

**REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS (DPWH)**

**PREPARATORY SURVEY
FOR EXPRESSWAY PROJECTS
IN
MEGA MANILA REGION**

**CAVITE LAGUNA EXPRESSWAY PROJECT
(Laguna Section)**

**FINAL REPORT
MAIN TEXT**

NOVEMBER 2012

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

**CTI ENGINEERING INTERNATIONAL CO., LTD
MITSUBISHI RESEARCH INSTITUTE, INC.
ORIENTAL CONSULTANTS CO., LTD
METROPOLITAN EXPRESSWAY CO., LTD**

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CALAX

EXCHANGE RATE

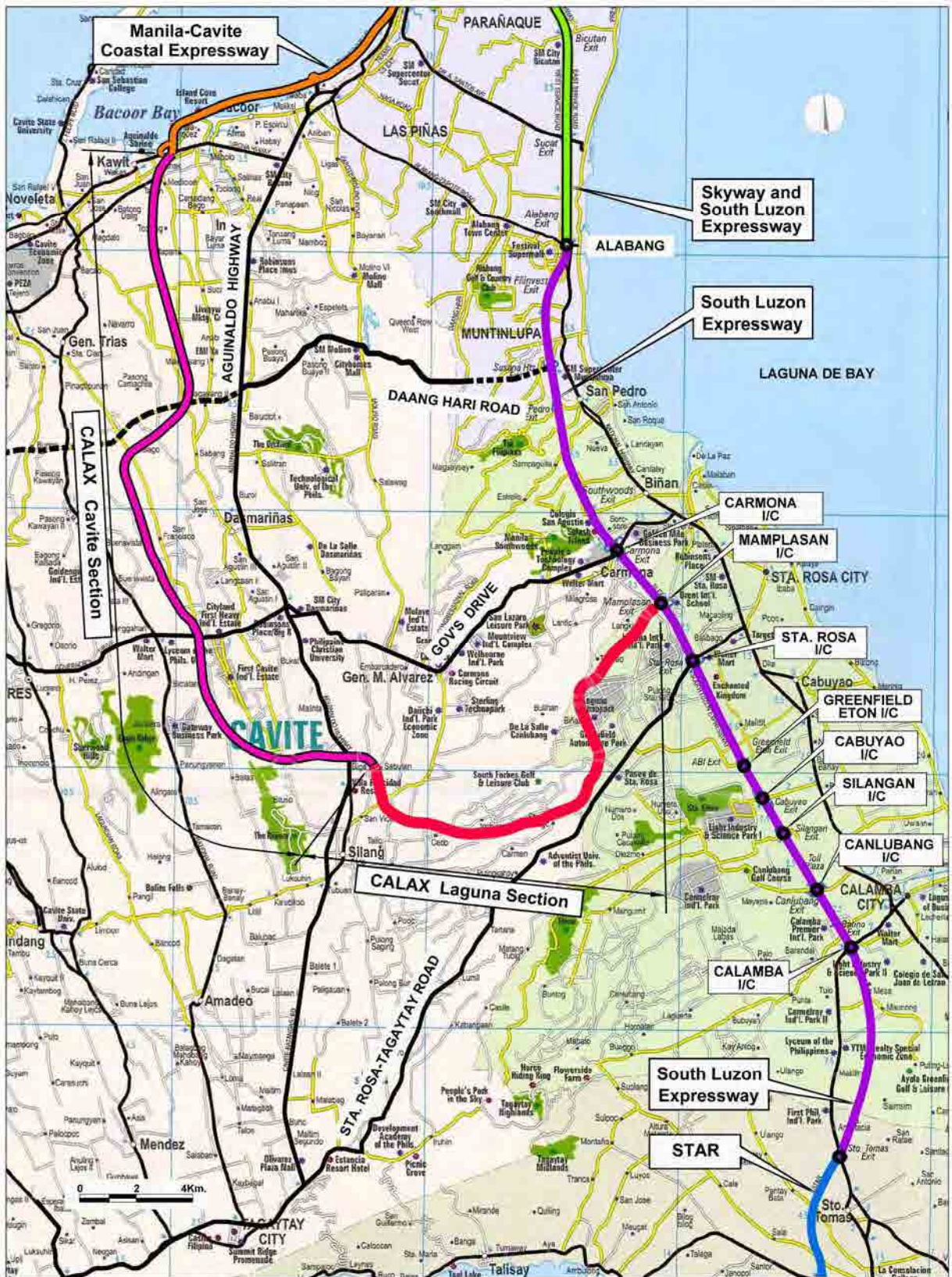
June 2012

1PhP= 1.86 Japan Yen

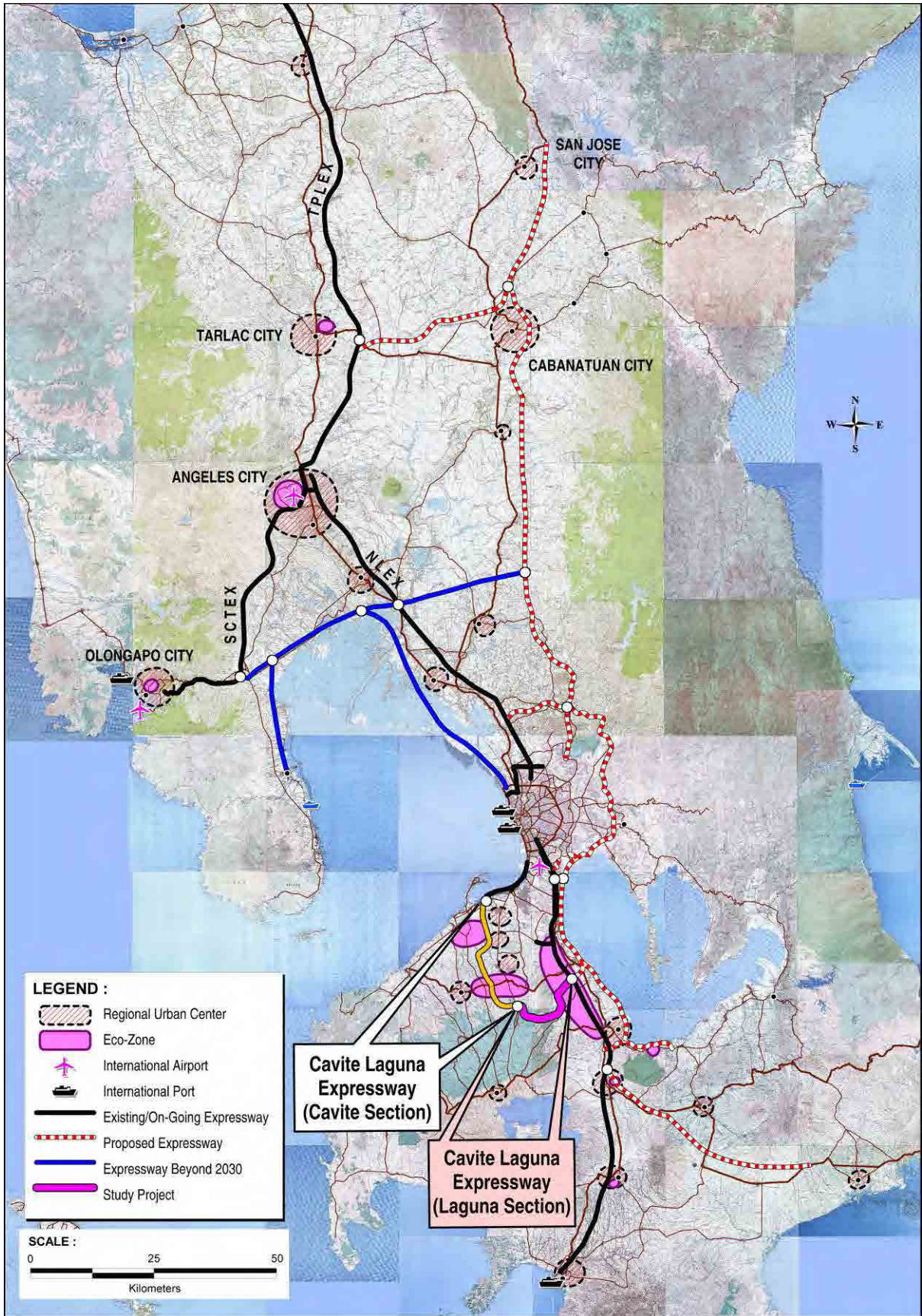
1US\$=42.7Philippine Peso

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Central Bank of the Philippines



LOCATION MAP OF CALAX



LOCATION MAP OF CALAX

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ACRONYMS AND ABBREVIATIONS

ADB	: Asian Development Bank	MIAA	: Manila International Airport Authority
B/C	: Benefit/Cost Ratio	MMDA	: Metro Manila Development Agency
BCDA	: Bases Conversion Development Authority	MRT	: Mass Rail Transit
BLT	: Build-Lease-Transfer	MRTC	: Metro Rail Transit Corporation
BOT	: Build-Operate and Transfer	NCR	: National Capital Region
CAAP	: Civil Aviation Authority of the Philippines	NDC	: National Development Corporation
CDCP	: Construction Development Corporation of the Philippines	NEDA	: National Economic Development Authority
CLEx	: Central Luzon Expressway	NGO	: Non-Governmental Organization
DBFO	: Design, Build, Finance and Operate	NLEx	: North Luzon Expressway
DBP	: Development Bank of the Philippines	NPER	: Net Public Expenditure Reduction
DENR	: Department of Environment and Natural Resources	NPV	: Net Present Value
DBM	: Department of Budget and Management	O&M	: Operation and Maintenance
DOF	: Department of Finance	ODA	: Official Development Assistance
DOTC	: Department of Transportation and Communications	OSG	: Office of the Solicitor General
DPWH	: Department of Public Works and Highways	PD	: Presidential Decree
DTI	: Department of Trade and Industry	PEA	: Philippine Estate Authority
EIA	: Environmental Impact Assessment	PEGR	: Philippines-Australia Partnership for Economic Governance Reform
EIRR	: Economic Internal Rate of Return	PIP	: Public Investment Plan
EIS	: Environmental Impact Statement	PMO-	: Project Management Office for
EO	: Executive Order	BOT	: Build-Operate-Transfer
FIRR	: Financial Internal Rate of Return	PNCC	: Philippine National Construction Company
GDP	: Gross Domestic Product	PNR	: Philippine National Railways
GFS	: Government Financing Support	PPA	: Philippine Port Authority
GOCCs	: Government-Owned and Controlled Corporations	PPP	: Public-Private Partnership
GOJ	: Government of Japan	R.A.	: Republic Act
GRP	: Government of the Republic of the Philippines	RAP	: Resettlement Action Plan
HSH	: High Standard Highway	ROW	: Right of Way
ICC	: Investment Coordinating Committee	SC	: Steering Committee
IEE	: Initial Environmental Examination	SCTEx	: Subic-Clark-Tarlac Expressway
IFC	: International Finance Corporation of World Bank Group	SLEx	: South Luzon Expressway
IRR	: Internal Rate of Return	SPC	: Special Purpose Company
JICA	: Japan International Cooperation Agency	STAR	: Southern Tagalog Arterial Road
KOICA	: Korean International Cooperation Agency	STOA	: Supplemental Toll Operation Agreement
LAPRAP	: Land Acquisition Plan and Resettlement Action Plan	TCA	: Toll Concession Agreement
LGUs	: Local Government Units	TOA	: Toll Operation Agreement
LRTA	: Light Rail Transit Authority	TOC	: Toll Operation Certificate
MARINA	: Maritime Industry Authority	TOR	: Terms of Reference
MRG	: Minimum Revenue Guarantee	TPLEx	: Tarlac-Pangasinan-La Union Expressway
		TRB	: Toll Regulatory Board
		TWG	: Technical Working Group
		USAID	: United States Agency for International Development
		WACC	: Weighted Average of Capital Cost
		WB	: World Bank

EXECUTIVE SUMMARY

1. BACKGROUND OF CALAX PROJECT

Cavite and Laguna are neighboring provinces of Metro Manila and rapid urbanization is taking place which is causing traffic congestions in both provinces. Many economic zones/industrial parks have been and are being developed. The two provinces are now the core center of the secondary industry of the Philippines. Cavite-Laguna Expressway (CALAX) provides vital transport access to provinces of Cavite and Laguna; where rapid urbanization propelled by the private developers is on-going and economic/industrial zones have and are being developed. CALAX will support sound urbanization of the two provinces and industrial development and economic development of the provinces as well as reduction of traffic congestion of the two provinces.

In 2006, JICA-assisted Feasibility Study and Implementation Support on the CALA East-West National Road Project (hereinafter referred to as the “2006 FS”) was undertaken. The 2006 FS studied three (3) roads as follows;

- North-South Road (for CAVITEX to north of Governor’s Drive)
- Daang Hari Road
- CALA Expressway (from Governor’s Drive to SLEX), section from Governor’s Drive to CAVITEX Extension was not included due to uncertain alignment and implementation of CAVITEX Extension.

After the 2006 FS, the DPWH tried to implement CALAX and several stakeholders meeting inviting concerned private land developers, however, most of land developers objected the CALAX Project because their development plans are severely affected. Thus, DPWH suspended further actions for implementation. Meantime, the DPWH continued discussions with the CAVITEX operator and concerned LGUs in Cavite Province and selected CALAX corridor alignment of the Cavite side.

In 2009, the World Bank decided to finance the transaction services for the Cavite section of CALAX project through its loan. The Consultant for the transaction services was selected and the work commenced in September 2011. JICA also decided to provide technical assistance for the Laguna section of CALAX in 2010.

2 NESSECITY OF CALAX PROJECT

Therefore the improvement in transport sector is necessary as follows.

- Traffic congestion of National Roads in Cavite and Laguna Provinces. Needs to reduce traffic congestion
- Economic and Social activities in the area are quite active. Transport infrastructure needs to support these activities
- Urbanization is quite rapid in the area. Need to support sound urbanization.
- Lack of Public Roads. Needs more public roads in the area

- Expressway network is not formed and expressways are functioning independently. Needs formation of expressway network

3 OBJECTIVE OF CALAX PROJECT

Based on the background the existing situation of Cavite-Laguna Provinces, the objectives of the CALAX project are as follows:

OBJECTIVES OF THE PROJECT

- (i) To provide fast, safe, comfortable and reliable means of transport in Cavite and Laguna Provinces.
- (ii) To decongest traffic of roads in Cavite and Laguna Provinces.
- (iii) To support economic development by providing better transport access to economic/industrial zones in the area, this contributes to promote local/foreign investments in the area.
- (iv) To support sound urbanization in the area.

The CALAX is divided into two sections namely, Cavite Section and Laguna Section. The Feasibility Study and Transaction Advisory Service of Cavite Section has been implemented with the finance of the World Bank. The Laguna Section of the CALAX is studied under this study.

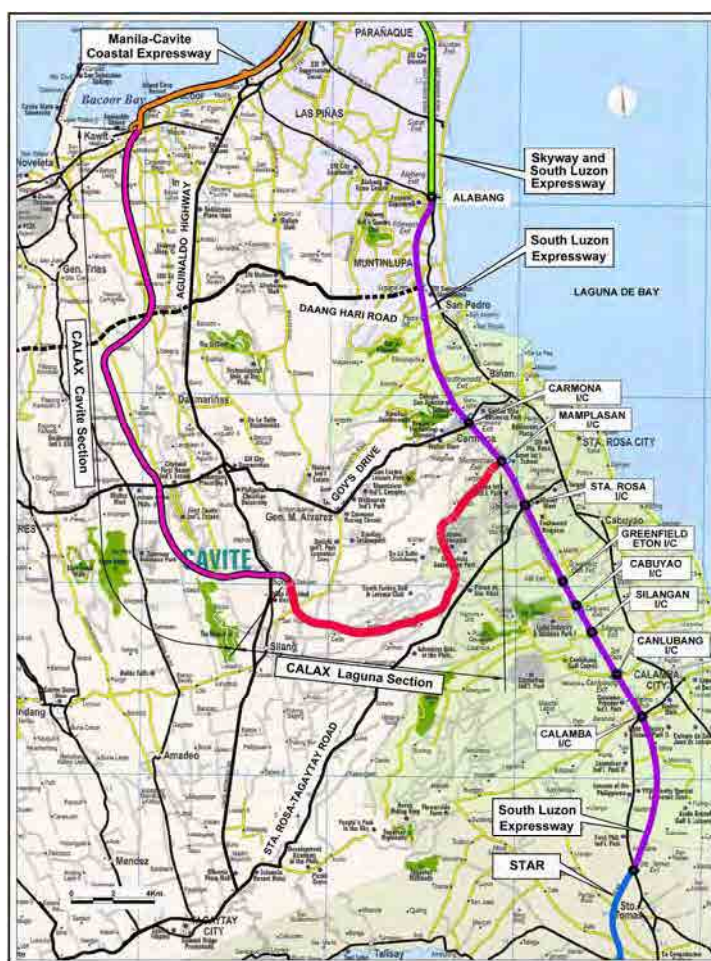


FIGURE 3-1 LOCATION OF CALAX

4 ALIGNMENT STUDY OF LAGUNA SECTION OF CALAX

4.1 Review of the 2006 FS

(1) Proposed Alignment by the 2006 FS

CALAX was studied in the JICA-assisted Feasibility Study and Implementation Support on the CALA East-West National Project. The alignment recommended by the 2006 FS is shown in **FIGURE 4.1-1**. The recommended alignment starts at Eton/Greenfield Interchange (IC) of SLEX and goes westwards crossing Sta. Rosa – Tagaytay Road and reaches to Aguinaldo Highway. From there, it goes north-east direction and ends at Governor’s Drive.

(2) Objection to the Proposed Alignment by the Land Developers

Many land developers such as Eton Properties Philippines, Inc., Greenfield Development Corporation, and University of Sto. Tomas, etc., purchased the lands in the corridor from SLEX and Sta. Rosa – Tagaytay Road. DPWH undertook the stakeholders meeting in 2006 and 2007 in order to realize the project, however, most land developers did not agree to the proposed alignment because their land development plan was severely affected. Thus, DPWH suspended the further actions for implementation.

(3) Engineering Concept

CALAX was planned as a national road and not as an access-controlled expressway, thus no toll facilities were planned, although grade separations at intersections with major roads were planned.

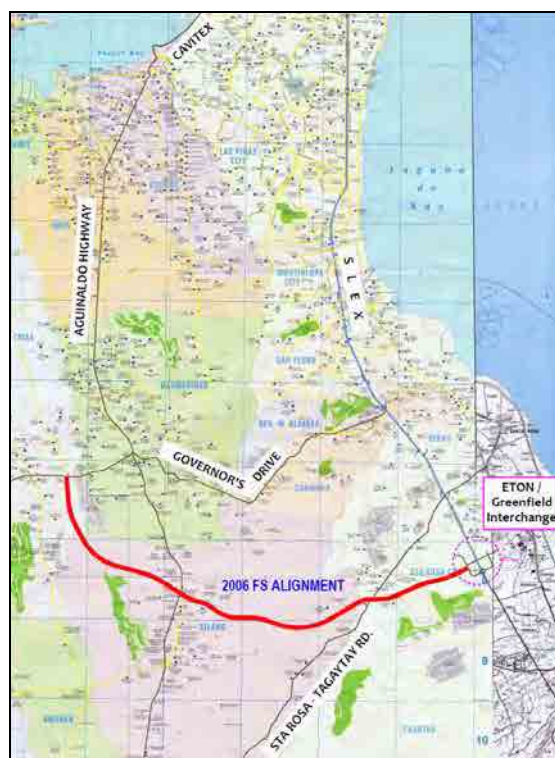


FIGURE 4.1-1 CALAX ALIGNMENT RECOMMENDED BY THE 2006 FS

4.2 Selection of the Beginning Point of Laguna Section (Connection Point of Cavite and Laguna Sections)

Three (3) alternative alignments were developed focusing on minimization of social impact or dislocation of people on the beginning point of Laguna Section. The Alternatives prepared are as follows.

- Alternative-1: Alignment Recommended by the 2006 FS
- Alternative-2: North Alignment to minimize social impact in the northern area of Silang Municipality town proper.
- Alternative-3: South Alignment to minimize social impact in the southern area of Silang Municipality town proper.

Three alternative alignments were evaluated as shown in **TABLE 4.2-1** and Alternative-2 was recommended due to minimize social impact and construction cost.

TABLE 4.2-1 EVALUATION OF ALTERNATIVE ALIGNMENTS AT BEGINNING POINT

<p>(Confidential)</p>

(Confidential)

4.3 Alignment Alternatives of CALA

The alignment study has been carried out in this study from the viewpoints as follows:

- Land area acquired by private land developers
- Road network status in the project area
- Existing land use and development plan in the project area
- Connection with existing and planned road network, interchange location

The six alternative alignments have been developed as shown in the **FIGURE 4.3-1**.

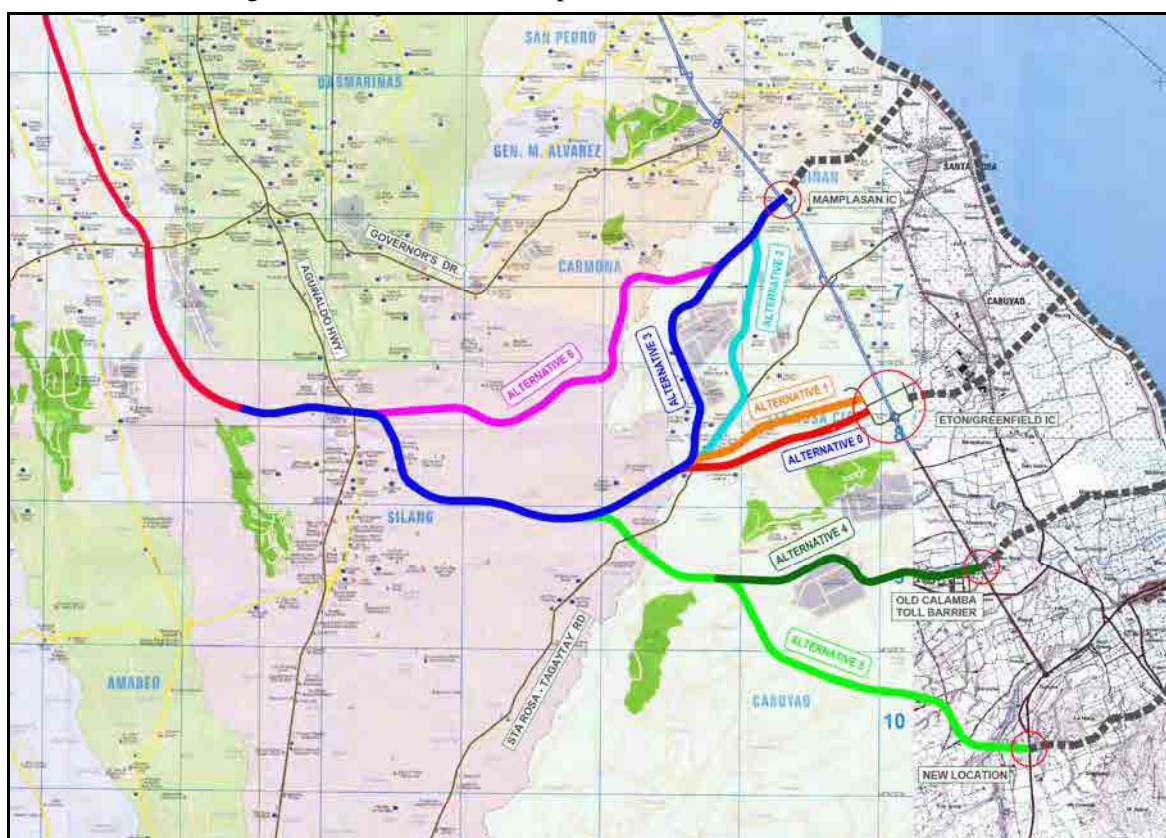


FIGURE 4.3-1 ALTERNATIVE ALIGNMENTS OF LAGUNA SECTION OF CALAX

The comparative analysis with the multi criteria evaluation method is show in **TABLE 4.3-1**, and Alternative-3 was recommended due to the following reasons;

- Cost is within 10% increase compared to the minimum cost alternative (Alternative-6). (Alternative-6 attracts least traffic). Second lowest alternative (Alternative-1) and Alternative-3 is almost the same cost.
- High traffic volume is attracted. Alternative-3 attracts the 2nd highest traffic. Highest is Alternative-4 and difference is 900 vehicle per day (or 1.6% difference).
- Social impact in terms of dislocation of people is the smallest.

- Since this alternative utilizes the 60m ROW of existing private road (for about 1/3) of the total expressway length), implementation in terms of ROW acquisition is the easiest and the fastest.
- Other alternatives affect people who have newly acquired a lot from the private land developers. When they bought their lots, they were not informed that their lots will be affected in the future by this project. Therefore, their life plan will have a drastic change. On the part of DPWH, ROW acquisition negotiation will take time.

TABLE 4.3-1 CHARACTERISTICS AND EVALUATION RESULT OF ALTERNATIVES ALIGNMENT

(Confidential)

(Confidential)

4.4 Viaduct along Laguna Blvd.

The proposed alignment utilized the existing Laguna Blvd. which was developed by Ayala Corporation and is operated as a private road, therefore, all vehicles cannot pass the road but only those with sticker at present.

The east side of the road is the Laguna Techno Park (industrial estate) and the west side of the road is mostly residential subdivisions.

The road has a right-of-way width of 60m. About 1/3 of the section is 4-lane divided road and the rest is a 2-lane road. Due to roadside development, there are many intersections as shown in **FIGURE 4.4-1**.

CALAX was planned to fly over all existing intersections and the profile of the section between intersections was planned to lower as much as possible to reduce the construction cost, thus, the section along Laguna Blvd. comprises of Viaduct Section and the mechanically stabilized earth wall (MSE Wall).

