

Republic of the Philippines

**DOTC*MMDA*DPWH*NEDA*PNP-NCR*HUDCC*UP-NCTS*EMB
Japan International Cooperation Agency (JICA)**

**METRO MANILA
URBAN TRANSPORTATION
INTEGRATION STUDY**

TECHNICAL REPORT NO. 7

**TRANSPORTATION
PROJECT REVIEW**

March 1999

mmutis

MMUTIS STUDY TEAM

SSF
JR
99-036 (10/16)

TABLE OF CONTENTS

	Page No.
1 INTRODUCTION	1-1
1.1 Objectives.....	1-1
1.2 Coverage.....	1-1
2 EXISTING TRANSPORTATION PROJECTS	2-1
2.1 Roads.....	2-1
2.1.1 Present Road Network.....	2-1
2.1.2 Existing Road Projects	2-4
2.2 Rails.....	2-13
2.2.1 Present Condition	2-13
2.2.2 Existing / Proposed Rail Projects	2-15
2.3 Ports.....	2-23
2.3.1 Present Condition	2-23
2.3.2 Development Plans and Programs for the Port of Manila.....	2-24
2.4 Airport	2-29
2.4.1 Present Condition	2-29
2.4.2 Development Plans and Programs for NAIA.....	2-29
3 REVIEW OF THE PROJECTS	3-1
3.1 Legal / Institutional Aspect	3-1
3.1.1 BOT Law	3-1
3.1.2 Toll Regulatory Board.....	3-3
3.1.3 Project Risk	3-4
3.2 Project Integration Aspect.....	3-5
3.2.1 Physical Aspects.....	3-6
3.2.2 Operational Aspects	3-8

LIST OF TABLES

Table No.	Title	Page No.
1.1	Coverage of Transportation Project	1-1
2.1	Existing Major Road Network in Metro Manila	2-2
2.2	On-going Major Toll Road Projects.....	2-8
2.3	Proposed Major Toll Roads Projects.....	2-9
2.4	Major On-going Road Projects	2-11
2.5	Major Proposed Road Projects.....	2-12
2.6	Rail Transportation Projects (On-going).....	2-20
2.7	rail Transportation projects (Proposed).....	2-21
2.8	Statistics of Manila Port (1996)	2-24
3.1	Inflation Rate for the Philippines and Metro Manila	3-4

LIST OF FIGURES

Figure No.	Title	Page No.
2.1	Existing Major Road Network in Metro Manila	2-3
2.2	On-going / Proposed Toll Road Projects.....	2-10
2.3	Existing Rail Network.....	2-14
2.4	Future Rail Transport Network	2-22
2.5	Location of the Port of Manila	2-26
2.6	South Harbor Expanded Port Zone (SHEPZ) Development Plan.....	2-27
2.7	Master Plan of Port of Manila.....	2-28
2.8	Location of Existing / Planned Terminals.....	2-30
2.9	Planned NAIA 2 Terminal	2-31
2.10	Planned NAIA 3 Terminal	2-32
2.11	Planned New ICT	2-32
3.1	Location of Terminal Sta. Line 1 (Doroteo Jose) & Line 2 (Recto)	3-7
3.2	Location of Terminal Stations of Line 2 and Line 3 (Cubao).....	3-9

LIST OF ABBREVIATIONS

EDSA	Epifanio de los Santos Avenue
NLTE	North Luzon Toll Expressway
SLTE	South Luzon Toll Expressway
DPWH	Department Of Public Works and Highways
URPO	Urban Roads Project office
PNCC	Philippine National Construction Corp.
PEA	Public Estates Authority
ETC	Electronic Toll Collection
AVI	Automatic Vehicle Identification
BOT	Build-Operate and Transfer
MCCR	Manila-Cavite Coastal Road
PNR	Philippine National Railway
HUDCC	Housing and Urban Development Coordinating Council
NHA	National Housing Authority
MMT	Metro Manila Tollway
LBCR	Laguna de Bay Coastal Road
CLE	Cavite-Laguna Expressway
MMSP	Metro Manila Skyway Project
MLN	Main Line North
MLS	Main Line South
MICT	Manila International Container Terminal
LRT	Light Rail Transit
OECF	Overseas Economic Cooperation Fund
LRTA	Light Rail Transit Authority
AFCS	Automated Fare Collection System
BLT	Build-Lease and Transfer
MRT	Metro Rail Transport
MCRRS	Manila-Clark Rapid Railway System
BCDA	Bases Conversion Development Authority
MCX	Manila-Calabarzon Express
NEDA-ICC	National Economic Development Authority-Investments Coordinating Committee
DOTC	Department of Transportation and Communication
PPA	Philippine Ports Authority
MICT	Manila International Container Terminal
ICTSI	International Container Terminal Services Inc.
SHEPZ	South Harbor Expanded Port Zone
NAIA	Ninoy Aquino International Airport
PD	Presidential Decree

1. INTRODUCTION

1.1 Objective

In the future demand analysis stage, future transportation network for both road and public transport shall be prepared. Recently, a lot of projects related to transportation such as roads, rails and terminals have been proposed both by the government and private sector. They are in various stages, however, some of them are on-going while others are merely being planned. Furthermore, even if it is an on-going project, it seems that the completion of implementation will be delayed because of the difficulties in funding, right-of-way acquisition and construction, and many others.

In the Progress Report I of MMUTIS in January 1997, a long list of transportation projects has been prepared. Technical Report No.7 entitled, "Transportation Project Review", focused on some of the big transportation projects which extremely affect the structure of the future transportation network in the study area of MMUTIS. In the preparation of the short list, most of the projects on transportation infrastructure development would be selected for review.

The schedule of selected projects should be preliminarily assessed in terms of the aspects from financing and problems in preparation and implementation such as formulation of implementation body, funding, licensing procedure and right-of-way acquisition, and many more. In addition, integration with existing transportation network and other projects should be pointed out i.e., fare system, transferring between lines, interchanges, and others.

1.2 Coverage

In this technical report, transportation projects planned in the study area have been covered. The following types of projects related to transportation should be reviewed.

TABLE 1.1
COVERAGE OF TRANSPORTATION PROJECT

Type of Transportation	Project Type
Toll Road	New Construction Widening/Rehabilitation
Ordinary Road	New Construction Intersection / Flyover Widening/Rehabilitation
Rail	New Construction Capacity Expansion/Rehabilitation
Terminal (Sea/River Port, Airport)	New Construction Expansion/Rehabilitation

2. EXISTING TRANSPORTATION PROJECTS

2.1 Roads

2.1.1 Present Road Network

The existing major road network in Metro Manila consists of ten radial roads (R-1 to 10) and five (5) circumferential roads (C-1 to C-5) emanating from the traditional Central Business District in the City of Manila as shown in Table 2.1 and Figure 2.1. Some sections of these major roads are still incomplete. C-4, called EDSA, is the main circumferential road with six lanes per direction including two bus priority lanes and absorbs a traffic volume of more than 100,000 vehicles per day.

