

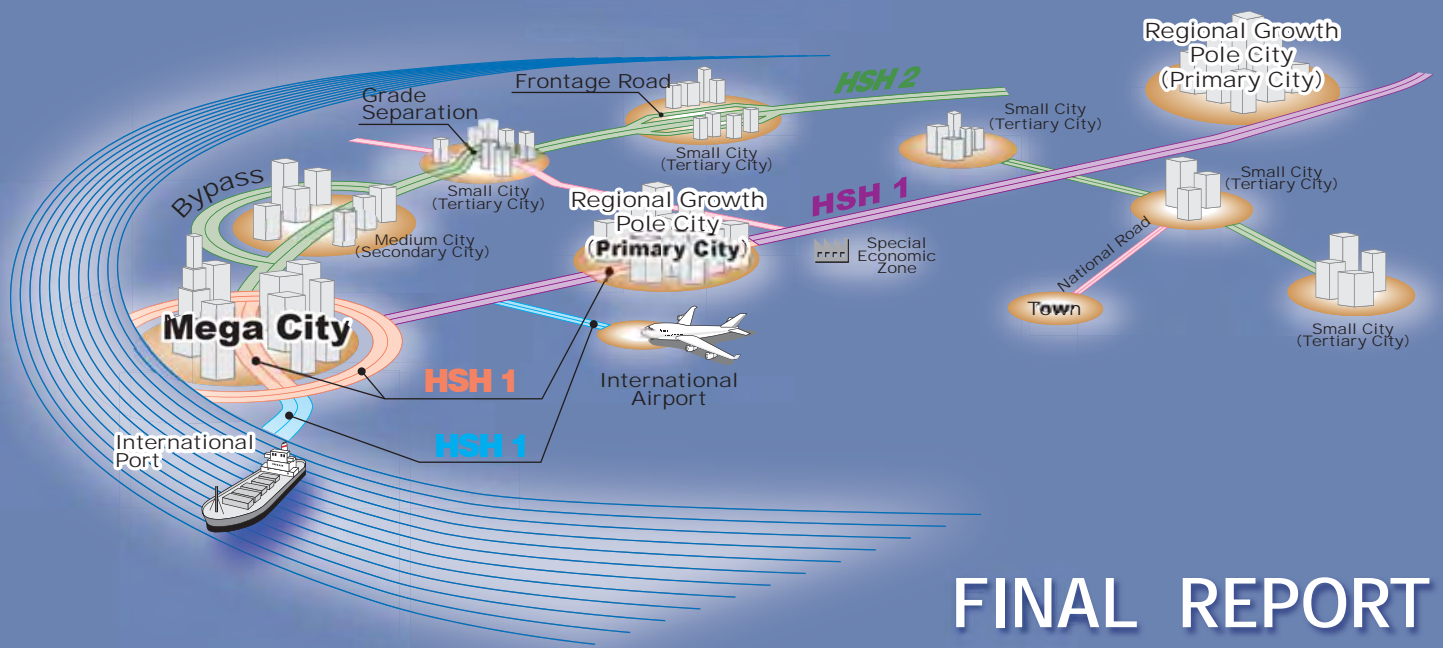


JAPAN INTERNATIONAL COOPERATION AGENCY



REPUBLIC OF THE PHILIPPINES  
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

# The Study of Masterplan on High Standard Highway Network Development In the Republic of the Philippines



## FINAL REPORT Executive Summary

JULY 2010



CTI ENGINEERING INTERNATIONAL CO., LTD.

EID
JR
10-100(1/4)

**JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)**

**REPUBLIC OF THE PHILIPPINES  
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS**

**THE STUDY  
OF  
MASTER PLAN  
ON  
HIGH STANDARD HIGHWAY  
NETWORK DEVELOPMENT  
IN  
THE REPUBLIC OF THE PHILIPPINES**

**FINAL REPORT**

**EXECUTIVE SUMMARY**

**JULY 2010**

**CTI ENGINEERING INTERNATIONAL CO., LTD.**

**EXCHANGE RATE**

February 2010

1 PhP = 1.95 Japan Yen

1 US\$ = 46.31 Philippine Peso

1 US\$ = 90.14 Japan Yen

*Central Bank of the Philippines*

## **PREFACE**

In response to the request of the Government of the Republic of the Philippines, the Government of Japan decided to conduct the “Study of Master Plan on High Standard Highway Network Development in the Republic of the Philippines” and entrusted the Study to the Japan International Cooperation Agency (JICA).

JICA selected and dispatched a Study Team headed by Mr. Mitsuo Kiuchi of CTI Engineering International Co., Ltd. from April 5, 2009 to May 20, 2010.

The Study Team held discussions with the engineers of the Department of Public Works and Highways (DPWH) and other officials of the Philippine Government and conducted field surveys, data gathering and analysis, formulation of Development Strategy for High Standard Highway Network, formulation of High Standard Highway Master Plan, Public-Private Partnership (PPP) Roadmap for project implementation and strengthening of DPWH’s capability to implement projects. The Study Team also held trainings, workshops and stakeholders meeting to solicit opinions from different stakeholders. Upon returning to Japan, the Study Team prepared this final report which summarized the results of the Study.

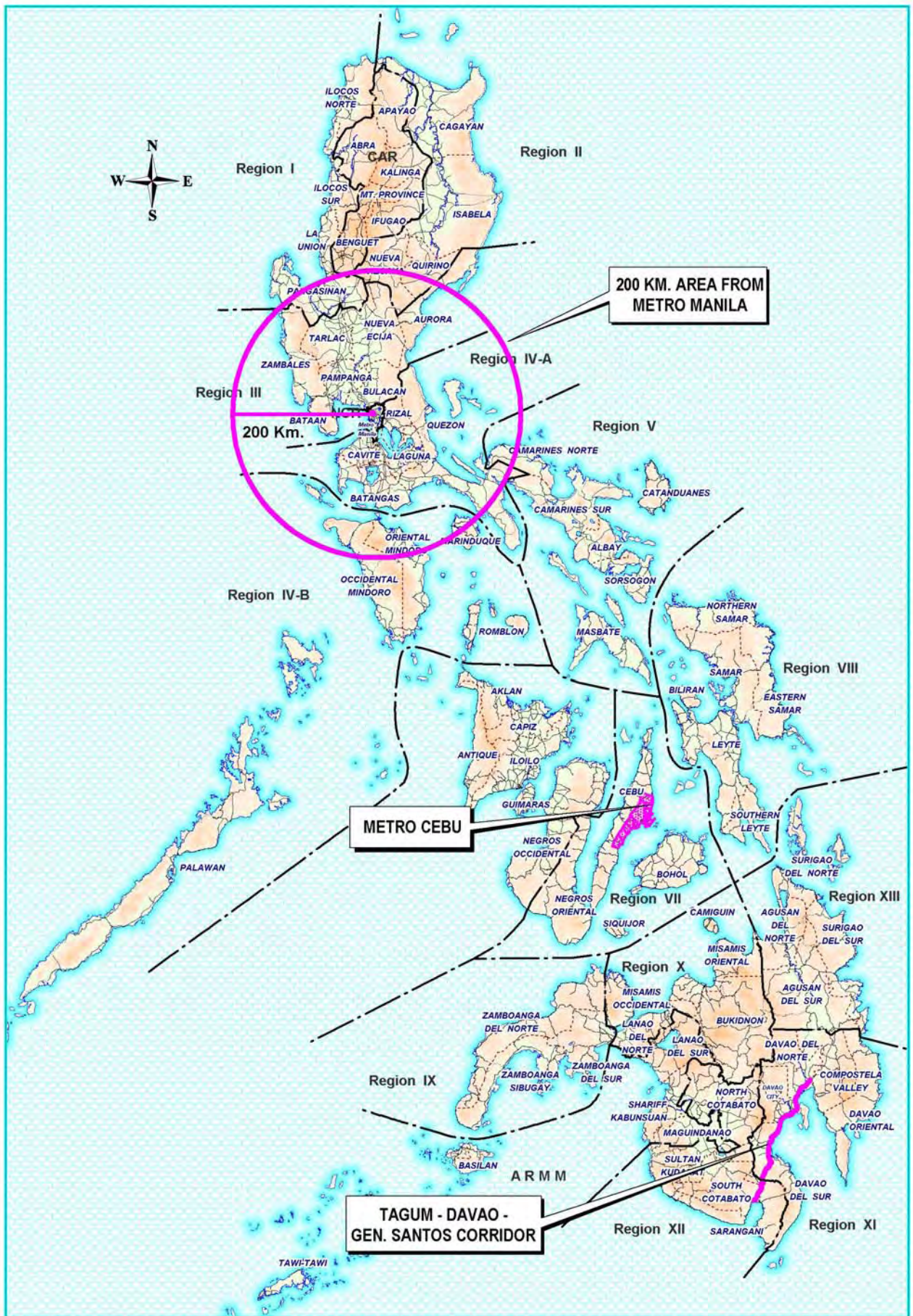
I hope that this report will contribute to the development of high standard highway network, promotion of proposed projects and to the enhancement of friendly relationship between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of the Philippines for their close cooperation and assistance extended to this Study.