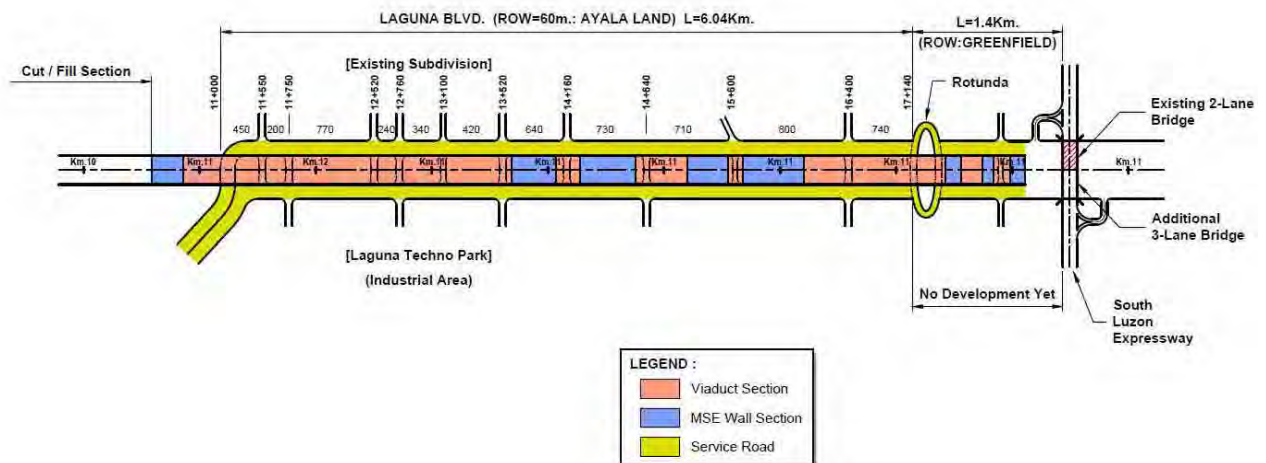


FIGURE .4.4-1 VIADUCT ALONG LAGUNA BLVD.

4.5 Mamplasan Interchange Connection

(1) Connection Method between CALAX and SLEX

Two types of connection methods were studied as follows;

Case-1: Direct connection between CALAX and SLEX (**FIGURE 4.5-1**)

Case-2: Indirect connection between CALAX and SLEX (**FIGURE 4.5-2**)

Both schemes were evaluated and Case-2: Indirect Connection was recommended due to the following reasons;

- Although the direct connection is ideal for the smooth traffic flow from/to CALAX to/from SLEX, however,
 - This scheme is quite expensive compared to Indirect Connection Method. (Higher by 1.67 times, or an additional Php 1,467 Million required.)
 - Accessibility to establishment/residents near the existing Mamplasan Interchange becomes worse than at present.
- Traffic flow of Indirect Connection Method can be improved by adopting flyovers at major intersections.

(2) Development Plan of Greenfield Development Corp. (GDC)

The area of about 1.2 km section adjacent to the Mamplasan Interchange is owned by Greenfield Development Corporation (GDC). GDC has a development plan of this area. GDC strongly requested CALAX not to follow the existing road, since GDC will totally change the road network in line with their development plan. It is also requested a rotary type of intersection (rotunda) be built near the Mamplasan Interchange. GDC committed to provide a 50m road right-of-way for the alignment of CALAX.

Many meetings were held and GDC agreed to follow the scheme shown in **FIGURE 4.5-3**.

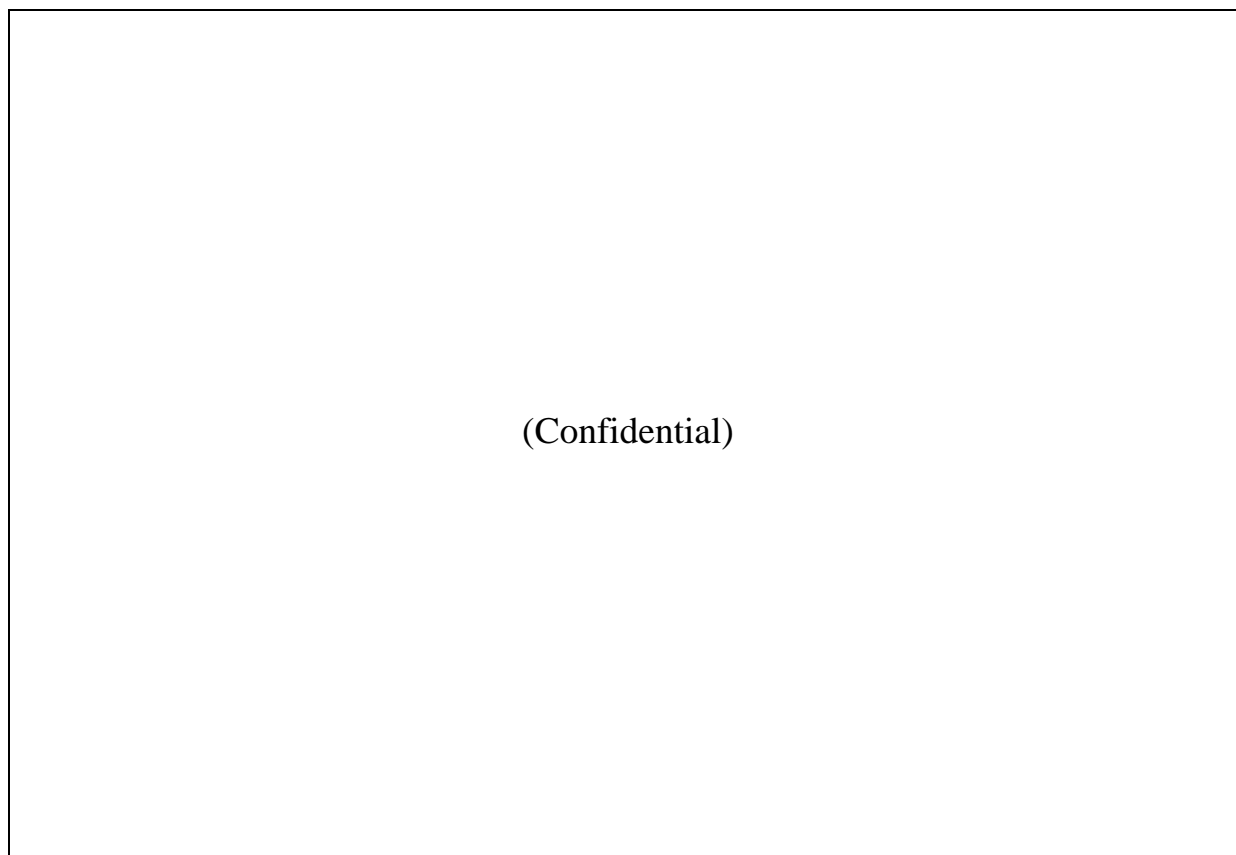


FIGURE 4.5-1 CASE-1: DIRECT CONNECTION BETWEEN SLEX AND CALAX

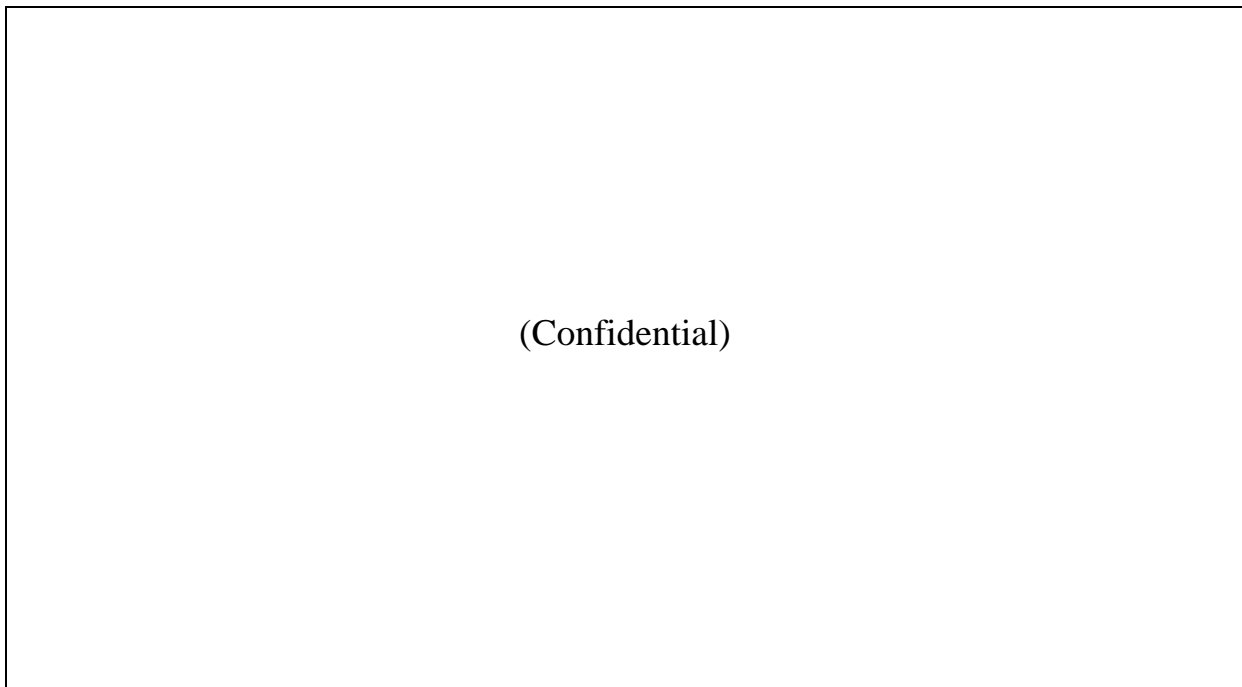


FIGURE 4.5-2 CASE-2: INDIRECT CONNECTION BETWEEN SLEX AND CALAX

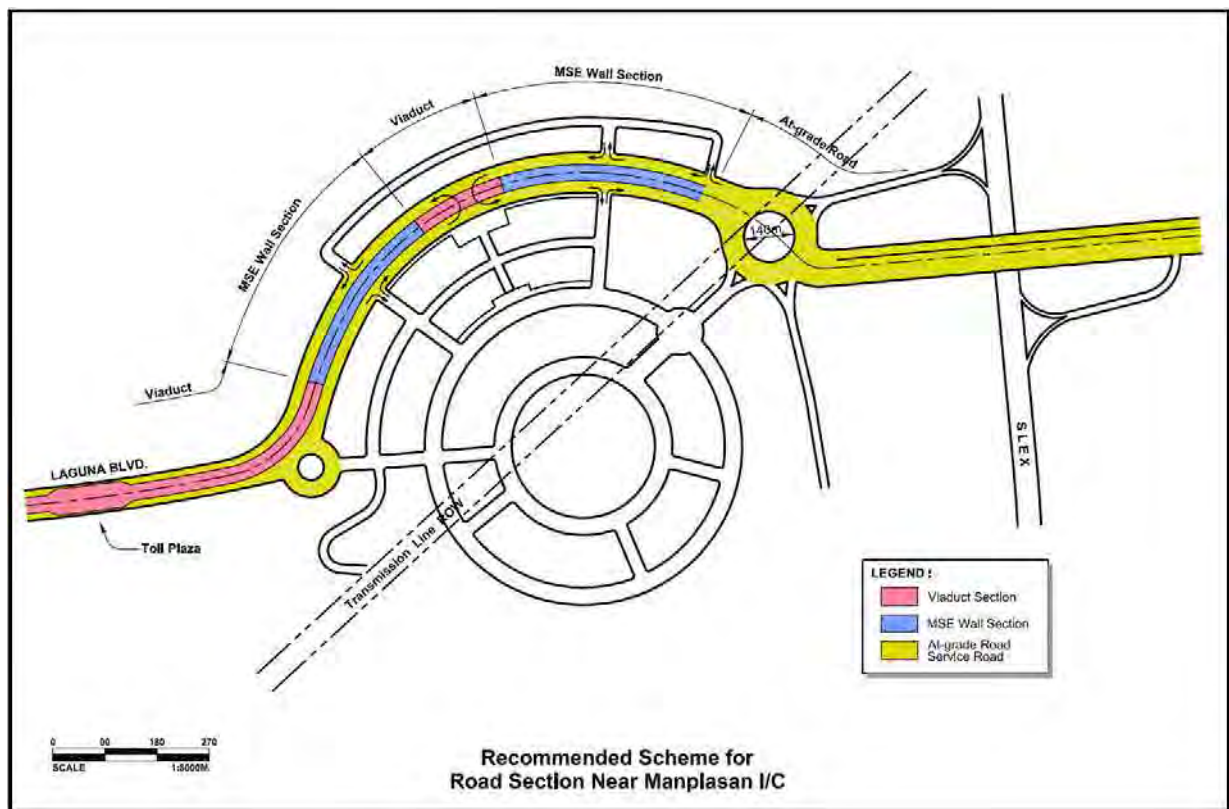


FIGURE 4.5-3 CASE-3: AGREED SCHEME FOR ROAD SECTION NEAR MAMPLASAN I/C

5 TRAFFIC DEMAND FORECAST

5.1 Existing Traffic Volume

FIGURE 5.1-1 shows the traffic volumes of the road network in Cavite area and some portions of Laguna province. The number denotes vehicles. The following were observed regarding the captured traffic volume:

- Traffic volume at the section of SLEX inside Metro Manila is extremely high compared to the sections outside of Metro Manila indicating that there are high numbers of vehicles using the expressway having their OD within Metro Manila.
- There is also a very high volume of vehicles between Metro Manila and coastal towns of Cavite which is served by the Manila-Cavite Expressway. These towns along with other towns within the periphery of Metro Manila are functioning as residing place of workers in the capital.
- Likewise, traffic volume at the trunk roads like Aguinaldo Highway and Governor's Drive is also high especially at the sections of these roads passing urban areas like in Dasmariñas City and Gen. M. Alvarez, and Carmona. Through traffic and local traffic like jeepneys and tricycles merges at this road section.

5.2 Existing Travel Speed

The travel time of selected routes are depicted in **FIGURE 5.2-1**. General observation appears that serious traffic congestion is experienced while the national road is passing a city center or the area has substantial number of economic zones and industrial parks. Congestion is also experienced when a road is about to merge with another important road.

5.3 Toll Rate vs. Revenue

In order to set the proper toll rate of CALAX, the traffic volume and the amount of revenue are estimated by traffic assignment model. **FIGURE 5.3-1** shows the result of traffic assignment of toll rate in year 2011.

- In case of toll free, total traffic volume to enter CALAX is 69,316 vehicles/day
- The toll rate for getting higher revenue is about 4 to 15 Peso/km and the amount of revenue is about 3.7 and 4.2 million Peso/day. Although maximum amount of revenue is 10 peso case, traffic volume to enter CALAX is only 19,819 vehicle /day which is about 30% of toll free case.
- The desirable toll rate for attractive to motorist and higher revenue is 4.0 Peso/km. Total traffic volume to enter CALAX is 41,567 vehicle/day (60% of toll free case). This toll rate is the almost same as that of Manila Cavite Toll Expressway (herein CAVITEX) phase-1 and it is cheaper than that of other new present expressways such as CAVITEX Phase-2 and Skyway Phase-2. Most motorists may still accept the 4.0 peso/km in year 2011.

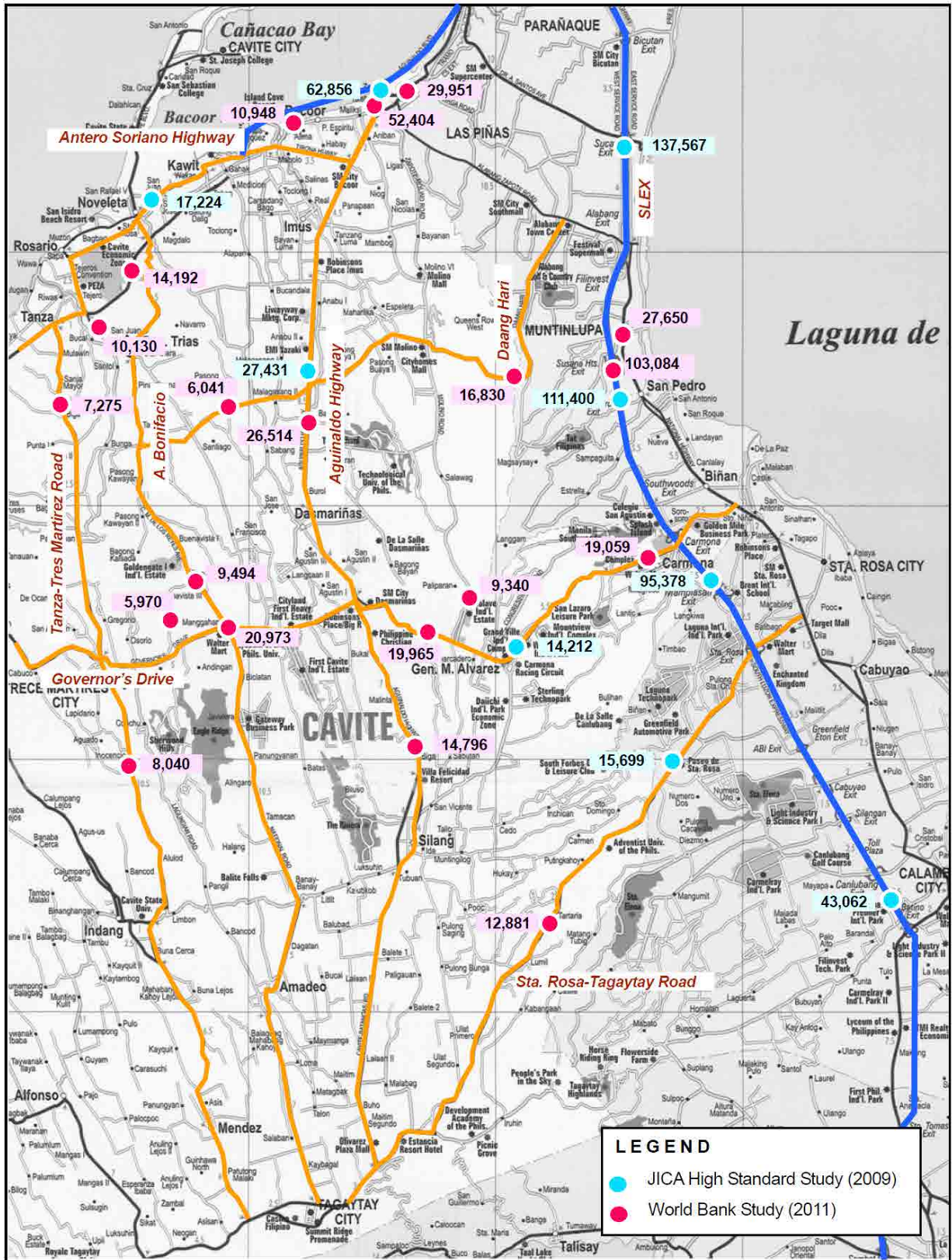


FIGURE 5.1-1 EXISTING TRAFFIC VOLUME

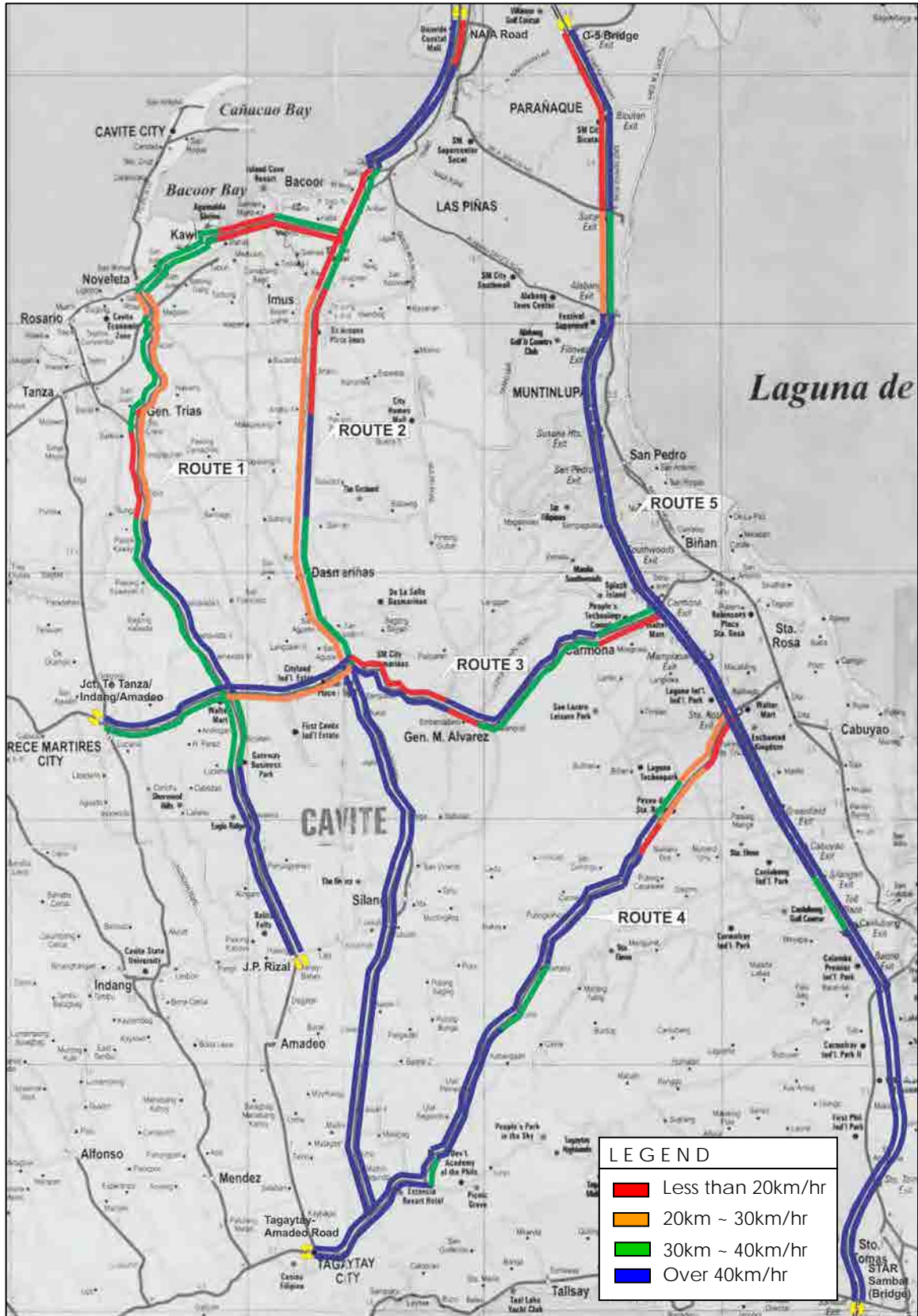


FIGURE 5.2-1 TRAVEL SPEED OF MAJOR CORRIDORS IN THE SOUTH OF METRO MANILA (AFTERNOON PEAK HOURS)

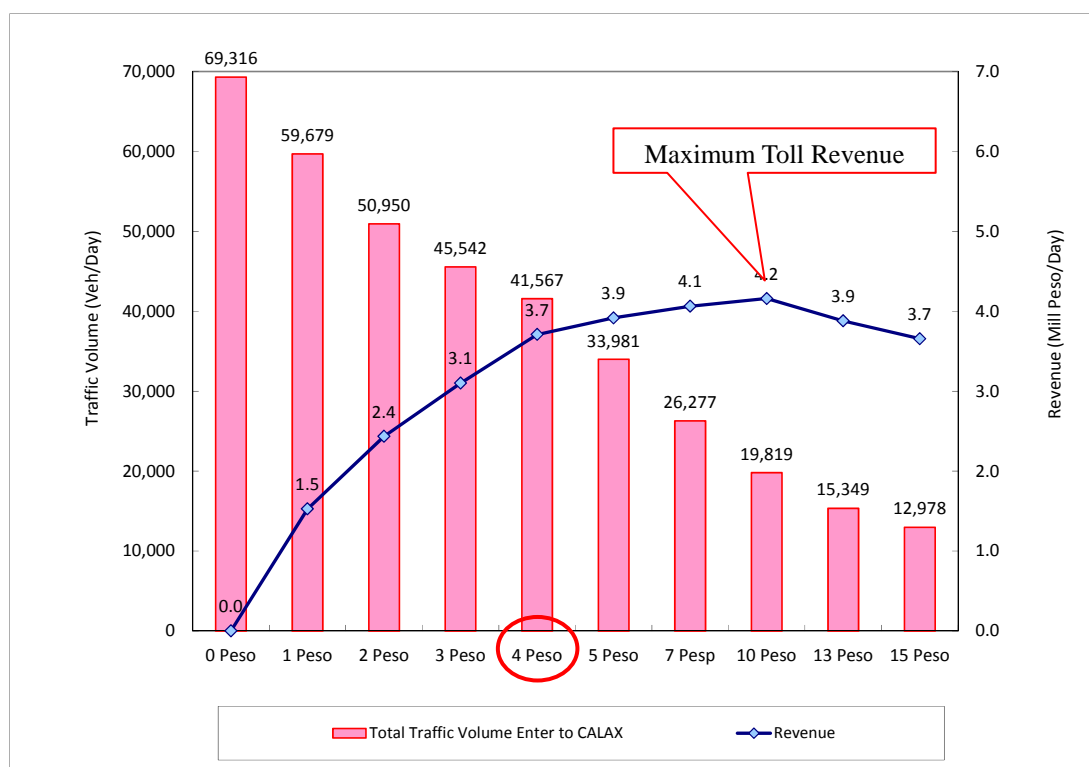


FIGURE 5.3-1 TOLL RATE VS REVENUE (CALAX, YEAR 2011)

5.4 Traffic Assignment

Figures 5.4-1 to 5.4-3 show the estimated traffic volume of CALAX Laguna section. The highest traffic volume interchange section is between Sta.Rosa-Tagaytay IC and Laguna Blvd. IC, which number of traffic are 23,208 (vehicle/day) in year 2017, 31,122 (vehicle/day) in year 2020 and 48,796 (vehicle/day) in year 2030.

TABLE 5.4-1 shows the total traffic volume to enter CALAX Laguna section and total vehicle km of CALAX Laguna Section.

