have been observed along the main streets. They are quite popular on the main road because of their maneuverability, passing through unoccupied spaces on congested roads. This practice, however, is prone to accidents, as other motorists are often caught unaware of their intended movements. These hired motorcycles are often found weaving unexpectedly through any unoccupied spaces, sometimes even occupying the wrong lanes. According to regulations, all motorcycles must operate on the curb lane. The lack of enforcement against this practice has allowed this to become a common phenomenon in Bangkok.

Serving as supplementary modes to the major public transit modes, silor-leks and hired motorcycles have provided services, satisfying the needs of commuters. Presently, there are no regulations concerning the organization of fare rates on both the untypical modes. Fare rates are not standard and rates may vary from one soi to another. Safety regulation has yet to be implemented.

2). PARATRANSIT IN METRO MANILA

REGULATION

Liberalization has become a byword of recent administrations with regard to the entry of new service providers. However, a closer look at related policies is merited in an attempt to understand the development of paratransit in the Philippines, with focus placed on Manila.

The government has been trying to attract investors by providing, for example, the means by which potential taxi operators can import cars tax-free. The objective of the government is to break up monopolies and encourage competition. This would induce operators to improve the quality of service they provide, in terms of safety and comfort.

New applicants for taxi operation must have a vehicle which is a 1985 or later model, in good operating condition, and is roadworthy. For renewing applicants, the vehicle must be a 1980 or later model similarly satisfying the other requirements. This is a loose attempt to get operators to get rid of decrepit vehicles. Recently, a maximum of 10,000 vehicles could have been imported tax-free by prospective taxi operators. However, very few attempted to avail of this incentive. To give an idea how large an amount is removed from acquisition costs, the import cost is 50% of the vehicle cost plus an additional 10% for Value Added Tax (VAT). Thus a total of 60% could have been saved by the applicant. What has happened, however, is that many try to import these supposedly for-use-as-taxi cars for use as private vehicles.

The government has also been trying to encourage more jeepney operators to provide service to the public. However, the applications of new operators has been met with resistance of previously established operators who usually belong to a jeepney driver's association. They usually state that the demand for a route is already met and they also cite the Public Service Act of 1935 which protects prior operators from incoming competition. The government has recently adopted the stance that the burden of proof is the responsibility of the oppositors, and not with the applicants. The very fact of the application to operate a jeepney service along a certain route is taken to mean that there is a perceived demand and that there is someone interested in meeting the demand. The strict interpretation

of the law would make this approach of the government agencies, having to do with the regulation of transport services, illegal and this in turn points to the need for corrective legislation. Thus the government (the transportation agencies, in particular) will be unhindered in providing their public service. Incentives for potential jeepney operators have been in the form of loan programs of major national banks, which are operated by the government.

Tricycles used to be regulated by the LTFRB/LTO in Metro Manila. Recently, however, their regulation has been turned over to the local or municipal governments. As such, the policies vary from area to area. However, the major accomplishment of the government with regard to this mode of transport is the use of safety regulations to achieve hierarchal relegation of tricycles to performing feeder services. Since it is difficult to avoid accidents when vehicles of this type of vehicle uses major roads, the sound argument for safety has convinced the operators to limit themselves to smaller roads where the usual speed is in the range they can operate at.

The government considers nationality before a franchise can be awarded to an operator. A single operator must be a Filipino citizen. In the case of corporations, the company must be at least 60% Filipino-owned. This policy seeks to assure that fledgeling Filipino investors will not be driven out by foreign groups with larger capital on their side.

The LTFRB and LTO used to be part of one organization known as the BOT or Board of Transportation before it was reconstituted into separate agencies. The LTFRB deals with the regulation of the entry of new convenience providers while the LTO takes care of the economic aspects such as fare. For the latest fare rates for taxis, jeepneys and tricycles, see TABLE-8.

The successful improvement of the taxi services in Bangkok may be attributed to the new policies which focused on specific objectives. Requiring that a car must have less than 20,000 kilometers on its odometer is very specific, since it can be inferred what kind of wear and tear a vehicle has undergone, which is in turn indicative of the roadworthiness of the vehicle. The general policies employed in Manila have to be evaluated, to determine their effectiveness in improving the quality of taxi service. Should it be found that there has been no improvement, perhaps it will be time to consider additional strategic approaches.

The phase-out of the jeepney is much talked about, but the implications of such a move should be carefully evaluated. Section 4.2 mentions the attempt to improve the bus service in Bangkok is being done through the introduction of better service of mini-buses. At first, it would be preferable to induce the shift of jeepney passengers to buses by using the market forces. If the commuter sees that a better service is offered, and he can afford it, it is likely that he will shift. If the market mechanism does not produce the shift, additional incentive may be necessary. Strict regulation should be used only as a last resort.

4.2 BUS TRANSIT SERVICES

1.) BUS TRANSIT SERVICES IN BANGKOK

Since 1976 buses in Bangkok have been largely operated by a state-owned enterprise called Bangkok Mass Transit Authority or BMTA under the supervision of Ministry of Transport and Communications.

Together, the state-owned enterprise BMTA and other privately-owned organizations, operate with 5,235 regular buses and 749 air-conditioned buses

TABLE-8 TRANSPORT POLICY SUMMARY FOR METRO MANILA

TRANSPORT POLICY ASPECT	PARATRANSIT MODE		
	Taxi	Jeepney	Tricycle
1. ENTRY REGULATION			
a. Regulating Agency	LTFRB	LTFRB	Local Government
b. Regulation	Presently deregulated, with attempts to attract investors	Presently deregulated, with attempts to attract investors	
c. Entry Requirements & Restrictions	New applicants' vehicle not earlier than 1985 model Renewing, applicants' vehicle not earlier than 1980 Must pass LTO safety, roadworthiness inspection	Must pass LTO safety, roadworthiness inspection	
	Lone operator: Applicant must be Filipino citizen Corporation: Must be 60% Filipino owned	Lone operator: Applicant must be Filipino citizen Corporation: Must be 60% Filipino owned	
2. FARE			
a. Regulating Agency	LTO	LTO	Local Government & Operators' Association
b. Regulation	Fixed rates per type	Fixed rate	
c. Structure			
i. Initial Fare	Flagdown: Aircon: P 3.50 1st 500 m Regular: P 2.50 1st 500 m	P 1.50 for 1st 5 km	Rates vary with different localities, ranging from P 2.00 to P 5.00
ii. Rate per distance	Aircon: P 1.00 per 200 m Regular: P 1.00 per 250 m	P 0.36 / succeeding km	
iii. Others, Additional	Aircon: P 12.50 Regular: P 7.50		
3. SERVICE			
a. Regulation	Restricted to GMA, must get permit for special trips outside Metropolitan Area	Must operate on designated route	
b. Area/Vicinity		Fixed Routes*	Fixed area**
c. Passengers/day			
d. Vehicle Capacity	4 to 5	16 to 18	4
4. FRANCHISE DISTRIBUTION			
a. Total Number of Vehicles	34,425***	38,662***	
b. No. of Franchises****	7,588***	24,883***	

GMA - Greater Manila Area
LTFRB - Land Transportation Franchising and Regulatory Board
LTO - Land Transportation Office
Fixed routes include main roads as well smaller ones, with routes supposedly limited to 15 km lengths. However enforcement of this optimum operating distance is lacking.
* Service areas usually confined to subdivisions or similar residential areas
** As of May1993, LTFRB figures
*** Information on breakdown into no. of single unit operators and no. of companies unavailable

covering 146 regular and 10 air-conditioned bus routes throughout Bangkok and its surrounding provinces. Although the bus services are operated mainly by BMTA, additional services are also provided by privately-owned organizations. In fact, the mini bus operations are entirely under the privately owned franchises. They operate in smaller size buses, charging the same fare as the ordinary BMTA buses. Altogether they operate with 2,140 buses on 58 routes and carried around 1.1 million passengers per day in 1989. These mini buses are plying along the same routes to that of the BMTA bus routes providing additional services but occasionally competing against the BMTA buses. Though, these mini buses together with the regular and air-conditioned private buses are managed by the private enterprises, BMTA controls the fare structure, routing and scheduling.