The major road network in Metro Manila is well formulated, however, it is still to be completed. The radial roads are mostly developed, however, development of the circumferential roads is still less than halfway to be completed for the time being. Although, these incomplete sections are under construction or in the pipeline, the overall progress tends to be delayed due mainly to the right-of-way acquisition, squatter problems, and many others.

In addition to the major roads, two toll expressways are existing. The North Luzon Toll Expressway (NLTE) with 80-km provides highway service between Balintawak, Metro Manila to Sta. Ines, Pampanga through the province of Bulacan while the South Luzon Tollway Expressway (SLTE) is operating with 42-km from Nichols, Metro Manila to Calamba, Laguna.

TABLE 2.1
EXISTING MAJOR ROAD NETWORK IN METRO MANILA

Major Road	Street Name
R-1	Roxas Blvd. (Delpan Bridge – Seaside Rd.) R1 Extension (Seaside Rd. – Bacoor, Cavite)
R-2	Taft Ave. (Lawton – Baclaran)
R-3	Manila South Expressway (Pres. Quirino – Zapote-Alabang Rd.)
R-4	Pasig Line (Pedro Gil St. - A. Francisco St.) Kalayaan Ave. (A. Francisco St. – Bel Air SD) Kalayaan Ave. (EDSA - C5)
R-5	V. Mapa St. (R. Magsaysay Blvd. - Valenzuela St.) P. Sanchez (Valenzuela St. - Gen. Kalentong St.) Shaw Blvd. (Gen. Kalentong St. – Capt. Javier St.) Pasig Blvd. (Capt. Javier St. - Dr. Sixto Antonio Ave.)
R-6	Legarda St. (C. M. Recto Ave. – Nagtahan) R. Magsaysay Blvd. (Nagtahan - V. Mapa St.) Aurora Blvd. (V. Mapa St. – Marcos Hway) A. Bonifacio Hway/Sumulong Hway (Marcos Hway - Marikina Boundary)
R-7	Lerma St. (Quiapo – Morayta St.) España Ave. (Morayta St. – E. Rodriguez Ave.) Quezon Ave. (E. Rodriguez Ave. – Elliptical Rd.) Commonwealth Ave. (Elliptical Rd. – Fairview Ave.)
R-8	Quezon Blvd. (Quiapo – Dapitan St.) Alfonso Mendoza Ave. (Dapitan St. – Laong Laan St.) Dimasalang St. (Laong Laan St. – Retiro St.) A. Bonifacio Ave. (Retiro St. – EDSA) Quirino Ave. (EDSA – Quezon City Limit)
R-9	Jose Abad Santos Ave. (C. M. Recto Ave. – Aurora Blvd.) Rizal Ave. Ext. (Aurora Ave. – EDSA) McArthur Hway (EDSA – Bulacan Boundary)
R-10	R-10 Rd. (Del Pan Bridge - Spine Rd.)
C-1	Padre Burgos St. (Roxas Blvd. – Taft Ave.) Ayala Blvd. (Taft Ave. – Echague St.) P. Casal St. (Echague St. – Legarda St.) C. M. Recto Ave. (Legarda St - R-10 Rd.)
C-2	Pres. Quirino Ave. (Roxas Blvd. – Mendoza-Guanzon St.) Nagtahan (Mendoza-Guanzon St. – Legarda St.) Alfonso Mendoza St. (Legarda St. – Dimasalang St.) Tayuman St. (Dimasalang St. - R-10 Rd.)
C-3	Sen Gil Puyat Ave. (Roxas Blvd. – Ayala Ave.) San Juan Bridge (N. Domingo St. – Aurora Blvd.) G. Araneta Ave. (Aurora Blvd. – Sgt. Rivera St.) Sgt. Rivera Ave. (G. Araneta Ave. - A. Bonifacio Ave.) C-3 Road (R-10 Rd. - A. Mabini Ave.)
C-4	EDSA (Taft Ave. – McArthur Hway) Samson Rd. (McArthur Hway - A. Mabini Ave.) Letre Rd. (A. Mabini Ave. – Sansiangco St.)
C-5	E. Rodriguez Ave. (Pasig Blvd. - B. Serrano Ave.) B. Serrano Ave. (E. Rodriguez Ave. – Katipunan Rd.) Katipunan Rd. (B. Serrano Ave. - P. Tuazon St./Aurora Blvd. - Commonwealth Ave.)

FIGURE 2.1
EXISTING MAJOR ROAD NETWORK IN METRO MANILA



2.1.2 Existing Road Projects

In the study area of MMUTIS, there are a number of on-going/proposed road projects for ordinary roads which are implemented by DPWH-URPO and a number of toll road projects by joint venture companies between government agencies such as PNCC, PEA, and many others and private sector investor under BOT scheme arrangement. Project type is classified as follows:

- New construction;
- Widening;
- Interchange/Flyover/Overpass/Underpass; and
- Rehabilitation (Pavement, etc.).

(1) Toll Road Projects

On-going Toll Road Projects

Five on-going toll road projects are listed in Table 2.2 and are shown in Figure 2.2. These are being implemented under BOT scheme. Some projects will connect Metro Manila and provinces while other projects include Metro Manila Skyway, identified as an urban expressway and Pabahay Sa Riles Tollway. The total length of these projects is about 252 kms. The outline of on-going projects are described as follows:

- SLE Extension (Sto. Tomas - Lipa City)

South Luzon Expressway Extension Project involves the construction of 22.16-km, 4-lane expressway (divided highway) from Sto. Tomas to Lipa City with a normal right-of-way width of 60 meters. This also includes four major interchanges at Sto. Tomas, Sambat, Bulihan and Tambo. The section is divided into four contract packages with total estimated cost of P 1,143 million.

- Metro Manila Skyway - Stage 1

Metro Manila Skyway Project involves the construction of a 6-lane elevated toll expressway linking SLE and NLE from Alabang to Balintawak with total length of 34.7 kms. It will be built directly over existing roads to minimize the problem of right-of-way acquisition. The project includes the rehabilitation and upgrading of the existing SLE from Alabang to Nichols to provide all-weather driving.

Stage 1 with length of 9.3 kms from Buendia to Bicutan was given the highest implementation priority to address urgent need to expand the commuter corridor of South Super Highway with traffic volume of 200,000 vehicles per day. Stage 1 of this project is divided into two phases. Phase 1 involves the construction of elevated expressway from Nichols to Buendia and rehabilitation of the existing SLE from Nichols to Alabang. While Phase 2 involves the construction of elevated expressway from Nichols and Bicutan.