TABLE 5.4-1 TRAFFIC VOLUME AND VEHICLE KM (CALAX LAGUNA SECTION)

Item	Vehicle Class	Year 2017	Year 2020	Year 2030
Traffic Volume (Veh./day)	Class 1	22,595	31,108	60,091
	Class 2	8,143	9,712	14,870
	Class 3	3,845	4,347	5,855
	Total	34,583	45,167	80,816
Vehicle*km	Class 1	204,109	275,222	510,503
	Class 2	87,460	106,403	151,367
	Class 3	45,718	53,809	73,808
	Total	337,287	435,434	735,678
Toll Revenue (Million Php/day)	All classes	2.8	4.0	10.5

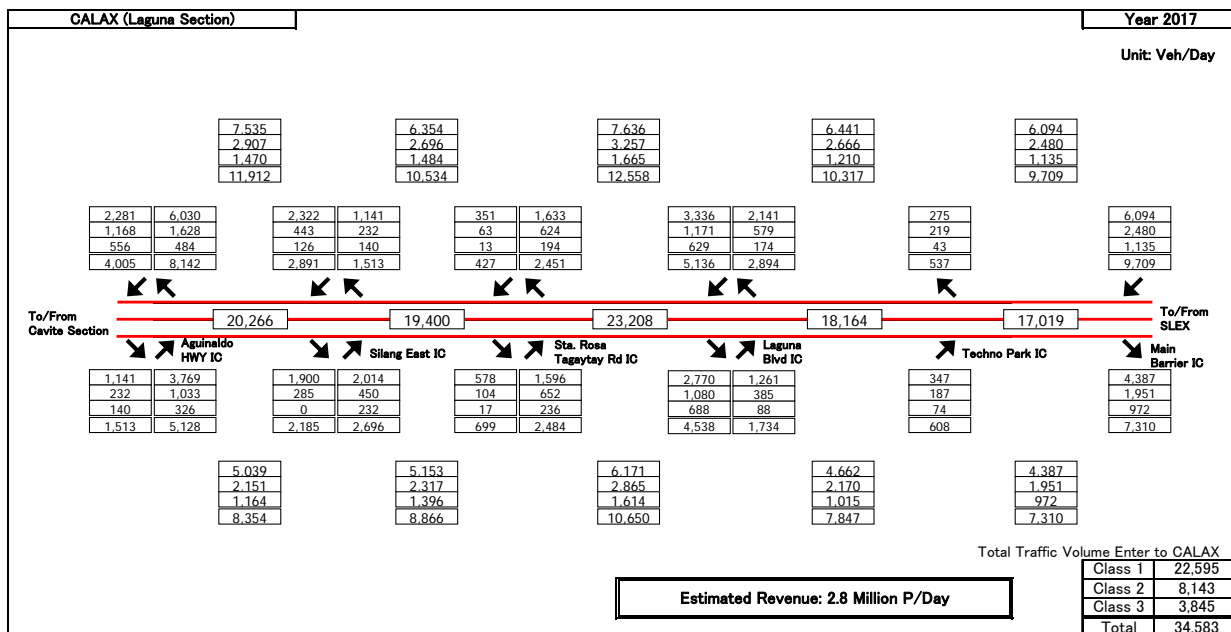


FIGURE 5.4-1 TRAFFIC PROJECTION (YEAR 2017) OF CALAX LAGUNA SECTION

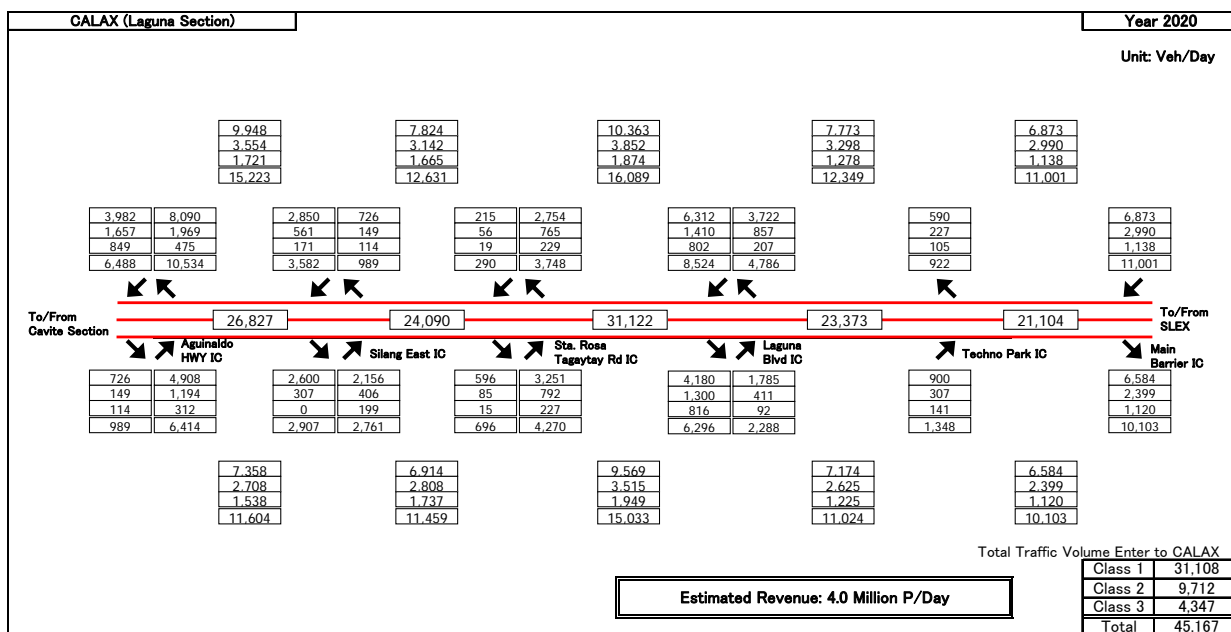


FIGURE 5.4-2 TRAFFIC PROJECTION (YEAR 2020) OF CALAX LAGUNA SECTION

Preparatory Survey for Expressway Projects in Mega Manila Region

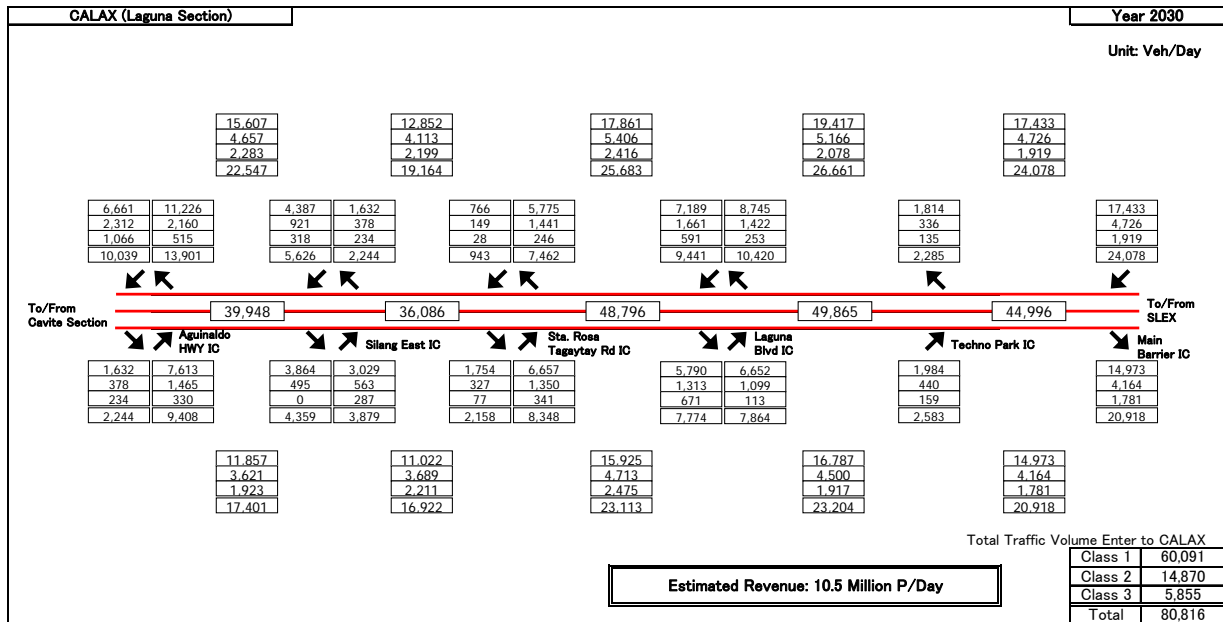


FIGURE 5.4-3 TRAFFIC PROJECTION (YEAR 2030) OF CALAX LAGUNA SECTION

6 SCOPE OF THE PROJECT

6.1 Outline of CALA Laguna Section Project

The proposed CALAX (Laguna Section) is to be constructed in the provinces of Cavite and Laguna, which are part of Region IV-A. The starting point of the expressway is at Aguinaldo highway, Silang Municipality and ends at Mamlasan Interchange of SLEX, Binan City. The proposed CALA Laguna Section has 18.10 kilometers long as a limited access 100 kph 4-lane divided toll expressway with 4 interchanges, namely Silang East IC, Sta. Rosa-Tagaytay Road IC, Laguna Blvd. IC and Techno Park IC, and one toll barrier. CALA Laguna Section has 13 bridges with the total length of 2,220 meters and viaduct sections over Laguna Blvd. with the total length of 5,035 meters. The ROW is the width of 50 to 60 meters throughout the Laguna Section

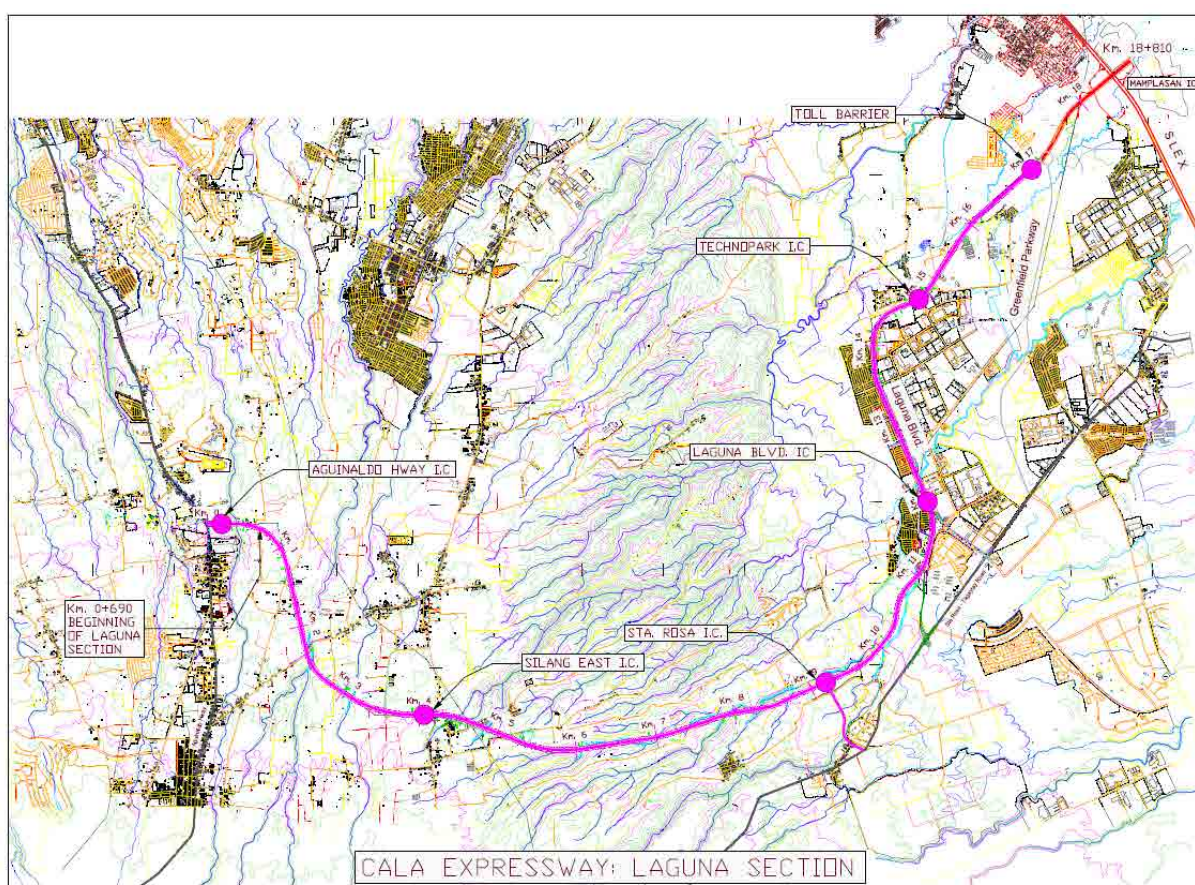


FIGURE 6.1-1 CALAX ROUTE MAP

6.2 Design Standard

The design concept is to provide a high speed toll road that allows safe and efficient movement of traffic as an expressway with fully controlled access, especially to improve the access from Aguinaldo Highway to South Luzon Expressway (SLEX). The following standard is mainly used as reference in CALA design, and the geometrical design standards are set up as shown in **TABLE 6.2-1**.

- A Policy on Geometric Design of Highways and Streets, AASHTO 2004
- Highway Safety Design Standards Part 1 Road Safety Design Manual, May 2004, DPWH
- Japan Road Association, Road Structure Ordinance, 2004
- Highway design manual, Metropolitan Expressway Co., Ltd., Japan
- Highway design manual, NEXCO, Japan

TABLE 6.2-1 GEOMETRICAL DESIGN STANDARD OF CALAX

Category	Item	Unit	Roadway Standard	Ramp way Standard
Basic Element	Design Speed	km/h	100	40
	Design Vehicle	-	WB-15	WB-15
	Stopping Sight Distance	m	185	50
	Passing Sight Distance	m	670	270
Cross Section Element	Pavement Type	-	Asphalt Concrete	Asphalt Concrete
	Number of lane	nos	4	1
	Lane Wide	m	3.50	3.50
	Median Width	m	2.00	1.00
	Inner Shoulder Width	m	0.75	0.75
	Outer Shoulder Width	m	2.50	2.50
	Normal Cross fall	%	2.00	2.00
	Maximum Super Elevation		6.00	6.00
	Super Elevation	%	Exhibit 3-26	Exhibit 3-26
Maximum relative Gradients	%	0.43	0.66	
Horizontal Alignment	Minimum Radius	m	437	50 (absolute 43)
	Minimum Transition Curve length	m	56	22
	Minimum Radius not requiring Transition Curve	m	2560	525
	Super elevation Run off	%	0.43	0.66
Vertical Alignment	Maximum Vertical Gradient	%	3 (absolute 4)	6 (absolute 7)
	Minimum K Value Crest	%	85.0	6.0
	Minimum K Value Sag	%	52.0	9.0
	Minimum Vertical Curve Length	%	60	60
	Maximum Composition Grade	%	10.0	11.5
	Vertical Clearance (Road)	m	5.200	5.200

6.3 Typical Roadway Cross Section

Typical cross sections are shown in **Figures 6.3-1 to 6.3-3**.

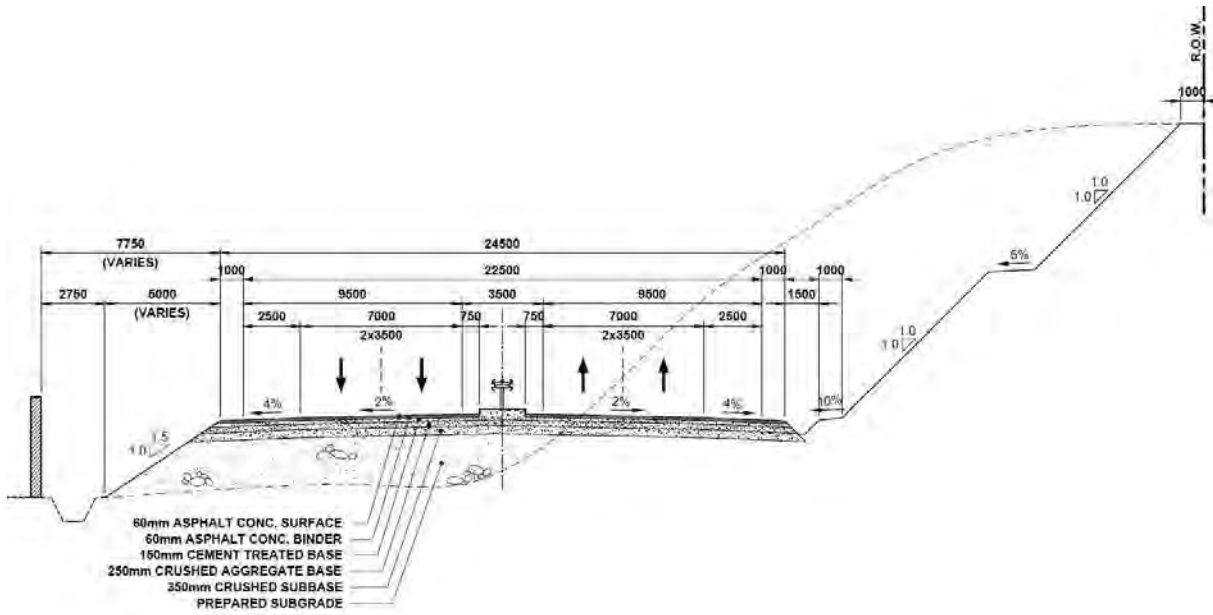


FIGURE 6.3-1 TYPICAL CROSS SECTION: EMBANKMENT AND CUT SECTION

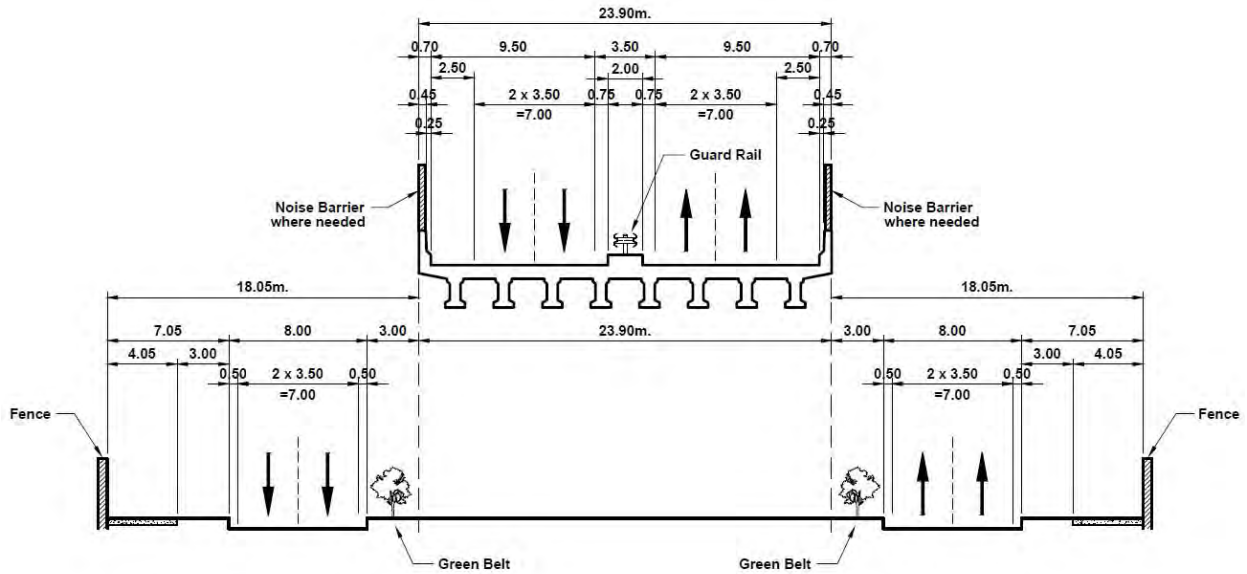


FIGURE 6.3-2 TYPICAL CROSS SECTION: FLYOVER SECTION

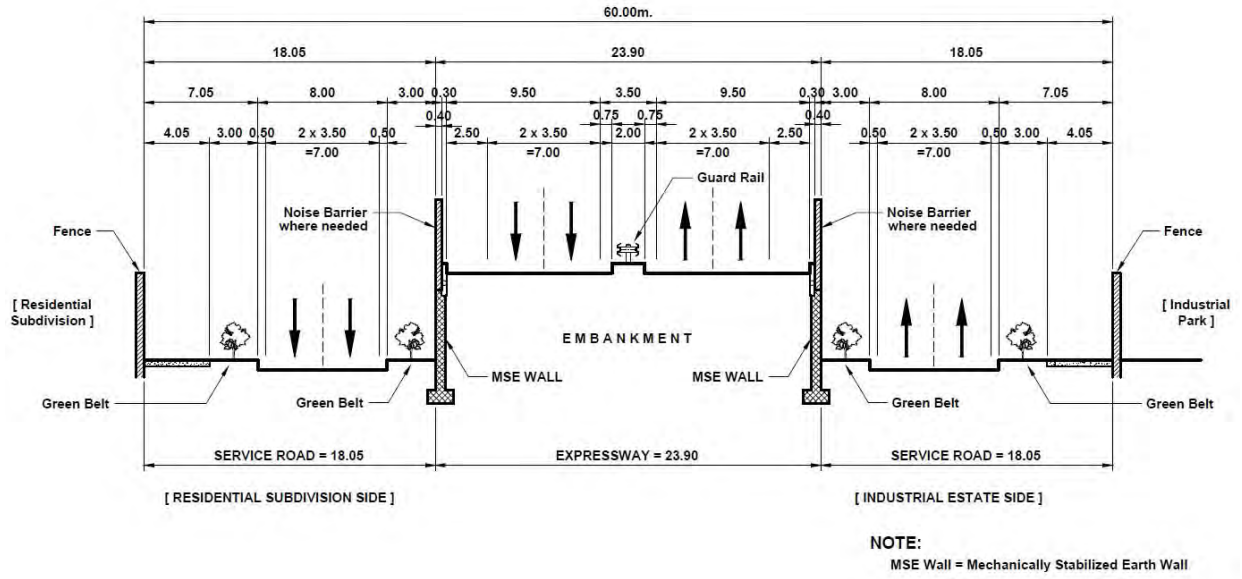


FIGURE 6.3-3 TYPICAL CROSS SECTION: MSE WALL SECTION

7 PROJECT COST

(Confidential)

TABLE 7-1 ESTIMATED PROJECT COST

(Confidential)

TABLE 7-2 ESTIMATED OPERATION AND MAINTENANCE COST

(Confidential)

8 ECONOMIC EVALUATION

8.1 Assumption and Indicators of Economic Analysis

(Confidential)

TABLE 8.1-1 UNIT VOC BY FOUR (4) VEHICLE TYPES IN 2011 (PESO/KM/VEH)

(Confidential)

TABLE 8.1-2 UNIT TRAVEL TIME COST IN 2011 (PESO/MIN/VEH)

(Confidential)

8.2 Results of Economic Analysis

(Confidential)

8.3 Project Sensitivity

(Confidential)

RESULTS OF SENSITIVITY TEST: EIRR

(Confidential)

9 PPP MODALITIES AND FINANCIAL EVALUATION

9.1 PPP Modalities Studied

The possible four (4) types of the PPP modalities are as shown below;

Type-1(base Type): BOT with GFS

Design and construction work for both Cavite section and Laguna section will be undertaken by the single concessionaire with the government financial support (GFS). The same single concessionaire will operate and maintain both sections.

Type-2: Segment divided Type (pattern 1)

Each of Cavite section and Laguna section will be implemented independently. Namely, Cavite section will be designed, constructed and operated by the concessionaire with GFS, while the design and construction of Laguna section will be undertaken by GOP with ODA loan, and O & M Concessionaire is selected for this section.

Two different concessionaires will operate and maintain each section independently. The one concessionaire will operate and maintain Cavite section under the self financing business scheme, while the other concessionaire will undertake Laguna section under the lease business scheme.

Type-3: Segment divided Type (pattern 2)

Each section is designed and constructed independently. However operation and maintenance is undertaken by the single concessionaire, selected by the Cavite Section.

Cavite section is designed and constructed by the concessionaire with GFS, while the design and construction of Laguna section will be undertaken by GOP with ODA loan.





The concessionaire selected for Cavite Section will operate and maintain both sections and the Concessionaire pays the lease fee to GOP as concession fee of Laguna section

Type-4: Lease Type

Both sections are designed and constructed by GOP with ODA loan. The single concessionaires will operate and maintain both sections under the lease business scheme.

The above four (4) types of the PPP modality are shown in **FIGURE 9.1-1**.

TABLE 9.1-1 PPP MODALITY FOR CALAX

		Cavite Section	Laguna Section	Examples	Remarks
Type-1: BOT with GFS	Design &Construction	Concessionaire A (with GFS)		TPLEX	<ul style="list-style-type: none"> • GOP expenditure for ROW acquisition is included in subsidy.
	O&M	Concessionaire A			
Type-2: Segment divided Case (pattern 1)	Design &Construction	Concessionaire A (with GFS)	GOP (with ODA loan)	TPLEX (Cavite Section)	<ul style="list-style-type: none"> • Tendering for Cavite sec. can be ahead of the Laguna section. • Interoperability agreement for both sections for especially toll collection must be secured. • Commencement of construction work for Cavite sec. can be done earlier than the one for Laguna sec.. However the time of completion of construction work for both sections should be almost same. • Same toll rates will not necessarily be applied to both sections. • Construction work for Laguna section undertaken by GOP is not considered as subsidy.
	O&M	Concessionaire A	Lease  Concessionaire B	SCTEX (Laguna Section)	
Type-3: Segment divided Case (pattern 2)	Design &Construction	Concessionaire A (with GFS)	GOP (with ODA loan)	STAR (GOP segment completed ahead of private segment)	<ul style="list-style-type: none"> • Tendering for Cavite section will be done ahead of the Laguna section. • Commencement of construction work for Cavite section can be done earlier than the one for Laguna section. However, the time of completion of construction work for both sections should be almost same. • Same toll rates will not necessarily be applied to both sections. • Construction work for Laguna section undertaken by GOP is not considered as subsidy.
	O&M	Lease  Concessionaire A			
Type-4: Lease Type	Design &Construction	GOP (with ODA loan)		SCTEX	<ul style="list-style-type: none"> • Construction work for both sections undertaken by GOP is not considered as subsidy. • This is the same scheme as SCTEX
	O&M	Lease  Lease  Lease Concessionaire A			

9.2 Results of Financial Analysis of PPP Modalities

1) Results of Financial Analysis

(Confidential)

TABLE 9.2-1 (1/3) CALAX: SUMMARY OF FINANCIAL ANALYSIS (TYPE 1 AND 2)

(Confidential)

TABLE 9.2-1 (2/3) CALAX: SUMMARY OF FINANCIAL ANALYSIS (TYPE 3)

(Confidential)

TABLE 9.2-1 (3/3) CALAX: SUMMARY OF FINANCIAL ANALYSIS (TYPE 4)

(Confidential)

2) Comparison of Type-1 and Type-3

(Confidential)

TABLE 9.2-2 COMPARISON OF TYPE-1 AND TYPE-3

<p>(Confidential)</p>

3) Recommendations on PPP Modality

(Confidential)

10 RISK MATRIX

Risk matrix of Type -3 is shown in **TABLE 10-1**.