BMTA is also facing the same problems as other developing countries' metropolises. The state-owned main public transportation system is not providing adequate services and is losing both passengers and revenue, even though many people still rely on it. The following problems have been observed in the bus services : 1) overcrowded buses, 2) excessive waiting time, 3) unreliable services, and 4) irregular interval of arrival of buses. BMTA has also been facing the following internal problems : 1) poor administrative procedures, 2) lack of sufficient revenue to cover expenditures, 3) inability to release inefficient personnel, 4) substantial overhead expenditures, and 5) lack of proper scheduling.

There are hardly any feeder routes to supplement the line-haul services which regulated in many overlapping operating distances. Some routes are as long as 42 km in length while the shortest is only 8 km in length. Moreover, they have been operating with irregular bus headway, inconsistent bus travel time, inappropriate and inconsistent bus layover time and severe bus bunching problems. Furthermore, the public attitudes toward the bus system are not highly favorable. They do not appreciate the services being offered. As such, BMTA has a poor image in the public opinions and finds it difficult to gain the public confidence.

BMTA is forced to provide bus services with very low bus fares because the passengers are totally against any increase in bus fare. A passenger is only paying a flat rate of 2.5 Baht(US$ 0.10) even for the longest route of 42 km. This unreasonable rate becomes even more pronounced when compared with the untypical paratransit system particularly the hired motorcycle's fare rate. It is interesting to note that commuters are willing to pay 3-5 Baht(US$ 0.12-US$ 0.20) for any short trip, for instance as short as 1 km length. As a result, BMTA is facing heavy financial losses on the entire bus operation. On the average they are losing about 2 million Baht(US$ 80,000) per day. With these heavy losses coupled with the inability to increase the bus fare rate, as it is entirely controlled by the Government, BMTA is in turn facing the difficulty of improving their operations and services to meet the expected standard. Nevertheless, it is worthwhile to note that the private buses including the mini buses manage to operate with profit even though they are collecting the same fare.

Inspite of the fact that mini buses have been providing competitive services to the BMTA and carry more than 1 million passengers per day, mini buses also receive constant complaints from the commuters regarding their services. Most frequent complaints are 1) poor manners of mini bus crews, 2) reckless driving, and 3) poor attitude of bus conductors.

Congested traffic obstructs effective bus circulation. Not only is more time taken on each routing, it also increases the operation cost as well. Moreover, there is also a problem of servicing during rush hours. Traffic rights and the right of way allowed for the public buses, particularly, the use of bus lanes, are always ignored by all concerned parties. Another foreseen problem in the long run is traffic

congestion caused by the increasing number of buses coming in and leaving Bangkok to other regions along the main routes. In addition, with the expansion of BMTA services there will be air-conditioned micro bus fleets operating on these major routes as well.

The above mentioned problems indicate very clearly that with the present traffic conditions, it is pointless to continue expanding the volume of bus services as a means to substitute the use of private cars in Bangkok. The public demand for bus services is already saturated. With the number of buses increasing, the traffic congestion will worsen as well. It is more important to facilitate the operation of existing fleets by allowing more traffic privileges and in improving the quality of services offered to the public. Various types of vehicles should be designed for higher loading capacity as well.

Already there had been several discussions on appropriate solutions to the various problems confronting the bus transport system in Bangkok. The following are the proposed measures to relieve the metropolis of these problems :

(a). In number the bus services can adequately serve the demand, but the loading capacity should be increased through the use of double-deckers and towed buses. Circulation of buses should also be improved. Certain inefficient bus operating procedures should be adjusted to provide more reliable services which could possibly bring back the public confidence. Recommended measures include the provision of "arrival time plan" and "even headway" releasing schedules. These measures could help lessen the severe bus bunching and irregular arrivals at bus stops.

(b). However, efforts on the implementation of the arrival time plan will probably be wasted unless the concerned authorities enforce strictly on the utilization and reintroduction of bus lanes. regardless of the past failures of the bus lane system. These special bus ways can allow for the use of the 4 and over passenger cars. Buses should be given priority to pass at all intersections. The distance of certain routes should be reduced as well as the number of bus stops.

(c). The number of mini buses should be reduced through the termination of licenses upon expiry and for those who break traffic laws. Rigid control should be adopted to allow for the operation of mini buses outside peak traffic hours or at night.

(d). To improve the quality of, as well as to expand the availability of services, it is suggested that BMTA should increase the number of air-conditioned buses and encourage investment from interested private operators to transport suburban commuters to Bangkok downtown areas including the opening of the 14 new routes for air-conditioned micro buses.

(e). BMTA needs to revise its own fare structures. To gain more public acceptance on the increment of the bus fare, the BMTA must consider employing the more equitable method of fare collection. This could be achieved through the implementation of the graduated fare method even though they might face difficulties in fare collections and some losses due to the few undependable and misbehaving bus crews. Bus fares should reflect the distance travelled by each passenger of which revenues can cover easily expected expenditures.

(f). The entire bus network needs to be revised and adjusted accordingly. Rerouting of certain bus routes must be carried out in order to avoid the overlapping of many different bus routes. Line-haul routes must be clearly identified and feeder route services should be introduced.

(g). Moreover, the need to integrate the public bus services with the water transport systems, particularly the express boat system is worthwhile considering. The possible integration can be exercised through the relocation of the bus stops

or rerouting some sections of the bus routes. This is to ensure a more convenient and readily accessible travel for the public which may help to attract more auto users to this public transport services.

(h). Traffic is much greater on schooldays than on school holidays. It is common for some Thai parents to send pupils to and from schools using their own private cars. In fact, the number of school trips during peak hours represent almost one-third of the total trips made in Bangkok. The provision of school buses should be seriously considered.

2). BUS TRANSIT SERVICES IN METRO MANILA

The government has identified two problems confronting the bus services in the metropolis namely : 1) the overcrowding of public transport and 2) the limited range of public transport services. The government agency tasked with planning and policy-formation for public transport is the Department of Transportation and Communication(DOTC). This agency formulated proposals for the improvement of the system. It declared the following problem-solving principles : 1) Deregulation, 2) Decentralization, 3) Devolution, 4) Democratization and 5) Privatization. This is called the 4 D's + 1 P Principle with the government seeks to concretize under the present administration.

Regarding the area of Deregulation, the government is pushing forward to liberalize controls on the entry and exit of investors in the transport industry and fare rates with the aim of enhancing the level of competition in the provision of public transport services. On the other hand, it seeks to strengthen administration controls on the aspects of safety and service standards.

DOTC issued Order No. 92-587 dated March 1992 defining the Policy Framework on the Regulation of Public Transport Services. This order expressed the following policies : 1) No Monopoly, 2) Presumption of need in favor of the applicant, 3) Abolish "prior operator" and "priority of filing" rules, 4) Route Measured Capacity used as guide and 5) Fare Range.