There will be three elevated access ramps between Buendia - Ayala Ave., Don Bosco - Amorsolo St. and Bicutan - Soledad Ave. and two on/off ramps located at Magallanes and between Don Bosco and Buendia. For the operation, an Electronic Toll Collection (ETC) system coupled with an Automatic Vehicle Identification (AIV) device for non-stop toll collection system will be installed.

The cost for stage 1 is estimated at P 7,575 million. The project is being implemented by PNCC in joint venture with Citra under BOT scheme arrangement. Construction for Phase 1 is on-going and to be completed in 1998 and construction of Phase 2 will start in 1998 to be completed within 1998.

- Manila - Cavite and C5 Expressway

The project is composed of: 1) construction of a 6-lane C5 Expressway with a total length of 6.0 kms from the existing Manila - Cavite Coastal Road (MCCR) up to the SLE; 2) operation of the 6.6-km tolled MCCR from Seaside Drive to Talaba, Bacoor; and 3) construction of 4-lane tolled MCCR Extension from Talaba up to the Noveleta - Rosario Road running along the shoreline of Bacoor up to Covelandia with a length of 9.54 kms.

The project cost is estimated at P 6,474 million. The project is being handled by PEA in joint venture with Renong Berhad (Malaysian firm) under BOT scheme arrangement. Upgrading of existing MCCR was commenced in 1996. Construction of C5 Expressway and MCCR Extension will start in 1997 to be completed by 1998.

- Pabahay Sa Riles Tollway

The project involves the construction of 16.3-km elevated toll expressway above PNR right-of-way from Samson Rd. Caloocan to Magallanes interchange in Makati. It also includes the construction of low/medium residential and commercial structures along the PNR right-of way outside the 5-meter danger zone from Caloocan to Makati, to provide on site resettlement to about 15,000 squatter families living within the PNR right-of way.

The cost for toll expressway construction is estimated at P 7,769 million. Implementation is being undertaken by PNR/HUDCC/NHA in joint venture with New San Jose Builders. The project is scheduled to be completed by the year 2000.

- C5 Northern Segment / NLE Rehabilitation and Extension / Subic Expressway

The project is composed of: 1) the construction of C5 Northern Segment from Commonwealth Avenue to Letre Road with a length of 21.0 kms ; 2) the rehabilitation of the existing NLE from Balintawak to Sta. Ines and its extension from Bambang to Clark with a length of 96.04 kms; and 3) the construction of the Subic Expressway from San Simon to Subic with a length of 64.2 km. Total length of this project is 181.2 kms.

The costs of the above-mentioned three projects are estimated at P 3,669.5 million, P1,475.5 million and P6,436.8 million, respectively. These projects are being undertaken by PNCC in joint venture with FPIDC under BOT scheme arrangement. Proposed implementation period is from 1996 to 2002 or 6 years, with the NLE and its Extension undertaken from 1996 to 1998, while the Subic Expressway and C5 from 1995 to 2002 and from 1996 to 1998, respectively.

Proposed Toll Road Projects

In addition to the on-going toll road projects mentioned above, a number of other toll road projects are being proposed in the study area as listed in Table 2.3 and shown in Figure 2.1. These are of the highest importance for the future transportation network. They are described below:

- **Circumferential Road 6 (C6) Project**

The general alignment of C6 Project is composed of the following three sections:

Metro Manila Tollway (MMT) with a total length of 38.4 kms, starts from the midpoint of the existing Malinta and Meycauayan Exits of NLE then runs eastward traversing San Mateo. Then it will be running in southeasterly direction crossing the Mangahan in Taguig. From there, the MMT will run along the shoreline of Laguna de Bay to connect passing runs eastward crossing Serrano Road.

Laguna de Bay Coastal Road (LBCR) with a total length of 18.6 kms, will be running along the coast of Laguna de Bay from Bicutan, Taguig to San Pedro, Laguna.

Cavite - Laguna Expressway (CLE) with a length of 19.0 kms, starts from the coast of Laguna de Bay to Cavite traversing mostly agricultural lands and running adjacent of the Orchard Golf Course.

The project costs for three sections of MMT, LBCR and CLE are estimated at P 20,181 million, P11,972 million and P5,037 million, respectively. The proposed schedule of implementation are also from 1997 to 2002, from 1999 to 2001 and 1999 to 2001, respectively. They will be implemented by Citra Metro Manila Tollway Corp., the joint venture company formed by PNCC and Citra Group.

- **Metro Manila Skyway Project - Stage 2 & 3**

In the Stage 2 of MMS Project, the three sections from Alabang to Bicutan with a length of 7.6 kms, from Buendia to P. Quirino Ave. with a length of 2.4 kms and from A. Bonifacio Ave. to NLE with a length of 3.8 kms will be constructed.

While in the Stage 3, the section from P. Quirino Ave. to A. Bonifacio Ave. with a length of 11.59 kms, will be constructed to complete the entire section of the MMS Project.

These stages are being proposed by joint venture of PNCC and Citra. The proposed implementation periods for Stages 2 & 3 are scheduled from 1997 to 1999 and from 1998 to 2000, respectively.

- Metro Manila Expressways (R4: Pasig Expressway & R5: Ortigas Expressway)

These two projects are being proposed by PNCC in joint venture with STRADEC, Marubeni Corp. and Kumagai Gumi Co., Ltd. under BOT scheme arrangement.

The partially elevated 6-lane Pasig Expressway with a length of 16.55 kms, starts at the intersection of Ayala Ave. and Buendia Ave. in Makati and terminates at the intersection of C6 and Ortigas Ave. Extension in Cainta. There will be nine (9) access points and two toll plazas along the expressway.

The proposed Ortigas Expressway is a multi-story structure over the existing Ortigas Ave. Extension from E. Rodriguez (junction with C5) to the C6 Antipolo Junction. The elevated expressway have three stories. Each story has six lanes going both ways. The 2nd level has on/off ramps at C5, Cainta and Antipolo Junctions, while the 3rd level has on/off ramps at C5 and Antipolo Junction only. The total length of the expressway is about 5.7 kms.

The project costs for Pasig and Ortigas Expressways are estimated at P 10,887 million and P 3,045 million, respectively. The proposed schedule of implementation is from 1997 to 2000. Pre-F/S is now under evaluation.

- Metro Manila Expressways (R6 & R7)

Metro Manila Expressway (R6) Project involves the construction of elevated expressway with a length of 12.0 kms along Santolan Road and Marcos Highway from C3 to Sumulong Highway. It also includes the widening of Santolan Road to conform with the expressway design.

Metro Manila Expressway (R7) Project involves the construction of 4-lane expressway with a length of 12.2 kms. The section along Quezon Avenue will be elevated, while the section along Commonwealth Ave. up to Batasan Pambansa will be at grade level.

The project costs for R6 and R7 Expressways are estimated at P 3,200 million and P3,270 million, respectively. It will be implemented under BOT scheme arrangement. The Pre-F/S has been completed in 1993.