TABLE 10-1 CALAX RISK MATRIX: PPP SCHEME TYPE-3

Implementation Stage	Cavite Section (Up to Construction by BOT with Subsidy, O & M : Both Section)				Laguna Section (Up to Construction by ODA)	
	Risk of GOP		Risk of the Private		Risk of GOP	
	Risk	Mitigation Measure	Risk	Mitigation Measure	Risk	Mitigation Measure
Detailed Design Stage	-	<ul style="list-style-type: none"> • Include Liquidated damage clause in TCA. 	Delay in Detailed Design	<ul style="list-style-type: none"> • Employment of competent engineering firm. 	Delay in Detailed Design	<ul style="list-style-type: none"> • Employment of competent engineering firm.
	-	<ul style="list-style-type: none"> • Jointly undertake extensive consultation meeting. 	Change of Scope of Civil Work	<ul style="list-style-type: none"> • Extensive consultation meetings with LGUs and other concerned agency and PAPs. 	Change of Scope of Civil Work	<ul style="list-style-type: none"> • Extensive consultation meetings with LGUs and other concerned agency and PAPs.
	-	<ul style="list-style-type: none"> • Periodic meetings with the Design Consultant. 	Delay in Approval of Detailed Design	<ul style="list-style-type: none"> • Periodic consultation meetings with BOD of DPWH and TRB. 	Delay in Approval of Detailed Design	<ul style="list-style-type: none"> • Periodic consultation meetings with BOD of DPWH and TRB.
	-	<ul style="list-style-type: none"> • Check Value Engineering results. 	Over Design/ Under Design	<ul style="list-style-type: none"> • Undertake value engineering. 	Over Design/ Under Design	<ul style="list-style-type: none"> • Undertake value engineering.
	-	<ul style="list-style-type: none"> • Require Professional Indemnity Insurance clause in TCA. 	Design Error	<ul style="list-style-type: none"> • Design checking by Independent Consultant (IC). • Professional Indemnity Insurance. 	Design Error	<ul style="list-style-type: none"> • Design checking by Independent Consultant (IC). • Professional Indemnity Insurance.
	-	<ul style="list-style-type: none"> • Jointly undertake consultation meetings with PAPs. 	Objection of Residents on Alignment Design	<ul style="list-style-type: none"> • Intensive stakeholders meeting with PAPs. 	Objection of Residents on Alignment Design	<ul style="list-style-type: none"> • Intensive stakeholders meeting with PAPs.
	-	<ul style="list-style-type: none"> • Receive reports from IC, if they are following same standards and specifications. 	Different Design Standards and Materials Specification	<ul style="list-style-type: none"> • Adopt the same standards and specifications. 	Different Design Standards and Materials Specification	<ul style="list-style-type: none"> • Adopt the same standards and specifications.

Implementation Stage	Cavite Section (Up to Construction by BOT with Subsidy, O & M : Both Section)				Laguna Section (Up to Construction by ODA)	
	Risk of GOP		Risk of the Private		Risk of GOP	
	Risk	Mitigation Measure	Risk	Mitigation Measure	Risk	Mitigation Measure
ROW Acquisition Stage	Delay in ROW Acquisition and Delivery to the Concessionaire	<ul style="list-style-type: none"> • Early start of ROW acquisition. • Put enough manpower. 	Delay in Financial Closure due to delayed ROW Acquisition and delayed start of construction.	<ul style="list-style-type: none"> • GOP be imposed Liquidated damage to be paid to the private. 	Delay in ROW acquisition and delivery to Contractor.	<ul style="list-style-type: none"> • Ask the private developers to issue "Permit to enter" prior to ROW acquisition.
	Delay in release of ROW Acquisition Budget	<ul style="list-style-type: none"> • Arrange with the private sector for advancing ROW acquisition cost. 	-	-	Delay in release of ROW Acquisition Budget.	<ul style="list-style-type: none"> • Arrange in advance the release of budget.
	Delay in payment of PAPs due to lack of complete documents.	<ul style="list-style-type: none"> • Arrange with the Private Sector for advancing ROW acquisition cost, if Key documents are prepared. 	-	-	Delay in payment to PAPs due to lack of complete documents.	<ul style="list-style-type: none"> • Arrange with the COA for flexible payment to PAPs.
Construction Stage	-	-	Delay in Financial Closure with other reasons than delayed delivery of ROW.	<ul style="list-style-type: none"> • The private sector be imposed Liquidated Damage payable to GOP. 	-	-
	-	-	Delay in Construction Completion	<ul style="list-style-type: none"> • The private sector be imposed Liquidated Damage payable to GOP. 	Delay in Construction Completion and Delay in Delivery of Facility	<ul style="list-style-type: none"> • Contractor be imposed liquidated damage payable to GOP. • GOP be imposed Liquidated Damage payable to the Concessionaire
	-	-	Poor quality of work (materials and workmanship)	<ul style="list-style-type: none"> • Employment of qualified contractor. • Strict checking by IC. 	Poor quality of work (materials and workmanship)	<ul style="list-style-type: none"> • Employment of qualified contractor. Preparatory Survey for Expressway

Implementation Stage	Cavite Section (Up to Construction by BOT with Subsidy, O & M : Both Section)				Laguna Section (Up to Construction by ODA)	
	Risk of GOP		Risk of the Private		Risk of GOP	
	Risk	Mitigation Measure	Risk	Mitigation Measure	Risk	Mitigation Measure
						Projects in Mega Manila Region • Strict construction supervision.
	-	-	Cost Overrun	• Responsibility of the Concessionaire and no adjustment of toll rates.	Cost Overrun	• Responsibility of the Contractor. • No adjustment of Contract Amount.
	-	-	Suspension or abandonment of Construction Work due to Concessionaire's own reasons.	• Sanction against the Concessionaire to be specified in the TCA.	Suspension or abandonment of Construction Work due to Contractor's own reasons.	• Sanction against the concessionaire to be specified in the Contract.
	-	-	Failure to follow environmental requirements	• Strict monitoring by IC. • Penalty to be imposed on the Concessionaire.	Failure to follow environmental requirements.	• Strict monitoring of environmental requirements.
	Delayed issuance of Government's Permits	• Liquidated damage to be paid to the Concessionaire.	Delayed Issuance of Government's Permits	-	-	-
	-	-	Poor Traffic Management	• Proper coordination with the LGUs. • Penalty imposed to the Concessionaire.	Poor traffic management.	• Proper coordination with LGUs. • Strict construction supervision.
O & M Stage	Delay in the delivery of Laguna Section to the Concessionaire	• Delivery date shall be specified with some allowance (say 6 months). • Liquidated damage to be paid to the Concessionaire.				

Implementation Stage	Cavite Section (Up to Construction by BOT with Subsidy, O & M : Both Section)				Laguna Section (Up to Construction by ODA)	
	Risk of GOP		Risk of the Private		Risk of GOP	
	Risk	Mitigation Measure	Risk	Mitigation Measure	Risk	Mitigation Measure
	Delay in Issuance of Toll Operation Certificate (TOC)	<ul style="list-style-type: none"> Liquidated damage to be paid to the Concessionaire. 				
	Delay in Approval of Toll Rates	<ul style="list-style-type: none"> Liquidated damage to be paid to the Concessionaire. 				
	Delay in Approval of Toll Rates Adjustment	<ul style="list-style-type: none"> Liquidated damage to be paid to the Concessionaire. 				
			Failure or Delay in Commencement of Operation.	<ul style="list-style-type: none"> Liquidated damage to be paid to GOP. 		
			Less traffic demand and toll revenue than expected.	<ul style="list-style-type: none"> Ramp-up factor to be considered in the financial analysis. 		
			Failure to satisfy Minimum Performance Requirement.	<ul style="list-style-type: none"> Pay penalty to GOP in accordance with the TCA. 		
			Delay in Payment of Lease Fee (or Concession Fee) to the Government	<ul style="list-style-type: none"> Pay compensation to GOP in accordance with the TCA. 		
	Failure or Delay in Payment of Compensation of Foregone Toll Income	<ul style="list-style-type: none"> Toll rate adjustment or extension of toll concession period. 				
					Premature deterioration of Facility.	<ul style="list-style-type: none"> IC to judge and impose compensation to be paid to the Concessionaire.

Implementation Stage	Cavite Section (Up to Construction by BOT with Subsidy, O & M : Both Section)				Laguna Section (Up to Construction by ODA)	
	Risk of GOP		Risk of the Private		Risk of GOP	
	Risk	Mitigation Measure	Risk	Mitigation Measure	Risk	Mitigation Measure
Common to all Stages	Force Majeure	<ul style="list-style-type: none"> Both parties should discuss how to cope with the situation in accordance with the TCA. 	Force Majeure	<ul style="list-style-type: none"> Partially covered by All Risk Insurance. 		
		<ul style="list-style-type: none"> Toll rate adjustment or extension of toll concession period. 	Change in Laws including Taxation			
		<ul style="list-style-type: none"> Both parties should discuss how to cope with the situation in accordance with the TCA. 	Economic Risk (extraordinary high inflation, foreign exchange rates, oil crisis, worldwide economic recession, etc.)			

Source: JICA Study Team

11 ENVIRONMENTAL AND SOCIAL CONSIDERATION

11.1 Assessment of Environmental Impact, Mitigation Measures and Monitoring

Environmental and social impacts of the project was assessed, mitigation measures were proposed and monitoring items were identified as shown in **TABLE 11.1-1** for pre-construction and construction stage, and **TABLE 11.1-2** for the operation and maintenance stage.

TABLE 11.1-1 ENVIRONMENTAL AND SOCIAL IMPACTS, MITIGATION MEASURES AND MONITORING FOR PRE-CONSTRUCTION AND CONSTRUCTION PHASE

Item	Assessment	Mitigation Measures	Monitoring Items
Involuntary Relocation/ Resettlement	<ul style="list-style-type: none"> A total of 36 structures (i.e. residential houses) with 50 households (or 197 people) will be affected and relocated. All of them are formal settlers. A total of about 77 farm land lots (or 64.7 ha.) will be affected. About 70.1% are land owners, about 5.2% are tenants. 24.7% are free occupants with permit of land owners. Number of people whose farm lands affected are estimated at about 460. 	<ul style="list-style-type: none"> To prepare Final RAP with full consensus with PAPS, and inventories of land and other assets. To provide just (or fair) compensation, or land swapping (if feasible), and other supports that are stated in LARRIPP/WB OP 4.12. 	<ul style="list-style-type: none"> If inventory of land and assets were made If valuation of land and assets were made by replacement cost.
Land Use	<ul style="list-style-type: none"> About 118.8 ha of lands, of which 64.7 ha. are farming/natural vegetation will be lost and changed to CALAX. These lots along the new road and around the interchanges might be converted to market places / shopping malls, or residential uses. 	<ul style="list-style-type: none"> Respective LGUs shall amend city/municipality Land Use Plan and Zoning Ordinance to control unorderly urban development along CALAX and to restrict conversion of farm land to other land use purposes, and strictly enforce amended zoning ordinance. LGUs should also freeze the development within the proposed ROW. 	<ul style="list-style-type: none"> If zoning ordinance is amended and implemented. If development within the proposed ROW is freeze.
Farm Land	<ul style="list-style-type: none"> About 64.7 ha of farmland/ natural vegetation will be lost by this project in exchange to the expressway. Negative impact to farmers is expected in a form of loss of lands. 	<ul style="list-style-type: none"> To provide just (or fair) compensation, replacement of land when feasible and other supports such as disturbance compensation and rehabilitation assistance in accordance with LARRIPP/WB OP 4.12. Detailed design shall be undertaken focusing on existing farm roads to assure accessibility to farm lands. 	<ul style="list-style-type: none"> If fair valuation is made, fair compensation is estimated and paid.
Means of Livelihood for the Poor and Socially Vulnerable	<ul style="list-style-type: none"> About 84% of affected households belong to the poor (or below Region IV-A poverty threshold). (+) Demands for labor to the construction and related work are expected to be increased temporarily, which further stimulates local economy. 	<ul style="list-style-type: none"> Qualified skilled workers and laborers in the Direct Impact Areas (DIA) duly endorsed by the Brgy. Captains will be given priority in hiring during implementation of the project. To include condition of priority employment of PAPs below poverty line into construction 	<ul style="list-style-type: none"> If these are specified in the contract. If these were

Item	Assessment	Mitigation Measures	Monitoring Items
	<ul style="list-style-type: none"> (-) Shops and small businesses locating on CALAX construction sites will have to be relocated. 	<p>contractor's contract.</p> <ul style="list-style-type: none"> To provide just (or fair) compensation for income loss and rehabilitation assistance in accordance with LARRIPP/WB OP 4.12. 	<p>implemented.</p> <ul style="list-style-type: none"> If these were implemented.
Sanitation	<ul style="list-style-type: none"> Sanitary condition around construction site is anticipated to become worse due to generation of wastes during the construction. 	<ul style="list-style-type: none"> Temporary sanitation facilities such as garbage bins and portable toilets must be provided by the Contractor at the construction area. Regular disposal of the solid and domestic wastes to the designated disposal areas duly-approved by respective LGUs and DPWH must be strictly complied with. Weekly inspection of the work sites must be undertaken by DPWH to ensure proper management of the solid and domestic wastes generated. 	<ul style="list-style-type: none"> If these conditions are specified in the contract. If these requirements are implemented.
Accident	<ul style="list-style-type: none"> Accidents involving construction works, vehicles and machineries operation are anticipated. Traffic accidents may happen by construction vehicles and heavy machines during construction. Fall down from higher position such as piers and bridges may happen. 	<ul style="list-style-type: none"> To construct temporary construction road within road right-of-way, implement traffic management plan in coordination with local police and inform construction schedule, etc. to people within the project area to prevent traffic accidents. To educate construction workers on various construction safety measures, and strictly implement such safety measures. To provide adequate lighting and reflectors and construction warning signs at construction sites as well as at traffic accident-prone sections of related roads. To provide temporary fences so as ordinary people not to enter in the construction sites. 	<ul style="list-style-type: none"> If these are specified in the contract. If these are properly implemented.
Soil Erosion	<ul style="list-style-type: none"> During the construction stage, erosion is likely to occur mainly by intense rain. 	<ul style="list-style-type: none"> To provide proper temporary drainage system to prevent water concentration at certain locations. To provide temporary dike within the road right-of-way to prevent flow of eroded soils. For high cut or embankment construction section, to cover embankment by vinyl sheet during heavy rain for prevention of slope collapse. 	<ul style="list-style-type: none"> If these are specified in the contract. If these are properly implemented.
Global	<ul style="list-style-type: none"> It is estimated that total emission 	<ul style="list-style-type: none"> To use clean filters and mufflers 	<ul style="list-style-type: none"> Measure

Item	Assessment	Mitigation Measures	Monitoring Items
Warming	of CO ₂ will be about 78,908 tons during construction phase.	of engines. <ul style="list-style-type: none"> • To minimize idling of engines. • To minimize traveling frequencies between construction sites and origin by making and executing efficient construction materials transportation schedule. • To prohibit old model equipment and vehicles. • To follow mitigation measures suggested for AIR POLLUTION. • To off-set this impact, plant enough trees along expressway and interchange sites. 	
Air Pollution	<ul style="list-style-type: none"> • Air quality was measured at 6 stations in dry season (2012). Results shows that highest values of TSP, SO₂ and NO₂ are 147 (DENR Standard: 300), 31 (DENR Standard: 340) and 11 (DENR Standard: 260), respectively. All parameters are far below DENR standards. • Air pollution will be expected due to emissions from construction vehicles and dust generated from construction activities during construction period. In dry and wet weather pollutants and particulates matters disperse to further distance and might affect sensitive area such as hospital and residential area 	<ul style="list-style-type: none"> • To spray exposed ground with water to minimize dust re-suspension. • To cover temporary stockpiles of excavated materials and construction spoils with tarpaulin or sack materials. • To transport and dispose construction spoils regularly to hauled areas duly-approved by the DENR/LGUs. • To perform regular maintenance of construction vehicles, heavy equipment and machineries. • Follow mitigation measures suggested for GLOBAL WARMING. • Aggravation of air pollution will be minimized by adoption of above measures, considering that most of construction sites are located in the rice field areas. 	<ul style="list-style-type: none"> • Measure air quality quarterly. • If these are specified in the contract. • If these are properly implemented.
Water Pollution	<ul style="list-style-type: none"> • Water quality was measured at 3 stations in dry season (2012). Total Coliform exceeds DENR Standard at all stations. Other parameters (ph, TSS, Lead, Dissolved Oxygen and BOD) did not exceed DENR. It is important not to worsen water quality than at present. 	<ul style="list-style-type: none"> • To adopt construction method minimizing generation of water pollution (e.g. Extra care shall be made to prevent cut/embankment and other materials to fall into the river). • To seal, remove, or contain solid wastes and other construction hazardous materials off from bare ground to prevent seeping into the ground especially when it rains. • To install and manage portable toilets for construction workers properly. • To maintain machineries and generators and to prevent oil leakage. • Aggravation of water quality will 	<ul style="list-style-type: none"> • Measure water quality quarterly. • If these are specified in the contract. • If these are properly implemented.

Item	Assessment	Mitigation Measures	Monitoring Items
		be minimized by adoption of above measures.	
Solid Waste	<ul style="list-style-type: none"> Construction debris and excavated soil are generated during the construction. Human waste will be generated from workers during construction and operation. 	<ul style="list-style-type: none"> To seal, remove, or contain solid wastes and other construction wastes. To dispose them at the disposal sites approved by respective LGUs and DPWH. To select eco-friendly waste disposal methods. To edificate and educate construction workers. To conduct EIS on the disposal site if the site is to be newly developed for the project. Effect of waste will be minimized by adoption of above measures. 	<ul style="list-style-type: none"> If these are specified in the contract. If these are properly implemented.
Noise and Vibration	<ul style="list-style-type: none"> Noise level was measured at 6 stations in dry season (2012). Noise level at all stations exceeded DENR Standard. It is important to adopt measures not to worsen noise level than at present. Noise and vibration occur from machineries and vehicles used during construction work, hence construction work and transporting of materials need to be carefully done. 	<ul style="list-style-type: none"> To bore piles should be adopted during foundation works instead of pile driving. To use noise suppressors equipped machineries. To work in day time or non-critical time to minimize noise disturbance to adjacent residential areas. To install temporary noise barriers at noise sensitive areas such as residential, schools, and places of worships to maintain noise level at permissible limit. To strictly prohibit overloading on trucks. Aggravation of noise and vibration will be minimized by adoption of above measures. 	<ul style="list-style-type: none"> Measure noise quarterly. If these are specified in the contract. If these are properly implemented
Traffic Congestion	<ul style="list-style-type: none"> During the construction, trucks transporting construction materials will cause traffic congestion. 	<ul style="list-style-type: none"> To implement traffic management plan in coordination with local police. To transport materials during off-peak hours. To prohibit parking of construction-related vehicles on the national/provincial roads. To use temporary construction road built within the acquired road right-of-way as much as possible. To educate truck drivers. 	<ul style="list-style-type: none"> If these are specified in the contract. If these are properly implemented.

TABLE 11.1-2 ENVIRONMENTAL AND SOCIAL IMPACTS, MITIGATION MEASURES AND MONITORING ITEMS FOR OPERATION AND MAINTENANCE PHASE

Item	Assessment	Mitigation Measures	Monitoring Items																				
Involuntary Relocation/ Resettlement	<ul style="list-style-type: none"> (-) Chances of PAFs degrade quality of livelihood after relocation 	<ul style="list-style-type: none"> PAF's recovery way of life after resettlement needs to be taken care of. DPWH shall monitor impacts after construction. 	<ul style="list-style-type: none"> If PAPs recovered their way of life. 																				
Farm Land	<ul style="list-style-type: none"> Estimated monetary values of crops that would yield in the land acquired for CALAX were estimated to be 570,000 pesos per year. Some of PAPs who lose farm land might face financial difficulty if their losses of income sources are not properly compensated or alternative means of compensation have been provided. 	<ul style="list-style-type: none"> To adopt high productivity farming methods and high yield seeds. To educate and finance farmers so as for them to adopt above Proper compensation such as job training and prioritized job opportunity. 	<ul style="list-style-type: none"> Check the agricultural production of Cavite and Laguna Provinces. 																				
Accident	<ul style="list-style-type: none"> CALAX will be built as 4-lane divided facility with center median and international geometric design standard is adopted therefore, occurrence of accidents will be unlikely due to quality of the facility. Accident may occur only when a driver does not follow traffic rules and regulations. Traffic on existing roads will be decreased, thus accidents will be expected to reduce. Traffic accident on ordinary roads will occur at the entrances/exits to/from the expressway. 	<ul style="list-style-type: none"> Provide traffic signal controlled intersection with channelization to minimize traffic accidents. Provide sidewalks with guardrails, pedestrian crossings on the ordinary roads near interchanges. Educate drivers to follow traffic rules and regulations. Install traffic signboards at appropriate places. Regularly repair roads and bridges to ensure good condition for vehicle movement. 	<ul style="list-style-type: none"> Check the report of concessionaire. 																				
Air Pollution	<ul style="list-style-type: none"> Predicted air qualities such as NOX, SO² and PM-10 are less than 1µg/Ncm with CALAX. During O & M period, all parameters are estimated to be below DENR Standards. <p><i>Maximum Predicted Air Quality along CALAX(Laguna section)</i></p> <table border="1"> <thead> <tr> <th>Year</th> <th>NOX (µg/Ncm)</th> <th>SO² (µg/Ncm)</th> <th>PM-10 (µg/Ncm)</th> </tr> </thead> <tbody> <tr> <td>2017</td> <td>11.724</td> <td>31.0009</td> <td>147.014</td> </tr> <tr> <td>2020</td> <td>11.884</td> <td>31.0011</td> <td>147.019</td> </tr> <tr> <td>2030</td> <td>12.163</td> <td>31.0017</td> <td>147.027</td> </tr> <tr> <td>DENR</td> <td>260</td> <td>340</td> <td>300</td> </tr> </tbody> </table>	Year	NOX (µg/Ncm)	SO ² (µg/Ncm)	PM-10 (µg/Ncm)	2017	11.724	31.0009	147.014	2020	11.884	31.0011	147.019	2030	12.163	31.0017	147.027	DENR	260	340	300	<ul style="list-style-type: none"> To use clean filters and mufflers of engines To minimize idling of engines To maintain vehicle mechanics, engines, oil filter, exhaust pipe, and such in proper shape To prohibit old model vehicles To strengthen vehicle emission regulation 	<ul style="list-style-type: none"> Measure air quality quarterly.
Year	NOX (µg/Ncm)	SO ² (µg/Ncm)	PM-10 (µg/Ncm)																				
2017	11.724	31.0009	147.014																				
2020	11.884	31.0011	147.019																				
2030	12.163	31.0017	147.027																				
DENR	260	340	300																				
Noise	<ul style="list-style-type: none"> Predicted noise level at church and school (13points) along CALAX are from 51.2 to 74.9 dBA during day time period and from 47.4 to 71.1 dBA for night time period on year 2020. Since the noise level standard of DENR during the day time and night time are 50 dBA and 40 dB respectively, noise level of all point excess the standard. For residential area (5 points), predicted 	<ul style="list-style-type: none"> Noise barriers can achieve 10dBA noise level reduction according to noise model prediction. Noise barriers will be constructed at the sensitive areas along CALAX before 	<ul style="list-style-type: none"> Measure noise quarterly. 																				

	<p>noise level on year 2020 are from 67.6 to 78.3 dBA during day time period and from 63.8 to 74.5 dBA during night time period. Since the noise level standard of DENR during the day time and night time are 65 dBA and 55 dB respectively, all points exceed noise standard during daytime and nighttime.</p> <ul style="list-style-type: none"> • It is necessary to reduce noise levels and make them acceptable based on the DENR regulation and/or at least the present average noise level of the area. 	<p>operation.</p>	
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Source: JICA Study Team

11.2 RAP Implementation

1) Overall RAP Requirements

(Confidential)

TABLE 11.2-1 OVERALL RAP REQUIREMENTS

<p>(Confidential)</p>

(Confidential)

2) RAP Implementation Organization

RAP Implementation organization is shown in **FIGURE 11.2-1**.

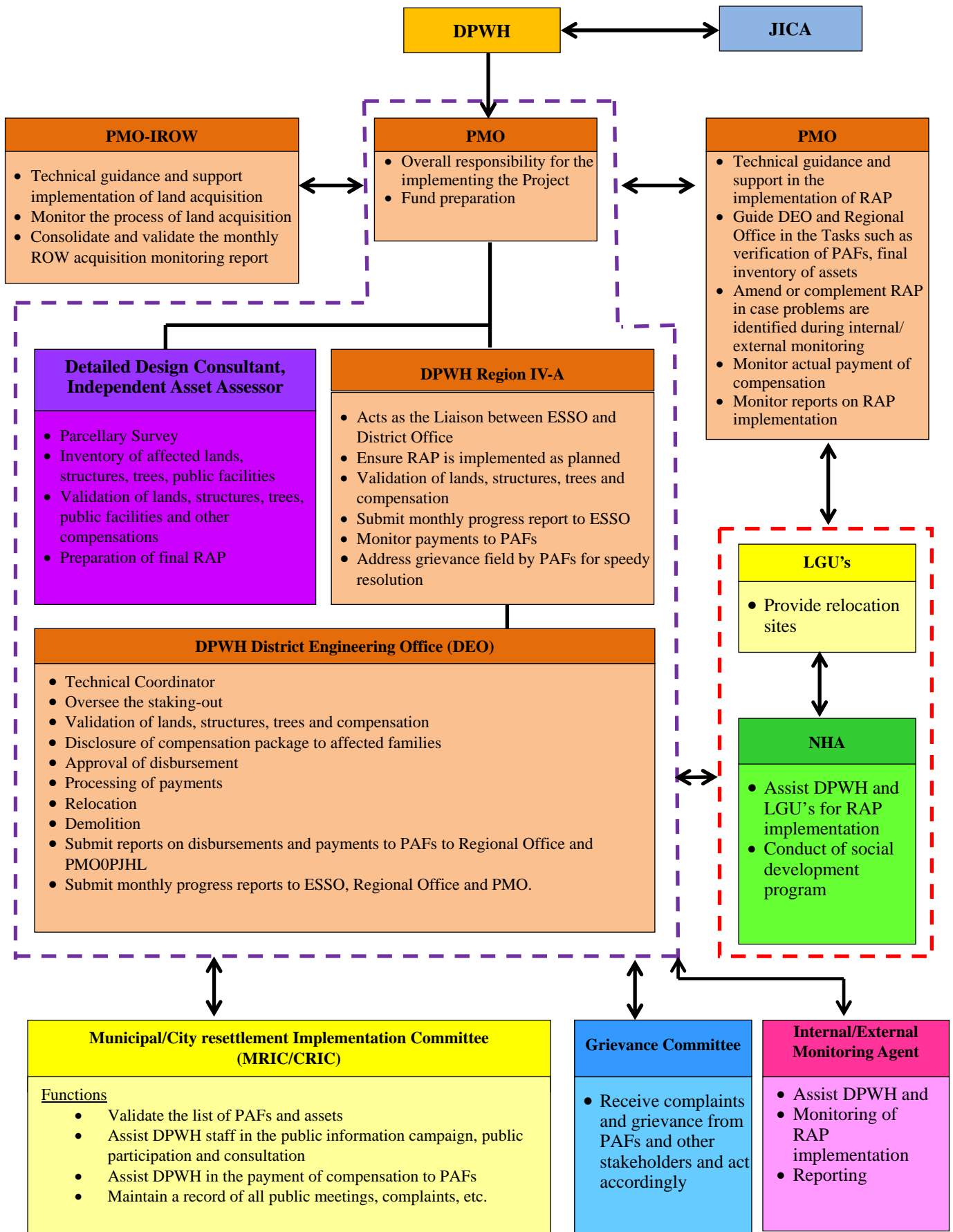


FIGURE 11.2-1 RAP IMPLEMENTATION ORGANIZATION

3) RAP Implementation Process

RAP implementation process is shown in **FIGURE 11.2-2**.