Two agencies under the Department of Transportation and Communication are tasked with the implementation of Public Transport Regulations. The Land Transportation Franchising and Regulatory Board(LTFRB) is the implementing agency for Economic Regulations while the Land Transportation Office is for the implementation of Safety Regulations as well as Enforcement functions.

REGULATION

LTFRB is a quasi-judicial body formed in 1987 which took some of the functions of the former Board Of Transportation(BOT). The present legislation implemented by the agency in the review as well the awarding of franchises is the Public Service Act. This act requires three essential requirements for an applicant to be granted a franchise : 1) Public need, 2) Financial Capacity and 3) Filipino Citizenship.

The Public Service Act implies that the burden of proof for public need lies on the applicant. This is the so called "prior operator" rule. It also supports the "priority filing" rule where the existing operator is given the priority over new applicants in the application for a franchise for a new route. The government, in order to promote public service presumes the need for public transport in favor of the applicant unless contested by existing operators. In which case, a hearing is held and LTFRB sits as the judge to decide the case.

Another important matter is the strict use of the Route Measured

Capacity(RMC) which tends to limit the entry of new applicants to an existing route. In line with the Deregulation thrust of the government, LTFRB promotes the use of RMC only as a guide in the entry of new applicants. Thus, the agency allows adjustments. The present administration feels that some provisions in the Public Service Act does not encourage new investors in the industry. Thus, it feels that changes should be considered. Thus, DOTC drafted amendments to the Public Service Act known as the Act Governing the Delivery of Public Transport and Telecommunications Services.

With the liberalization of the public transport industry, the government seeks to break monopolies in the industry. In this way, competition among operators is enhanced and the riding public is benefited. a concrete example of this initiative by the government is the setting up of a minimum fare for the Air conditioned Bus.

LTFRB recently issued a circular that a Vehicle Inspection Report(VIR) be required before any franchise is released. This will ensure that vehicles are checked for roadworthiness and presence of deficiencies.

DOTC drafted the National Road Safety Program(1993-1998) by an Inter-Agency Road Safety Committee. The areas addressed are : 1) Vehicle Standards, 2) Traffic Enforcement, 3) Traffic Engineering and Safety Facilities, 4) Traffic Education and Information.

With the current thrust of the government to privatize government-owned and controlled corporations, the Metro Manila Transit Corporation has been programmed to be completely privatized within the current year(1993).

It is very important to note interesting points arising from the comparison of bus transport policies between Bangkok and Metro Manila. The first point is with regards to the number of bus operators within the industry. In Bangkok, the state-owned enterprise, BMTA, dominates the market in the provision of bus services in the metropolis. To enhance competition, the government introduced private operators of the Mini-bus with better services. In a situation such as this, the passengers can readily discern and evaluate which company is providing better services.

The scenario in Metro Manila is quite the opposite. There is a great number of bus operators in the public transport industry. This is evident by the high volume of franchises released by LTFRB. The latest figure shows a cumulative total of 4,658 franchises released by the agency as compared to BMTA's franchises totalling only to 467 in 1987. In such a case,it is difficult to clearly evaluate the level of service offered by each operator. Different passengers will have differing opinions as to which operator provides the better one. Having too many operators within the industry puts it in a disadvantage. On the other hand, having too few will encourage monopoly and likewise do the same. It is beneficial, therefore, for the government to study and determine the optimum number of operators required.by the industry.

Secondly, the bus transport industries of both metropolises suffer from certain degrees of financial losses and inefficiency. On one hand, the bus industry in Metro Manila is at an advantage because it having the burden of lesser loss15 compared to Bangkok.

A final point concerns the behavior of the passengers towards an increase in bus fares. It is quite interesting to note that the riding public is eager to pay more for other modes with the same distance than accept a relatively small increase in bus fares. Without an increase in fare, it is impossible to raise the level of service.

See Table 9 for a summary of bus transport policies.

Table-9. SUMMARY OF BUS TRANSPORT POLICIES

	BANGKOK	METRO MANILA
1. ENTRY REGULATION		
a. Regulating Agency		
i. Economic Regulations	Department of Land Transport (DLT)	Land Transportation Franchising and Regulatory Board (LTFRB)
ii. Safety Regulations	Department of Land Transport (DLT) a. Bangkok Metropolis Transport Office (under Land Transport Act) b. Motor Vehicle Registration Office (under Motor Vehicles Act)	Land Transporation Office (LTO)
2. BUS ROUTE REGULATION	Fixed Route Bus Transport Non-fixed Route Bus Transport	Fixed Routes
3. FARE STRUCTURE	All bus fares are fixed. - Fixed Route Bus Fares - Non-fixed Route Bus Fares	Regular Bus : Fare is fixed. Aircon Bus : Minimum fare is decided.
4. BUS OPERATION		
a. Existing Franchises	Regular Buses 227 units Aircon Buses 240 units	# of franchises/ # of units PUB 4,658 21,494 School Bus 793 1,624 Shuttle Bus 198 455
b. Existing Bus Fleets		
i. Bus Sizes	10-m, 12-m(Regular and Aircon) Minibus	10-m(Regular and Aircon) Minibus
ii. Capacity	Regular and Aircon 83 persons(10-m bus) 92 persons(12-m bus) Minibus 30 persons	Regular and Aircon 60 persons(seated) Minibus(Aircon) 40 persons(seated)
iii. Routes serviced	Regular Bus 145 routes Aircon Bus 19 routes Minibus 58 routes	17 routes
iv. No . of units	Regular Bus 5,235 units (3,904 BMTA-owned) Aircon Bus 740 units (454 BMTA-owned) Minibus 2,140 units (all privately-owned)	Total no. of buses 5413 units MMTC Bus Fleet Aircon 183 units Non- Aircon 207 units 309 units

PUB - Public Utility Bus
BMTA - Bangkok Mass Transit Authority
MMTC - Metro Manila Transit Corporation

Sources :
UNESCAP Questionnaire on Urban Public Transport, Basic Fact Sheet For Metro Manila Transit Corporation
Department of Land Transport, Ministry of Transport And Communication: Land Transport Department Sector, March 31, 1990

4.3 RAILWAY PROJECTS

1). RAIL-BASED PROJECTS IN BANGKOK

The present construction of a railway system in Bangkok is guided by a master plan outlining the need for a mass transit network to alleviate the city's traffic problems. The system considers the hierarchy of railway networks. It includes an inter-city railway (Hopewell SRT), a railway catering to the suburban areas (Hopewell Community Train) and an urban light rail transit system (MRTA Initial System and Tanayong). A profile of the projects in Bangkok may be seen from Table 10.

The MRTA Initial System started out as the Skytrain Project of the Lavalin International Group. Lavalin unfortunately could not find a company to replace another which failed to confirm the latter's participation in Skytrain. Lavalin's contract was therefore nullified, leaving the government with the task of building and operating the Initial System. Lately, the government has been considering to switch to a B.O.T. scheme to lighten its financial burden.

The Tanayong and Hopewell projects have been approved and contracts with the government are already in place. The two projects were negotiated under a B.O.T. scheme. Yet, the dates for the implementation of the two projects remain unclear causing further delay in the construction of the two systems. This delay in effect contributes to the worsening state of Bangkok traffic. Table 11 shows the status of the Bangkok railway projects as of 1992.