Table 2.2
On-going Major Toll Road Projects

Project Name	SLE Extension	Metro Manila Skyway (Stage 1)	Manila – Cavite & C5 Expressway	Pabahay Sa Riles Tollway
Route	Sto. Tomas - Lipa City	Buendia – Bicutan & Ayala	Zapote - SLE & Seaside Drive – Talaba – Noveleta	Samson Rd. - Magallanes
Route Length (km)	22.2	9.3	22.1	16.3
Implementing Body	DPWH	PNCC/Citra	PEA/Renong Berhad	PNR/HUDCC/ NHA/NSJB
Estimated Project Cost (P million)	1,143 Const.:943 ROW:200	7,575	6,474.8 Const.:5,574.8 ROW:900.0	7,760
Funding Source	OECD	BOT	BOT	BOT
Implementation Schedule	1993-1998	1996 – 1999	1996 – 1998	1996 - 2000
Project Status	On-going	On-going	On-going	On-going

Project Name	C5 Northern Segment	NLE Rehabilitation & Extension	Subic Expressway
Route	Commonwealth Ave. - Letre Rd.	Balintawak – Sta. Ines & Bambang – Clark	San Simon – Subic
Route Length (km)	22.2	96.04	64.2
Implementing Body	PNCC/FPIDC		
Estimated Project Cost (P million)	3,669.5 Const.:1,804.5 ROW:1,865.0	1,475.5 Const.:1,475.5 ROW:0.0	6,436.8 Const.:5,223.8 ROW:1,213.0
Funding Source	BOT		
Implementation Schedule	1996 - 1998	1996 – 1998	1995 – 2002
Project Status	On-going	On-going	On-going

Table 2.3
Proposed Major Toll Road Project

Project Name	Circumferential Road 6 (C6)			Metro Manila Skyway (Stage 2 & 3)
	Metro Manila Tollways (MMT)	Laguna de Bay Coastal Rd (LBCR)	Cavite - Laguna Expressway (CLE)	
Route	Meycauayan (NLE) - Bicutan (SLE)	Bicutan – San Pedro	C6 – Cavite	Bicutan - Alabang, Buendia -NLE
Route Length (km)	38.4	18.6	19	13.8 & 11.59
Implementing Body	PNCC/Citra			PNCC/Citra
Estimated Project Cost (P million)	20,181 Const.:8,541 ROW:11,640	11,972 Const.:9,528 ROW:2,444	5,037 Const.:4,206 ROW:831	-
Funding Source	BOT			BOT
Implementation Schedule	1997 - 2002	1999 – 2001	1999 – 2001	Stage 2: 1997-1999 Stage 3: 1998-2000
Project Status	Pre-F/S			Pre-F/S

Project Name	Metro Manila Expressway (R4 - Pasig Expressway)	Metro Manila Expressway (R5 – Ortigas Expressway)	Metro Manila Expressway (R6)	Metro Manila Expressway (R7)
Route	Ayala Ave./ Buendia -C6	C5 - C6 (Ortigas Ave. Extension)	C3 - Sumulong Highway)	España Rtd. – Batasan
Route Length (km)	16.55	5.7	12	12.2
Implementing Body	PNCC/STRADEC etc.			-
Estimated Project Cost (P million)	10,887 Const.:8,994 ROW:1,893	3,045 Const.:2,496 ROW:549	3,200 Const.:3,000 ROW:200	3,270 Const.:3,159 ROW:111
Funding Source	BOT			-
Implementation Schedule	1997 - 2000	-	-	-
Project Status	Pre-F/S	Pre-F/S	Pre-F/S	Pre-F/S

FIGURE 2.2
ON-GOING/PROPOSED TOLL ROAD PROJECT



(2) Ordinary Road

A number of projects regarding major road development and improvement are on-going and are being proposed by DPWH-URPO. There are projects for new construction, widening, interchange improvement and rehabilitation of existing roads.

Major On-going Road Projects

Major on-going road projects in the study area are classified by the type of project as shown in Table 2.4.

TABLE 2.4
MAJOR ON-GOING ROAD PROJECTS

Type	Projects	Length (m)	Estimated Cost (P million)	Implementation Period
New Construction	Mindanao Ave. Extension (Stage II-B/C)	8,200	69.8	1997 – 1998
	Nagtahan Link Road & Bridge	1,950	333.8	1996 – 1998
	San Mateo – Batasan Road	2,077	235.4	1995 – 1997
	C3 Missing Link, Northern Package	900	153.0	1997 – 1998
	C5 Commembo Link Road	2,700	40.0	1997 – 1997
	C5 Lower Bicutan Access Road	1200	35.0	1997 – 1997
Widening	Parañaque - Sucat Road Widening	-	23.2	1996 – 1997
Interchange Improvement	Alabang - Zapote Flyover	217	453.0	1996 – 1998
	C5/Pasig Blvd./J. P. Rizal Interchange	684	500.0	1997 – 1998
	EDSA/Pasay Road/Ayala Ave. Interchange	-	726.0	1996 - 1999
	EDSA/Shaw Blvd. Overpass	653	147.0	1996 - 1998

- New construction

Five new road construction projects are on-going. The total length of these projects is about 17.0 kms. Implementation of these projects is scheduled to be completed by 1998. The total project cost including right-of-way acquisition is estimated at P 867 million.

- Widening

Widening project is on-going only along Parañaque-Sucate Road, widening present two-lane to 6-lane. The estimated project cost is P 23.2 million. The project is scheduled to be completed by 1997.

- Interchange Improvement

Interchange improvement projects are on-going at some intersections along major roads such as EDSA and C5. These involve the construction of overpass/underpass and flyover for grade separation of intersection. Total project cost is estimated at P 1,826 million. These projects are scheduled to be completed by 1999.

Major Proposed Road Projects

Major proposed road projects in the study area are classified by the type of project as shown in Table 2.5.

TABLE 2.5
MAJOR PROPOSED ROAD PROJECTS

Type	Projects	Length (m)	Estimated Cost (P million)	Implementation Period
New Construction	C3 Missing Link, Southern Package	-	853.8	1998 - 2000
	Visayas Ave. Extension	4,200	390.0	1998 - 1999
	Marikina Bridge & Access Road	-	400.0	1998 - 1999
Widening	Alabang – Zapote Road Widening	10,300	834.0	1998 - 1999
	C. P. Garcia Ave. Widening	2,500	60.0	1998 – 1999
	R-10 Widening	4,960	156.0	1998 – 1999
Interchange Improvement	C5/B. Serrano Ave./Katipunan Interchange	230	600.0	1998 – 1999
	C5/Lanuza Ave./Julia Vargas Ave. Flyover	1,000	160.0	1998 – 1999
	C5/Ortigas Ave. Interchange	505	628.0	1998 - 1999
	C5/R4 (Kalayaan Ave.) Flyover	650	220.0	1998 – 1999
	C5/Sampaguita Interchange	-	150.0	1999 – 2000
	EDSA/North Ave. Interchange	-	400.0	1999 – 2000
	EDSA/Quezon Ave. Interchange	-	400.0	1999 – 2000
	EDSA/Roosevelt Grade Separation	400	150.0	1999 – 2000
Rehabilitation	Manila Road Pavement Rehabilitation Project (MMRPR) - Phase 2	66,600	718.6	1998 – 1999

- New construction

Three new road construction projects are being proposed to complete the major road network in Metro Manila. Implementation of these projects is scheduled to be completed by 1998 or 2000. Total project cost including right-of-way acquisition is estimated at P 1,644 million.