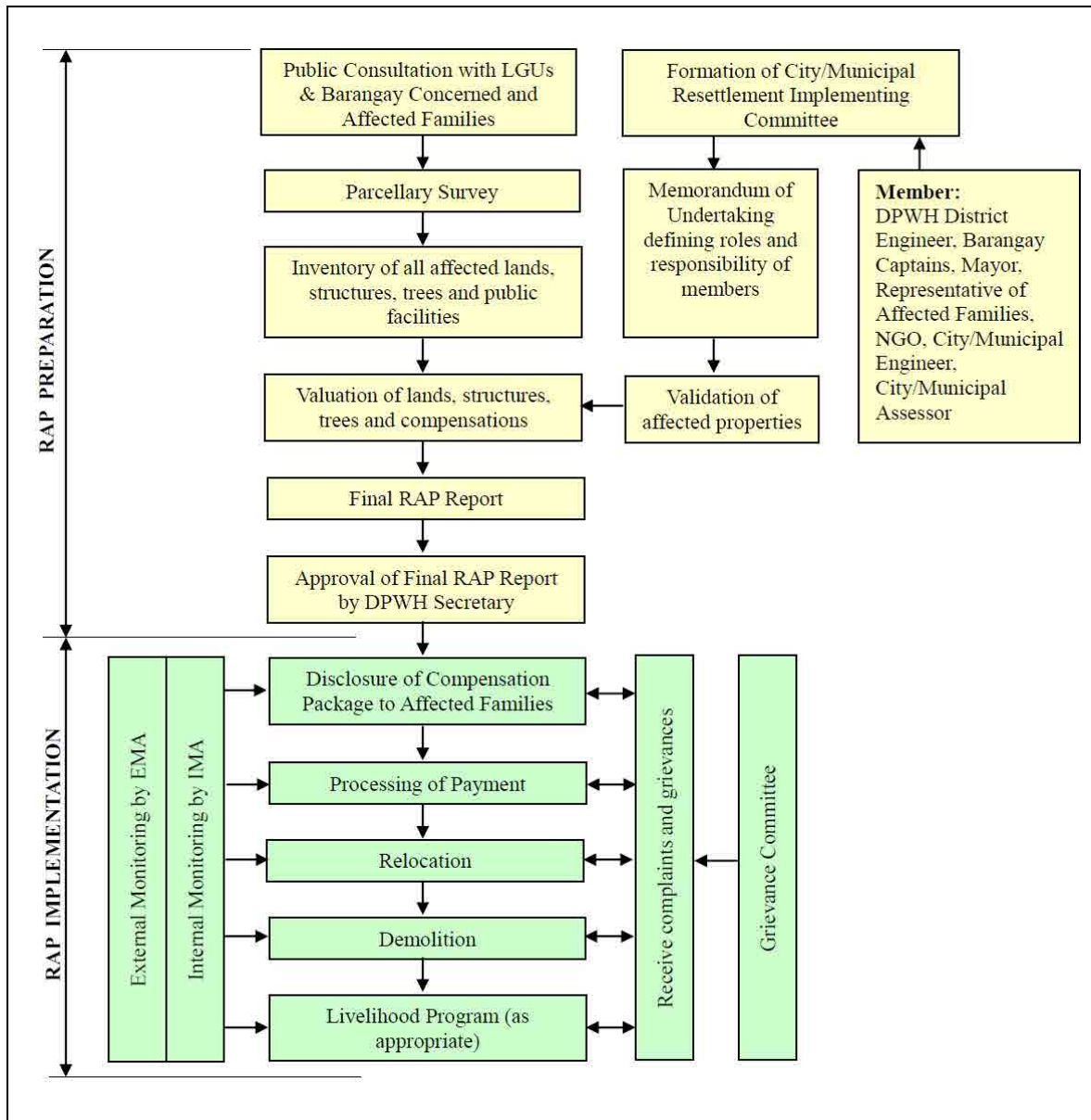


FIGURE 11.2-2 RAP IMPLEMENTATION PROCESS

4) RAP Implementation Schedule

RAP implementation schedule is shown in **TABLE 11.2-2**.

TABLE 11.2-2 RAP IMPLEMENTATION SCHEDULE

	2012				2013				2014				2015				2016				2017			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
First Disclosure of the Project (Public Consultation Meeting)																								
Cut-off date announced																								
Preparation of Initial RAP																								
Coordination with the LGUs (Friezing Development, Zoning Ordinance)																								
Coordination with NHA (relocation of PAFs)																								
Public Consultation Meeting																								
Conduct of Parcellary Survey																								
Inventory of Affected Land, Structure, Trees, etc.																								
Valuation of Land, Structure, etc., and Compensation by Replacement Cost																								
Preparation of farm lands for land to land compensation																								
Preparation of Draft Final RAP																								
Submit Draft Final RAP to JICA																								
Approval of Final RAP																								
Formation of CRIC/MRIC																								
Validation of Affected Properties																								
Disclosure of Compensation Package to Affected Families																								
Processing of Payment																								
Relocation																								
Demolition																								
Implementation of Livelihood Restoration Program																								
Internal Monitoring																								
External Monitoring																								
Formation of Grievance Committee																								
Receive and Act on Complaints/Grievance																								
Commencement of Construction - End of Construction																								

Source: JICA Study Team (2012)

12 PROJECT IMPLEMENTATION

12.1 Implementation Schedule

Implementation schedule is shown in **TABLE 12.1-1**.

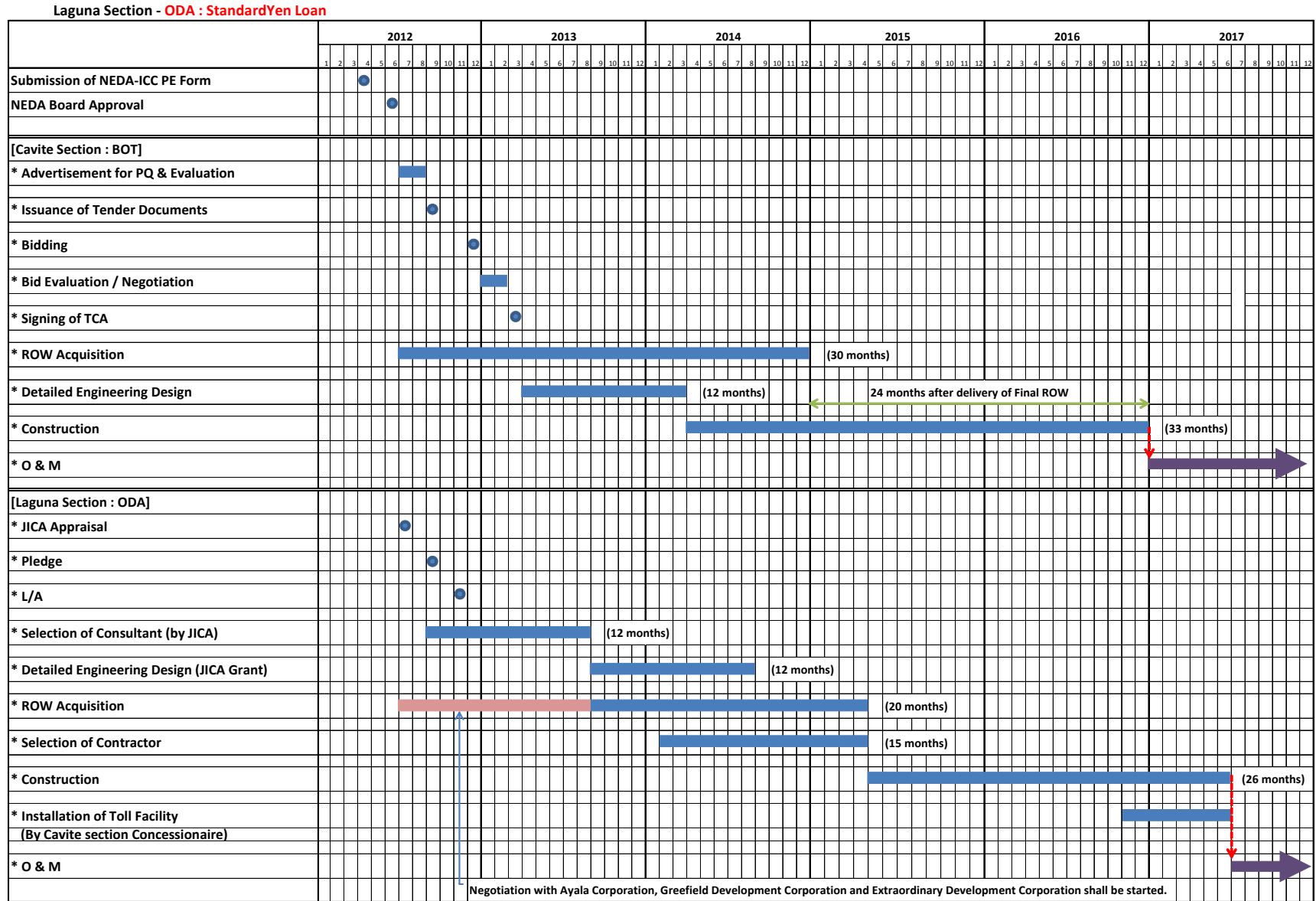
Cavite Section

- Soon after the project is approved by NEDA Board (July 2012), Cavite Section will be advertized for the pre-qualification of interested investors/bidders.
- Bidding is expected to be held in December 2012.
- Toll Concession Agreement (TCA) is expected to be signed in March 2013.
- Since the parcellary survey is included in the current WB Consultant's scope of work, ROW acquisition is expected to start by July 2012 (soon after the project is approved by NEDA Board). ROW acquisition is estimated to require 30 months.
- Detailed Engineering Design will start by May 2013 and will be completed in April 2014.
- Construction is expected to start by June 2016 and will be completed in November 2016.
- Operation and Maintenance will start by December 2016.

Laguna Section

- Project Appraisal by JICA is expected in November 2012.
- Loan Agreement is expected to be signed in March 2013.
- Selection of Consultant for the detailed engineering design will start in January 2013 and end in August 2013.
- Detailed engineering design will start from September 2013 and be completed in August 2014.
- Selection of contractor will start April 2014 and be completed in April 2015.
- ROW Acquisition will start in September 2013 and be completed in April 2015 (20 months).
- DPWH should start negotiation with Ayala Corporation, Greenfield Development Corporation and Extraordinary Development Corporation for the land value to be paid to them soon after the Project is approved by NEDA Board.
- Construction will start May 2015 and be completed in June 2017 with the construction period of 26 months.
- Installation of toll facility will be done by the selected concessionaire for Cavite Section. It will start November 2016 and completed in June 2017.
- Completion of Laguna Section will be about 6 months behind that of the Cavite Section.

TABLE 12.1-1 IMPLEMENTATION SCHEDULE: CAVITE SECTION BY BOT, LAGUNA SECTION BY ODA



Source: JICA Study Team

12.2 Civil Work Contract Packaging

Laguna Section is divided into two (2) contract packages considering the cost, scale of works and characteristics of works.

Contract Package 1 :	Km. 0 + 690 ~ Km. 10 + 600	(L = 9.91 km)
Contract Package 2 :	Km. 10 + 600 ~ Km. 18 + 810	(L = 8.21 km)

12.3 Procurement Plan

Consultancy services and civil work contractor will be procured through the following method in accordance with JICA Guidelines for Procurement under Japanese ODA Loans, March 2009.

1) Consultancy Services

Consultancy services will be procured by two (2) steps, Pre-qualification and Tendering, under the International Competitive Bidding (ICB). Quality- and Cost-Based (QCBS) method will be adopted.

2) Civil Work Contractor

Civil work contractor will be provided by 2 steps, Pre-qualification and Tendering, under the International Competitive Bidding (ICB).

12.4 Organizational Structure

Implementing agency is the Department of Public Works and Highways (DPWH).

Implementing office is the Project Management Office – Build-Operate-Transfer (PMO-BOT). PMO-BOT is currently implementing or preparing the following projects;

- Daang Hari – SLEX Connector Road (Detailed Design is on-going.)
- TPLEX (under Construction)
- NLEX – SLEX Connector Road (under evaluation of the unsolicited proposal)
- NAIAX (preparation for bid)
- CALAX – Cavite Section (preparation for bid)

It is necessary for PMO-BOT to reinforce its staff from other PMOs who have experiences of Japan's ODA projects such as PMO-PJHL and PMO-URPO. Environmental and RAP related staff should be also reinforced.

12.5 Financial Plan

1) Project Cost

(Confidential)

TABLE 12.5-1 PROJECT COST

<p>(Confidential)</p>

2) Annual Fund Requirement
(Confidential)

TABLE 12.5-2 ANNUAL FUND REQUIREMENT (1/2)

(Confidential)

TABLE 12.5-2 ANNUAL FUND REQUIREMENT (2/2)

(Confidential)

TABLE 12.5-3 SUMMARY OF ANNUAL FUND REQUIREMENT

(Confidential)

13 OPERATION AND EFFECT INDICATORS

Summarized operation and effect indicators are shown in **TABLE 13-1**.

TABLE 13-1 OPERATION AND EFFECT INDICATORS

	Indicators	Road Name	Baseline (2011)	Target (2020)	Data Collection Method	
Operation Indicators	Traffic Volume (vehicle /day)	CALAX (Aguinaldo IC ~ East Silang IC)	-	26,827	Traffic count survey	
	Toll Revenue (Thousand Peso/day)	CALAX (Laguna Section)		4,156	Data collection from Operator	
Effect Indicators	Traffic Congestion Rate (V/C Rate)	Aguinaldo Highway (Imus)	1.33	1.15	Calculation based on Traffic count survey	
		Governor's Drive (Carmona)	1.12	1.05		
		Sta.Rosa-Tagaytay Road(Sta.Rosa)	1.03	1.05		
	Travel Time (hr:min)	Silang – NAIA (Morning Peak)				Travel Time Survey
		Via Aguinaldo + Coastal Rd	1:05	Via CALA X and SLEX 0:34		
		Via Govener's Dr +SLEX	1:11			
Travel Time Saving (hours/day)	Aguinaldo Highway, Governor's Drive and Sta. Rosa-Tagaytay Road to CALAX	-	20,840	Calculation based on Travel Time Survey		
Travel Time Cost Saving (Peso/year)		-	5.42 billion	Calculation based on Time Cost and Travel Time Survey		

CHAPTER 1

INTRODUCTION

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND AND BRIEF HISTORY OF THE PROJECT

1.1.1 Background of the Project

The Philippines has been experiencing relatively slower economic development partly due to limited flow of direct investments into manufacturing sector compared to other rapidly growing ASEAN countries after the recovery from Asian Economic Crisis. In order to foster both domestic and foreign investments, improving overall investment climate including road network has been an urgent matter. In particular, the economic activities are extremely concentrated in Metro Manila where 37% of GDP and 13% of total population are accumulated in merely 0.2% of the country's land. This extreme concentration causes serious congestion and delays of distribution of goods and movement of people, resulting to huge damage to economy and lowering the country's international competitiveness as an investment destination. Likewise living condition in Metro Manila has eroded due to air pollution and traffic noise caused by chronic congestion. In summary, solving traffic congestion in Metro Manila by networking surrounding cities and upgrading/expanding highways around Mega Manila – the area covering Metro Manila, Central Luzon and CALABARZON – contributes to improvement of both investment climate and living climate. Cavite-Laguna Expressway (CALAX) is located along the Subic-Clark-Manila-Batangas Logistic Corridor (or known as North-South Industrial Development Beltway), and provides vital transport access to provinces of Cavite and Laguna including Batangas Port; where rapid urbanization propelled by the private developers is ongoing and economic/industrial zones have and are being developed. CALAX will support sound urbanization of the two provinces and industrial development and economic development of the provinces as well as reduction of traffic congestion of the two provinces.

This report covers Cavite-Laguna Expressway Project (Laguna Section) (hereinafter referred to as “CALAX (Laguna Section)” or “the Project”).

1.1.2 Brief History of the Project

The Government of Japan has been providing financial and technical assistance for the Project area.

In 1991, financial assistance (or yen loan) was provided to “the Cavite Export Processing Zone Development and Investment Promotion Program”.

In 1998, financial assistance (or yen loan) was provided to “the development Project on the Port of Batangas”.

In 2006, JICA-assisted Feasibility Study and Implementation Support on the CALA East-West National Road Project (hereinafter referred to as the “2006 FS”) was undertaken. The 2006 FS studied three (3) roads as follows;

- North-South Road (for CAVITEX to north of Governor's Drive)
- Daang Hari Road
- CALA Expressway (from Governor's Drive to SLEX), section from Governor's Drive to CAVITEX Extension was not included due to uncertain alignment and implementation of CAVITEX Extension.

After the 2006 FS, the DPWH tried to implement CALAX and several stakeholders meeting inviting concerned private land developers, however, most of land developers objected the CALAX Project because their development plans are severely affected. Thus, DPWH suspended further actions for implementation.

Meantime, the DPWH continued discussions with the CAVITEX operator and concerned LGUs in Cavite Province and selected CALAX corridor alignment of the Cavite side.

In 2009, the World Bank decided to finance the transaction services for the Cavite section of CALAX project through its loan. The Consultant for the transaction services was selected and the work commenced in September 2011.

JICA also decided to provide technical assistance for the Laguna section of CALAX in 2010 and dispatched the JICA Study Team in 2011.

1.2 OBJECTIVES OF THE PROJECT

Objectives of the project are as follows:

OBJECTIVES OF THE PROJECT

- | |
|---|
| <ul style="list-style-type: none">(i) To provide fast, safe, comfortable and reliable means of transport in Cavite and Laguna Provinces.(ii) To decongest traffic of roads in Cavite and Laguna Provinces.(iii) To support economic development by providing better transport access to economic/industrial zones in the area, this contributes improvement of local/foreign investments in the area.(iv) To support sound urbanization in the area. |
|---|

1.3 THIS REPORT

This report presents all the findings and recommendations so far made for the Cavite - Laguna Expressway (CALAX) Project.

CHAPTER 2

ROAD SECTOR OVERVIEW

CHAPTER 2

ROAD SECTOR OVERVIEW

2.1 PHILIPPINE DEVELOPMENT PLAN (2011 – 2016)

Philippine Development Plan (PDP), 2011-2016 was announced in 2011. Development policies of infrastructure are as follows;

DEVELOPMENT POLICIES OF INFRASTRUCTURE

“Accelerating Infrastructure Development”

- (1) To optimize resources and investment
 - Improve project preparation, development and implementation
 - Synchronize planning and budgeting
 - Coordinate and integrate infrastructure initiative
- (2) To attract investments in infrastructure
 - Improve the institutional and regulatory environment of the infrastructure sector
 - Encourage PPPs
- (3) To foster transparency and accountability in infrastructure development
 - Encourage stakeholder participation
- (4) To adopt to climate change and mitigate the impacts of natural disasters
 - Institutionalize Climate Change Act (CCA) and Disaster Risk Reduction Management (DRRM)
- (5) To provide productive employment opportunities
 - Adopt a labor-intensive scheme where applicable.

With regards to the transport sector, issues and challenges are established as follows;

TRANSPORT SECTOR ISSUES AND CHALLENGES

- (a) Assessment and Issues
 - Lack of integrated and coordinated transport network
 - Overlapping and conflicting functions of transport and other concerned agencies
 - Transport safety and security concerns
- (b) Strategic Plan and Focus
 - Adopt a comprehensive long-term National Transport Policy (NTP)
 - Develop strategic transport infrastructure assets
 - Prioritize asset preservation
 - Provide access to major and strategic tourism destinations and production areas
 - Promote environmentally sustainable and people-oriented transport
- (c) Develop an Integrated Multi-modal Logistics and Transport System
 - Identify and develop strategic logistics corridors based on a National Logistics Master Plan
 - Improve RORO terminal system
 - Explore ASEAN connectivity through sea linkages

- (d) Separate the Regulatory and Operation Functions of Transport and Other Concerned Agencies. To address the overlapping and conflicting functions of transport and other concerned agencies.
- (e) Comply with Safety and Security Standards. To ensure transport safety and standards.
- (f) Provide Linkages to Bring Communities into the Mainstream of Progress and Development. To promote conflict-affected and highly impoverished areas.

2.2 ROAD DEVELOPMENT GOALS

Public Investment Program (PIP) (2011 - 2016) was formulated by DPWH in 2011. Goals were set as follows;

DEVELOPMENT GOALS UNDER PIP

1. Provide safe environment through quality infrastructure facilities;
2. Increase mobility and total connectivity of people through quality infrastructure resulting to improved quality of life;
3. Strengthen national unity, family bonds and tourism by making the movement of people faster, cheaper and safer;
4. Facilitate the decongestion of Metro Manila via a transport logistics system that would ensure efficient linkages between its business centers and nearby provinces;
5. Implement more Public-Private Partnership (PPP) projects for much needed infrastructure and level playing field for investment;
6. Study the mechanism for longer maintenance period for roads and bridges; and
7. Generate more transport infrastructure with minimal budget cover or contingent liabilities.

Strategic focuses were set as follows;

STRATEGIC FOCUS

- Implement activities in the following order of priorities:
 - a. Maintenance or asset preservation – to preserve existing roads in good condition
 - b. Rehabilitation – to restore damaged roads to their original designed condition
 - c. Improvement – to upgrade road features so that they efficiently meet traffic demands; and
 - d. New Construction
- Prioritize upgrading of the national road network, as to quality and safety standards
- Prioritize national roads to address traffic congestion and safety in urban centers and designated strategic tourism destinations
- Completion of on-going bridges along national roads
- Develop more Public-Private Partnership (PPP) projects for much needed infrastructure and level playing field for investments
- Study the mechanism for a longer maintenance period (5 – 10 years) in road and bridges construction contract provision
- Prioritize flood control projects in major and principal river basins to address climate change based on master plan and adopting new technologies in flood control and slope management
- Prioritize adequate flood control and upgraded drainage design standards and facilities in flood-disaster prone areas to mitigate loss of river and damage to properties
- Promote innovative technology such as geo-textiles and coco-netting in slope protection and

soil erosion control <ul style="list-style-type: none"> • Promote retarding basin and rain water harvesting for non-domestic use • Prioritize water supply in designated strategic tourist destinations/centers
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2.3 BRIEF HISTORY OF EXPRESSWAY PPP PROJECTS IN THE PHILIPPINES

The expressway development has evolved through three distinct approaches, namely “Franchise Approach”, in Joint Venture Approach” and “BOT Law Approach”.

(1) Franchise Approach: Late 1970s to 2000s

The first toll road with the private sector participation in the public infrastructure project was North Luzon Expressway (NLEx) and South Luzon Expressway (SLEx). Both expressway were originally constructed by the public fund. To allow the private sector to operate, maintain and expand the facility, Presidential Decree (PD) No. 1112 called as “Toll Operation Decree” was issued 1977 and the Toll Regulatory Board (TRB) was created. The TRB was authorized to enter into contracts for the construction, operation and maintenance of toll facilities such as but not limited to national highways, roads, bridges and public thoroughfares.

Under PD No. 1113 in 1977, the Construction and Development Corporation of the Philippines (CDCP) was granted, for a period of thirty (30) years from May 1, 1977, the right privilege and authority to construct, operate and maintain toll facilities with extension to Pangasinan of the North Luzon Expressway (NLEx) and Quezon of the South Luzon Expressway (SLEx).

Through PD No. 1894 in 1983, the Philippine National Construction Corporation (PNCC formerly CDCP) was further granted the authority to construct, maintain and operate any and all such extension, linkages or stretches from any part of NLEx and/or Metro Manila Expressway. The franchise for the Metro Manila Expressway and all extensions/linkages shall have a term of thirty (30) years commencing from the date of completion of the project.

Major project implemented under this approach were;

- North Luzon Expressway (NLEx)
- South Luzon Expressway (SLEx)
- Manila-Cavite Coastal Expressway (CAVITEx)

(2) Joint Venture Approach: Early 1990s to Present

With the increase of traffic and deteriorated conditions of franchised expressways needs of rehabilitation, improvement and widening of the facilities increased sharply. Since the original franchise holders did not have enough financial capacity to undertake such works, the private investors submitted unsolicited proposal to the original franchise holders for financing of required rehabilitation/widening/improvement of the facilities under the joint venture approach. The private investors in joint venture with the original franchise holder implemented the necessary works and the Joint Venture Company contracted the supplemental toll operation agreement (STOA) with TRB.

Major projects implemented under this approach were;

- Rehabilitation, improvement and widening of NLEx

- Rehabilitation, improvement and widening of SLEx
- Construction of Skyway Phase I and Phase II over SLEx
- Extension of CAVITEx

(3) BOT Law Approach: Middle of 1990s to Present

In 1990, Republic act (RA) No. 6597, otherwise known as the BOT Law, authorized the financing, construction, operation and maintenance of infrastructure projects by the private sector.

In 1994, RA No. 6597 was amended by RA No. 7718, which, among other things, allows more BOT variants, recognizes the need for private investors to realize rates of return reflecting market conditions, allows government support for BOT projects and allows unsolicited proposals, although it is actually discouraging unsolicited proposals by limiting the Government Financial Support. The Revised Implementing Rules and Regulations (Revised IRR) for the BOT Law, as amended, have been prescribed to cover all private sector infrastructure or development projects.

Major projects implemented under this approach were:

- Southern Tagalog Arterial Road (STAR)
- Subic-Clark-Tarlac Expressway (SCTEx)
- Tarlac-Pangasinan-La Union Expressway (TPLEx) which is under construction at present

2.4 MASTER PLAN ON HIGH STANDARD HIGHWAY NETWORK

The study of master plan on High Standard Highway (HSH) Network Development was conducted in Year 2010. **Figure 2.4-1** shows the proposed HSH network in Metro Manila and 200 km sphere. Based on this master plan, Public Investment Program (2011-2016) for expressway projects was formulated.