At this point, it is interesting to note that experience worldwide confirms that rapid transit revenues are never adequate to cover the costs and produce a return attractive to a private investor. Thus, there is a need for public funding. The ideal scenario would be for a government to get involved in projects by assuming the risks involved in a project. These risks may be due to the instability of an economy or to a calamity, which cannot be prevented. A government should realize that further delay in the implementation of projects such as those involving mass transportation would cause losses to both the public and the private sectors in terms of time, fuel and operating costs.

2). RAIL-BASED PROJECTS IN MANILA

The Light Rail Transit Line 1 (Taft-Rizal Line) was opened in 1984 as the initial system of a rapid transit network in Manila. It has since been attracting passengers, what with its competitive fare and the relative convenience it offers to passengers in terms of shorter travel time along its route. Yet, even though operation of LRT 1 has helped ease the congestion in parts of Manila, it subsequently caused new problems which in effect negated its positive influence. The lack of transfer facilities for passengers to transfer from one mode to another, caused bottlenecks of road to form around the LRT stations. A station plaza where passengers can be accommodated during transfers is therefore necessary so that there will be no congestion in the vicinity of the stations.

LRT Line 3 (EDSA Line) is already under way and was negotiated under a B.O.T. scheme. It is interesting to note that LRT 3 may be able to learn from the lessons taught by the problems encountered by the railway projects in Bangkok as well as those from LRT Line 1. It may be recalled from preceding discussions that, similarly from the B.O.T. projects in Bangkok, the government should realize the risks involved in a mass transit project. These risks include losses from delay as well as those from the devaluation of currency. Also, LRT 3 may learn from LRT 1 by constructing adequate facilities for the efficient transfer of passengers from one mode to another. At present it may consider the

TABLE-10 Profile of Bangkok Railway Projects.

	Hopewell (SRT)	Hopewell (CT)	Tanayong	Initial System
No. of Cars	15-20	12	2	4-6
Guideway Width, m	26-34	26-34	8.30	7.20
Capacity				
- per train	6,000	3,600	600-700	900-1,100
- per hr/direction	20,000	60,000	15,000	15,000
Headway, minutes		3.5	3.5	4-6
Track	2-3	4	2	2
Gauge, m	1.00		1.435	1.435
Net Length, km	60.1	60.1	14.5	19.0
Station Interval, m	3000-7000	700-1200	500 approx.	1000 approx.
No. of Stations	12			20
Platform Length, m	500-1000	300-500	50-80	
Max. Speed, kph	80.0	90.0	80.0	80.0
Comm. Speed, kph	40-60	30-40	20-25	30-40
Horiz. Curvature, m	400	200 min.	50 min.	100 min.
Max. Gradient, %	1.0	3.0	4.0-5.0	5.0
Project Cost, Baht	80.0 Billion including expressway		17.7 Billion	46.0 Billion
Fare, Baht	0.9 per km	0.9 per km	15.0 max.	4.0 + 1.0/km

Sources:
- Prof. Tony M. Ridley, Bangkok Advice on Rationalisation of Rapid Transit Systems: Recommendations, September, 1992.
- Wilbur Smith and Associates, Advisory Consulting Services for the Coordination of Expressway and Mass Rapid Transit Megaprojects in Bangkok: Final Report, Vol. II: Technical Appendices, 199

Table-11 Status of Thai Railway Projects as of September, 1992.

	MRTA Initial System	Hopewell	Tanayong
Contract Status	Skytrain contract with Lavalin Corp. terminated. MRTA to develop new strategy.	Concession contract with SRT in place.	Concession contract with BMA in place.
Land Acquisition	Negotiations advanced in some areas (specifically those while still under the Lavalin contract). More powers needed.	Being planned inside SRT owned land.	Alignment planned inside BMA owned land.
General Progress	MRTA in the process of assembling Project Team.	Engineering well advanced. About to start foundations.	Engineering started August 1992. Topo survey well advanced. Site investigation complete.
Interchange Stations	Need recognized and agreed. Not yet designed.	Need recognized and agreed. Not yet designed.	Need recognized and agreed. Not yet designed.
Target or contract dates	Start construction mid-1993. Open late 1997.	Total construction period 8 years. Civil structures for first lines complete during 1994.	Phase 1 operational May 1996. Phase 2 on November 1996.

(Source: Bangkok Advice on Rationalisation of Rapid Transit Systems : Recommendations by Prof. Tony M. Ridley, September 1992.)

appropriation of an adequate area for a station plaza. Table 12 shows proposed LRT projects envisioned to form, together with LRT 1 and LRT 3, a light rail network around Metro Manila. Table 13 shows a comparison between the Bangkok Initial System and Manila's LRT Line 1.

The Philippine National Railways (PNR) is currently upgrading their system in Manila. However, squatters along the PNR properties pose a problem, making implementation of the necessary improvements very difficult if not impossible. Here we can learn from the solutions brought up by the Jabotabek Mass Transit Study in Jakarta where the existing national railway was elevated and transformed into an improved urban railway system, solving the squatter problem.

It is important to note that in the future, the hierarchy of railway systems should be realized in Manila. The LRT and PNR systems should form a network. Already, LRT 3 and LRT 1 forms a network similar to that of the Yamanote Line in Tokyo with the latter having a train with 11 coaches passing every 3 minutes. Note that the Yamanote Line is very congested and it may seem that the LRT is going in that direction what with its capacity already less than the demand. Thus, it is very important to consider how to manage the systems for their future demand such that they will remain as efficient systems.

4.4 EXPRESSWAY PROJECTS

1) EXPRESSWAY PROJECTS IN BANGKOK

The First Stage Expressway System(FES)

This project was the first expressway system constructed 1978.The last section was opened to traffic in December of 1987. It was a government project supervised by the Expressway and Rapid Transit Authority of Thailand(E.T.A.).

The E.T.A. through its Expressway Management Department(EMD), operated the expressway after its completion. The EMD manages the FES and collects toll. The toll rates are divided into three categories:

four-wheel vehicle - 15 Baht
six or ten wheel vehicle - 20 Baht
more than ten wheel vehicle - 30 Baht

The management of the traffic control system is handled by the Rescue and Traffic Control Division under the EMD. The traffic control system consists of :

Information - CCTV cameras, emergency telephones, patrol cars, toll plazas
Processing - control desks and TV monitors
Control - matrix signs, rescue staff, traffic assistants, police

The Second Stage Expressway System(SES)

This expressway system's construction responded to the Thailand Government's policy of encouraging the private sector in investing in the project. The E.T.A. then signed an investment contract with the Bangkok Expressway Company, Limited(BECL) in December 22, 1988 for implementation, operation and maintenance of the SES for 30 years. The Expressway System Project Office of the E.T.A. was the assigned office to supervise the project.

The SES consists of two main lines which are the North-South Route(Bangklo-Chaeng Wattana) and the East Route(Phayathai-Srinakarin).

TABLE-12 Proposed rail-based projects in Metro Manila.

	LRT Line 2	LRT Line 4	LRT Line 5	LRT Line 6
Length, km	11.76	10.35	11.0	7.55
Description	fully elevated	partly elevated	fully elevated	fully elevated
No. of Stations				
- terminals	2	2	1	2
- intermediate	10	10	9	5
Contract Type	B.O.T.*	B.O.T.	B.O.T.	B.O.T.
Project Cost, Pesos	11.30 Billion	16.0 Billion**	9.6 Billion	13.9 Billion**
Implementation	1993-1997	1995-2000	1996-1999	1995-1998

Notes: * B.O.T. - Build, Operate and Transfer
** Does not include right-of-way costs

Sources:
- Revised NEDA Profiles of Capital Assistance Projects.
- Project Brief, Department of Transportation and Communications.