- Widening

Widening projects are on-going along Alabang-Zapote Road, C. P. Garcia Ave. and R10 Road. Estimated project cost is P 1,050 million. The project is scheduled to be completed by 1999.

- Interchange Improvement

Interchange improvement projects are being proposed at some intersections along major circumferential roads of EDSA and C5 with major radial roads. Total project cost is estimated at P 2,708 million. These projects are scheduled to be completed by 2000.

- Rehabilitation

The project including rehabilitation of pavement and drainage is being proposed for Metro Manila roads with a total length of 66.6 kms. The cost for this project is estimated at P 718.8 million. Its implementation period is from 1998 to 1999.

2.2 Rails

2.2.1 Present Condition

The Philippine National Railways (PNR) operates in Luzon Island through Metro Manila from north to south. There are two levels of service, passenger and freight. The long-distance service on Main Line North (MLN) from Manila to Meycauayan (15-km), Main Line South (MLS) from Manila to Ligao (445-km) and its branch line to Carmona (4-km) are now in operation, while commuter service operates from Meycauayan to Calamba and Carmona. Freight services are almost non-existent, carrying 14,000 tons in 1995, although a container train service has started to operate between MICT and a new interchange depot near Carmona. The number of long-distance passengers was 598,000 in 1995. The PNR commuter service carried four million passengers in 1995. These results are still considered to be very low compared to actual capacity.

The existence of squatters along the PNR tracks significantly slows down train operation. Further, the rail itself is used as access way for the people living in the squatters.

In addition to PNR operation, a Light Rail Transit (LRT) system with 18 stations and about 15-km of elevated double tracks has been commenced commercial operation in 1984 (half-line) and 1985 (full-line) along Taft and Rizal Avenues from Monumento to Baclaran. This LRT Line 1 carried 143 million passengers in 1996 and 396 thousand passengers per day on the average in 1996. At present, 2.5 minutes headway in train operation during peak hours and 3.0 minutes intervals during inter-peak hours are being maintained.

Figure 2.3 shows existing rail network in the study area.

FIGURE 2.3
EXISTING RAIL NETWORK



2.2.2 Existing/Proposed Rail Projects

In Metro Manila including the adjoining provinces, many construction and improvement projects of railway are on-going and being proposed recently. These major existing rail transportation projects are outlined in Table 2.6 and Table 2.7 and shown in Figure 2.4

On-going Rail Projects

1) Rehabilitation of PNR Commuter Line South

This project aims at improving 40.3-km railway service between Paco to Carmona to be able to transport 20,500 commuters per day by 1998. The project involves the improvement of track and road bed including introduction of concrete sleepers and supply of ballast, rehabilitation of bridges between Carmona and Tutuban, improvement of signalling and telecommunications system and construction of right-of-way fencing between Tutuban and Paco.

The implementation of project has commenced since February 1995 and is scheduled to be completed by 1997. The project is being implemented by PNR. The project cost is US\$ 25 million funded by OECF.

2) LRT Line 1 Capacity Expansion

LRT Line 1 Capacity Expansion Project is now on-going. The aim of this project is to increase its capacity by 50 % (i.e., from nominal carrying capacity of 18,000 to 27,000 passengers per peak hour per direction). It essentially involves the procurement of additional seven new 4-car trains and transformation of the existing 2-car trains to 3-car trains with corresponding modifications to the existing vehicles, systems, facilities, and structures to support the operation of this expanded system.

The project cost is US\$ 105 million funded by OECF and local government. The project will be completed by the middle of 1998.

Furthermore, the Phase 2 of this project aims at expanding capacity by 100 % which is being proposed by LRTA. On the other hand, a number of projects related to improvement of LRT Line 1 are 3 now on-going, such as Automated Fare Collection System (AFCS) Project with cost of US\$ 14 million, Line 1 Track Maintenance and Ballast Renewal Project with cost of US\$ 12 million, Line 1 Rehabilitation Projects I and II with total cost of US\$ 75 million.

3) MRT Line 3 (Phase 1)

MRT Line 3 Project Phase 1 involves the construction of a 16.8-km partly elevated double track system in a dense north-south travel corridor of Metro Manila running along EDSA from Taft Ave. in Pasay City to North Ave. in Quezon City where the proposed depot area is located. There will be 13 stations and a total of 73 LRVs will be operated on the line, providing a capacity of 600,000 passengers per day.

The project is being implemented by the Metro Rail Transit Corp. under BLT scheme. The project cost is estimated at US\$ 655 million. The project is now under construction and scheduled to be completed by 1999. Phase 2 of MRT Line 3 is proposed to be constructed from North Ave. to Monumento, Caloocan along EDSA.

4) MRT Line 2

MRT Line 2 Project involves the construction of a 14-km elevated line running from C. M. Recto to Santolan where the proposed depot area is located passing through Legarda, Magsaysay, Aurora Avenues and Marcos Highway. With 11 stations, Line 2 is designed as a high-capacity system with wider Metro-type vehicles initially in a 4-car train setting. These vehicles, run by 1500 dc-powered electric motors, will be fully air-conditioned. All stations shall be provided with mezzanine for pedestrian to have an access from both sides of the road.

The project cost is estimated at US\$ 988 million and to be funded by OECF. The project is scheduled to be completed by the year 2000. The project is now on the bidding stage. The implementation of project is arranged in the following four packages:

- Package 1: Depot (Santolan);
- Package 2: Substructure (foundations, piling, columns), including the 750-m tunnel and underground station of Katipunan;
- Package 3: Superstructure and stations; and
- Package 4: Systems (track, signaling and rolling stock).

Major Proposed Rail Projects

1) Manila-Clark Rapid Railway System (Northrail)

The Manila-Clark Rapid Railway (MCRRS) aims to ensure the viability of the Clark International Airport by connecting it to Metro Manila and to provide a fast and efficient suburban commuter system as well as to promote the growth of satellite communities outside Metro Manila. The alignment of LRT Line 5 has already been absorbed by MCRRS as part of the Metro Manila segment.