June 2010

**KIYOHUMI KONISHI**  
Director General  
Economic Infrastructure Department  
Japan International Cooperation Agency (JICA)





**LOCATION MAP OF THE STUDY AREA**

# EXECUTIVE SUMMARY

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## ACRONYMS AND ABBREVIATIONS

AADT	: Annual Average Daily Traffic	KOICA	: Korean International Cooperation Agency
AASHTO	: American Association of State Highway and Transportation Officials	LLCR	: Loan Life Cover Ratio
ADB	: Asian Development Bank	LOS	: Level of Service
ADT	: Average Daily Traffic	LRT	: Light Rail Transit
B/C	: Benefit/Cost Ratio	LS	: Legal Service, DPWH
BAC	: Bids and Awards Committee	MMDA	: Metro Manila Development Authority
BC	: Business Case	MRT	: Mass Rail Transit
BCDA	: Bases Conversion Development Authority	MTPDP	: Medium-Term Philippine Development Plan
BDs	: Bidding Documents	MTPIP	: Medium Term Public Investment Programs
BIR	: Bureau of Internal Revenue	MVUC	: Motor Vehicle User's Charge
BLT	: Build-Lease-and-Transfer	NAIA	: Ninoy Aquino International Airport
BOD	: Bureau of Design	NCR	: National Capital Region
BOI	: Board of Investments	NEDA	: National Economic Development Authority
BOO	: Build-Own-and-Operate	NGO	: Non-Government Organization
BOT	: Build-Operate-Transfer	NHA	: National Housing Authority
BRT	: Bus Rapid Transit	NPV	: Net Present Value
BT	: Build-and-Transfer	NSCB	: National Statistical Coordination Board
BTO	: Build-Transfer-Operate	NSO	: National Statistics Office
CLEX	: Central Luzon Expressway	O&M	: Operation and Maintenance
CNC	: Certificate of Non-Coverage	OD	: Origin - Destination
CO <sub>2</sub>	: Carbon Dioxide	ODA	: Official Development Assistance
DA	: Department of Agriculture	OJT	: On-the-Job Training
DAR	: Department of Agrarian Reform	PBAC	: Pre-Qualifications, Bids, and Awards Committee
DBFO	: Design-Build-Finance-Operate	PCU	: Passenger Car Unit
DENR	: Department of Environment and Natural Resources	PD	: Presidential Decree
DEO	: District Engineering Office	PIP	: Public Investment Plan
DO	: Department Order	PMO	: Project Management Office
DOF	: Department of Finance	PMO-BOT	: Project Management Office for Build-Operate-Transfer
DOT	: Department of Tourism	PNR	: Philippine National Railways
DOTC	: Department of Transportation and Communications	PPP	: Public-Private Partnership
DPD	: Development Planning Division, DPWH	PRA	: Philippine Reclamation Authority
DPWH	: Department of Public Works and Highways	PS	: Planning Service, DPWH
DSCR	: Debt Service Cover Ratio	PSP	: Private Sector Participation
DTI	: Department of Trade and Industry	RA	: Republic Act
ECC	: Environmental Clearance Certificate	RAP	: Resettlement Action Plan
EIA	: Environmental Impact Assessment	RDIPs	: Regional Development Investment Programs
EIRR	: Economic Internal Rate of Return	RO	: Regional Office
EIS	: Environmental Impact Statement	RORO	: Roll-on/Roll-off
EMB	: Environmental Management Bureau	ROW	: Right-of-Way
ENPV	: Economic Net Present Value	ROWA	: Right of Way Acquisition
EO	: Executive Order	RRIM	: Road Roughness Index Measurements
EOJ	: Embassy of Japan	SC	: Steering Committee
ETC	: Electronic Toll Collection	SIA	: Social Impact Assessment
EU	: European Union	STOA	: Supplemental Toll Operation Agreement
FIRR	: Financial Internal Rate of Return	TA	: Technical Assistance
FNPV	: Financial Net Present Value	TCA	: Toll Concession Agreement
FS	: Feasibility Study	TCR	: Target Cumulative Revenue
GAA	: General Appropriation Act	TDM	: Traffic Demand Management
GDP	: Gross Domestic Product	TIC	: Traffic Information System
GFS	: Government Financing Support	TOA	: Toll Operation Agreement
GOCCs	: Government-owned and Controlled Corporations	TOC	: Toll Operation Certificate
GOJ	: Government of Japan	TRB	: Toll Regulatory Board
GRDP	: Gross Regional Domestic Product	TTC	: Travel Time Cost
GRP	: Government of the Republic of the Philippines	TWG	: Technical Working Group
HSH	: High Standard Highway	UN	: United Nations
ICC	: Investment Coordination Committee	UNDP	: United Nations Development Programme
IEE	: Initial Environmental Examination	USAID	: United States Agency for International Development
IEEC	: Initial Environmental Examination Checklist	V/CR	: Volume/Capacity Ratio
IEER	: Initial environmental examination report	VOC	: Vehicle Operating Cost
IROW	: Infrastructure Right-Of-Way	WB	: World Bank
IRR	: Implementing Rules and Regulations	WTP	: Willingness-To-Pay
JETRO	: Japan External Trade Organization		
JICA	: Japan International Cooperation Agency		



## ACTIVITY PHOTOS



*1<sup>st</sup> Steering Committee Meeting*



*4<sup>th</sup> Steering Committee Meeting*



*Stakeholders Meeting (Manila)*



*Stakeholders Meeting (Cebu)*



*Stakeholders Meeting (Davao)*



*Technical Working Group Meeting*



*Training on JICA STRADA software*



*Training in Japan*





## PART I - GENERAL

### 1. INTRODUCTION

#### 1.1 Background

- Arterial roads of the country faced serious traffic congestion creating various problems such as increase of travel time, failure of timely delivery of goods and people, losses of people's valuable time, aggravated roadside environment including air pollution, noise and vibration among others.
- These problems are hurting sound socio-economic development of the regions and the country as a whole, losing global competitiveness and foreign and domestic investment.
- In order to improve the above serious problems, provision of transport facilities to assure high mobility with high transport capacity are definitely needed, thus development of high standard highways is required.
- To cope up with the above problems, the Department of Public Works and Highways (DPWH) has drawn-up various measures such as development of expressway network, construction of bypasses and ring roads at regional cities, widening of existing roads among others. These plans, however, were not implemented well due to lack of overall master plan with project prioritization, lack of proper implementation schemes involving private sector's participation, lack of both public and private funds, and lack of appropriate operation and maintenance system.
- In view of the above, the Government of the Republic of the Philippines (GRP) requested the Government of Japan (GOJ) for the conduct of the Master Plan on High Standard Highway Network Development in the Republic of the Philippines (the Study) under the Technical Assistance of the JICA.

#### 1.2 Objectives of the Study

The objectives of the Study are as follows:

- 1) Formulation of Development Strategy for the High Standard Highway (HSH) Network; and

- 2) Formulation of the High Standard Highway Master plan.

#### 1.3 Study Area

The development strategy for the High Standard Highway Network covers Metro Manila and 200 km sphere, Metro Cebu and the Tagum – Davao - Gen. Santos corridor.

The Master plan however covers only Metro Manila and its surrounding areas within the 200 km sphere.

#### 1.4 Scope of the Study

The Study consists of the following main activities:

- Review and Analysis of Current Conditions
- Conduct of Traffic Survey and Logistics Survey
- Formulation of Socio-Economic Framework
- Conduct of Traffic Demand Forecast
- Formulation of Concept and Principal Policy for Development of High Standard Highway
- Formulation of Development Strategy for High Standard Highway Network
- Study on Future Road Network
- Formulation of Plan for Road Development and Identification of HSH Network
- Preliminary Design of Selected HSHs
- Project Cost Estimate and Project Implementation Schedule
- Economic and Financial Analysis
- Study on Project Implementation Scheme and Financial Analysis
- Selection of Priority Projects
- Strengthening of Institutional / Organizational Capacity of DPWH

#### 1.5 Final Report Organization

The final report is organized as follows:

- Executive Summary
- Main Text
- Annex
- Project Profile
- Traffic Data (CD-ROM)

## 2. DEFINITIONS OF HSHs AND IDENTIFICATION CRITERIA OF HSH CORRIDORS

### 2.1 Necessity of HSHs

#### Policy for Development (MTPIP)

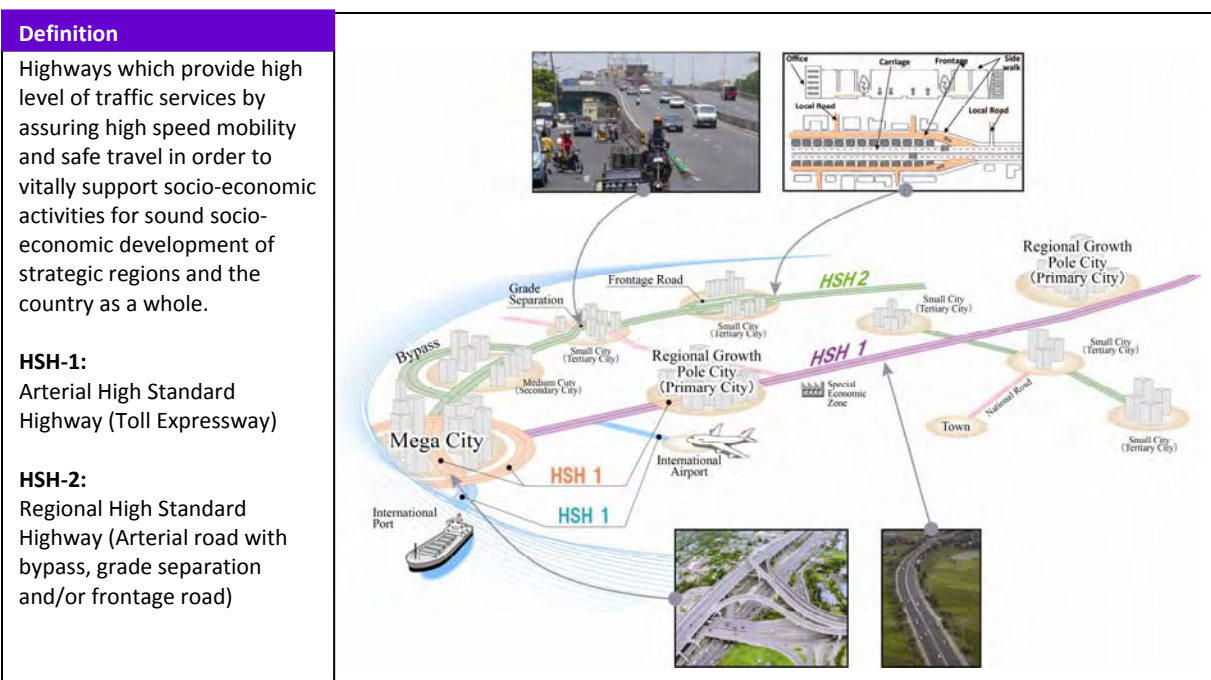
Following the ten (10)-point agenda declared by the administration, the Medium-Term Public Investment Plan (MTPIP) (2005-2010) was formulated below. To attain the MTPIP, among others item (a), (b), (c) and (d), the HSH network is to be properly developed.