TABLE-13 Comparison of MRTA Initial System and LRT Line I.

	MRTA	LRT
	Initial System	Line I
Train (No. of cars)	4-6	2
Guideway Width, m	7.28	8.00
Capacity		
- per train	900-1,100	748
- per hour/direction	15,000	18,000
Headway, minutes	4-6	2.5
Track	2	2
Gauge, m	1.435	1.435
Net Length, km	19.0	15.0
Platform Length, m		100
Number of Stations	20	18
Station Interval, m	1,000 approx.	825 ave.
Maximum Speed, kph	80	
Commercial Speed, kph	30-40	60
Horizontal Curvature, m	100 min.	170 min.
Maximum Gradient, %	5.0	4.0
Power Supply	750 volts D.C.	750 volts D.C.
Depot area, hectares	59	6
Project Cost*	Bt. 46.0 B	P 2.201 B
Fare	Bt. 4 + 1/km	P 6.00
Present Status	Construction	Operational
Target Dates	late 1997	December, 1996
- event	Start of operation	Capacity expansion

Notes: * LRT Line 1 cost of P 2.201 Billion is based on 1980 prices. Studies in 1986 showed an approximate cost of P 3.3626 Billion considering devaluation of currency.

Sources:
- Prof. Tony M. Ridley, Bangkok Advice on Rationalisation of Rapid Transit Systems: Recommendations, September, 1992.
- Light Rail Transit Authority Brochure, July, 1983.

With respect to the land acquisition policy of the government, the E.T.A. will first advance the cost of land acquisition which was about 22.436 Billion Baht. The private firm or the BECL will then return the cost on privatization basis during the 30-year concession period. The E.T.A. coordinated with the National Housing Authority(N.H.A.) of Thailand to avoid trouble on land expropriation along the right-of-way of the SES.

The construction of the SES was completed in May of 1993 ahead of the scheduled opening in September of 1993. The operator, BECL wanted it opened in May but the E.T.A. wanted it to be formally opened to traffic in September.

The planned toll fee was set at 30 Baht but it was not approved and now there is discussion of reducing it to 20 Baht. It is at this stage that political pressure affects such important planning policies to make the expressway systems efficient.

The Don Muang Tollway(DMT)

The main objective for the construction of this tollway is to link the First Stage Expressway System with the Don Muang Airport or the Bangkok International Airport.

The construction of the DMT also followed the new government policy of privatization of transport infrastructure projects. An invitation in September of 1987 led to a preferred bidder, the Don Muang Tollway Company(DMTC), selected in March of 1988. The contract runs 25 years from signing, included opening tolls, toll review dates and amounts, and for toll increases and unforeseen construction of rival roads , a re-negotiation of contract should occur. The Department of Highways(DOH) is the responsible agency for the supervision of the project. It mainly passes over the Main Airport Road.

At present, it is at construction stage and it is expected to be completed on the middle of 1993.

The Ramindra-Atnarong Expressway System(RAE)

The responsible agency for the RAE project is the Expressway System Project Office under the E.T.A. being a government project.

The E.T.A. proposed the Draft Royal Decree for land expropriation to the Cabinet and was approved in 1990. In November of 1990, the E.T.A. signed an agreement with an engineering consultant to conduct the engineering detailed design of the project. The E.T.A. then signed a loan agreement with the Overseas Economic Cooperation Fund (OECF) in 1991 for the financing of cost of construction and supervision. The E.T.A. will supervise the contractor in the construction stage. In July of 1992, it was at its land acquisition stage and invitation to prequalify to bid for engineering supervision and construction was done. Construction starts in 1993 and it is expected to be opened to traffic in 1996.

The Third Stage Expressway System(TES)

The responsible agency for this project is the E.T.A. through its Technical and Planning Division under the Technical Department. In determining the route alignment, the E.T.A. commissioned the engineering faculty of the Chulalongkorn University to conduct pre-feasibility study of the TES project. There were four corridors proposed consisting priority and non-priority corridors.

In line with the government policy of encouraging the private sector involvement in transport infrastructure projects, the E.T.A. board invited the private sector on the privatization of the first two priority corridors.

The objectives of having the private sector invest in the TES are to alleviate the investment burden of the government and to have the private sector participate in the development of the nation's transportation system and expedite the expansion of the expressway network. To achieve these, the role of the private sector is enumerated as follows:

a) to study the feasibility study, environmental impact assessment, engineering and detailed design of the project
b) invest in construction of civil works, procurement, supply and installation of electromechanical work, toll system equipment, communication system, traffic control system in accordance with E.T.A. standards
c) operate and maintain the TES
d) establish and collect tolls and other revenues from the operation and related functions in right-of-way areas within the investment period.

The E.T.A. also enumerated the requirements of the TES investment package:

a) land acquisition will be first shouldered by the E.T.A.
b) the government shall not make grant or subsidy to the investor
c) the investor shall be responsible for construction, operation and maintenance costs
d) the investor shall reimburse the land acquisition cost together with interest
e) the investor shall have rights to set up toll rates at suitable level
f) the investor can collect toll charges for a period of 30 years starting from construction date
g) the investor shall get first priority in any construction extension related to the project if condition is not less favorable to E.T.A. or any other candidate.

The E.T.A., as of July of 1992 was awaiting the resolution of the Council of Economic Ministers.

The Fourth Stage Expressway System(FSES)

The responsible agency is the Technical and Planning Division under the Technical Department of the E.T.A.

The feasibility study, environmental impact assessment of the FSES project will use data analysis on transportation system in Bangkok and 20 adjacent provinces. The E.T.A. invited consulting engineering firms to submit proposals about planning and feasibility study of FSES and the environmental impact assessment based on the guidelines of the Office of Environmental Policies and Planning(OEPP) and financial study of the project.

The FSES will be privatized after approval of study . The investor would be selected to conduct engineering and detailed design. After land acquisition and construction, it would be open to traffic in 1997.

The Hopewell System(HW)

The State Railway of Thailand(SRT) is the agency responsible for the project which consists of railway and freeway. The main objectives of the proposal are to provide urban freeway network and local ground level local roads to releive traffic congestion and provide capacity for anticipated economic growth.

The Ministry of Transportation and Communication's(MOTC) policies include a 30-year concession period inclusive of construction to operate mass transit services on elevated track and management of toll roads and development of four tracts of SRT lands totaling 39.6 hectares.

The Hopewell project proposed an 8-year construction of 60 kilometers of elevated railway and mass transit services and 56.8 kilometers of expressway above the railway. The proposal provided for the BMTA Bus Terminus and ample parking facilities.

The financing would be split into two components. The 50% would come from abroad consisting of equity and loan. The other 50% would come from local borrowings.

The Khlong Saen Saep Tollway(SST)

The Department of Highways(DOH) would be the responsible agency for this project. This project proposal came from the private sector in 1987. The DOH in January of 1990 invited bids for construction and operation of 13 kilometers of expressway above Khlongs Saen Saep, Maha Nak and Tan.

The Bangkok Communication and Transportation System Company, Limited(BCTS) was the sole bidder for a total cost of 2.5 Billion Baht.

For a summary of the expressway projects in Bangkok; please see Table 14 of this paper.

2) EXPRESSWAY PROJECTS IN MANILA

The Manila South Tollway(MST)

The Manila South Tollway BOT Project is proposed combined ground level and elevated expressway project with route along the existing South Luzon Expressway(SLE) from Alabang Interchange to President Quirino Avenue. This is a BOT project. The rationale of the project is that it will provide a continuous and uninterrupted route through an expressway link between Metro Manila and the emerging industrial areas of CALABARZON at its south end and the resource-rich and food-producing provinces of Southern Tagalog and the Bicol Region.