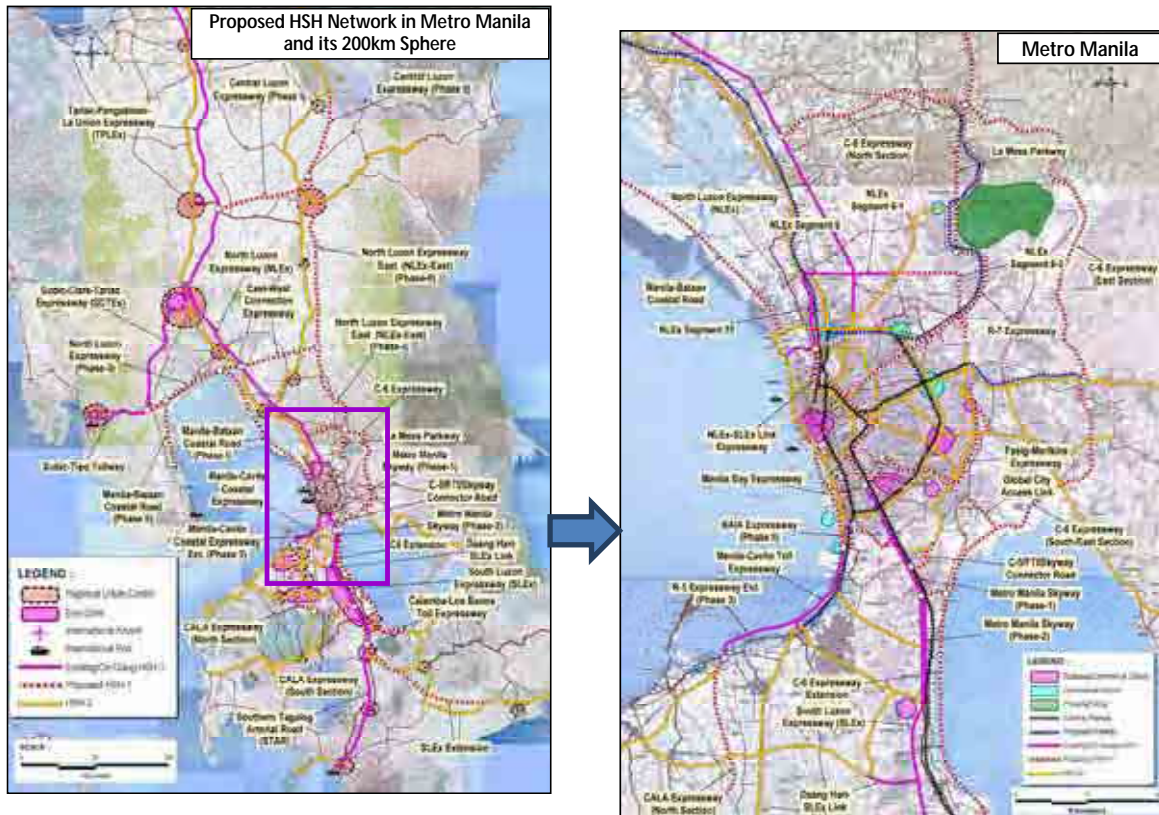


FIGURE 2.4-1 PROPOSED HSH NETWORK

Source: *The Study of Master plan on High Standard Highway Network Development, 2010, JICA*

CALA Expressway is one of the 1st priority projects in this Master plan shown in **TABLE 2.4-1**.

TABLE 2.4-1 PROPOSED HSH PROJECTS PRIORITY

	Name of HSH	Length (km)	Cost (billion pesos)
1 st Priority Group	NLEX-SLEX Link Expressway	13.4	31.14
	CALA Expressway	41.8	19.67
	C-5/FTI/SKYWAY Connector Rd.	3.0	4.76
	NAIA Expressway (Phase 2)	4.9	12.18
	C-6 Expressway/Global City Link	66.5	54.29
	Central Luzon Expressway (CLLEX)	63.9	29.23
	SLEX Extension (to Lucena)	47.8	16.45
	Calamba-Los Banos Expressway	15.5	5.23
	Sub-total	256.8	172.95
2 nd Priority Group	R-7 Expressway	16.1	25.81
	NLEX East / La Mesa Parkway	103.0	38.94
	Manila – Bataan Coastal Road	70.3	72.94
	NLEX (Phase 3)	36.2	28.42
	East-West Con. Expressway	26.6	16.48
	C-6 Extension	43.6	18.61
	Manila Bay Expressway	8.0	46.54
	Pasig Marikina Expressway	15.7	49.58
	Sub-total	319.5	297.32
TOTAL	576.3	470.27	

Source: *The Study of Master plan on High Standard Highway Network Development, 2010, JICA*

2.5 CURRENT ROAD INFRASTRUCTURE SECTOR AND ITS DEVELOPMENT PLAN RELATED TO THE PROJECT

DPWH Public Investment Program (PIP) for 2011 -2016 contains the following target and priority programs

TABLE 2.5-1 TARGET OUTCOMES OVER THE MEDIUM TERM

	Year			Requirement
	2011	2014	2016	
a. National Arterial Roads (15,987 km)	94% Paved	100% Paved in good condition		<ul style="list-style-type: none"> • Paving of 1,443km • Rehab./ widening/ upgrading/ construction of 2,828km
b. National Secondary Roads (15,372 km)	72% Paved	81% Paved	100% Paved in good condition	<ul style="list-style-type: none"> • Paving of 3,329km • Rehabilitation of 1,798km
c. National Bridge (330,089m) (7,792 bridges)	95%	98%	100% Permanent	<ul style="list-style-type: none"> • Replacement of 8,544 lm of temporary bridges • Improvement of 6,047 lm of existing bridges • Construction of 2,154 lm new bridges • Repair/rehabilitation of 104,293 lm of bridges

Source: Public Investment Program (2011-2016) As of April 2012, DPWH

Under the PIP for 2011-2016, DPWH is envisaging a total investment of 698,084 million pesos. Of this total investment requirement in the PIP, 585,938 million pesos or 84% is earmarked for the highway sector, 83, 948 million pesos (12%) for flood control works and 28,198 million pesos (4%) for other locally-funded projects over the six (6) year program.

The total investment requirement for 2013 up to 2016 is based on the annual 10% increase from the approved budget of 99,490 million pesos for Y2012.

TABLE 2.5-2 (2011-2016) PUBLIC INVESTMENT PROGRAM SUMMARY

List of Project	Prior Year	Proposed Allocation (in Million Pesos)						Total (2011-2016)
		2011	2012	2013	2014	2015	2016	
1.Roads	75,703	75,047	81,246	91,697	101,347	113,722	122,878	585,938
-Foreign assisted project	41,490	19,566	14,257	30,313	28,889	35,186	39,162	167,645
-PPP	-	-	1,474	11,164	7,450	4805	-	24,894
-Locally funded project	34,213	55,481	65,243	50,219	65,008	73730	83,715	393,398
2.Flood Control	19,692	11,166	10,816	12,523	13,854	14,960	20,628	83,948

Project								
-Foreign assisted project	13,283	2,978	2,300	2,670	3,728	6656	12,406	30,738
-Locally funded project	6,419	8,188	8,517	9,853	10,127	8304	8,221	53,211
3. Other Locally Funded DPWH Project	36,288	4,474	7,428	5,219	5,181	3,738	2,157	28,198
GRAND TOTAL	131,683	90,687	99,490	109,439	120,383	132,421	145,663	698,084

Source: Public Investment Program (2011-2016) As of April 2012, DPWH

2.6 PAST AND FUTURE PLAN OF OTHER DONOR'S PROJECT RELATED TO PPP POLICIES

(1) Technical Assistance by ADB, AusAID, and CIDA

In terms of capacity building, "Technical Assistance for Strengthening Public-Private Partnerships in the Philippines" are being carried out as of November 2011. This is a capacity development program financed by ADB AusAID (the Australian Agency for International Development), and CIDA (The Canadian International Development Agency). The purpose of the program is to help the Philippines to clear obstacles and to pave the way for PPP. Under this program, ADB provides a US\$1.5 million grant, AusAID provides a US\$7 million grant and CIDA provides a US\$1.2 million grants. The program is to run from April 2011 to July 2013.

The expected outputs of the program are 1) Strengthening of PPP Enabling Framework, 2) Strengthening Capacity of the PPP Center, 3) Institutionalization of PPP Best Practice and 4) Establishment of Long-term Financing and Risk Guarantee Mechanisms.

(2) Other Programs and Activities

Besides ADB TA, there are several assistance programs planned by GoP and foreign agencies.

Singapore Cooperation Enterprise (SCE) has agreed with GoP to provide TA to promote PPP. The objectives of SCE TA are to:

- Achieve an in-depth understanding of the benefits and challenges for greater private sector participation in the financing of public sector projects; and the policy actions required to strengthen the enabling environment, legislative and regulatory frameworks for PPP;
- Build capabilities for key public sector officials involved in the procurement and implementation of infrastructure projects, through the implementation of a pilot PPP transaction; and
- Provide examples of Singapore's infrastructure procurement process by sharing Singapore's lessons and experience in developing successful and commercially viable PPP projects.

It was agreed that SCE will provide a grant worth approximately S\$1.423 million (P48.373 Million) to DOTC for PPP capacity development of DOTC. GoP will provide counterpart fund of S\$ 270,100. The grant will cover one-year period. Based on the Joint Press Release issued by SCE and Temasek Foundation on March 31, 2011, SCE will work with the DOTC to develop institutional capabilities for

key agencies within the Philippine Government responsible for the procurement of infrastructure projects under the PPP framework.

Furthermore, according to the Joint Press Release, SCE will send a team of Singapore PPP experts to work with DOTC to prepare and structure a pilot project for procurement under the PPP framework. The pilot project will provide a real-life and hands-on case study where Philippine Government officials can adapt relevant lessons from Singapore to bring projects to a biddable and bankable stage.

SCE will also help DOTC organize a series of capacity building workshops to build capacity for some 100 Philippine Government officials in the development and implementation of PPP transactions. During these workshops, Singapore public sector agencies, such as Public Utilities Board, Singapore Sports Council and Institute of Technical Education, will share with the workshop participants the key challenges Singapore had faced, including the policy considerations, regulatory framework and practical experiences in implementing Singapore's PPP projects. The Singapore private sector players involved in Singapore's PPP projects will also share the perspective of the private sector investors and project developers in investing in a PPP project.

There is also information about assistance coming from the World Bank. According to the World Bank's website, they are interested in helping specific projects, such as expansion of the LRT System and the sewerage system in Manila. There can be further assistance that is directed towards individual projects.

2.7 RELATION BETWEEN OTHER ODA LOAN PROJECTS

Projects related of NAIAX are below.

- Daang Hari SLEX Link Project
- NLEx-SLEx Connector Road Project

1. Daang Hari SLEX Link Project

- Daang Hari SLEX Link aims to additional access between Metro Manila and Cavite where rapid urbanization is being experienced.
- New 4 kilometer, 4-lane paved toll road that will pass through the New Bilibid Prison reservation that will connect Bacoor, Cavite to the South Luzon Expressway thru Susana Heights shown in **Figure 2.7-1**.
- Daang Hari SLEX Link bagged by the Ayala group, Civil works is expected to commence by May 2012 and the expressway to be fully operational on or before November 2013 following the Build-Transfer-Operate (BTO) arrangement for a period of 30 years.



FIGURE 2.7-1 LOCATION MAP OF DAANG HARI SLEX LINK PROJECT

3. NLEx-SLEx Connector Road Project

Currently, Metro Pacific Tollways Development Corp (MPTDC) and San Miguel Corp-backed Citra Metro Manila Tollways Corp (CMMTC), headed by San Miguel have presented their proposal on their respective NLEx-SLEx connector road projects.

The road projects will link Makati City to Caloocan and Balintawak.

Linking NLEx and SLEx has been in the pipeline since 2010, when MPTDC submitted an unsolicited proposal for it. It was supposed to be just one project until CMMTC submitted its own proposal, claiming it has the right to develop the project as an extension of its Skyway. The two proposals covered different routes for the proposed link.



TWO ROADS. Metro Pacific and San Miguel-Citra propose to build separate roads connecting NLEX and SLEX. MPIC's proposal is the pink line, while San Miguel-Citra's is the shorter, dark blue line. Illustration from the SMC-Citra group

FIGURE 2.7-2 LOCATION MAP OF NLEX-SLEX CONNECTOR ROADS

2.8 LESSON AND COUNTERMEASURE FROM THE SIMILAR PAST PROJECT

Interview surveys were conducted to government officials and the private O& M companies in order to identify the bottleneck and recommendation in the Preparatory Survey for PPP infrastructure Development Project (JICA 2011).

Table 2.8-1 shows the summary of major issues and bottlenecks of PPP project and corresponding recommendations.

TABLE 2.8-1 MAJOR ISSUES AND BOTTLENECKS OF PPP PROJECTS

	Issues and Bottlenecks of PPP Projects	Recommendations
1. Legal Framework	<p>1.1 There are two laws/E.O. to allow the private sector to invest infrastructure projects:</p> <ul style="list-style-type: none"> a) RA 7718 (BOT Law) and its IRR b) EO 423 and its Guidelines and Procedure for entering into joint venture agreement between the Government and the private entities. <ul style="list-style-type: none"> ▪ No NEDA ICC nor NEDA Board's project approval is required. ▪ Head of Agency has authority to approve the JV Agreement regardless of project cost. 	<p>1.1 Options:</p> <p>Option 1 : EO 423 be abolished and integrated into RA 7718</p> <p>Option 2 : Modification of Guidelines and Procedure</p> <ul style="list-style-type: none"> - Project should be approved by NEDA ICC or NEDA Board - Ceiling of project cost should be specified. - Enough time should be given to challengers.
	<p>1.2 Modification of IRR of RA 7718 Amendments of IRR is being studied on</p> <ul style="list-style-type: none"> i) Approval of Individual Projects and Draft Contract, ii) List of Priority Projects, iii) Publication of Invitation, iv) Approving Authority for the Contract, v) Contract Variation, vi) Protest Fee, vii) Timelines, viii) Substitution/Withdrawal of a Member of a Consortium/Joint Venture, ix) Government Shoulder the Differential, x) Period of Comparative Bids Preparation, xi) Information Disclosure of Unsolicited Proposal, xii) New ROW Acquisition Under Unsolicited Proposal 	<p>1.2 Amendments should be finalized as early as possible.</p>
	<p>1.3 Creation of PPP Laws Present BOT Law is for the one type of PPP schemes, which should be improved by adding other PPP schemes so as to add more flexibility to other types of PPP schemes and to specify the Government's responsibilities.</p>	<p>1.3 Study on creation of PPP Law should start.</p>

Source: Preparatory Survey for Public-Private Partnership (PPP) Infrastructure Development Project (JICA2010)

TABLE 2.8-1 MAJOR ISSUES AND BOTTLENECKS OF PPP PROJECTS

	Issues and Bottlenecks of PPP Projects	Recommendations
2. Institutional Framework	2.1 Lack of Experiences/Capacity of Government Officials for Planning and Implementation of PPP Projects <ul style="list-style-type: none"> - Historically, planning and implementation of BOT projects was led by the private sector's initiative. - The Government is discouraging the unsolicited proposals. - The Agencies are required to be more pro-active and take a leadership for PPP projects. 	2.1 Agencies should take a leadership for promotion of PPP projects. <ul style="list-style-type: none"> - Develop priority projects with implementation priority and firm implementation schedule. - The roles of the private sector, government agencies and other authorities as well as LGUs in transport infrastructure development in operation and management needs to be defined.
	2.2 No PPP Project Specialized Office except DPWH.	2.2 Organize PPP Specialized Office.
	2.3 BOT Center has been not so active.	2.3 In close coordination with Agencies, BOT center should be more active in project development of PPP projects.
	2.4 Strengthening of DPWH Planning Service and PMO-BOT <ul style="list-style-type: none"> - In line with the DPWH Rationalization Plan, DPWH is planning to upgrade existing PMO-BOT to PPP Service. 	2.4 PMO-BOT should be upgraded to PPP Service as early as possible.
	2.5 Materials for PPP Capacity Development and manuals/standards are incomplete. <ul style="list-style-type: none"> - Training materials for PPP - Standard PQ/Tender and Draft Toll Concession Agreement - O & M manual 	2.5 Necessary materials, standards and manuals should be prepared. DPWH should establish regular PPP training course.
3. PPP Project Financing	3.1 Long period (sometimes years) is required for financial closure due to unfavorable offer of banks to the investor (short repayment period with no grace period and high interest rate). Some commercial banks are not familiar with the PPP project financing.	3.1 PPP fund to finance the private entities needs to be created.
	3.2 Delay in ROW acquisition delays financial closure.	3.2 Refer to 4.4

Source: Preparatory Survey for Public-Private Partnership (PPP) Infrastructure Development Project (JICA2010)

TABLE 2.8-1 MAJOR ISSUES AND BOTTLENECKS OF PPP PROJECTS

	Issues and Bottlenecks of PPP Projects	Recommendations
3. PPP Project Financing	3.3 Project Development Fund (PDF) of BOT Center is not fully utilized.	3.3 PDF needs to be revitalized by increasing fund as well as establishment of rules and guidelines for usage.
	3.4 On the part of financing the Government expenditure, it is still relying on the project loans from the international lending institutions and/or bilateral sources.	3.4 PPP fund to finance the Government expenditure needs to be studied and established.
4. Bottlenecks in PPP Project Cycle	4.1 <u>Master Plan/Basic Plan/Project Identification Stage</u> <ul style="list-style-type: none"> • Master Plan and/or basic plans were not updated. • Listing of projects and their implementation schedule was not updated. • Project promotion has been largely relied on the private sector. 	4.1 Master Plan, project list and project implementation priority should be always updated and firm implementation schedule and corresponding budgeting should be done.
	4.2 <u>Business Case/Feasibility Study Stage</u> <ul style="list-style-type: none"> • Level of feasibility studies has been incomplete/inadequate. • Soon after a feasibility study is completed, it has been difficult to go into a tendering stage due to unfixed ROW, lack of ECC, lack of LGUs' endorsement, etc. • Agencies' capacity and local consultants' capacity to undertake a feasibility study of PPP project is not sufficient. 	4.2 <ul style="list-style-type: none"> • More fund and time should be spent for this study • Complete information and documents for NEDA's project approval and succeeding tendering should be prepared.
	4.3 <u>Project Approval Stage</u> <ul style="list-style-type: none"> • Lengthy time is required until the project is approved by NEDA ICC or NEDA Board. 	4.3 <ul style="list-style-type: none"> • Complete information and documents should be prepared during the feasibility study stage. • NEDA should undertake seminars on "ICC Project Evaluation Procedure and Guidelines".

Source: Preparatory Survey for Public-Private Partnership (PPP) Infrastructure Development Project (JICA2010)

TABLE 2.8-1 MAJOR ISSUES AND BOTTLENECKS OF PPP PROJECTS

	Issues and Bottlenecks of PPP Projects	Recommendations
4. Bottlenecks in PPP Project Cycle	<p>4.4 <u>ROW Acquisition / Resettlement Stage</u></p> <ul style="list-style-type: none"> • Preparation of IROW plan and parcellary plan takes long time due to inaccurate land registration, difficulty to locate land owners, inaccurate record of lot boundary, etc. • A lot of documentations are needed and lot owners have difficulty to prepare required documents. • Land valuation is made based on BIR land valuation for the first offer, and based on Provincial/ City Appraisal Committee or Land Bank valuation for the second offer, these are close to, but still lower than market value. • In case that land owners fail to prepare complete documents, expropriation is the only solution. • ROW acquisition Teams are not provided sufficient logistics (like service vehicles, computers, etc.). • More staff who are familiar with ROW acquisition are needed. • Some Toll Concession Agreements include the private sector's funding for ROW acquisition. 	<p>4.4</p> <ul style="list-style-type: none"> • Preparation of IROW plan and parcellary plan and succeeding ROW acquisition should start soon after the project is approved by NEDA Board or NEDA ICC. • Once major critical documents are prepared, cash advance by the private sector should be made to PAPs through the Government, which shall be refunded to the private sector. This arrangement should be specified in TCA. • Land value should be based on the prevailing market price. • Enough logistics support such as service vehicles, computers, etc. should be provided for ROW acquisition team, cost of which should be included in the project cost. • IROW Procedural Manual should be updated and more staff should be trained.
	<p>4.5 <u>Tender Stage</u></p> <p>1) <i>Government Projects</i></p> <ul style="list-style-type: none"> • Selection of Consultants and Contractors takes lengthy time. <ul style="list-style-type: none"> - Consultant selection - over 8 months - Contractor selection - over 10 months <p>2) <i>Selection of Project Proponent of PPP Project</i></p> <ul style="list-style-type: none"> • Selection of project proponent takes lengthy time - over 12 months <p>3) <i>Unsolicited Proposal</i></p> <ul style="list-style-type: none"> • Takes much longer time to finalize due to many disputes and counteroffers and negotiation of contract terms such as toll rates, risk allocation, etc. 	<p>4.5</p> <p>1) <i>Government Projects</i></p> <ul style="list-style-type: none"> • Selection of Consultants should target 6 months or less. • Selection of Contractor should target 8 months or less. <p>2) <i>Selection of Project Proponent of PPP Project</i></p> <ul style="list-style-type: none"> • Selection of Project Proponent should target 10 months or less. • Agency should undertake project campaign and enough information should be disclosed before the project is advertised. • All tender conditions and draft Toll Concession Agreement should be agreed between DPWH and TRB before advertisement.

Source: Preparatory Survey for Public-Private Partnership (PPP) Infrastructure Development Project (JICA2010)

TABLE 2.8-1 MAJOR ISSUES AND BOTTLENECKS OF PPP PROJECTS

	Issues and Bottlenecks of PPP Projects	Recommendations
4. Bottlenecks in PPP Project Cycle	4.6 <u>Contracting Stage</u> <ul style="list-style-type: none"> • Review of Toll Concession Agreement (TCA) by TRB usually takes lengthy time. • Approval of NEDA Board also takes lengthy time. 	4.6 <ul style="list-style-type: none"> • Close coordination between NEDA and Agencies should be made.
	4.7 <u>Toll Operation Agreement Stage</u> <ul style="list-style-type: none"> • Review by TRB of toll adjustment formula and other O & M aspects take considerable time. 	4.7 <ul style="list-style-type: none"> • From the feasibility study stage, TRB should be involved.
	4.8 <u>Fund Procurement/Preparation Stage</u> <ul style="list-style-type: none"> • Government <ul style="list-style-type: none"> - Budget constraints and delay in budget release - Difficult to cope with cost overrun. • Private <ul style="list-style-type: none"> - Delay in attaining financial closure due to difficulty in meeting lender's requirement such as complete ROW acquisition, government financial support, approval of toll rates and toll rate adjustment formula. - Difficult to find appropriate financier (short repayment period with no grace period, and high interest rates). - Unexpected changes requiring additional costs due mainly to additional facilities required by LGUs and LGU fees. 	4.8 <ul style="list-style-type: none"> • Government <ul style="list-style-type: none"> - Needs provision of adequate annual budget. - Needs to tap ODA. • Private <ul style="list-style-type: none"> - Creation of fund to finance the private sector for infrastructure project implementation should be studied.
	4.9 <u>Detailed Design Stage</u> <ul style="list-style-type: none"> • Lacks proper coordination with LGUs, thus modification of design, requirement of additional facilities, etc. is required by LGUs. • Lacks proper coordination with utility companies for relocation/protection of public utilities affected. 	4.9 <ul style="list-style-type: none"> • Proper coordination with LGUs and utility companies should be done during the feasibility study. • Value engineering should be exercised.

Source: Preparatory Survey for Public-Private Partnership (PPP) Infrastructure Development Project (JICA2010)

TABLE 2.8-1 MAJOR ISSUES AND BOTTLENECKS OF PPP PROJECTS

	Issues and Bottlenecks of PPP Projects	Recommendations
4. Bottlenecks in PPP Project Cycle	4.10 <u>Construction Stage</u> <ul style="list-style-type: none"> • Delayed construction due to delayed delivery of ROW and financial closure. • Needs more strict quality control and schedule control. 	4.10 <ul style="list-style-type: none"> • An Independent Certificate Engineer should be employed at the cost of the Government.
	4.11 <u>Operation and Maintenance Stage</u> <ul style="list-style-type: none"> • Approval of toll fee and adjustment of toll fee by TRB is delayed. • Increase of toll fee is usually objected by the people and politicians and adoption of new toll rate is delayed. 	4.11 <ul style="list-style-type: none"> • TRB should approve toll fee and its adjustment in accordance with provisions of TCA. • The Government should compensate the loss of revenue due to delayed increase of toll rates. • TRB and operators should jointly make information disclosure to the people why toll rates and toll adjustment are needed and determined and what are benefits of users.
	4.12 <u>End of Contract and Facility Transfer Stage</u> No experience on this stage, yet.	-

Source: Preparatory Survey for Public-Private Partnership (PPP) Infrastructure Development Project (JICA2010)

2.9 DPWH ORGANIZATION AND CURRENT O& M COMPANY

(a) DPWH Organization (Central Office)

Organization chart of DPWH is shown in **Figure 2.9-1**. Offices within the DPWH which are related to the development of PPP projects are highlighted and discussed below.

Planning Service (PS)

Tasked to formulate policies, plans and programs for the development of the national road network, which includes expressways; prepare PPP proposals for ODA financing; maintain a national road database; and prepare multi-year and annual budgets for the construction (including right-of-way and engineering) and maintenance of national roads.

PMO-Feasibility Studies (PMO-FS)

Assigned to conduct/supervise FS of major foreign-assisted and locally-funded road and expressway projects; and assist the PS and PMO-BOT in preparing project proposals for ODA financing.