Policy for Development						
(a)	Promotion of national integrity by strengthening the National Highways linking roads and ferries.					
(b)	Decongestion of traffic in Metro Manila.					
(c)	Active support for development of Clark and Subic being international logistics bases.					
(d)	Improvement of accessibility to main tourist spots.					
(e)	Road development for peace recovery in conflict regions such as Mindanao.					
(f)	Maintaining the road assets.					
Road Investment Plan (unit: Billion Pesos)						
Projects	2005	2006	2007	2008	2009	2010
Foreign Aid	171	243	173	178	327	324
Local Fund	94	111	200	397	393	404
Total	265	355	373	576	721	728
Rate to Pre. Yr	--	1.3	1.05	1.5	1.2	1.0

Source: Medium-Term PIP (2005 - 2010), revised version in 2008

### 2.2 Definition of HSHs

Concept and definition of HSHs are shown below.

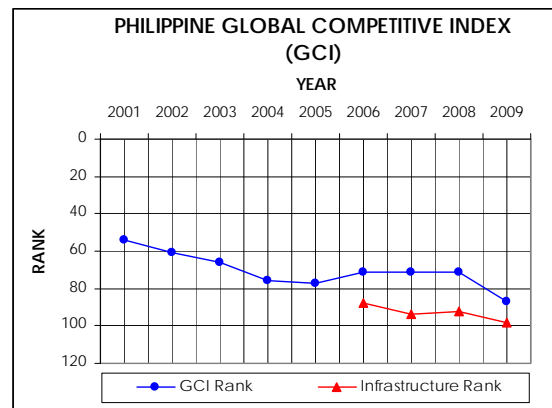


#### Need for Traffic Efficiency

- Traffic congestion in the road network has been a perennial problem directly affecting the socio-economic activities in the country;
- The low quality and limited scope of existing infra is one of the major factor contributing to decline of Philippine Global Competitiveness;
- Poorly developed transport network increases gap between regions and economic centers which lowers productivity and increases costs to markets;



.. these conditions pull down the country's global competitive advantage, thus losing opportunities for foreign, as well as domestic investments to neighboring countries . . .



Source: The Global Competitiveness Report, World Economic Forum (2009)

## Functions of HSHs

HSH Type		Function
Arterial High Standard Highway (HSH1)	Type1 (Inter - urban)	To connect major urban centers, strategic development areas, major transport facilities each other with highly efficient and reliable means of transportation.
	Type 2 (Intra - urban)	To connect traffic generating sources, economic development centers and major transport facilities each other with highly efficient and reliable means of transportation
Regional High Standard Highway (HSH2)		<ul style="list-style-type: none"> <li>▪ To connect HSH-1 each other</li> <li>▪ To function as supplementary to HSH-1</li> </ul>

## Features of HSHs

Factors to be considered in selecting HSHs area as follows:

Features	HSH-1	HSH-2
Access Control	Full access control	Partial access control or no access control
Usage of Highway	Exclusive for vehicles except slow moving vehicles such as jeepneys and tricycles	All kinds of vehicles w/ special consideration for slow moving vehicles and pedestrians
Toll or Not	Basically toll road	Non-toll road
LOS Target	LOS B (Inter-Urban)	LOS C (Inter-Urban)
	LOS C (Intra-Urban)	LOS D (Intra-Urban)
Design Speed (km/hr)	100-120 (Inter-Urban)	80-100 (Inter-Urban)
	60-80 (Intra-Urban)	60 (Intra-Urban)
Intersecting Road	Interchange- major road	Grade separation - major road
	Over bridge or underpass for minor road	At-grade intersection for minor road
HSH Facility	Full access-controlled expressway	Arterial road with bypass(es)
		Arterial road with frontage roads
		Arterial road with grade separation at intersection
		Multi-lane Arterial road

## 2.3 Design Standards of HSHs

		Philippines (proposed)				U.S.A		Japan		Asian Highway	
		HSH 1		HSH 2		AASHTO (Interstate Highway)		NEXCO	Metro polita n Express way Co.	AH26 (Inter-Urban Highway)	
		Inter-Urban	Intra-Urban	Inter-Urban	Intra-Urban	Inter-Urban	Intra-Urban	Inter-Urban	Intra-Urban	Primary (Express way)	Class I <sup>*1)</sup>
Design Speed (km/h)		100-120	60/80	100	60/80	121	89	100-120	60/80	120	100
No. of Lanes		4 or more		2 or more		4 or more		4 or 6	4	4 or more	
Lane Width (m)		3.65	3.50	3.50	3.25	3.66		3.50	3.25	3.50	
Shoulder Width (m)	Outer Shoulder	3.0	2.50	3.0	2.50	3.05	-	2.50	1.25	3.0	3.0
	Inner Shoulder	1.25	0.75	1.25	0.75	1.22	-	1.25	0.75	-	-
Median Strip Width (m)		4.0	3.0	3.0	1.75	11.0	3.0	4.50	1.75	4.0	3.0
Bridge	Traffic Load	HS20-44		HS20-44		HS20-44		B Live Load <sup>*3)</sup>		HS20-44	
	Vertical Clearance (m)	5.30 <sup>*5)</sup>	5.30 <sup>*5)</sup>	5.00 <sup>*5)</sup>	4.27 <sup>*2)</sup>	4.88	4.27	4.50 <sup>*4)</sup>	4.50 <sup>*4)</sup>	4.50	4.50

\*1) Class I may correspond to the Arterial Road in the Philippines.

\*2) Through urban areas at least one route of the intra-urban HSH2 should have 5.0m clearances to secure continuity between the inter-urban HSH2 and the intra-urban HSH2.

\*3) Almost corresponding to (HS20-44)X1.25.

\*4) In case that allowance for extralayers of pavement is considered, the vertical clearance is to be 4.70m. A vertical clearance of 4.5m is the requirement for safe passage of standards ISO containers.

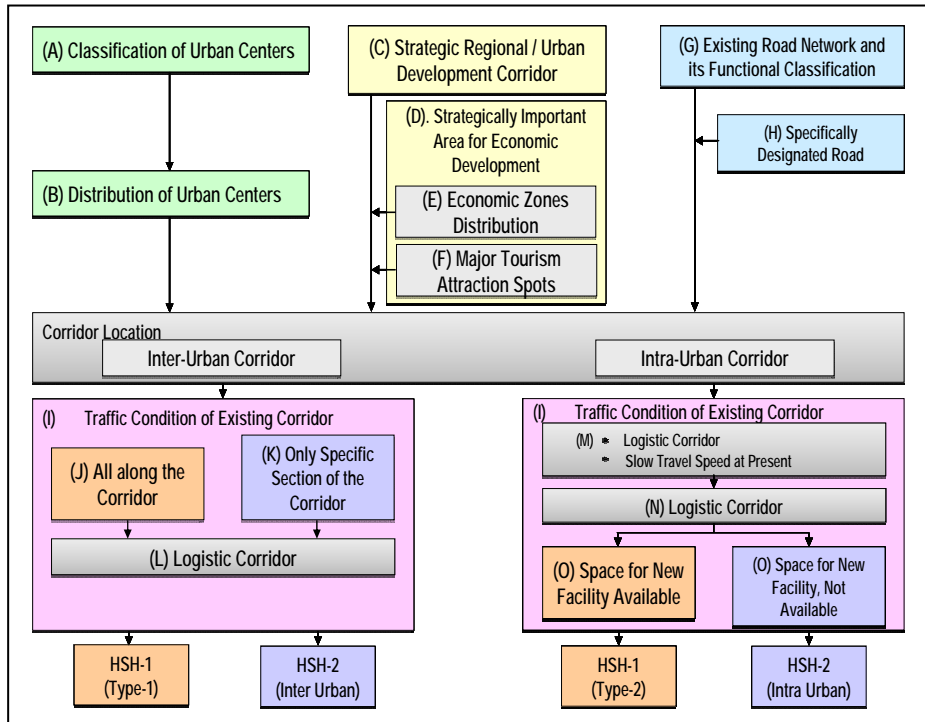
\*5) JICA Study Team recommends a vertical clearance of 4.88 m