This project involves the construction of four-lane, two carriageway elevated expressway from Alabang in Muntinlupa to President Quirino Avenue in the city of Manila utilizing the right-of-way of the Philippine National Railways(P.N.R.) Lines running parallel to the existing SLE. Included in the B.O.T. project is the rehabilitation of the reverted section of the SLE or the existing ground level expressway from Alabang to Quirino Avenue. This portion is a BOT project wherein the private contractor will rehabilitate the expressway, install traffic management system and facilities, maintain and collect toll from vehicles using it.

As of present, the feasibility study, the draft final report, the detailed design and engineering components have been completed by the consulting engineering firms headed by Louis Berger International, Incorporated and Pacific Consultants, International, Incorporated.

The lead agency for the MST Project is the BOT Project Management Office under the DPWH(BOT-PMO-DPWH) which also handles all the BOT-type infrastructure projects.

Manila-Cavite Expressway

The first phase of this government project was the construction of the Manila-Cavite Coastal Road running from the end of Roxas Boulevard in Paranaque up to Bacoor Junction in Cavite. It was opened to traffic in 1987 and at present, it is still in its finishing stage by the contractor the Philippine National Construction Corporation(P.N.C.C.). The

TABLE - 14. A SUMMARY OF EXPRESSWAY PROJECTS IN BANGKOK

EXPRESSWAY PROJECT	FES	SES	TES	SST	HW	FSES	RAE	DMT
AGENCY	EMD-ETA	ESPO-ETA	TPD-TD-ETA	DOH	SRT	TPD-TD-ETA	ESPO-ETA	DOH
OPERATOR or CONCESSIONAIRE	ETA	Bangkok Expressway Co., Ltd.	Obayashi-Italian -Thai Joint Venture	Bangkok Comm. and Trans. System Co.,Ltd	Hopewell Holdings, Incorporated		ETA	Don Muang Tollway Co., Limited
NO. OF LANES and TYPE OF STRUCTURE	6lanes: dual;elevated	6lanes: dual; elevated		4 lanes dual;elevated	6 lanes dual;elevated		6 lanes dual; elevated	6 lanes dual; elevated
PRIORITY SECTION LENGTH(km.)	27.1	31.8	31.0	13.0	57(or 46)		18.7	19.5
PROJECT NATURE	Gov't Project	BOT (30 years)	BOT(30 years)	BOT	BOT:30 years	BOT	Government Project(OECF)	BOT(25 years)
TOLL RATES	4W veh=15 baht 6/10W veh=20 baht >10W veh=30 baht	30 baht						
TOTAL COST (EXCLUDING LAND COST) in BAHT	6.867 billion	27.5 billion		2.5 billion	80 billion including land acquisition cost		26.617 billion	10.0 billion
PROJECT STATUS	construction completed; opened to traffic in 1987	construction completed in May 1993 but still not open to traffic	planning stage	Planning Stage	Planning Stage	Planning Stage	Construction Stage;due 1996	Construction Stage;due 1993
DESIGN SPEED	80 kph	80 kph		80 kph	80 kph		80 kph	80 kph
NO. OF TOLL PLAZAS		23		NA	NA		7	9
LAND ACQUISITON COST in BAHT		22.436 Billion					16.0 Billion	
NON-PRIORITY SECTION	None	eastern corridor	western corridor	7 km. more	None		None	None

Sources: Expressway and Rapid Transit Authority of Thailand. ROLE, FUNCTION AND PROJECTS CONCERNED. July, 1992

Wilbur Smith Associates. ADVISORY CONSULTING SERVICES FOR THE COORDINATION OF EXPRESSWAY AND MASS RAPID TRANSIT MEGAPROJECTS IN BANGKOK: Final Report, Volume II: Technical Appendices. December, 1991

PNCC in 1993 would be installing a toll plaza at Bacoor to collect toll from vehicles for the maintenance of the expressway.

The second phase of the project involves the construction of a four-lane ground level expressway which starts from the end of the R-1 Expressway in Talaba, Bacoor and continue westward direction about 200 to 300 meters from the existing shoreline traversing the proposed reclamation to be undertaken by the Public Estates Authority. It runs in the southwest direction, cutting through the Bacoor Bay traversing built-up areas until it connects with the Noveleta-Rosario Diversion Road.

East Luzon Expressway - A

EDSA to C-5 along Ortigas Avenue: This project involves the construction of a four-lane expressway along Ortigas Avenue from EDSA up to the proposed alignment of the Circumferential Road 6(C-6).
C-5 to C-6: This involves the construction of a four-lane expressway along Boni Serrano Avenue from EDSA to Circumferential Road 5(C-5) and along Marcos Highway from C-5 to Sumulong Highway.

East Luzon Expressway - B

EDSA to C-6 along Santolan Avenue: This project will provide a four lane expressway from EDSA to C-6.
C-5 to Sumulong Highway along Marcos Highway: This will provide a four-lane expressway along Marcos Highway from C-5 to Sumulong Highway.

C-5 from Radial Road 1(R-1) to South Luzon Expressway:

This involves the construction of a tollway between R-1 Expressway and the South Luzon Expressway and construction of interchanges at intersection with the South Luzon Expressway and Benigno Aquino Avenue.

This project already has funding from the Overseas Economic Cooperation Fund.

C-2/C-3 Expressway

R-3 to Nagtahan Link Road: This project will construct a tollway from the intersection of Quirino Avenue and the South Luzon Expressway and then turns right to the proposed Nagtahan Link Road.
Nagtahan Link Road to North Luzon Expressway in Balintawak: This will involve the construction of tollway from the end of the propsed Nagtahan Link up to Valenzuela Street in Sta. Mesa and then it will turn towards the San Juan River and then travels on a northly direction up to San Francisco Street until it ends in Balintawak Interchange.

Through comparison, it can be stated that Bangkok is advanced in terms of building and planning urban expressways. The plans and policies for implementation, operation and maintenance of expressways specially the BOT policies are already established. Manila, therefore, must follow Bangkok since traffic accompanying economic development would be serious traffic congestion. An expansion of the expressway network within the metropolitan area and to the eastern areas is necessary to augment existing north and south expressways.

The toll rate for Manila expressways is about 2.25 Pesos for a length of 5 kilometers which is very low compared to Bangkok's flat toll of 15 Baht for the same length of expressway. Manila's toll rate must be increased so that motorists can benefit more from a better maintenance. Also, a flat toll rate system must be instituted such that high-earning sections of the expressway could subsidize low-earning sections in terms of maintenance. This is a form of cross-subsidy.

The cross-subsidy policy is already implemented in Japan. The profit gained from the high-revenue sections of the expressway covers the deficit incurred in low-revenue sections. It is also used for investing on new expressways. The advantage of this policy is that the expansion of the network can continue.

5. FINANCIAL INSTITUTION FOR TRANSPORTATION INFRASTRUCTURE

Transportation problems in Manila and Bangkok will become more serious with the expected increase in population and motorization in the near future, and these problems will consist the bottle-neck of economic growth and improvement of the quality of people's life. A similar situation exists in other metropolitan areas in Asian countries owing to a lack in financial resources and rapid motorization. The first priority policy which is believed to be the most effective solution to this problem is the BOT (Built-Operate-Transfer) Scheme. Although the BOT Scheme as a policy is attractive enough to encourage the private sector to get involved with its many infrastructure projects, additional efforts of the government are still essential to solve financial difficulties.