PMO-Built-Operate-Transfer (PMO-BOT)

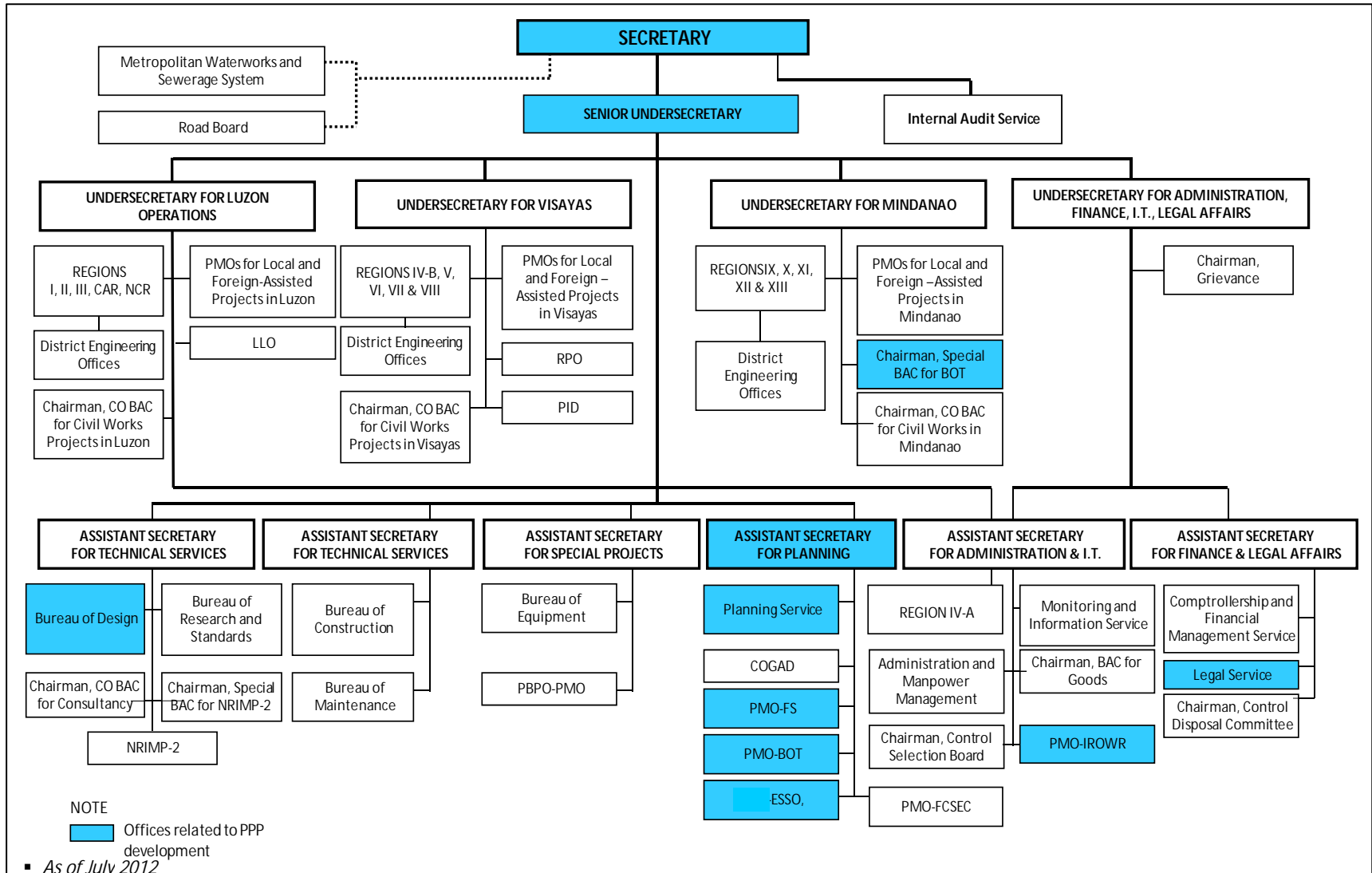
Tasked to identify and initiate projects for BOT/PPP implementation; prepare/review feasibility studies (FS) and proposals for BOT/PPP projects for approval of the NEDA-Investment Coordinating Committee (ICC); prepare bidding documents; participate in negotiations and finalization of BOT/PPP contracts; and monitor/supervise the implementation of BOT/PPP projects.

Environmental and Social Services Office (ESSO)

Involved in preliminary planning activities related to Environmental Impact Assessment (EIA), Social Impact Assessment (SIA), Rapid Social Assessment, Resettlement Action Plan (RAP); conduct public consultations on PPP projects; conduct Information, Education and Communication (IEC) on environment-related concerns; and compliance and effects monitoring of ECC conditions and Environmental Management Plan (EMP).

PMO-Infrastructure Right-of-Way and Resettlement (PMO-IROWR)

Tasked to consult with LGUs, local communities, project affected persons, and the designer/contractor for PPP projects; coordinate with the Presidential Commission for the Urban Poor (PCUP) and the National Housing Authority (NHA) on the relocation of squatter families; conduct census and tagging of affected lots and improvements; coordinate with the Bureau of Internal Revenue or BIR (for zonal valuation), Registry of Deeds (for titles), Assessor's Office, and DAR (for land conversion); coordinate and negotiate with affected property owners on the sale of their properties; coordinate with the Office of the Solicitor General (OSG) for filing of expropriation proceedings; and effect payment of affected properties.



Source: DPWH website

FIGURE 2.9-1 ORGANIZATION CHART OF DPWH

(b) Overview of Current toll expressway companies for construction and O&M

Table 2.9-1 shows the summary of toll expressway investors and O&M companies and Table 2.9-2 shows the summary of current toll collection system and traffic control system.

TABLE 2.9-1 Toll Expressway Company

Investors	Operating Expressway(length)	O&M Companies	Remarks
Manila North Tollways Corp.(MNTC)	<ul style="list-style-type: none"> North Luzon Expressway (82.6km) Subic-Tipo Tollway (8.5km) 	Tollways Management Corp.	Metro Pacific Investment Corp.(Hong Kong Fund)
(BCDA)	<ul style="list-style-type: none"> Subic-Clark-Tarlac Expressway (93.8km) 	Tollways Management Corp.	Construction by ODA fund
Private Infrastructure Development Corp. (PIDC)	<ul style="list-style-type: none"> Tarlac-Pangasinan-La Union Expressway (88.0km under construction) 	-	PIDC was established by ten (10) local contractor companies
UEM-MARA Philippine Corp.	<ul style="list-style-type: none"> Manila-Cavite Coastal Expressway (8.8km) and Extension (11.2km) 	Direct operation	Malaysian Fund
Citra Metro Manila Tollways Corp./ San Miguel Corp.	<ul style="list-style-type: none"> Skyway : PhaseI (9.4km) South Luzon Expressway (13.4km) Skyway : PhaseII (6.8km) 	Skyway O&M Company	Indonesia Fund
San Miguel Corp.	<ul style="list-style-type: none"> South Luzon Expressway (37.2km) 	South Luzon Tollways Corp.	Philippine Fund
Ayala Corp/	<ul style="list-style-type: none"> Daang Hari SLEx Link Road 		Philippine Fund
San Miguel Corp.	<ul style="list-style-type: none"> Southern Tagalog Arterial Road (STAR) (41.9km) 	Star Infrastructure Development Corp.	Philippine Fund

TABLE 2.9-2 Toll Expressway's Toll Collection System and Traffic Control System

Operating Expressway(length)	Toll Collection System	Traffic Control System
<ul style="list-style-type: none"> North Luzon Expressway (82.6km) 	<ul style="list-style-type: none"> Cash, EC-tag, Easy Trip 	Yes, CCTVs, Vehicle detectors and VMSs (Variable Message e Sign) are installed.
<ul style="list-style-type: none"> Subic-Clark-Tarlac Expressway (93.8km) Subic-Tipo Tollway (8.5km) 	<ul style="list-style-type: none"> Cash only 	Not yet installed
<ul style="list-style-type: none"> Manila-Cavite Coastal Expressway (8.8km) and Extension (11.2km) 	<ul style="list-style-type: none"> Cash only 	Not yet installed
<ul style="list-style-type: none"> Skyway : PhaseI (9.4km) South Luzon Expressway (13.4km) Skyway : PhaseII (6.8km) 	<ul style="list-style-type: none"> Cash, E-pass 	Yes, CCTVs are installed.
<ul style="list-style-type: none"> South Luzon Expressway (37.2km) 	<ul style="list-style-type: none"> Cash, E-pass 	Yes, CCTVs and VMSs are installed.
<ul style="list-style-type: none"> Southern Tagalog Arterial Road (STAR) (41.9km) 	<ul style="list-style-type: none"> Cash only 	Not yet installed

CHAPTER 3

SOCIO-ECONOMIC CONDITION OF THE PROJECT AREA

CHAPTER 3 SOCIO-ECONOMIC CONDITION OF THE PROJECT AREA

3.1 SOCIO-ECONOMIC CONDITIONS

3.1.1 Physical Profile

The project is located in Region IV-A specifically in the provinces of Cavite and Laguna. Region IV-A is composed of five provinces of Batangas, Cavite, Laguna, Quezon, Rizal and the lone city of Lucena City. The region covers about 16,612 square kilometers or equivalent to 4.9% of land area of the country. **Table 3.1.1-1** shows the land area share of Region IV-A to country as well as share of neighboring regions to the country.

TABLE 3.1.1-1 POPULATION SHARE

Region	Land Area (sq. km.)	Share to Philippines (%)
Philippines	344,879	
NCR	619	0.2
Region III	22,014	6.4
Region IV-A	16,612	4.9

Source: National Statistics Office

3.1.2 Demographic Trend

The population of Region IV-A reaches 11.7 million in 2007. This number represents 13.3% of the total population of the country. Growth rate in the region is higher than that of the national average as well as the growth rate of Region III and NCR. Between 2000-2007, the annual growth rate in Region IV-A is 3.36% while Region III had 2.45% and NCR posted only 2.18% as presented in **Table 3.1.2-1**. This trend is expected to continue partly due to population spillover from NCR and continuing expansion of economic zones and other industries in the area.

Population of Barangays Directly Affected by the Expressway Project (Laguna Section)

The population of barangays directly affected by the alignment of CALAX totaled 137,707 of which Cavite province has 39,177 and Laguna province has 98,530. The total area covered by these barangays is about 65.6 km² of which 35.8 km² is located in Cavite side and the remaining is on the side of Laguna. Barangays directly affected by the expressway project is illustrated in **Figure 3.1.2-1**.

TABLE 3.1.2-1 DEMOGRAPHIC TREND IN THE STUDY AREA

Region	Province	Actual Population				Land Area (sq km)	Density (persons/sq km)				Past Annual Population Growth Rate (%)		
		1990	1995	2000	2010		1990	1995	2000	2010	1990-1995	1995-2000	2000-2010
Philippines		60,703,206	68,616,536	76,504,077	92,337,852	340,575	178	201	225	260	2.48	2.20	2.12
NCR		7,948,392	9,454,040	9,932,560	11,855,975	620	12,830	15,261	16,033	18,650	3.53	0.99	2.02
Region III		6,338,590	7,092,191	8,204,742	10,137,737	22,015	288	322	373	442	2.27	2.96	2.37
Region IV-A		6,349,452	7,750,203	9,320,629	12,609,803	16,873	376	459	552	696	4.07	3.76	3.49
	Batangas	1,476,783	1,658,567	1,905,348	2,377,395	3,120	473	532	611	720	2.35	2.81	2.41
	Cavite	1,152,534	1,610,324	2,063,161	3,090,691	1,574	732	1,023	1,311	1,815	6.92	5.08	5.05
	Laguna	1,370,232	1,631,082	1,965,872	2,669,847	1,918	714	850	1,025	1,290	3.55	3.80	3.39
	Quezon	1,221,831	1,359,991	1,482,955	1,740,638	9,070	135	150	164	182	2.17	1.75	1.78
	Rizal	977,448	1,312,489	1,707,218	2,484,840	1,192	820	1,101	1,432	1,916	6.07	5.40	4.77
	Lucena City	150,624	177,750	196,075	246,392	69	2,199	2,595	2,862	3,451	3.37	1.98	2.49

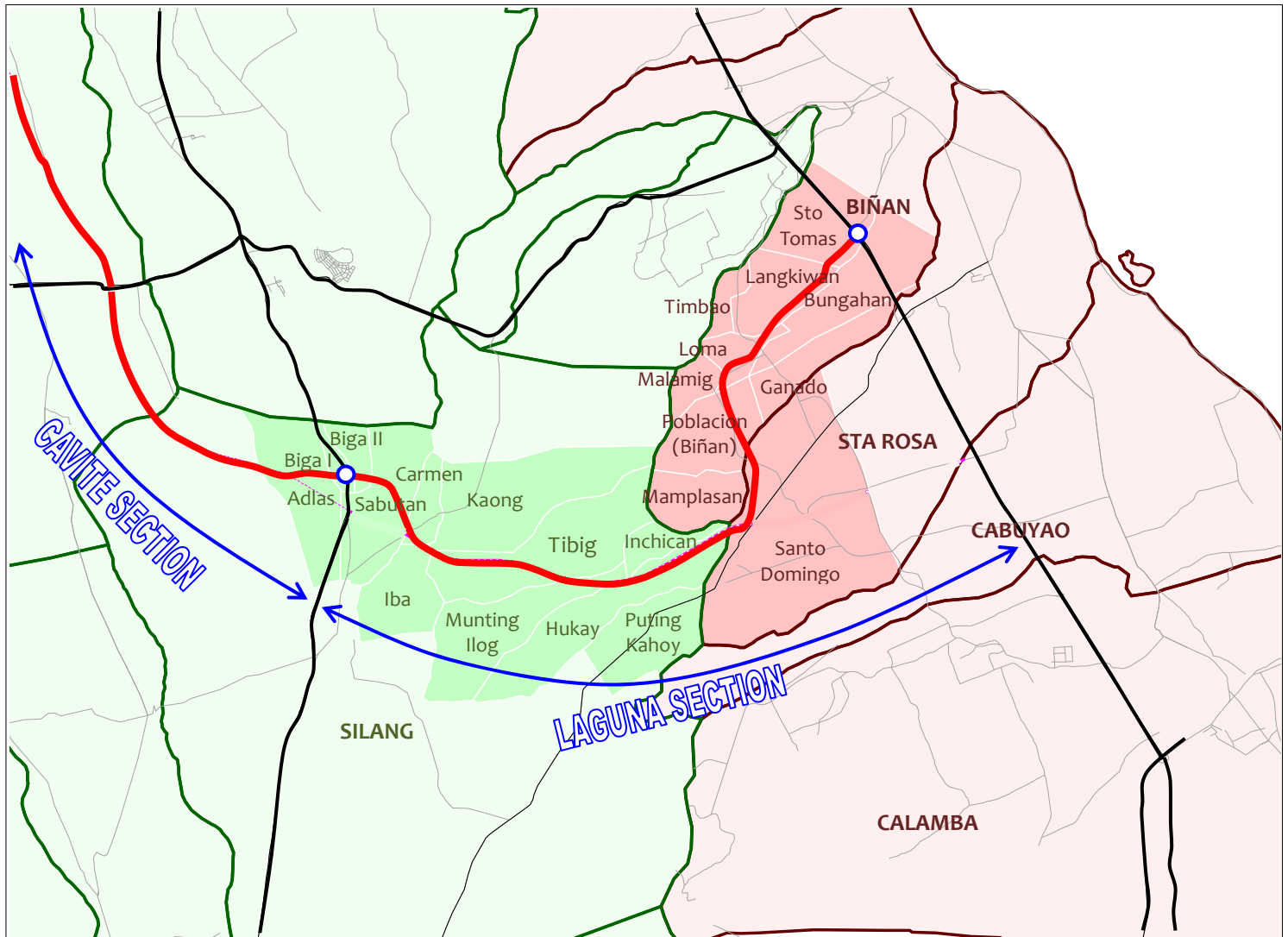
Source: NSO,

Note: *CALAX is located in the provinces of Cavite and Laguna

TABLE 3.1.2-2 POPULATION OF BARANGAYS DIRECTLY AFFECTED BY THE PROJECT

	Province / City / Municipality	Barangay Name	Land Area (Sq. Km)	Population	
				2000	2010
	CAVITE		1574.200	2,063,161	3,090,691
	Silang		128.790	156,137	213,490
		Adlas	3.826	1,432	4,956
		Carmen	0.995	1,280	1,768
		Hukay	4.580	1,238	1,414
		Iba	2.509	2,995	3,875
		Inchican	0.973	2,009	4,284
		Kaong	5.854	4,602	6,767
		Munting Ilog	4.240	2,757	2,995
		Puting Kahoy	3.274	3,467	5,838
		Sabutan	3.868	3,964	4,616
		Tibig	5.653	2,042	3,119
	LAGUNA		1,917.900	1,965,872	2,669,847
	Biñan		36.916	201,186	283,396
		Bungahan	4.072	876	1,709
		Ganado	2.180	2,381	3,952
		Langkiwan	2.326	1771	25,709
		Loma	1.039	1,601	6,769
		Malamig	0.892	1,089	2,929
		Mamplasan	2.138	2,681	6,086
		Poblacion	.262	2,842	3,640
		Sto Tomas	3.152	30,113	38,990
		Timbao	0.737	1,837	8,746
	Sta. Rosa		39.733	185,633	284,690
		Santo Domingo	13.017	1,295	3,178
	Total (Cavite Side)		35,772	29,301	39,177
	Total (Laguna Side)		29.815	46,486	98,530
	Grand Total		65,587	75,787	137,707

Source: NSO,



BARANGAY MAP
CALA EXPRESSWAY (LAGUNA SECTION)
Source: JICA Study Team

Note: Final alignment still to be selected 0 1 2 3 4 Kilometers

FIGURE 3.1.2-1 ALIGNMENT OF CALAX SHOWING DIRECTLY AFFECTED BARANGAYS

3.1.3 Economic Trend

The economic performance of Region IV-A as well as neighboring provinces is depicted in **Figure 3.1.3-1**. These three regions, NCR, Region III and Region IV-A, are considered the economic engine of the country contributing 56.8% of the country's economic output. NCR consistently surpassed the national average. Region IV-A's growth rate is just a bit lower than the national average but still a strong growth at 6.1%

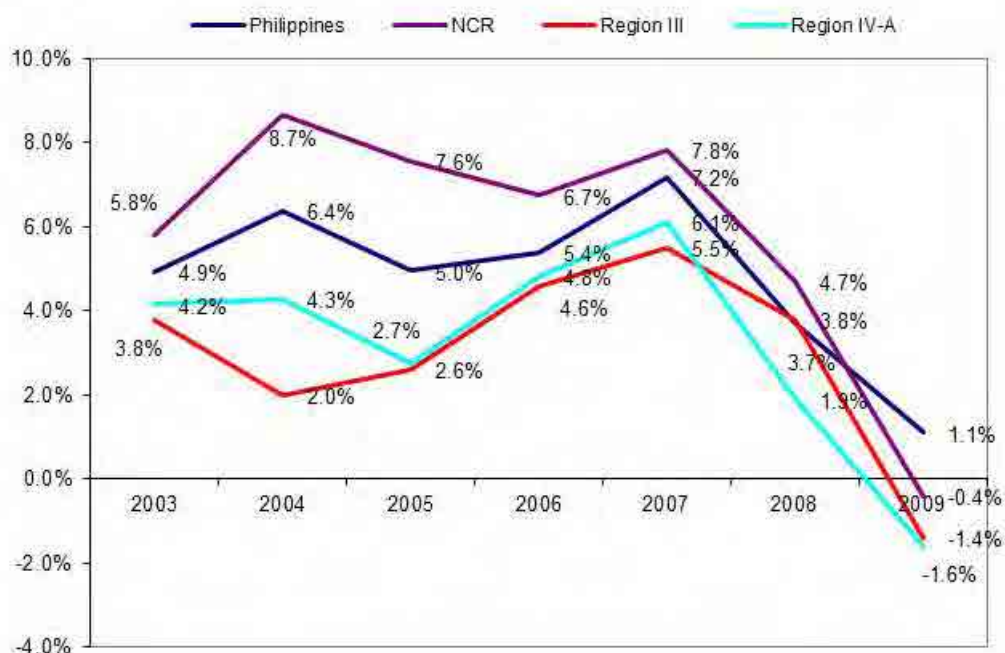


FIGURE 3.1.3-1 GDP AND GRDP GRWOTH RATE

The industrial structure of the economy of Region IV-A is as follows: Primary Sector (19%), Secondary Sector (40%), and Tertiary Sector (42%) as shown in **Table 3.1.3-1**. The region has the most number of economic zones. Construction of CALAX will further boost the attractiveness of the region as it is the prime economic zone location in the country.

TABLE 3.1.3-1 INDUSTRIAL STRUCTURE OF THE ECONOMY, 2008

	Primary	Secondary	Tertiary	Total
Philippines	259,406	465,017	694,530	1,418,953
NCR	1	161,980	306,401	468,382
Region III	28,798	41,895	47,031	117,724
Region IV-A	31,533	66,836	69,930	168,299
IN PERCENTAGE				
Philippines	18%	33%	49%	100%
NCR	0%	35%	65%	100%
Region III	24%	36%	40%	100%
Region IV-A	19%	40%	42%	100%

Source: NSO, 2007

In terms of economic growth rate, the country in general posted high economic growth from 2002 to 2009. High growth is particularly observed from 2006 to 2007 where 7.18% growth rate was recorded. After 2007, growth rate was decreased. At regional level, Region IV-A registered -1.56% from 2008 to 2009; Region III had -1.42% and NCR with -0.36% in the same period as depicted in **Table 3.1.3-2**.

TABLE 3.1.3-2 ECONOMIC GROWTH RATE (2002-2007)

	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09
Philippines	4.93 %	6.38 %	4.95 %	5.40 %	7.18 %	3.69%	1.06%
NCR	5.82 %	8.67 %	7.56 %	6.74 %	7.84 %	4.65%	-0.36%
Region III	3.79 %	2.00 %	2.74 %	4.83 %	6.11 %	3.75%	-1.42%
Region IV-A	4.15 %	4.27 %	2.59 %	4.57 %	5.49 %	1.90%	-1.56%

Source: NSCb, 2011

3.1.4 Per Capita GDP and GRDP

The per capita GRDP in current price and constant price are shown in **Table 3.1.4-1** and **Table 3.1.4-2** respectively. As expected, NCR being the capital of the country has the highest per capita GRDP which almost 3 fold higher than the national average. Per capita GRDP of Region IV-A is a bit lower than that of the national average at 0.83. The country's per capita GRDP grew by 3.8% per annum from 2003 to 2009. Highest growth is realized in NCR and followed by Region IV-A and then by Region III as presented in **Table 3.1.4-2**.

TABLE 3.1.4-1 PER CAPITA GRDP IN CURRENT PRICE

Unit: Peso

	2003	2004	2005	2006	2007	2008	2009	
Philippines	52,718	58,149	63,556	69,365	74,947	81,910	83,261	1.00
NCR	148,743	165,814	184,758	205,117	223,332	243,528	246,753	2.96
Region III	39,407	42,256	45,789	49,469	52,351	58,460	57,862	0.69
Region IV-A	50,997	55,213	59,320	63,640	67,466	70,320	68,895	0.83

Source: NSCB, 2011

TABLE 3.1.4-2 PER CAPITA GRDP IN CONSTANT PRICE

Unit: Peso

	2003	2004	2005	2006	2007	2008	2009	Growth Rate
Philippines	13,252	13,789	14,186	14,681	15,429	15,666	15,528	2.29
NCR	31,730	33,867	35,742	37,856	40,252	41,541	40,838	3.67
Region III	11,092	11,054	11,142	11,448	11,904	12,039	11,636	0.69
Region IV-A	13,853	14,068	14,159	14,439	14,891	14,750	14,209	0.36

Source: NSCB, 2011

3.1.5 Employment

The number of establishment in Region IV-A reaches 114,208 in 2007. This number is higher than the number of establishment recorded in the neighboring provinces except Metro Manila. The said number of establishments generated 856,193 employments in the region.

TABLE 3.1.5-1 NUMBER OF ESTABLISHMENTS AND EMPLOYMENTS BY REGION/PROVINCE: LUZON

Region/Province	No. of Establishments			No. of Employments		
	2005	2006	2007	2005	2006	2007
Philippines	782,980	783,065	783,869	5,479,297	4,984,883	5,187,793
NCR	195,412	195,632	196,426	1,976,359	1,869,507	2,025,751
Region III	84,368	84,344	84,361	480,020	419,320	421,962
Region IV-A	114,182	114,114	114,208	924,867	857,361	856,193
Batangas	19,606	19,579	19,599	128,134	113,700	109,162
Cavite	28,737	28,705	28,709	286,300	266,149	261,334
Laguna	27,028	27,015	27,059	318,264	311,564	322,732
Quezon	16,219	16,223	16,223	67,586	53,952	52,475
Rizal	22,592	22,592	22,618	124,583	111,996	110,490
Luzon Total	362,654	362,819	363,539	2,790,975	2,564,084	2,723,991

Source: NSO, Statistical Sampling and Operations Division, 2000 List of Establishments

3.2 REGIONAL DEVELOPMENT PLAN

The Philippine Development Plan (2011 – 2016) is pursuing the following national development policies;

NATIONAL DEVELOPMENT POLICIES

- | |
|--|
| <ul style="list-style-type: none"> • Development of an integrated multi-modal logistics/transport system to achieve an economic corridor • Decongestion of Metro Manila • Promotion of development of impoverished area • Promotion of PPP projects for acceleration of infrastructure development |
|--|

Due to economic growth in the capital regions, economic sphere is expanding from Metro Manila towards its neighboring regions of Region III and Region IV-A. Thus, the development strategy cannot be planned only for Metro Manila but involving Region III and Region IV-A as a whole. Overall development strategy will be as follows;

1) 200 km radius sphere from Metro Manila

- Metro Manila together with Region III and Region IV-A will continue to propel the country's economy.
- To promote decentralization and to mitigate overconcentration of Metro Manila, regional urban centers outside Metro Manila shall be developed. (see **Figure 3.2-1**)
- Strategic areas along the Pacific coast shall be regarded as the impoverished areas for universal development and accessibility to those areas shall be strengthened. (see **Figure 3.2-2**)
- In order to support tourism development, the tourism development axes shall be developed for the strategic areas of tourism development. (see **Figure 3.2-2**)

2) Metro Manila and its suburbs

- Due to accumulation of infrastructure of expressways, international airports and ports and

economic zones along the north-south direction, the north-south industrial development beltway which connects Batangas-Metro Manila-Clark-Tarlac will be the key axis for the development of the Metropolitan areas and the country as a whole. (see **Figure 3.2-3**)

- Sound urbanization of Metro Manila and its suburbs shall be achieved. (see **Figure 3.2-1**)