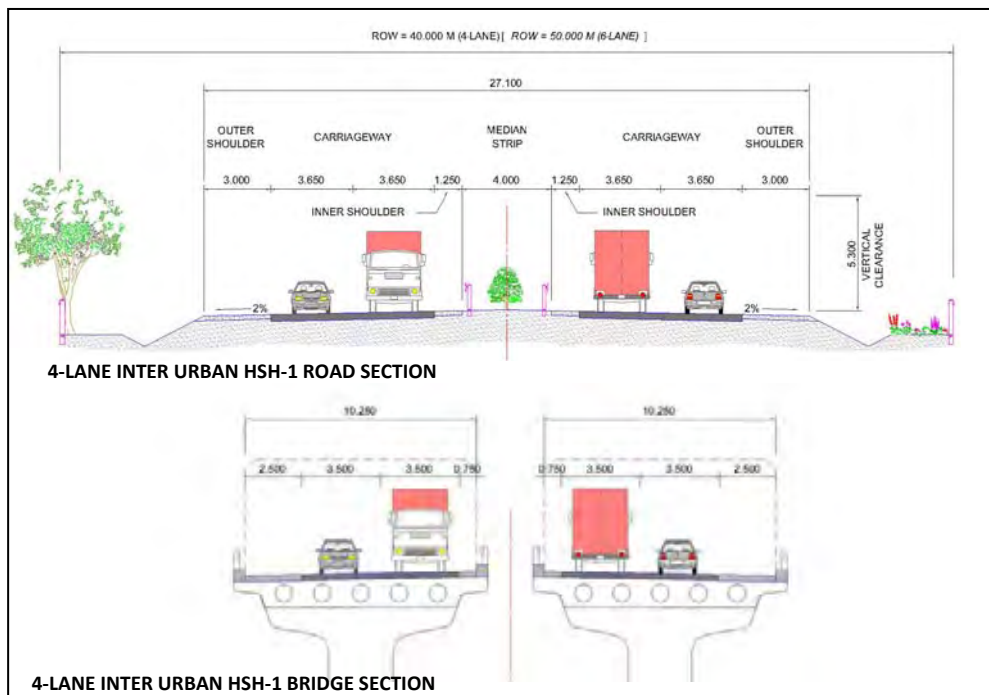
### HSH Corridor Identification Criteria

- Distribution of Urban Centers and Urban Centers to be connected by HSH
- Country's Regional/Urban Development Strategy
- Distribution of Strategically Important Areas for Economic Development
- Existing Road Network and Its Function
- Specifically Designated Road
- Traffic Conditions

### HSH Corridor Selection Procedure



### Typical Cross Section of HSH



### 3. PRESENT ROAD CLASSIFICATION

#### 3.1 DPWH Functional Road Classification

The functional road network classifications are: (i) Arterial Roads comprising of North-South Backbone, East-West Laterals and other Road of Strategic Importance or Strategic Roads and (ii) National Secondary Roads.

##### Arterial Roads

##### **North-South Backbone (5,234km)**

The backbone road network in consideration of road and sea (ferry) linkages. This includes interconnection of primary centers and roads leading to growth corridors.

##### **East-West Laterals (2,965 km)**

Arterial roads which inter-links North-South backbone road network in an east-west lateral orientation across the country with an interval of 50 to 200 km.

##### **Strategic Roads (7,360 km)**

Roads which connect other primary centers and all tertiary centers not on the above road categories. These include roads which interconnect the above category roads at an appropriate interval as well as forming a closed network and alternative roads, including island circumferential and cross-island roads.

##### **National Secondary Roads (13,810km)**

All other national roads that are not classified as arterial roads.

#### 3.2 Nautical Highway Network System

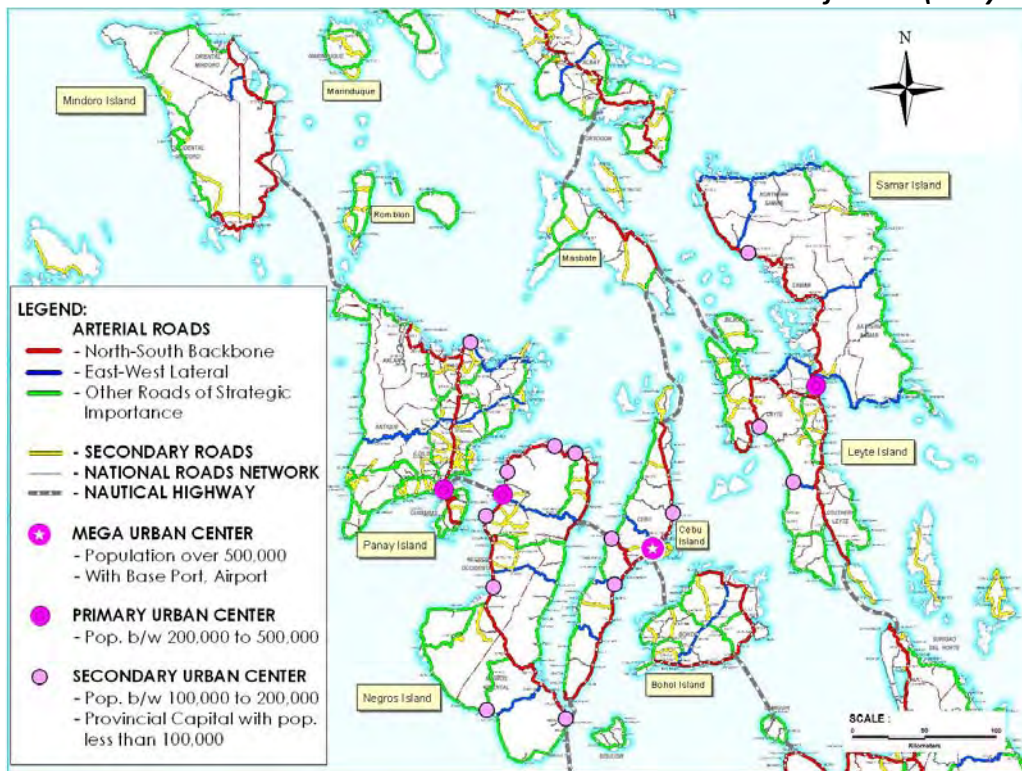
Nautical Highway is an integrated set of highway segments and ferry routes, which forms the backbone of a nationwide vehicle-accessible transport system

**Road Functional Classification (Luzon)**



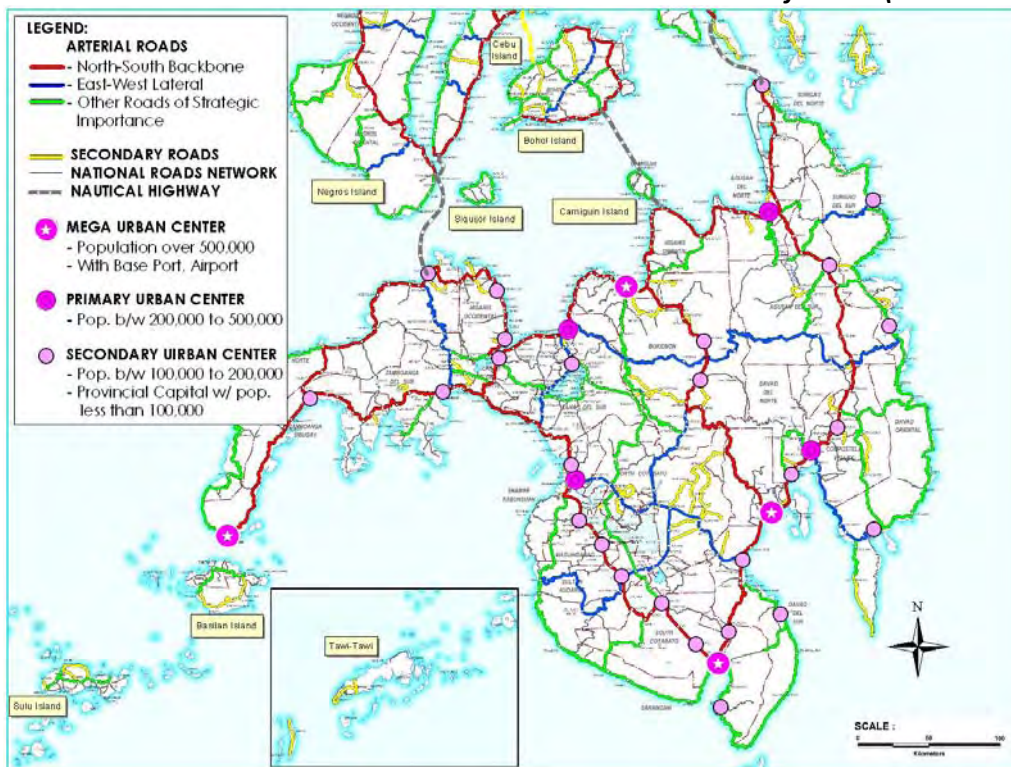
Source: DPWH Atlas, 2007

**Road Functional Classification (Visayas)**



Source: DPWH Atlas, 2007

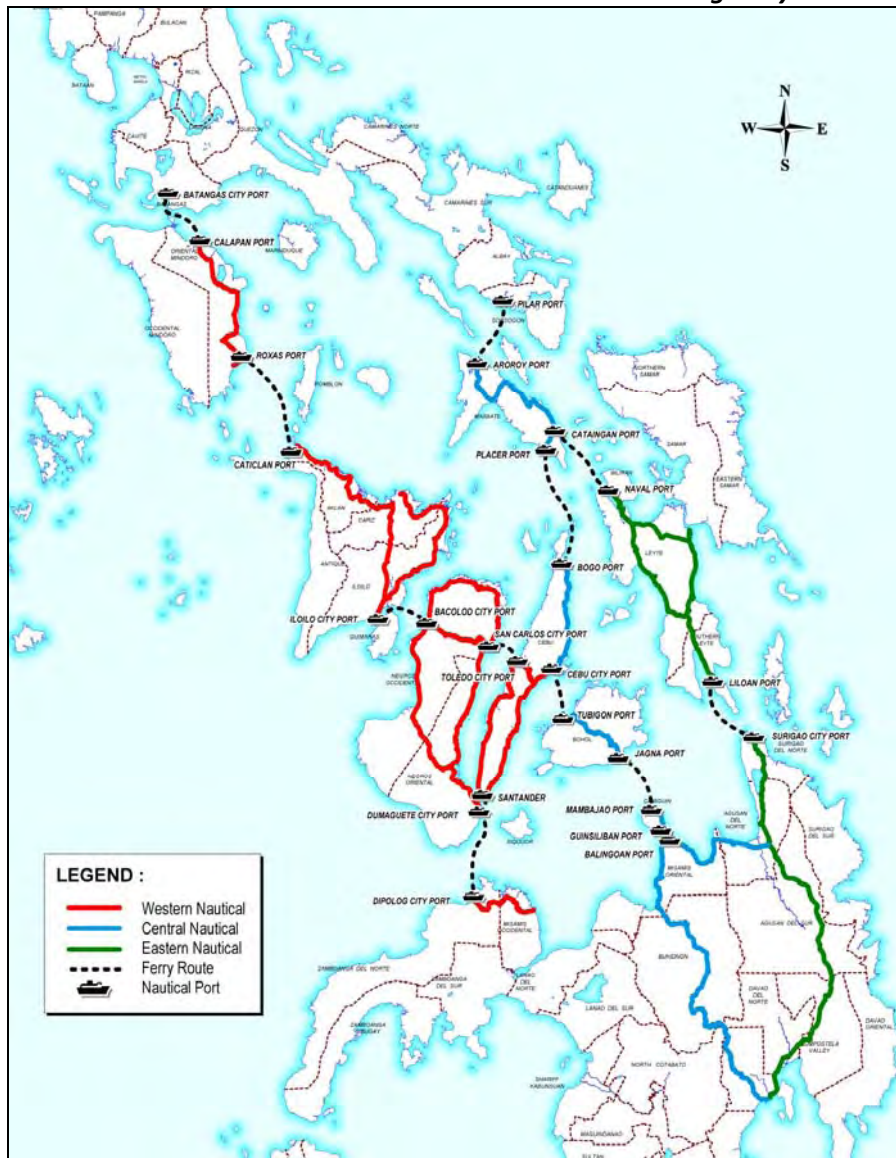
**Road Functional Classification (Mindanao)**