The project involves the design and construction of a 100-km double track rapid rail system between Fort Bonifacio and Clark. MCRRS will be traveling within the right-of-way of PNR from Clark to Caloocan. This will be generally at-grade or on embankments at this section. There will be grade separations at major road crossing. While from north of Caloocan to Fort Bonifacio, MCRRS will be travelling in a 24-km tunnel. There will be 3 multi-modal terminals at Clark, Valenzuela and Fort Bonifacio and 18 in-line stations between multi-modal terminals. Three levels of services will be provided; Commuter Service (Inter-Urban and Metro), Airport Service and Freight Service.

The project cost is estimated at US\$ 2,000 million or more. The MCRRS is to be constructed, operated and maintained by North Luzon Railways Corp. (Northrail), a joint venture cooperation by the government and the private sector investors. Northrail is composed of the Base Conversion Development Authority (BCDA), PNR, DMCI Metro Pacific Inc., Fort Bonifacio Development Corp., Euroma and Spanish Railway Group. The project is now on Detailed Design stage and scheduled to be completed by 2000.

The MCRRS is Phase 1 of the Northrail's project. Other phases to be implemented in the future are: Phase II San Fernando (Pampanga) - Subic, Phase III Clark - San Fernando (La Union) and Phase IV San Fernando (La Union) - Laoag City and Tarlac - San Jose City.

2) Manila Calabarzon Express (MCX) Rail

The Manila Calabarzon Express (MCX) Rail Project consists of the design, construction, financing and operation of a commuter and freight rail system between Metro Manila and South Luzon. The first phase of MCX involves the construction of one additional set of track within the existing PNR right-of-way between Tayuman/Caloocan and Sucat and two additional tracks between Sucat and Calamba, with spur lines to Carmona and Canlubang. Improvements to the commuter rail service as well as stations and depots and associated facilities will also be introduced, in accordance with accepted international standards. It is estimated that the rail service will cater to around 150,000 passengers per day, compared to only 13,000 being served daily at present.

The project cost for phase 1 is estimated at US\$ 480 million. The project will be undertaken under BOT scheme arrangement by Ayala Land, Inc. The project is scheduled for completion by the year 2000. Unsolicited BOT proposal was approved by NEDA-ICC in March, 1997 in the initial stage.

Extension to Batangas City, Sta. Cruz, Laguna and Lucena, Quezon are being planned for later phases of the Project.

3) Silangan Railway Express 2000

Silangan Railway Express 2000 (Marilaque Railway) Project aims to provide an efficient transportation system to complement the economic development of the Marilaque area. The project involves the construction of a new 95-km railway line from the PNR Paco Station in Manila to Real, Quezon passing through the proposed route of the Pandacan Container Yard, the Pasig River, Manggahan Floodway, Morong, Baras and Tanay, Rizal and Sampaloc, Quezon.

The project cost is estimated at US\$ 154 million excluding right-of-way acquisition and rolling stocks. The project will be undertaken under BOT scheme arrangement by Marilaque Commission and DOTC. The project is scheduled to be completed by the year 2000. Feasibility Study was proposed for US-TDA Assistance.

4) MRT Line 2 West and East Extension

Project of MRT Line 2 Extension East and West is being proposed.

The West Extension Project involves the construction of 2.5-km extension from C. M. Recto station of Line 2 to North Harbor (Pier 8) with 3 stations serving around 175,000 passengers per day during the first year of operations. A cost-sharing concept may be formed among LRTA, PPA and the City of Manila. Urban development around the port area will generate a big demand for this transit system. The project cost is estimated at US\$ 62 million and will be funded by OECF.

The East Extension Project involves the construction of 4.8-km extension from Santolan station of Line 2 to Masinag, Antipolo with four stations. Considering the fast urbanization in the east of Metro Manila, the number of trips for this line is estimated to be 250,000 trips per day in 2010. The financial viability of this project may be enhanced jointly with the private sector by developing the residential areas at or near/around Antipolo. The project cost is estimated at US\$ 212 million and will be funded by OECF.

Recently, the proposals of both projects were already submitted to NEDA-ICC for approval. The West and East Extension Projects are scheduled to be completed by the years 2000 and 2001, respectively.

5) MRT Line 4 (Phase 1)

MRT Line 4 Project Phase 1 involves the construction of a 15.1-km double track railway, elevated at built-up areas, while remaining at-grade outside EDSA. Line 4 follows the radial alignment of España, Quezon and Commonwealth Avenues from Old Bilibid in the City of Manila to Batasan, Quezon City in a dense southwest-northeast travel corridor in Metro Manila. There will be 18 stations along this line.

The project cost is estimated at US\$ 590 million. The project is to be undertaken under BOT scheme arrangement and financed by French Consortium (Sofretu Grou etc.). Implementing Agency is DOTC. The project is scheduled to be completed by the year 2000. Unsolicited BOT proposal was approved by NEDA-ICC in March, 1997.

Phase 2 of MRT Line 4 Project is also now being proposed. This phase involves 7.5-km extension with five stations from Batasan to Quirino Highway passing through Commonwealth and Regalado Avenues.

6) MRT Line 6

MRT Line 6 Project involves the construction of railway from Baclaran station of Line 1 to the areas of south Metro Manila and Cavite province and development of reclamation at coastal area east of Cavite City.

Phase	Name	Length	Duration
Phase 1:	Backborn Line (Baclaran - Zapote)	12.0 km	1998 - 2000
Phase 2:	Backborn Line (Zapote - Cavite City)	10.0 km	2006 - 2010
Phase 3:	Dasmariñas Spur Line (Zapote - Dasmariñas)	14.5 km	2001 - 2003
Phase 4:	Airport Access Line (Ninoy Aquino Ave. - NAIA)		2003 - 2005
Phase 5:	Sucacat Spur Line (Dr. J. Rizal - Sucacat)	9.0 km	2004 - 2008
Phase 6:	Alabang Spur Line (Zapote - Alabang)	12.0 km	2006 - 2010
	Reclamation	1,000ha	1998 - 2006
	Commercial Development	20 ha	1999 - 2002

The total project cost excluding reclamation and commercial development, is estimated at US\$ 2,647.5 million. The project is to be undertaken under JV scheme with DOTC and financed by Australian Investor Group (TMG etc.). The whole project is scheduled to be completed by the year of 2010. Pre-F/S was completed and submitted to DOTC and PEA for approval.

7) Manila Airport LRT

Manila Airport LRT Project involves the construction of a fixed guideway transit system that will be extended to the south from LRT Line 1 to Line 3, and will serve the Manila Airport and Sucacat Road, and in the east, as far as the South Super Highway. Exact alignment has still to be determined.

The project cost is still unknown, but approximately US\$ 500 million according to the investors. The project will be undertaken under the BOT scheme arrangement and will be financed by American Investors (Jefferie's Bank, Lord Development Ltd.). MOU with DOTC has been issued in March 1997.