In Japan, many kinds of government institutions have been established after World War II to solve the problems of transportation like those of finances and infrastructure. They are as follows:

Road Institutions:

(1) Road Development Special Account with revenues from gas and automobile-related taxes and with expenditures reserved for general road projects costs of the central government, for subsidy to the road works of local governments, for government capital for public highway corporations, and for public loan for road-related projects such as parking, roadside improvement, technical development, and so on.

(2) Land Readjustment Institution (Kukaku-Seiri) which aims to improve road network in urban areas. This institution enables the united development of new public facilities and private housing lot simultaneously by replotting system. Land owners acquire new lots which are smaller than but whose costs are similar to their previous ones under the increasing prices due to the addition of public facilities. These facilities are developed through land contribution of the landowners and by subsidy from the abovementioned Special Account System.

(3) The toll road systems which were established in order that four public corporations, one private corporation and many local road authorities can construct toll roads with financial assistance from the central and local governments in terms of equity, subsidy, government loan, government guaranteed bond, and so on. The toll is set so as to redeem the loan for construction and to settle maintenance and operation costs in 30 years. The cross subsidy is permitted between highway routes belonging to the same corporation. Therefore, the old route continues to serve as a toll road over the period of redemption in order to cover for the newly constructed route.

Railway Institutions:

(1) The Railway Improvement Fund which is derived from the general tax revenue and sales revenue of existing bullet railway infrastructure to JRs and which supports the construction and improvement of intercity and urban railways. (Figure-1 and Table-15)

(2) Special Railway Urban Fund with additional revenues from additional fare permitted for future large-scale improvement through railways and which is stocked without tax.

(3) Institutions for direct or indirect compensation from beneficiaries.(Table-16)

Airport Institution: Airport Development Special Account

Port Institution: Port Development Special Account.

The financial institutions suitable to every kind of transportation infrastructure differ because of historical backgrounds. Competition between ministries and bureaus fosters the development of various kinds of financial institutions for the improvement of all transport systems under the lack of general tax revenues. However, there are basic principles which should be followed by these financial systems:

(1) Beneficiaries' pay principle
- Special account system
- Compensation from all beneficiaries including users, land-owners, land-use developers, and so on.

(2) Cross subsidy for projects in the same account.

(3) Combination of the Subsidy by the central government and local government for curbing the requirement of the local government.

(4) Involvement of the private sector.

(5) Combination of subsidy, public loan and private loan in order to reduce public expense.

The special account systems have some disadvantages such as the lack of general tax revenue, the lack of flexibility of expense and the difficulty of designing comprehensive policies. Therefore, they have initially been approved only as temporary policies with a 5-year span. However, they are extended after every five years because of the following advantages:

(1) Efficient use of budget: because independent systems with special financial resources came from each user, the allocation of budget has been consistent with demand.

(2) Continuation of transportation infrastructure policies: to implement each master plan, the long-term investment policies have been supported by the established financial resources.

In order to solicit adequate contributions for many kinds of transportation projects from the central government, local government and the private sector, different kinds of

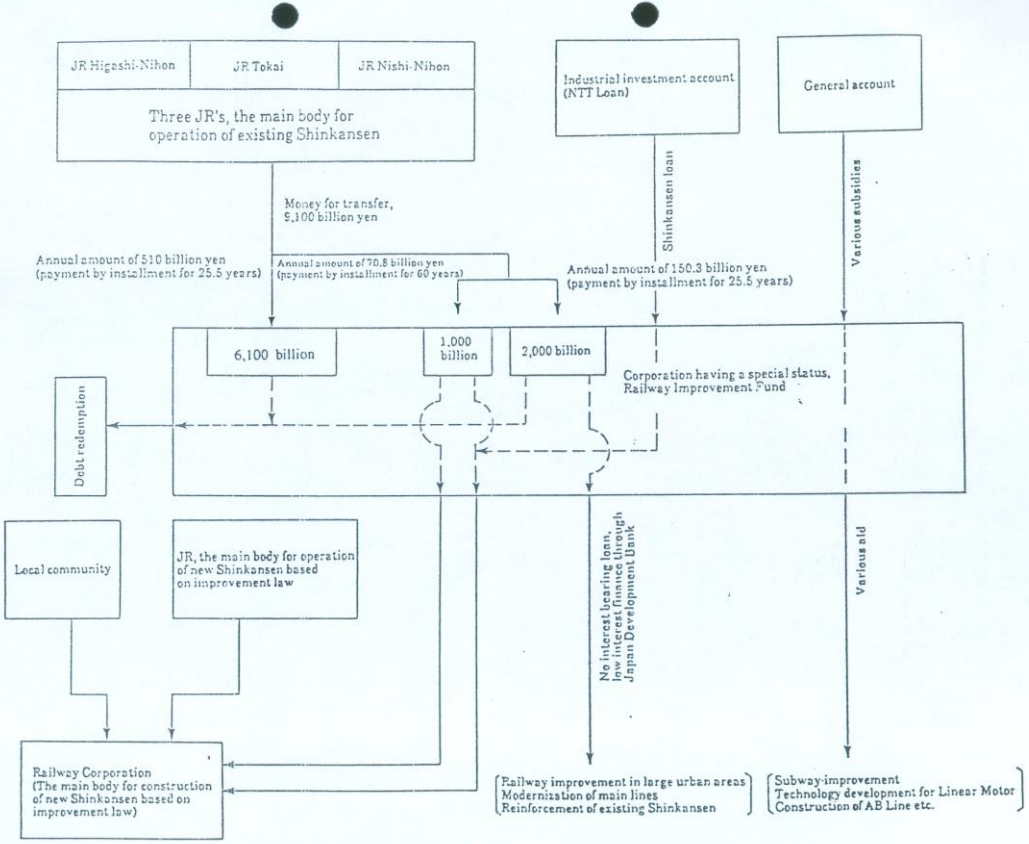

Fig.-1 Aid Flow by Railway Improvement Fund

Table-15 Urban Railway and Track Assistance System

Items	Contents of assistance
. Construction and improvement of subways	70% of qualified construction costs will be paid equally by the central and municipal governments in ten-year installment subsidies.
New town railways	36% of qualified construction costs will be subsidized by the central and municipal governments in a six-year installment from the year following the commencement of operations, provided that new town developers pay part of construction costs.
Private railway line construction by Japan Railway Construction Public Corporation	Japan Railway Construction Public Corporation constructs railway facilities and will transfer them for a 25-year equal redemption of the principal and interest. In this case, interest that exceeds 5% will be equally subsidized by the central and municipal governments.
Monorail right-of-ways, etc. (public and quasi-public)	The objective is to ensure smooth road traffic by such means as monorails or often automated guideway systems. Qualified infrastructure construction costs will be subsidized by the central and local governments. Amount of subsidy will be 44.9% of total construction costs, 2/3 paid by the central government and 1/3 by municipal governments.

Table-16 Some Examples of Value Capture of Urban Railways in Japan

1. Below are some examples of direct compensation from beneficiaries to railway carriers.

Developers

- Partial payment of railway construction cost by developers of new towns
  (Examples: Senpoku rapid railway, Hokuso Kaihatsu railway, etc.)
- Agreement to pay between developers and railway carriers
  (Examples: Chiba New Town Railway and the Nissei Line of Nose Electric Railway)
- Acquirement of railway right-of-way by land readjustment projects

Specific beneficiaries other than developers → **Railway Carriers**

- Voluntary payment based on an agreement between beneficiaries and railway carriers.
  (Examples: Sharing of subway station construction costs by building owners, etc.)