Source: DPWH Atlas, 2007



### Nautical Highway Network



Source: DPWH Atlas, 2007



## PART II – METRO MANILA AND ITS 200 KM RADIUS SPHERE

### 4. GENERAL PROFILE OF THE STUDY AREA

#### 4.1 Physical Profile

##### Topography

The prevailing landforms in Region III can be described as a large basin surrounded by mountain ranges on three sides. Region IV-A, can be generally described as part of the Macolot Corridor. Metropolitan Manila is divided morphologically into three major parts as shown in the figure below. These are the: (i) Central Plateau, (ii) Coastal Lowland and (iii) Marikina Valley.

##### Geology

The Philippine archipelago can be divided into two main geologic entities, namely: the Philippine Mobile Belt and the North Palawan Block. Each of these two entities is composed of different types of lithologic units that can be classified into four (4) general groups, namely: 1) metamorphic rocks, 2) ophiolites

and ophiolitic rocks, 3) magmatic rocks and active volcanic arcs, and 4) sedimentary basins.

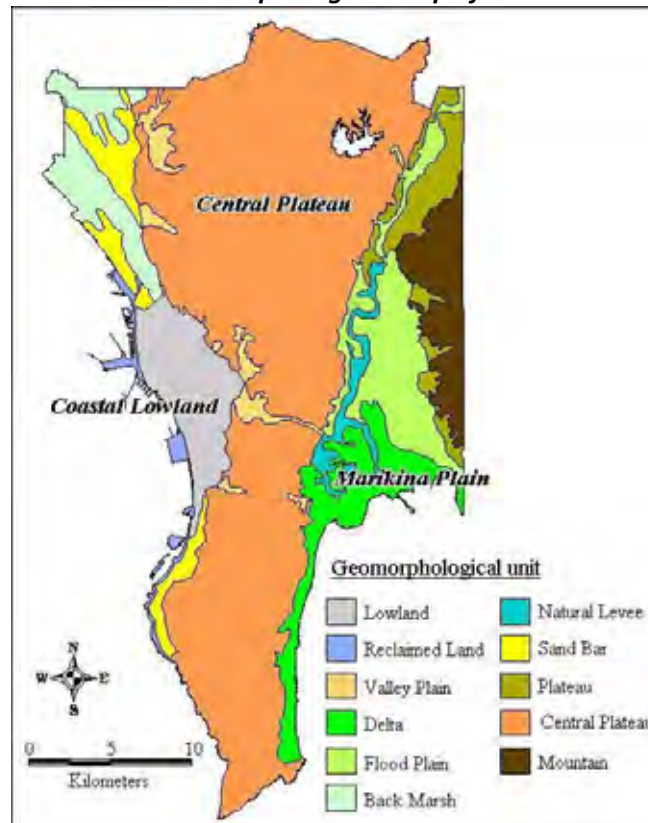
##### Potential Earthquake Generators

There are five (5) major geotectonic features that can affect the study sphere, in terms of generating significant earthquakes. These are the: (i) Manila Trench and its related structures, (ii) East Luzon Trough (iii) Philippine Fault Zone, (iv) Seismic and volcanic activity from Taal Volcano, and (v) the Valley Fault System (VFS). Figure which shows active faults and trenches in Luzon Island is available in the succeeding page.

##### Flood Potential Area

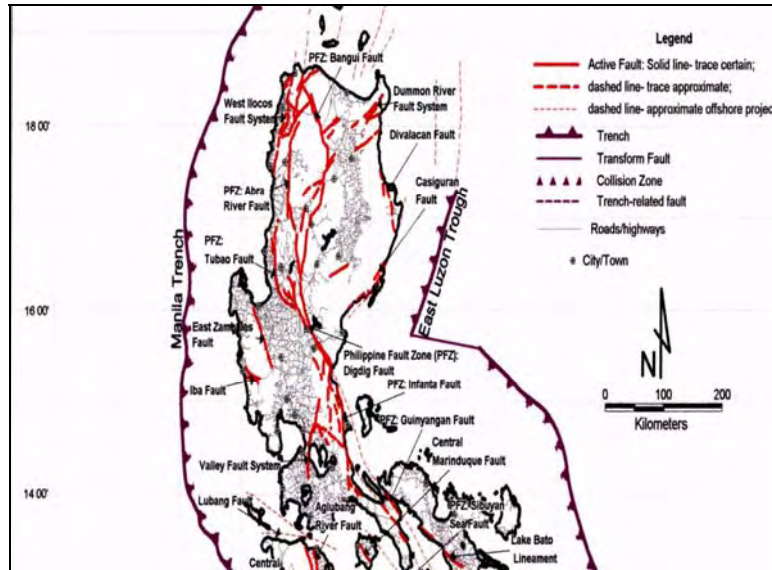
Flooded areas have to be taken into account for the type of structures to be used for high standard roads. A figure showing areas potential for flooding in Region III, Metro Manila and part of Region IV-A is presented in the succeeding page.

**Geomorphological Map of Metro Manila**



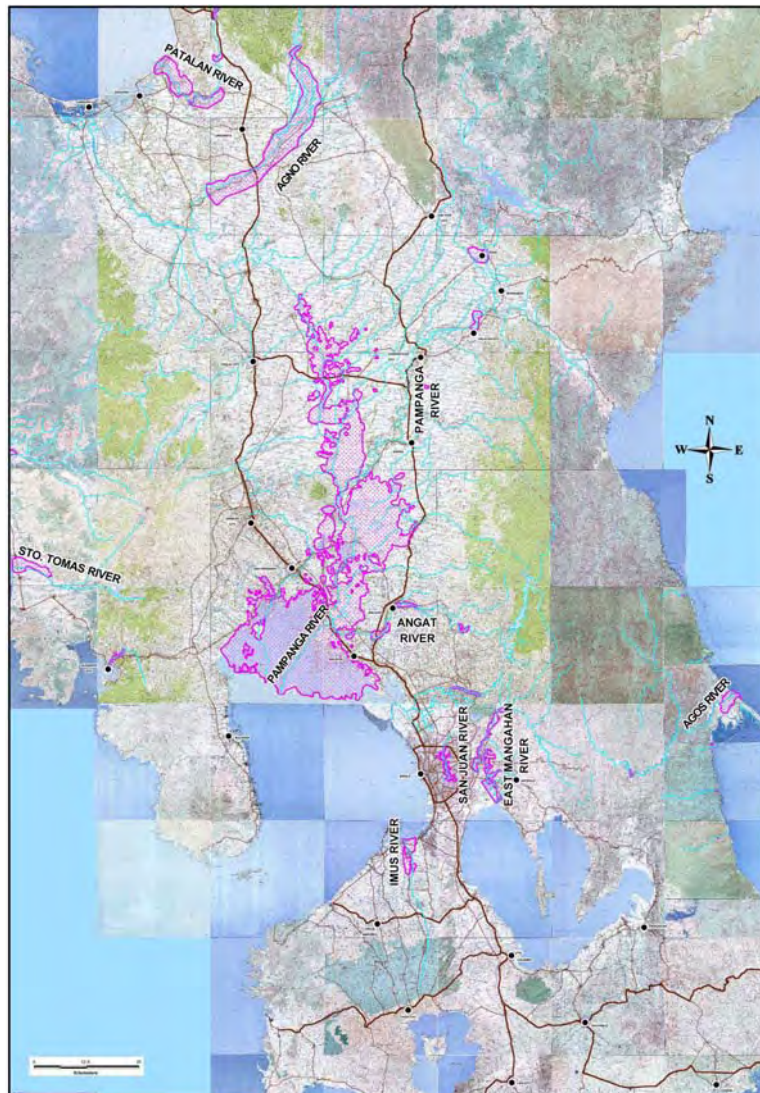
Source: Philippine Institute of Volcanology and Seismology (PHIVOLCS)

### Active Faults and Trenches in Luzon



Source: PHIVOLCS and EPRMP for LRT Line 1 North Extension, 2009

### Flood Potential Area

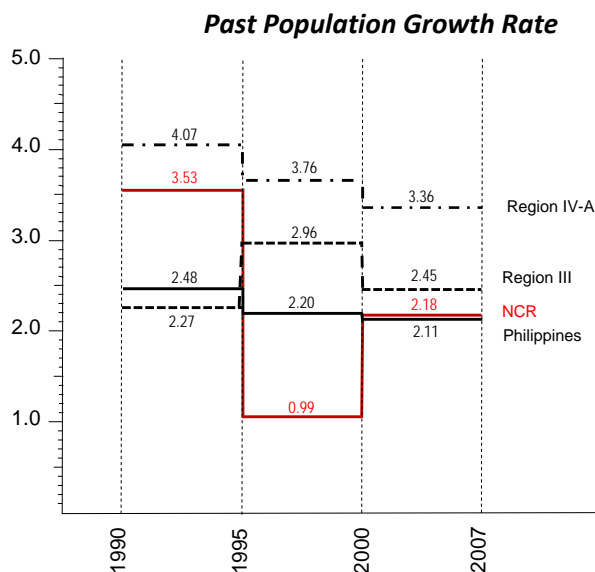


Source: Study Team

## 4.2 Socio-economic Profile

### Demographic Trend

- Population of NCR reached 11.6 million in 2007 (16% of the country's population) and population density is extremely high at 187 persons/hectare.
- Region III's population registered at 9.7 million in 2007 (about 11% of the country's population) and population density is 4.5 persons per hectare.
- Region IV's population in 2007 recorded at 11.7 million and population density is 7.1 persons/hectare.