3) North of Metro Manila

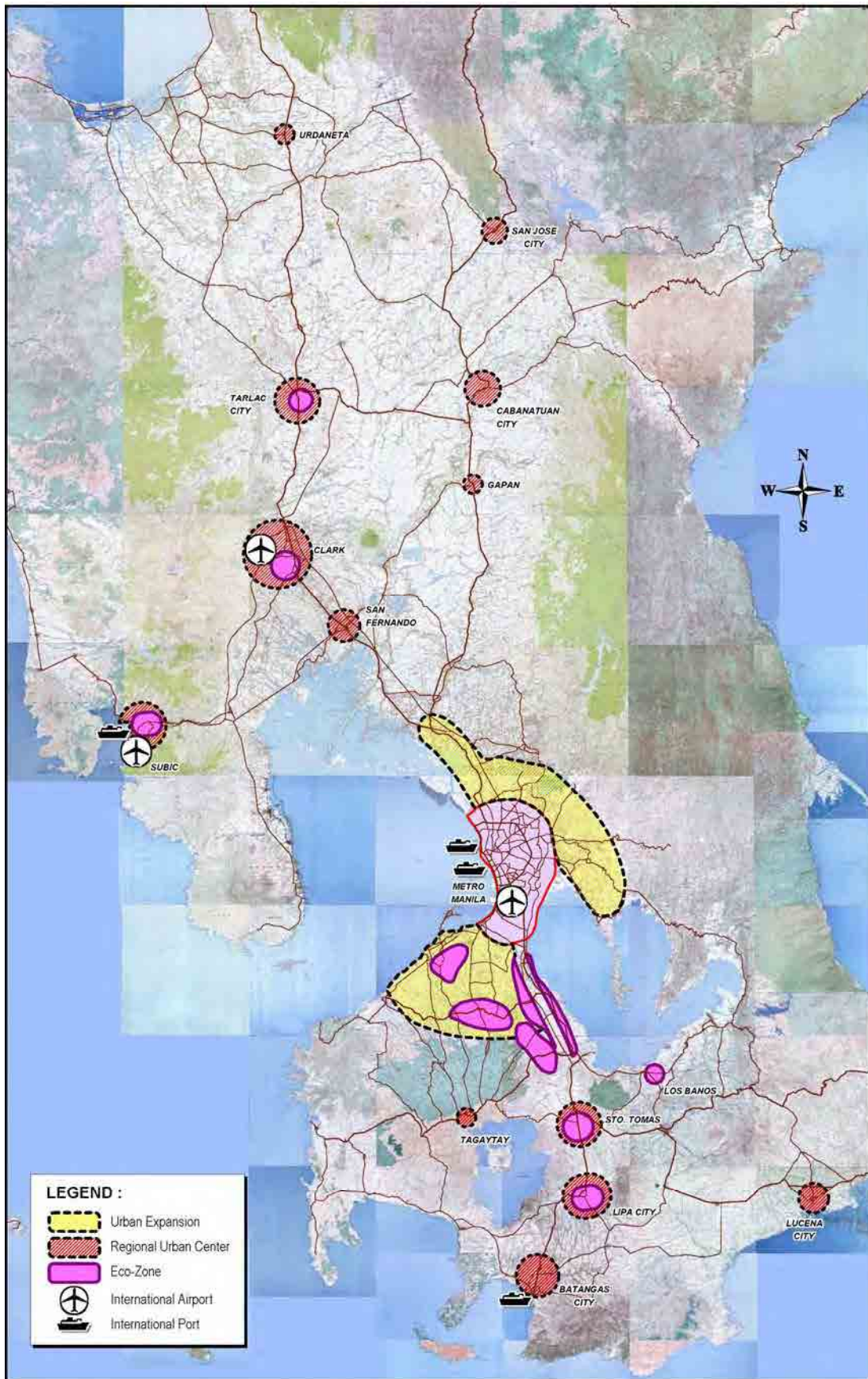
- Clark-Subic corridor shall be developed as a logistic axis not only for the country but also for the southeast and ASEAN countries. (see **Figure 3.2-3**)
- To support the development of CAR and Region I, the North-West Luzon development axis shall be developed. (see **Figure 3.2-3**)
- For the development of Region II, the North-East Luzon development axis shall be developed. (see **Figure 3.2-3**)

4) South of Metro Manila

- To support the development of Region V, the South-Luzon development axis shall be developed. (see **Figure 3.2-3**)

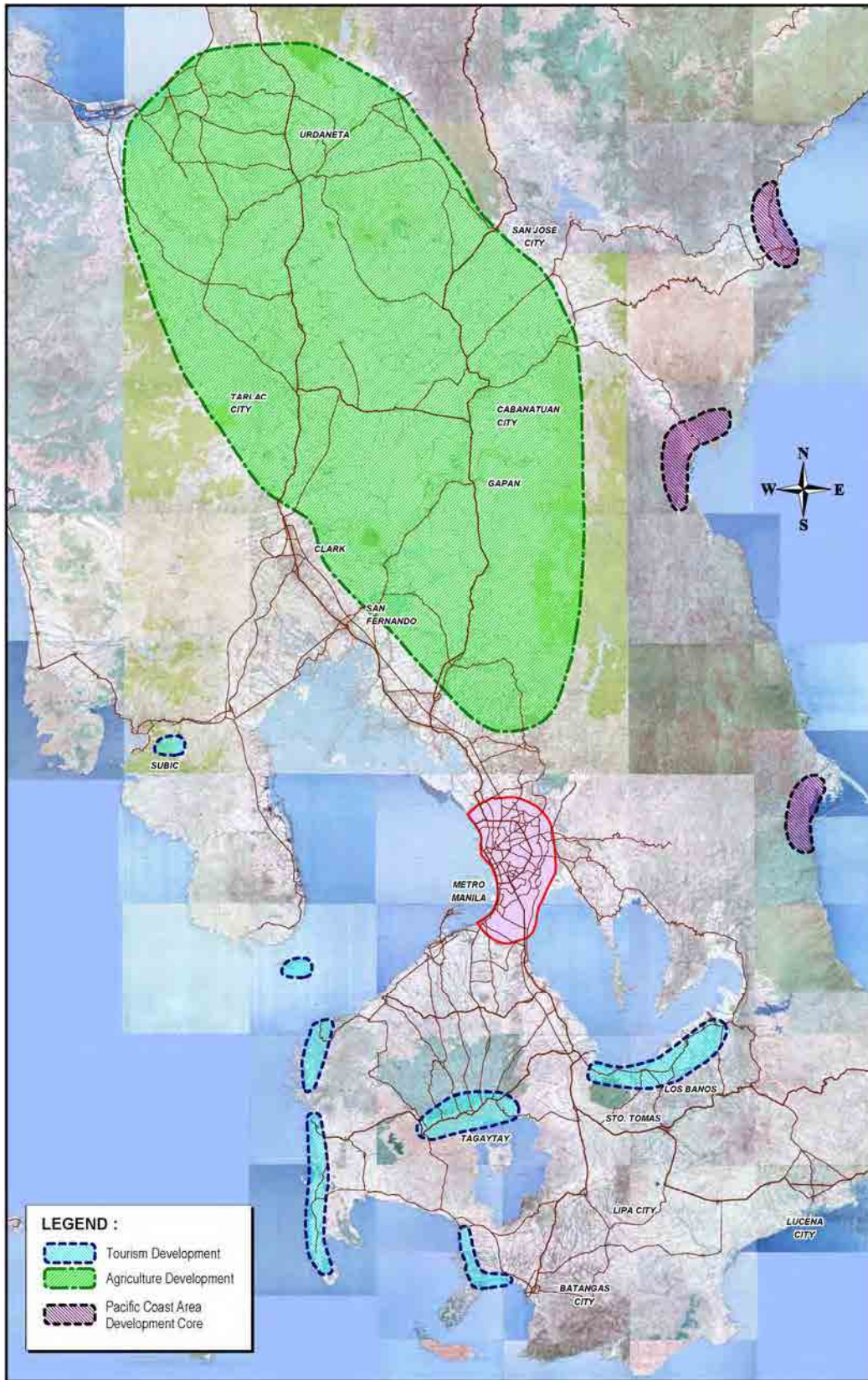
5) Overall Regional Development Scenario

- Overall regional development scenario is shown in **Figure 3.2-4**.



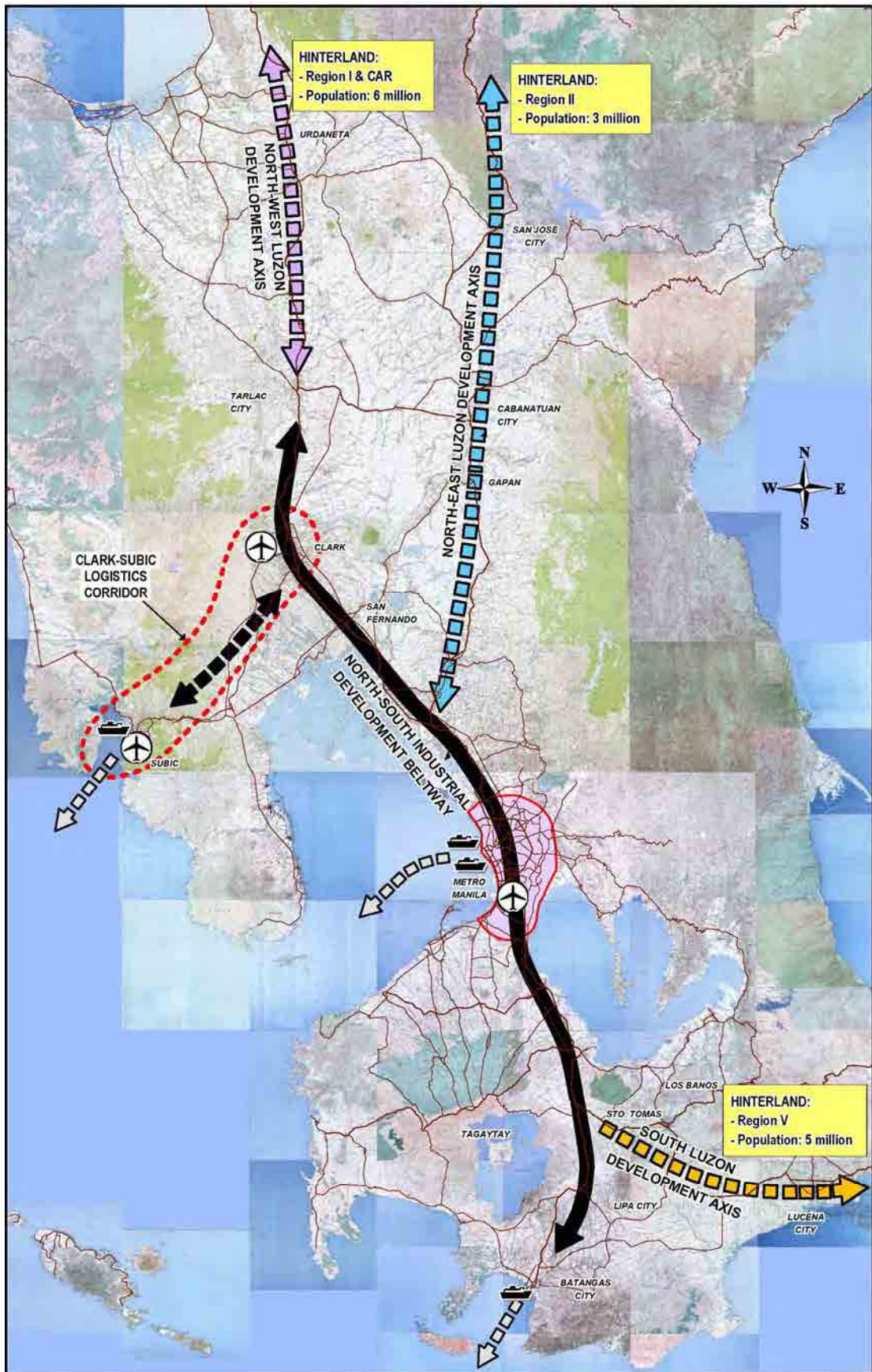
Source: HSH Development Master Plan, JICA, 2010

FIGURE 3.2-1 URBAN DEVELOPMENT STRUCTURE



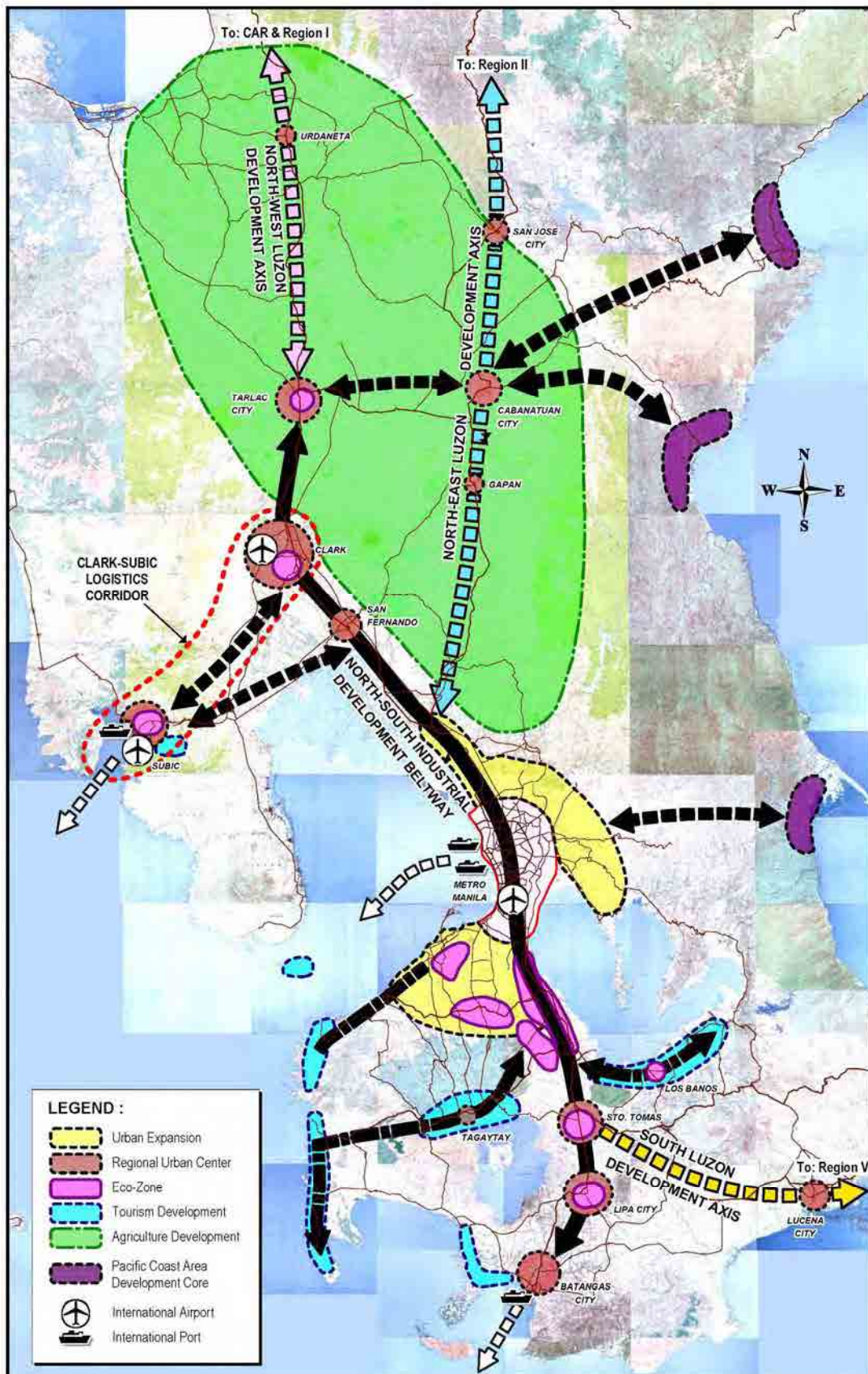
Source: HSH Development Master Plan, JICA, 2010

FIGURE 3.2-2 AGRICULTURE AND TOURISM DEVELOPMENT AND PACIFIC COAST DEVELOPMENT



Source: HSH Development Master Plan, JICA, 2010

FIGURE 3.2-3 DEVELOPMENT AXES



Source: HSH Development Master Plan, JICA, 2010

FIGURE 3.2-4 DEVELOPMENT STRATEGY : 200KM RADIUS SPHERE OF METRO MANILA

3.3 MANUFACTURING COMPANIES IN THE PROJECT INFLUENCE AREA

3.3.1 Japanese firms in the Philippines and the Project Area

According to the statistics of the Embassy of Japan (EOJ), as of October 2010, there are 1,075 Japanese firms in the Philippines. Table 3.3.1-1 shows distribution of Japanese firms by area. A total of 902 Japanese firms or (83.9%) are situated in the project influence area.

Table 3.3.1-1 DISTRIBUTION OF JAPANESE FIRMS BY AREA

Area		No. of Japanese Firms	% Share
Project Influence Area	Metro Manila	531	49.4%
	Laguna Province	187	17.4%
	Cavite Province	140	13.0%
	Batangas Province	44	4.1%
	Sub-total	902	83.9%
Other Areas of Luzon		34	3.2%
Visayas		127	11.8%
Mindanao		12	1.1%
Total		1,075	100.0%

Source: Embassy of Japan

3.3.2 Economic Zones in the Project Area

By taking advantage of the proximity to Metro Manila, many economic zones/industrial estates have been developed in Cavite and Laguna Provinces as shown in **Figure 3.3.2-1**. Many manufacturing companies are in operation in those economic zones/industrial estates, contributing to development of manufacturing industry, economic development and employment. Number of Japanese manufacturing companies in major economic zones/industrial estates is shown in **Table 3.3.2-1**.

TABLE 3.3.2-1 NUMBER OF JAPANESE MANUFACTURING COMPANIES BY ECONOMIC ZONE/INDUSTRIAL ESTATE

Name of Economic Zone/Industrial Estate	Number in Figure 3.3.2-1	No. of Japanese Manufacturing Company
Laguna Technopark	(16)	86
Cavite Economic Zone	(1)	68
First Cavite Industrial Estate	(6)	37
Carmelray Industrial Park I	(19)	17
Light Industry & Science Park II	(22)	15
Light Industry & Science Park I	(18)	13
Carmelray Industrial Park II	(21)	8
Gateway Business Park	(4)	6
First Philippine Industrial Park	(24)	1 (Note-1)
Toyota Special Economic Zone	(17)	3(Note-1)

Note-1: Survey for JICA-assisted HSH Master Plan Study, 2010

Source: Embassy of Japan, 2010

Transport access to these economic zones/industrial estates are basically made by Aguinaldo Highway, Governor's Drive, and two expressways of SLEX and CAVITEX. Since the two national roads of Aguinaldo Highway and Governor's Drive are already heavily congested, the economic zone/industrial estate locators are hoping that CALAX will be built as early as possible.

Many Japanese manufacturing companies want to utilize Batangas Port instead of Manila Port, since access roads to Manila Port is heavily traffic-congested. CALAX will improve the accessibility to Batangas Port, this many Japanese manufacturing companies are expecting early completion of CALAX.

Figure 3.3.2-2 shows the information of economic zones/industrial estates, such as area, number of locators, number of Japanese company and share of product using port..

3.3.3 Types of Factories Located in Economic Zones

JICA-assisted High Standard Highway (HSH) Master Plan study conducted the interview survey to the economic zones/industrial estates in 2009. The types of factories located in the selected economic zones are shown in **Table 3.3.3-1**.

- Many electrical and electronics related factories are in operation.
- There are also many factories manufacturing automobiles and spare parts.
- Many economic zones employ over 10,000 people.

TABLE 3.3.3-1 TYPE OF FACTORIES LOCATED IN SELECTED ECONOMIC ZONES

Name of Eco-zone	No. in Map	Location and Area (ha.)	No. of Locator (No. of Employees)	Type of Factory						
				Electrical, Electronics	Automobiles, parts	Process, Food, Beverages	Textile	Iron, Steel	Non Metallic Mineral	Others
Cavite Economic Zone	①	Rosario, Cavite (278 ha.)	257 (N.A.)	88	9	-	31	43	25	61
Gateway Business Park	④	General Trias, Cavite (90 ha.)	22 (13,661)	14	-	1	-	2	-	5
First Cavite Industrial Estate	⑥	Dasmariñas, Cavite (119 ha.)	97 (16,419)	24	8	4	13	-	12	36
Toyota Special Economic Zone	⑰	Sta. Rosa, Laguna (120 ha.)	5 (3,258)	-	5	-	-	-	-	-
First Philippine Industrial Park	⑳	Sto. Tomas, Batangas (315 ha.)	49 (14,254)	15	7	-	-	2	-	25

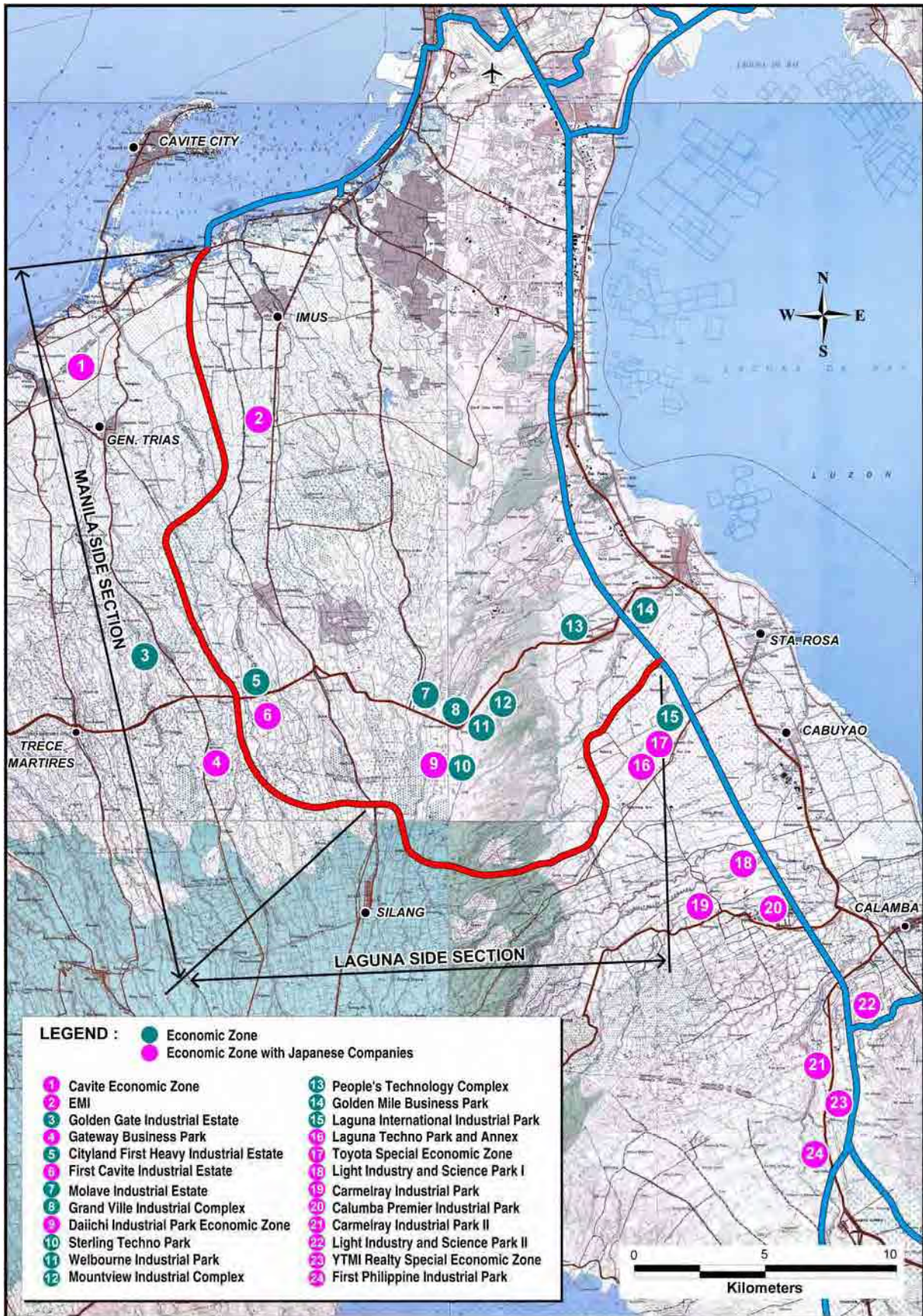


FIGURE 3.3.2-1 DISTRIBUTION OF ECONOMIC ZONES ALONG CALA EXPRESSWAY

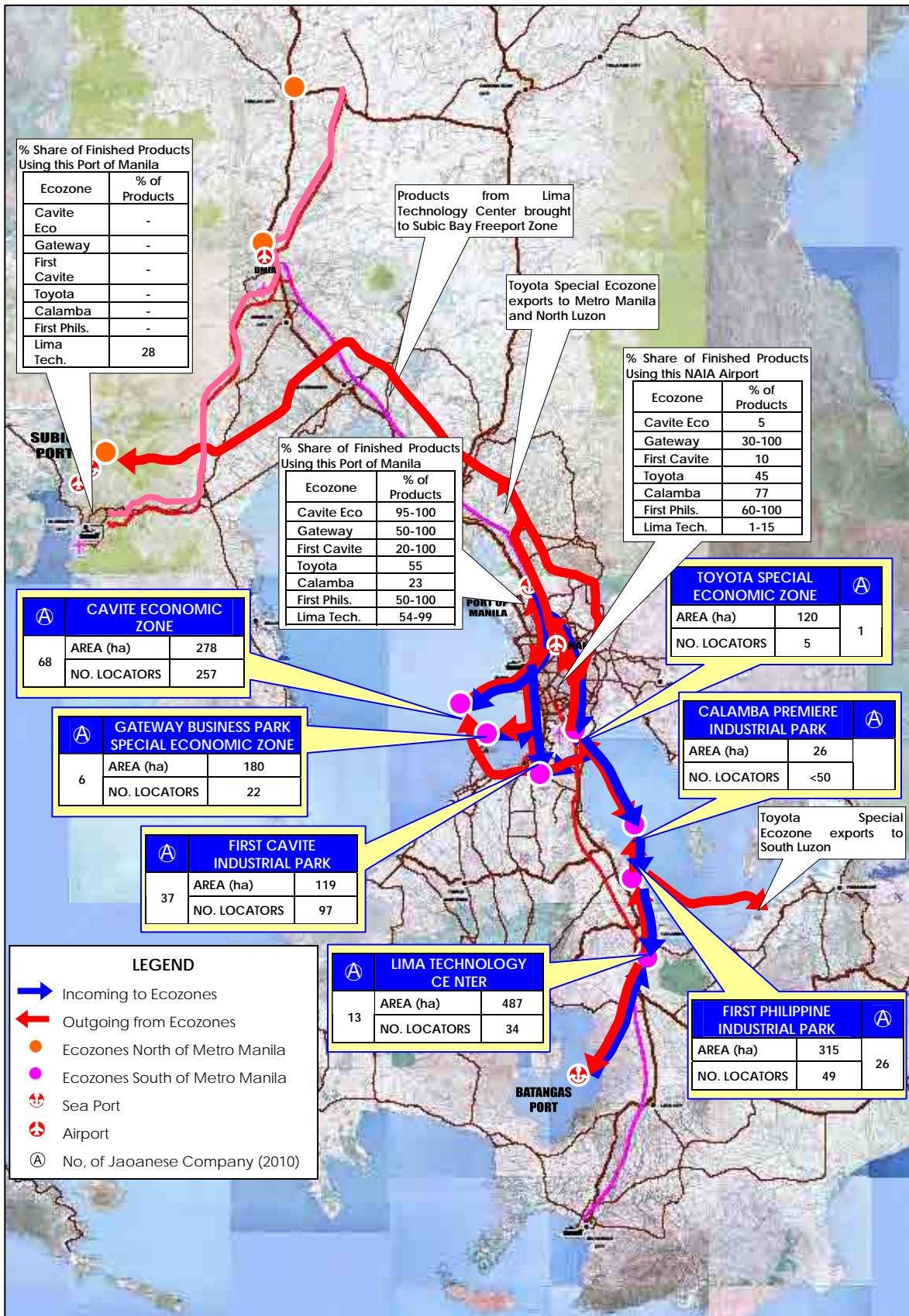


FIGURE 3.3.2-2 ECONOMIC ZONES INTERVIEWED SOUTH OF METRO MANILA