Nonspecific beneficiaries

- Petitioned station formula

2. Below are some examples of indirect compensation by municipalities.

<< Absorption Formula >>

Developers

- Payment by developers based on housing land development guidelines, etc.
  (Example: The Seishin line of the Kobe municipal subway)

Specific beneficiaries other than developers

- Imposition of beneficiary charges based on the former law for municipal planning
  (Example: The Midosuji line of the Osaka municipal subway)

Nonspecific beneficiaries

- Special local taxation fund
  (The use of a certain percentage of a specific local tax increase or of increased tax revenue for the construction and improvement of railways)
  (Examples: Subways in Sendai, Fukuoka and Kitakyushu)

<< Assistance Measures >>

Assistance at construction stage

- Investment (includes investment in kind of land for railways)
- Construction loans at no interest or at low interest rates
- Construction cost subsidies
- Transfer of station buildings and railway land
  (petitioned station formula)

Municipal Governments → Railway Carriers

Assistance at operating levels

- Operating cost subsidies
- Loans for operating funds at no interest on low interest rates

institutions and operating bodies for each transport infrastructure project have been established (Table-17). These institutions will also vary for every country because of differing historical backgrounds and socio-economic situations. The point however is that some financial institution is required to supplement a BOT Scheme in order to effectively improve transport systems.

6. CONCLUSION

We can identify the following key issues from the discussion in this paper:

(1) The serious transportation problems looming in the future especially for the metropolitan areas have to be recognized considering the world-wide trend in urbanization.
(2) The urban railway network and the urban expressway network are essential to effectively manage transportation with acceptable time distance in large-scale metropolitan areas. Both railway and road network should consist their hierarchy systems. We can learn these from examining the different investment policies in Bangkok, Manila and Jakarta.
(3) In order to attain a higher level of service in transportation, liberalization, privatization and involvement of the private sector in transportation projects are necessary. In addition, policies which give incentives to operators to improve the level of service should be implemented. We can learn this from the experience of taxi and bus policies in Bangkok.
(4) The BOT Scheme involving the private sector seems to be the best method for the improvement of transport systems in developing countries. However, it should be considered that not all essential tasks can be implemented through the BOT Scheme. Therefore, organized efforts similar to the Japanese policies for transportation infrastructures should be considered in order to obtain more funding from the government. In this regard, a flexible combination between the public and private sector should be developed.
(5) Fare policies are still very important to the efficiency of transport operators and to the prevention of monopoly problems. However, we also have to take into account the effect of very low fares and lack of financial resources to the level of service as inferred from the comparative transportation studies of Bangkok, Manila and Jakarta. More of the burden of cost should be shouldered by the beneficiaries so that serious transport problems in the future can be prevented.

ACKNOWLEDGEMENTS

The author is deeply indebted to Mr. Prachod Krainetr, Senior Land Transport Expert, Department of Land Transport, Thailand, and Mr. George D. Esguerra, Direçtor of Transportation Planning Service, Department of Transportation and Communications, the Philippines, and other Government officers who gave me a lot of valuable information and suggestions. Many thanks also to the following graduate students of transportation engineering at U.P. Diliman: Mr. Crispin Emmanuel D. Diaz, Mr. Jose Regin F. Regidor, Mr. Karl N. Vergel and Mr. Noriel Christopher C. Tiglao, and Miss Ma. Antonia V. Bornas for their contributions to the discussions and the analysis of the transportation policies.

Table-17 Operation Bodies for Each Project of Transport Infrastructure

TRANSPORT INFRASTRUCTURE	PROJECTS OF TRANSPORT INFRASTRUCTURE	OPERATING BODY
RAILWAY	·URBAN RAILWAYS	·Japan Railway Construction Corporation(JRCC), Private Railway Company,Teito Rapid Transit Authority, Public Metro Company,The Third Sector,Special Company(JR)
	·LOCAL RAILWAYS	·JRCC,Private Railway Company,The Third Sector,JR
	·NATINAL TRUNK RALWAYS	·JRCC,JR
AIRPORT	·AIRPORT PROJECT	
	·FIRST CLASS AIRPORT	·Ministry of Transport,Public Corporation,Special Company, Private Company
	·SECOND CLASS AIRPORT(TYPE-A)	·Ministry of Transport,Private Company
	·SECOND CLASS AIRPORT(TYPE-B)	·Local Public Body,State,Private Company
	·THIRD CLASS AIRPORT	·Local Public Body,State,Private Company
	·COMMUTER AIRPORT	·Local Public Body,Private Company,(Ministry of Transport)
	·HELIPORT	·Local Public Body,Private Company
	·AIR ROUTE PROJECT	·Ministry of Transport
PORT	·PORT PROJECT	·Ministry of Transport,Local Public Body
	·LOAN PROGRAM FOR TERMINAL IMPROVEMENT	·Port Terminal Corporation,Ferry Terminal Corporation, Container Terminal Co.Ltd,Marina Co.Ltd
	·PROJECTS FOR PROMOTING PORT FACILITIES, SWEET PORT AREA PROJECT	·Local Public Body
	·PROJECTS OF LOCAL GOVERNMENT	·Local Public Body
	·PROJECT OF SPECIFIC FACILITIES DESIGNATED BY PROVISIONAL MEASURES LAW, PROJECT RELATED TO MULTI-POLAR PATTERN NATIONAL LANDFORMATION PROMOTION, THE COMPREHENSIVE RESORT AREA PROJECT	·The Third Sector,Private Company
ROAD	·GENERAL ROAD PROJECT	
	·NATIONAL ROAD	·Ministry of Construction,Prefecture,Special City
	·PREFECTURAL ROAD	·Prefecture
	·MUNICIPALROAD	·Municipal
	·TOLL ROAD PROJECT	
	·NATIONAL EXPRESSWAY	·Japan Highway Public Corporation(JHPC)
	·URBAN EXPRESSWAY	·Metropolitan Expressway Public Corporation, HanshinExpressway Public Corporation, Special City Expressway Corporation
	·HONSHU-SHIKOKU ROAD BRIDGE	·Honshu-Shikoku Bridge Authority
	·TRANS-TOKYO BAY HIGHWAY	·JHPC,The Third Sector(Trans-Tokyo Bay Highway Corporation)
	·GENERAL TOLL ROAD	·JHPC,Local Toll Road Corporation,Prefecture,Municipal
	·TOLL ROAD BRIDGE	·Prefecture,Municipal
URBAN ROAD	·STREET PROJECT	·Local Public Body,Housing and Urban Development Corporation (HUDC),The Third Sector
	·LAND READJUSTMENT PROJECT (KUKAKU-SEIRI PROJECT)	·Private,Union,Local Public Body,Administrative Ministry, HUDC,Japan Regional Development Corporation(JRDC),Local Housing Supply Corporation(LHSC)
	·URBAN REDEVELOPMENT PROJECT	·Private,Urban Redevelopment Union,Local Public Body,HUDC, JRDC,LHSC,Metropolitan Expressway Public Corporation, Hanshin Expressway Public Corporation
NEW TRANSPORT SYSTEM	·MONORAIL ROAD PROJECT	·Local Public Body,The Third Sector
PARKING	·ON-STREET PARKING PLACE	·Local Public Body
	·CITY PLANNING PARKING PLACE	·Local Public Body,Public Corporation,Public Company,Private

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