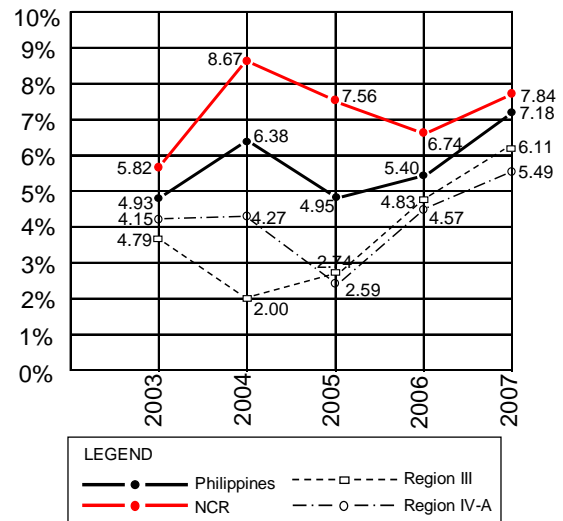


Source: NSO, 2008

### Economic Trend

The country has recorded high economic growth from 2003 to 2007, ranging from 4.9% to 7.2%. However, it was seriously affected by the international economic crisis in 2008 where growth rate was dropped to 3.8%.

### GDP and GRDP Growth Rate



Source: NSCB, 2008

### Employment

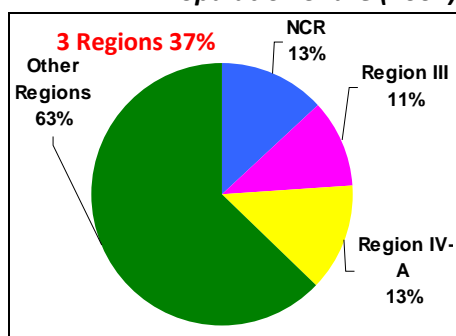
Employed persons by major industry group are shown in the table below.

#### Employed persons by major industry group ('000)

	Philippines		NCR		Region III		Region IV-A	
	2005	2007	2005	2007	2005	2007	2005	2007
Primary Sector	12,171 (1.00)	12,161 (1.00)	40 (1.00)	29 (0.73)	799 (1.00)	804 (1.01)	736 (1.00)	789 (1.07)
Secondary Sector	4,883 (1.00)	5,076 (1.04)	864 (1.00)	852 (0.99)	664 (1.00)	690 (1.04)	1,054 (1.00)	1,101 (1.04)
Tertiary Sector	15,820 (1.00)	16,437 (1.04)	3,263 (1.00)	3,247 (1.00)	1,740 (1.00)	1,902 (1.09)	2,102 (1.00)	2,307 (1.10)
Total	32,875 (1.00)	33,672 (1.02)	4,166 (1.00)	4,128 (0.99)	3,203 (1.00)	3,396 (1.06)	3,891 (1.00)	4,197 (1.08)

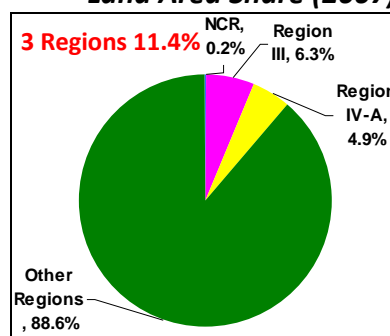
Source: NSCB, 2008

### Population Share (2007)



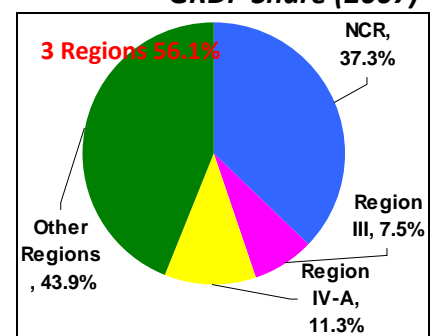
Source: NSO, 2008

### Land Area Share (2007)



Source: NSCB, 2008

### GRDP Share (2007)



Source: NSCB, 2008



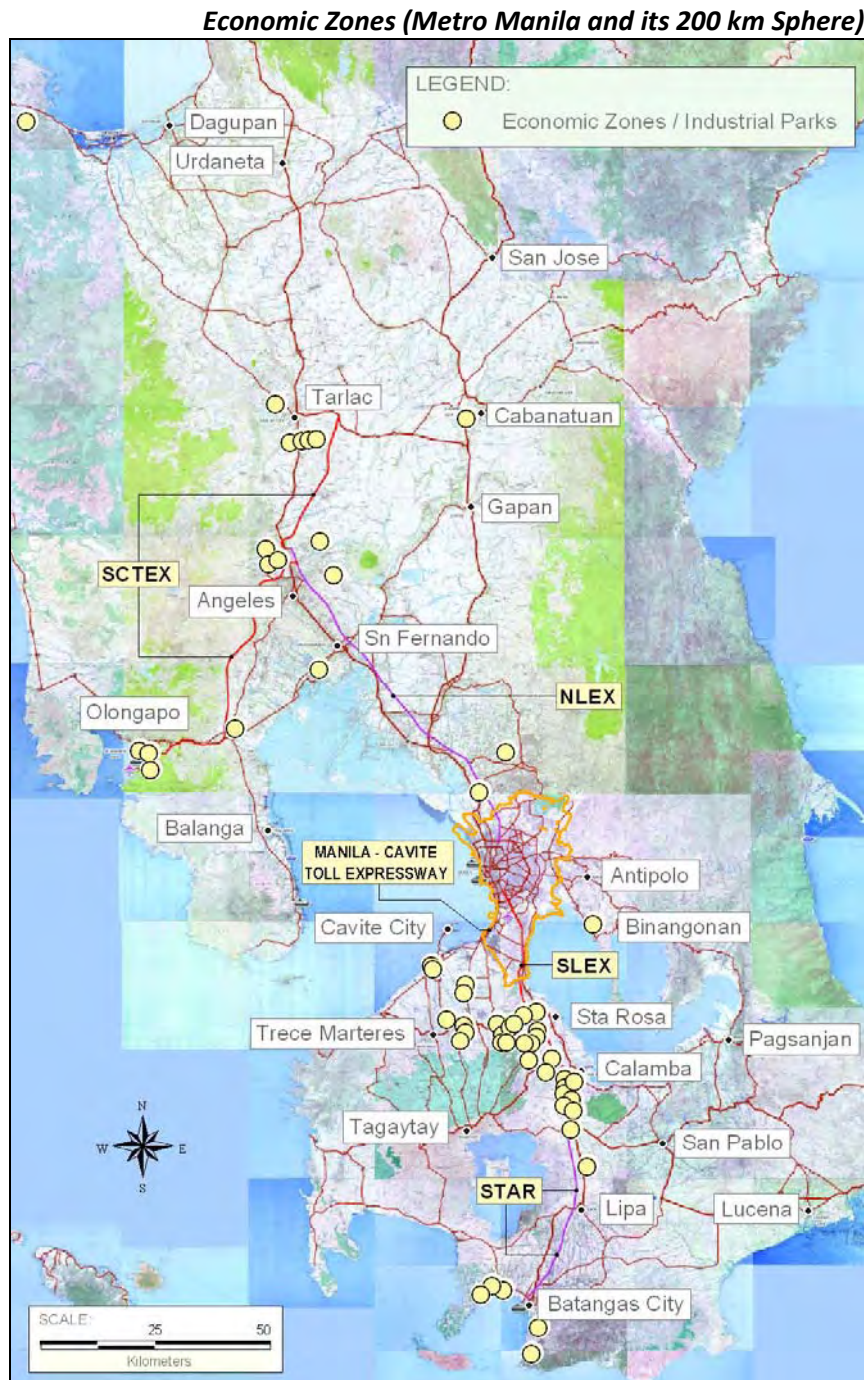
## 5. PRESENT TRAFFIC CONDITIONS

### 5.1 Distribution of Traffic Generation Sources

Both Region III and Region IV are dotted with numerous economic zones which are mostly located closer to the expressways or national road for easy transportation of their products. Location of ecozones is shown in the figure below while the population of Metro Manila and its 200 km sphere is shown in the succeeding page.