The feasibility study partially financed by the USTDA (US Trade Development Authority) that shared 50 % of the study cost with the investors has recently been commenced.

Some alignment of Manila Airport LRT overlapped with the above-mentioned project of LRT Line 6, i.e., section along Parañaque-Sucacat Road., Airport Access Line. Coordination and integration between the two projects shall be done appropriately.

Table 2.6
Rail Transportation Projects (On-Going)

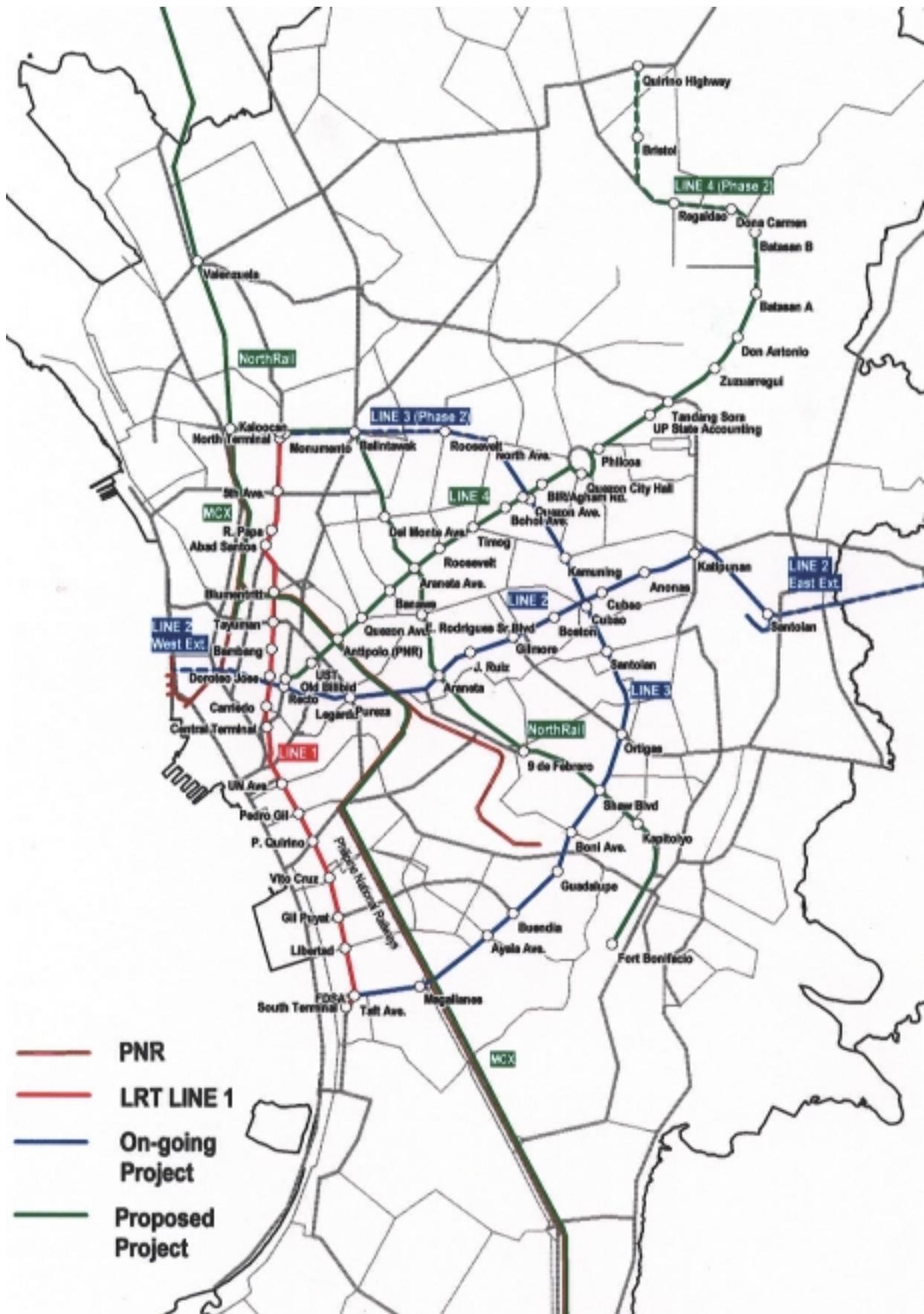
Project Name	Rehabilitation of PNR Commuter Line South	LRT Line 1 Capacity Expansion	MRT Line 3 (Phase 1)	MRT Line 2
Route	Paco – Carmona	Monumento – Baclaran	North Ave. - F. B. Harrison	C. M. Recto - Santolan
Route Length (km)	40.3	15	16.8	14
Implementing Body	PNR	LRTA	Metro Rail Transit Corp. (DOTC etc.)	LRTA
Estimated Project Cost (US\$ million)	25	105	655	988
Funding Source	OECF	OECF	BLT	OECF
Scheduled Completion Year	1997	1998	1999	2000
Project Status	On-going	On-going	Under Construction	Bidding
Remarks	Implementation of project was deleted section between España – Manila because of squatters' removal	Phase 2 - expand capacity by 100%	Phase 2 – extension from North Ave. – Monumento	Extension to west and east

TABLE 2.7
RAIL TRANSPORTATION PROJECTS (PROPOSED)

Project Name	MRT Line 2 Extension (West)	MRT Line 2 Extension (East)	MRT Line 4 (Phase 1)	MRT Line 6 (Phase 1)
Route	Recto St. - North Harbor	Santolan St. - Masinag	Old Bilibid – Batasan	Baclaran - Zapote
Route Length (km)	2.5	4.8	15.1	12.0
Implementing Body	LRTA	LRTA	French Consortium (Sofretu etc.)	PEA/TMG Consortium
Estimated Project Cost (US\$ million)	62.1	212	590	616
Funding Source	OEFC	OEFC	BOT	JV scheme
Scheduled Completion Year	2000	2001	1999	2000
Project Status	Proposal is under NEDA-ICC	Proposal is under NEDA-ICC	Revised Proposal is being evaluated	Pre-F/S is under DOTC/PEA
Remarks			Phase 2 Extension from Batasan - Quirino Highway	Phase 2-6 Extension to south and reclamation project

Project Name	Manila Calabarzon Express (MCX) Rail (Phase 1)	Manila - Clark Rapid Railway System (MCRRS)	Silangan Railway Express 2000	Manila Airport LRT
Route	Tayuman – Calamba/Canlubang	Fort Bonifacio - Clark	Paco - Real	Baclaran - Sucat
Route Length (km)	-	100	95	-
Implementing Body	Ayala Land Inc. (Sponsor)	North Luzon Railways Corp. - NorthRail (BCDA/PNR/ Private Sector)	DOTC/Marilaque Commission	Jefferrie's Bank/ Lord Development Ltd.
Estimated Project Cost (US\$ million)	480	2000 or more (for Phase 1B only)	154 (excl. ROW & RS)	500
Funding Source	BOT	JV	BOT	BOT
Scheduled Completion Year	2000	2000	2000	-
Project Status	Unsolicited proposal is being evaluated	D/D	F/S proposed for US-TDA	Pre-F/S is on-going
Remarks	Extension to Batangas City, Sta. Cruz, Lucena	Extension to San Fernando – Subic, Clark – Laoag City, Tarlac - San Jose City		

FIGURE 2.4
 FUTURE RAIL TRANSPORT NETWORK



2.3 Port

2.3.1 Present Condition

The Port of Manila is the most important international and domestic port in the Philippines handled by the Philippine Ports Authority (PPA) that is located in the National Capital Region with the territorial jurisdiction over Manila Bay and Provinces of Bataan, Pampanga, Bulacan and Cavite. It accounts for 60 % of the nation's cargo throughput. The major ports under jurisdiction of the Manila Port are being supervised by the Port Management Office of North and South Harbors.

1) North Harbor

The North Harbor, considered as the primary domestic port in the Philippines, is located along the shore of Tondo, Northeast of the Manila International Container Terminal (MICT). The port has six finger piers with water depth ranging from 4.5 - 6.0 meters that can provide 41 berths.

The port was originally constructed to handle general cargoes with a maximum draft limitation of around six meters. However, since 1978, there has been a steady increase in containerization and shipping companies began acquiring bigger vessels. Port accommodated 4.26 million passengers in 1995. The existing facilities were already considered inadequate to accommodate the increasing growth in vessel traffic and cargo throughput.

2) South Harbor

The South Harbor which handles both general and container cargoes is located at the South of Manila Harbor. The port has five finger piers which can provide 26 berths. It has a total operating area of 151,430 m² used for warehousing, open storage and container yards. The existing facilities of South Harbor are already inadequate to accommodate the increasing growth in vessel traffic as well as cargo throughput.

Another facility under South Harbor is the Pasig River Terminal which provides a 25-km natural inland waterway from Laguna Lake to the Manila Bay. Along the Pasig River, there are 63 government berths and around 55 private ports.

3) Manila International Container Terminal (MICT)

The MICT which handles international container traffic is located north of Pasig River. It has a 1,200-meter wharf divided into five berths. The total port area is around 940,000 m² in which 290,320 m² serves as a container yard with a rated capacity 23,000 TEUs.

MICT is the first port privatized by PPA. The International Container Terminal Services, Inc. (ICTSI) handles the management, operation and development of the port. Since it was privatized, the volume of containers handled has moved ahead by leaps and bounds and continues to increase.

4) Grains Terminal

One of the major products being handled at the anchorage area at South Harbor are grains products. This involves double handling as the grains are unloaded at barges and transported to flour mill plants at the Pasig River. Productivity is very low and it will take days before the cargoes will be unloaded. On February 17 1996, the Mariveles Grains Terminal in Mariveles, Bataan began its operation.

TABLE 2.8
STATISTICS OF MANILA PORT (1996)

	Cargo Throughput - In/Out (000 metric tons/year)	Container Traffic - In/Out (000 TEUs/year)	Domestic Passenger Traffic - In/Out (000 pax/year)
North Harbor	15,000	681	4,750
South Harbor	11,250	448	-
MICT	9,160	842	-
Port of Manila	59,240	1,971	-

2.3.2 Development Plans and Programs for the Port of Manila

In order to cope up with the increasing volume of cargo traffic and ship calls, the following projects were incorporated in the 25-Year Master Plan of PPA:

1) South Harbor Expanded Port Zone (SHEPZ) Development (Figure 2.6)

The land area within the South Harbor Expanded Port Zone under E. O. 321 shall be divided into operational and non-operational areas. The operational area shall be utilized for terminal handling and for storage of containerized and general cargoes. Government agencies and private lessees shall be required to vacate the area to give way to facilities required to receive the increasing volume of cargoes and containers. The non-operational area shall include the following: Financial District, Government Center, Manila Hall of Justice, Commercial and Port-Related Establishments, Hotel and PPA Housing.

2) South Harbor Expansion Plan (Figure 2.7)

With the increasing volume of traffic and size of vessels calling at South Harbor, it is envisioned that the existing facilities will not be anymore adequate to absorb the future traffic. As such, reclamation project is being planned at Engineering Island for a modern port facilities.

3) Manila Cruise Center

Luxury cruise liner vessels with the likes of Queen Elizabeth II, Crystal Symphony and others are continuously calling at the Port of Manila. Furthermore, foreign navy vessels and training ships on goodwill visits to South Harbor are presently using commercial berths. In order to promote tourism and good image of the country, a Manila Cruise Center is being envisioned to be set-up at the back of the Quirino Grandstand. It will involve a reclamation of around

30-50 hectares and may integrate the proposed “ Eco-Tourism Park” as envisioned by the City of Manila.

4) Manila Ferry Terminal

The eruption of Mount Pinatubo has brought about the isolation of Zambales, Bataan and portion of Pampanga that needs the improvement of the sea transport as an alternative mode of transporting cargoes and passengers in this area. A proposed Manila Ferry Terminal connecting Bataan and Manila is being proposed to be set-up at the back of the Film Center at CCP Complex. The Ferry Terminal will be integrated with the development of CCP which will be complementary with each other.

5) Manila International Container Terminal (MICT) Expansion Plan (Figure 2.7)

The MICT expansion plan shall include reclamation project along southern side of breakwater at Isla Puting Bato, North Harbor. At present, PPA is evaluating the proposed construction of Berth 6, which would accommodate post-panamax vessels.

6) North Harbor Expansion Plan (Figure 2.7)

The North Harbor expansion plan shall include a 30-40 hectare reclamation along the northern side of the break water at Isla Puting Bato. The expansion project is complemented by a 79-hectare reclamation project of the R-II Builders at Smokey Mountain where 20 hectares will be developed into a port complex. The port facilities shall include seven berths with a depth of around 10 meters.

7) North Harbor Passenger Terminal Building

A Proposed Modern Passenger Terminal Building is being planned at Terminal 16, North Harbor to solve the present chaotic condition at the area. The project calls for an expansion of the port facility to accommodate passenger vessels and the construction of a PTB complete with all amenities for the convenience of the riding public. Coordination is also being made to extend LRT 3 to the area which will serve as a mass transport system that will bring the passengers to their eventual destination.

8) North and South Manila Bay Port Development Project

As a long range plan and coupled with problems brought about in highly urbanized center, like traffic congestion, a new port, north and south of Manila Bay, is being studied by PPA. Several sites are being considered in Cavite as well as Bataan. A private proponent is now undertaking a Feasibility Study for these new ports.

FIGURE 2.5
LOCATION OF THE PORT OF MANILA