### 5.2 Existing Number of Lanes

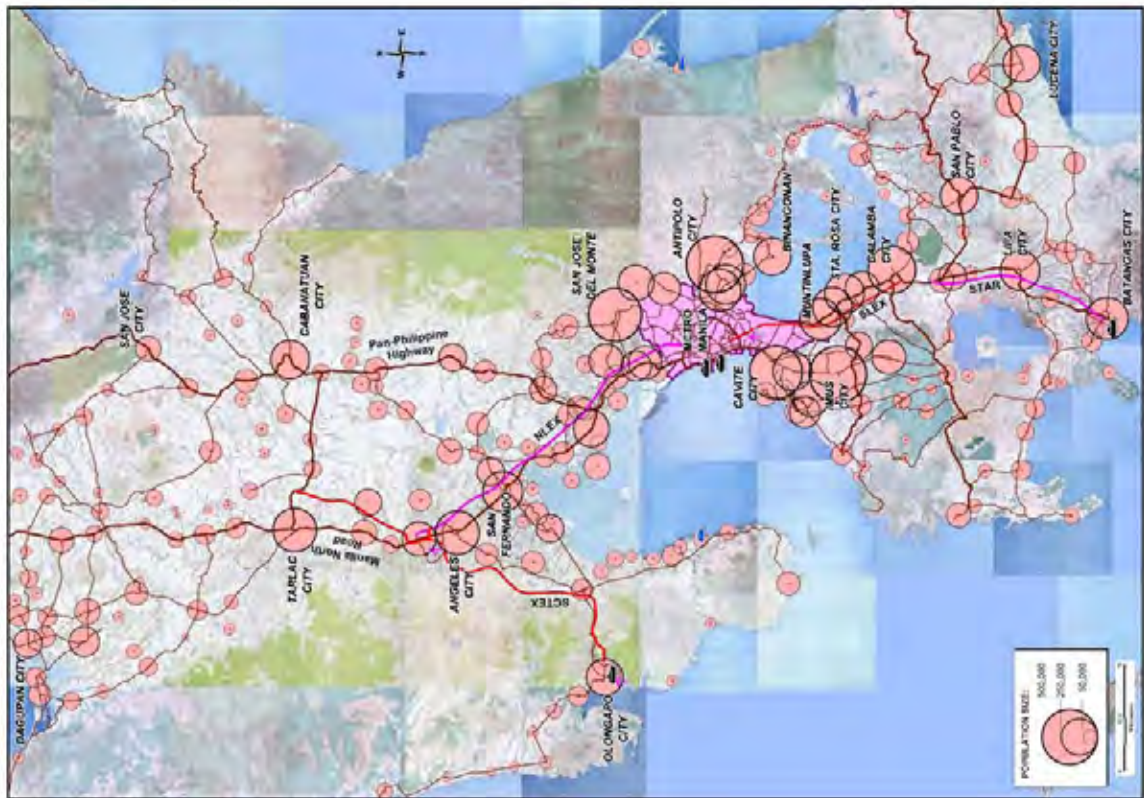
Arterial roads in the north and south of Metro Manila are mostly 2-lane highways except the expressway with 4-lane. Metro Manila's road has mix number of lanes where some are as wide as 20-lane and some are just 2-lane.



Source: Prepared by the Study Team based on the data of Philippine Economic Zone Authority (PEZA), 2008



**Population Distribution: Metro Manila and its 200 km Sphere**



Source: Prepared by the Study Team based on NSO 2007 data

**Number of Lanes of Metro Manila Road**



Source: Prepared by the Study Team based on DPWH data

### 5.3 Traffic Conditions

#### Metro Manila

- Traffic congestion is one of the most serious problems of Metro Manila and experienced all day long from 6:00 AM to 10:00 PM.
- Travel speed of most arterial roads in Metro Manila is quite low, less than 20 km./hr, and in some arterial roads is less than 10 km./hr.
- Traffic congestion is creating various problems such as increase of travel time, failure of timely delivery of goods and people, losses of people's valuable time, aggravated roadside environment including air pollution, noise and vibration, etc.
- Traffic congestion is also affecting sound socio-economic activities and industries are losing international competitiveness, resulting in loss of international/domestic investment.

#### North of Metro Manila

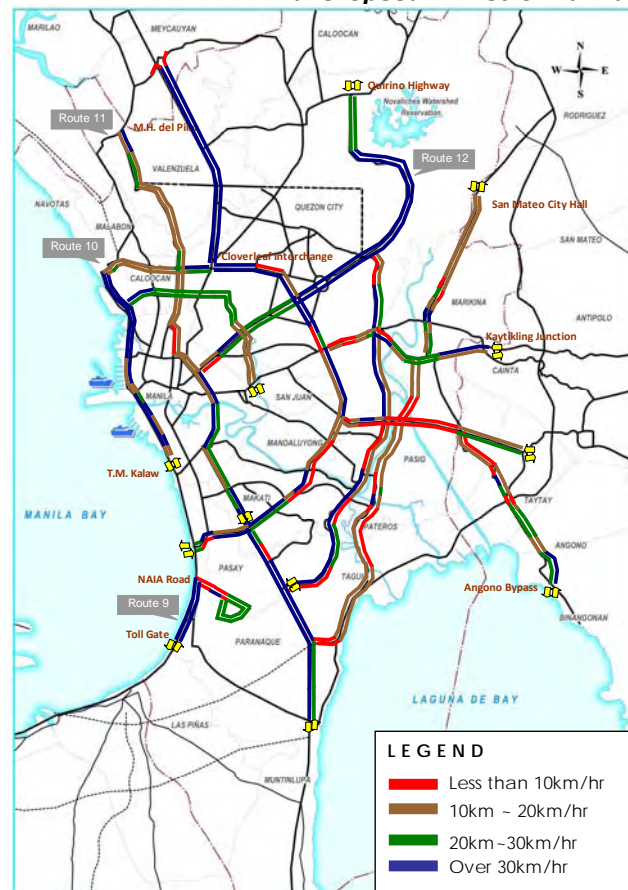
Typical inter-city traffic problems on arterial roads are;

- The inter-city arterial road connects small, medium and large size urban centers at an interval of about 10 km. At such urban sections, local traffic like jeepneys and tricycles drastically increase which greatly affect smooth flow of traffic.
- Thus, traffic bottlenecks are created only at urban sections of the inter-city roads. And widening of such urban sections is difficult due to roadside development.
- There are two solutions, one is to construct a bypass at regional urban centers and the other is to construct an expressway parallel to the inter-city road.

#### South of Metro Manila

- Arterial roads in Cavite and Laguna Provinces have the similar traffic congestion problems as arterial roads in Metro Manila.
- Arterial roads in Batangas Province have the similar traffic congestion problems as that of arterial roads in north of Metro Manila.

**Travel Speed in Metro Manila**



Source: Study Team



## 5.4 Freight Movement and Logistics Corridors

### Port and Airport Freight Movement

The truck OD survey revealed that there are strong truck movements between: Metro Manila – Laguna; Metro Manila – Bulacan; Metro Manila – Batangas; and Metro Manila – Cavite as illustrated in the figure below.

### Logistics Corridors of Ecozones

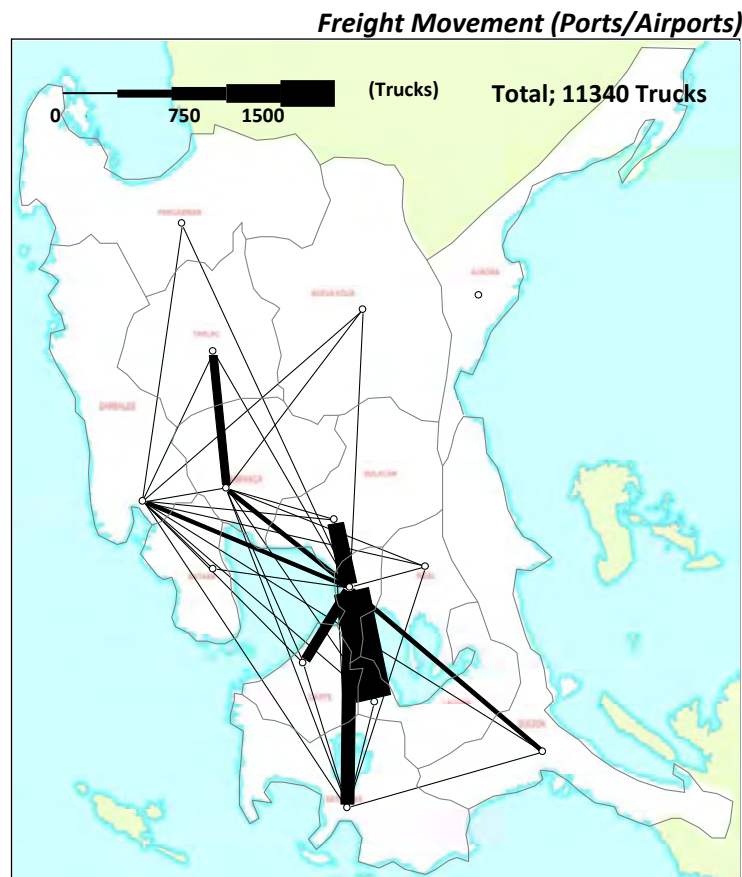
Logistics routes of Eco-zones located in the south of Metro Manila:

- South Luzon Expressway
- Manila-Cavite Coastal Expressway

- Southern Tagalog Arterial Road
- Aguinaldo Highway (Cavite)
- Governor's Drive (Cavite)
- North Luzon Expressway
- Olongapo – San Fernando Road

Logistics routes of Eco-zones located in the north of Metro Manila are:

- North Luzon Expressway
- Manila North Road
- Olongapo – San Fernando Road
- South Luzon Expressway
- Southern Tagalog Arterial Road
- Governor's Drive



## 6. ROAD PROJECTS PROPOSED BY VARIOUS ENTITIES

Roads projects proposed by various entities are shown in the succeeding pages.

### 6.1 Pre-screening of Proposed Projects

There are a total of 39 projects (including existing/on-going) proposed by various entities. Some are proposed along the same corridor, thus these were integrated into one project.

Proposed projects were pre-screened based on the following criteria:

#### Type A

The expected traffic volume is very low (less than 3,000 vehicle/day).

#### Type B

Among those project proposed along the same direction, a project of which relative priority is low due to high construction cost.

#### Type C

Due to ROW acquisition problems, HSH standard can not be easily maintained.

#### Type D

Project which requires long and/or under-sea tunnel over 10 km.

### 6.2 Integration and Pre-screening Result

The result of integration of projects and pre-screening is summarized as follows:

Integration and Pre-screening	Project No.*
• Total number of proposed projects – 39	[1]~[39]
• 12 are existing/on-going projects	[1,2,4,6,11,13,15,16,19,23,24,25]
• 11 projects were integrated to 5 for candidates of HSH-1	[5, 10, 12],[26**] [27,32],[3,34], [7,8,9]
• 9 projects were selected as candidates for HSH-1	[17,30,20,22,28, 29,31,33,35]
• 1 project was selected as candidate for HSH-2	[39]
• 6 projects were screened out from HSH	[14,18,21,36,37,38]

\* [Number] refers to the project location on the map in the succeeding page.

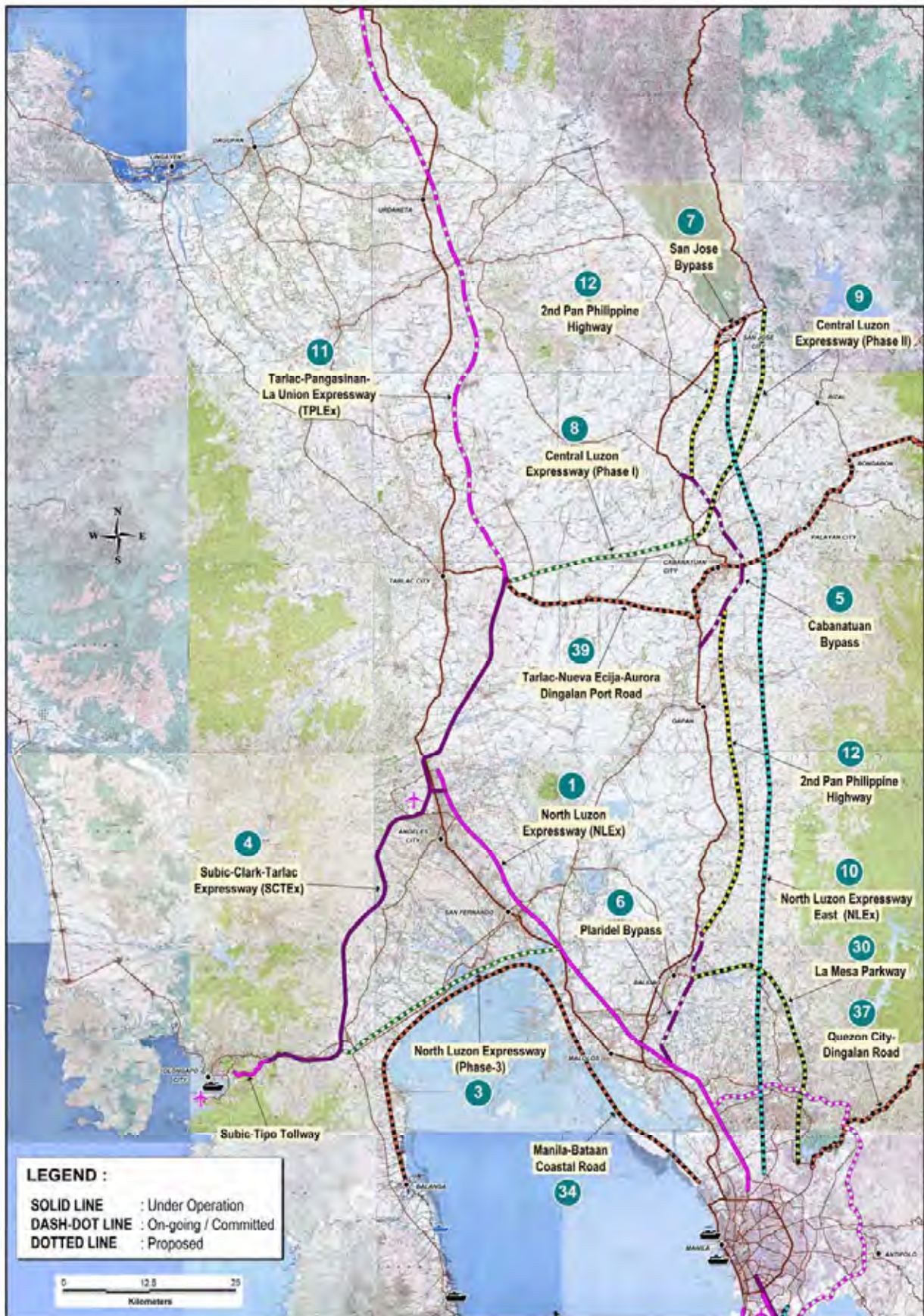
\*\* 3 alternative routes were integrated into [26].

### 6.3 HSH-1 Candidate Projects

A total of 14 projects were selected as candidates for HSH-1 which are (project number refers to the project location on the map in the succeeding page):

Project Title	Project No.
(1) NLEx-East	5, 10, 12
(2) La Mesa Parkway	30
(3) NLEx-SLEx Link Expressway	26
(4) C-6 Expressway	27, 32
(5) NLEx Phase-3	3
(6) CLEx	7, 8, 9
(7) SLEx Extension	17
(8) CALA Expressway	20
(9) Calamba-Los Baños Expressway	22
(10) Manila Bay Expressway	28
(11) NAIA Expressway	29
(12) Pasig-Marikina Expressway	31
(13) C-5/FTI/Skyway Connector Road	33
(14) C-6 Extension	35

Proposed Road Projects (North of Metro Manila)



Source: Prepared by the Study Team based on various proposal documents



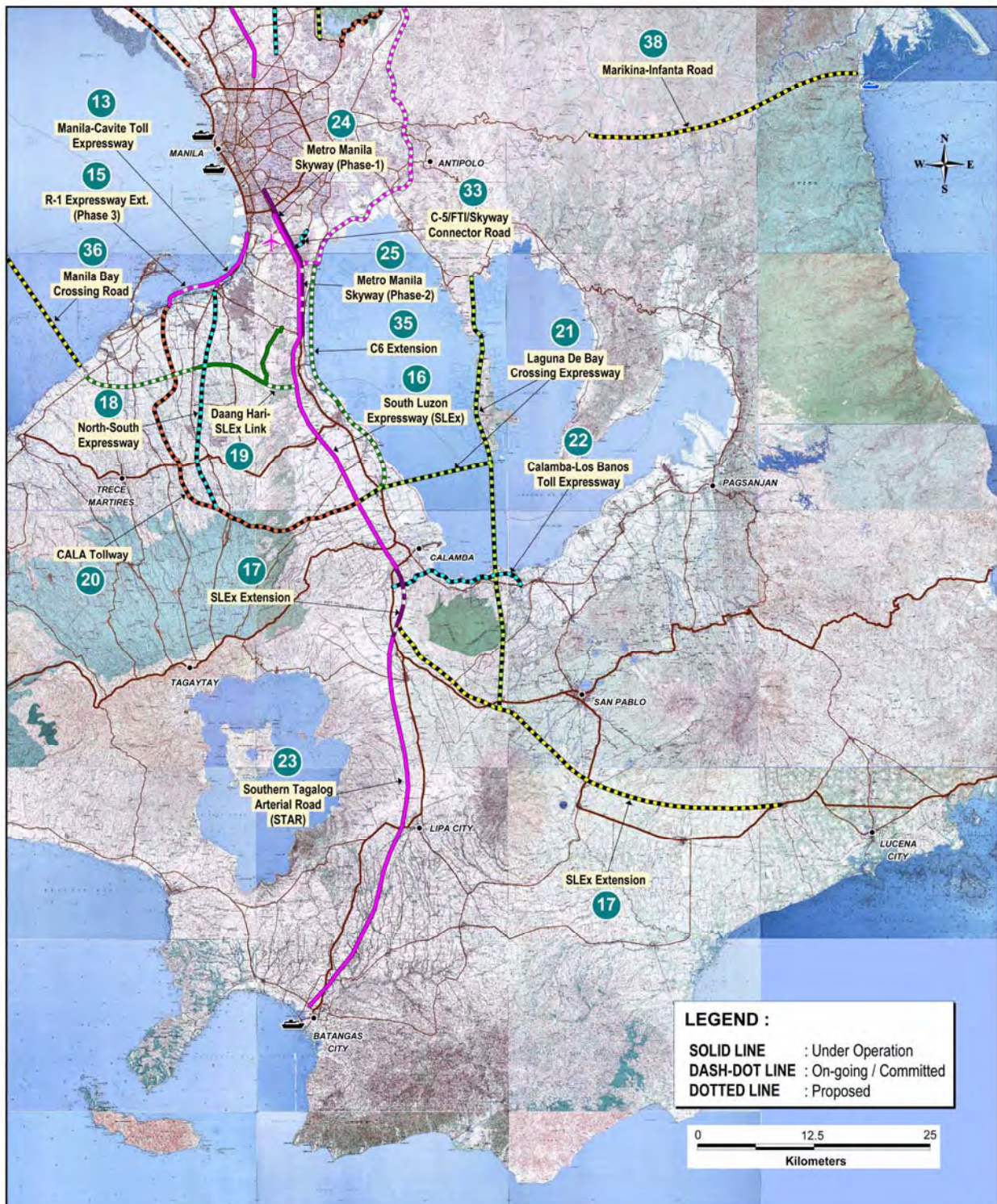
Proposed Road Projects (Metro Manila)



Source: Prepared by the Study Team based on various proposal documents



Proposed Road Projects (South of Metro Manila)



Source: Prepared by the Study Team based on various proposal documents