SUMMARY

1   INTRODUCTION

1.1   Background

The increasingly deteriorating traffic conditions of the CALA area is being addressed by the Government of the Philippines in coordination with international donor agencies such a JICA and the World Bank. In particular, since the identification of these concrete problems by the JICA-assisted MMUTIS study in 1999, preparation for project implementation has been favorably taking place with the conduct of the World Bank transport strategy study (1999) and the Feasibility Study on the Proposed Cavite Busway System by JICA (2002).

Unfortunately, the delay of the LRT Line 1 extension, which was regarded as a prerequisite of the Cavite Busway, as well as the serious financial deficits of the national government, has necessitated the deferment, if not the total discontinuance, of the initiated project preparation to get the relevant projects into operation. However, in response to the growing concern on continuing deterioration of traffic conditions that affects the regional economy, a "Review of the Cavite Busway Road Project" has been implemented by the JICA Philippines Office. This review investigated the possibility of modifying the function of the proposed Cavite Busway System into an alternative trunk road to serve the north-south movement in Cavite, thus improving the general road traffic conditions in the area, while waiting for the realization of the LRT Line 1 extension project.

This Study is based on the past study outcomes and related agencies' efforts for project realization. Formulation of concrete measures such as reaffirmation of investment scale according to current financial capability of the Philippines or a re-examination of optimum network under a limited national budget cover were considered. In addition, this Study also addressed the issue of consensus building not only among national and local government-related agencies but also among international agencies including donors.

1.2   Study Objectives

The study objective is not only to conduct a feasibility study of the road, but also to conduct a review of the regional development concept and the transport masterplan. In particular, this Study aims to alleviate the traffic congestion in the CALA area; to improve the living environment of local residents; to promote dispersion of urban function of Metro Manila; as well as to further encourage the improvement of investment environment in the area given its strategic location vis-à-vis the international port in Batangas City. Based on these priority aims, the Study will be implemented with the following objectives:

i)   Review of CALA regional traffic network development scenario;

ii)   Examination of the feasibility of CALA East-West road and related projects and preparation of project implementation plan; and

iii)   Capacity development for staff of counterpart agency and other related

agencies.

1.3 Study Area

The proposed CALA East-West road is expected to have a direct impact on Cavite Province and part of Laguna Province and Metro Manila. The coverage of the study area is shown in Figure 1.3.1.
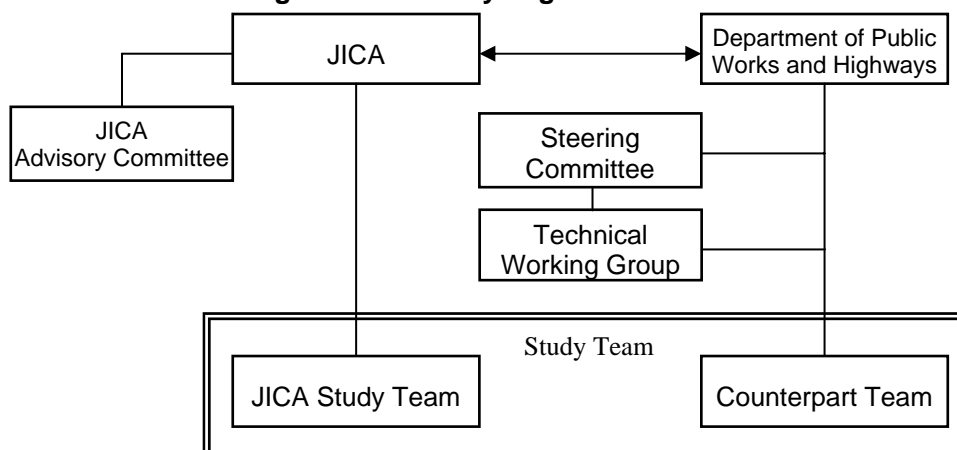
Figure 1.3.1 Study Coverage Area
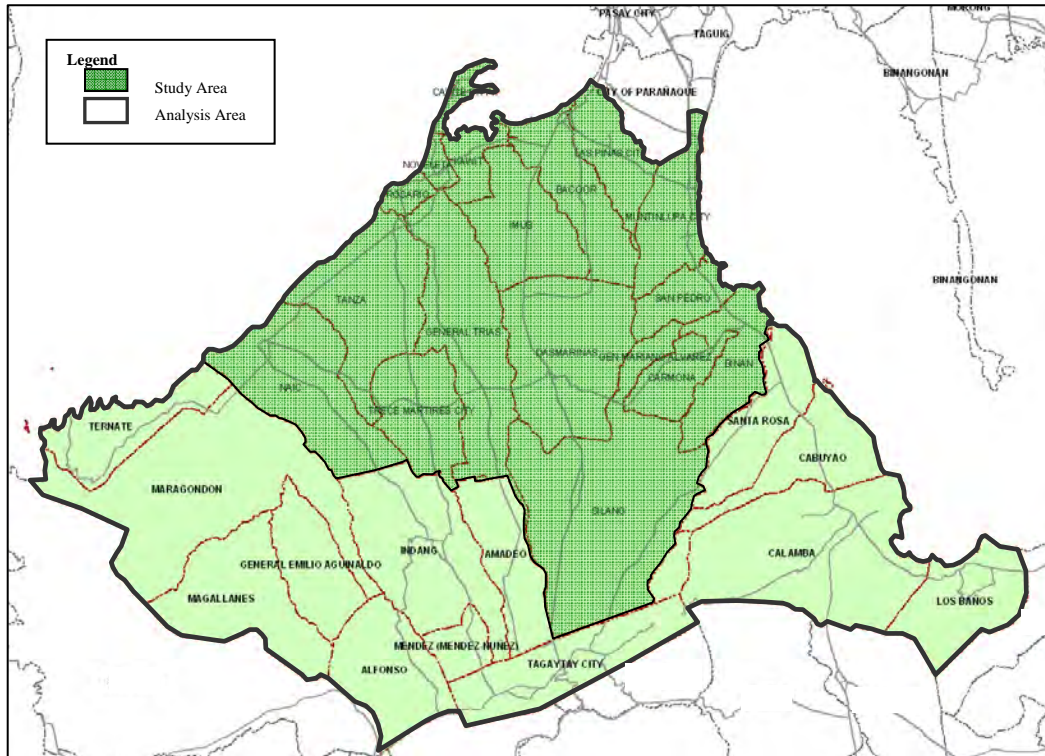
Source: JICA Study Team

1.4 Composition of the Study Organization

The study organization is composed of the JICA Advisory Committee and the JICA Study Team on Japan side and the Steering Committee, the Working Group, and the Counterpart Team on the Philippines side, as shown in Figure 1.4.1.

Figure 1.4.1 Study Organization

2 EXISTING CONDITIONS OF THE STUDY AREA

2.1 Socio-economic Profile

Population

The CALA area has experienced a sharp increase in its population with annual average growth rate of 6.46% for Cavite and 3.32% for Laguna during the period 1990 to 1995, and continued with the same strength from 1995 to 2000 with 5.45% for Cavite and 4.08% for Laguna.

The rapid increase of population in CALA between 1980 and 2000 can be largely attributed to the following: its proximity to Metro Manila as well as the latter's squatter relocation program; development of affordable middle-income housing; Metro-Manila's 50-kilometer radius ban policy on industries, discouraging further industrial activity within Metro Manila and promoting the industrial dispersal strategy; intensive middle-income residential development; and rapid industrialization brought about by the promotion of the CALABARZON growth area.

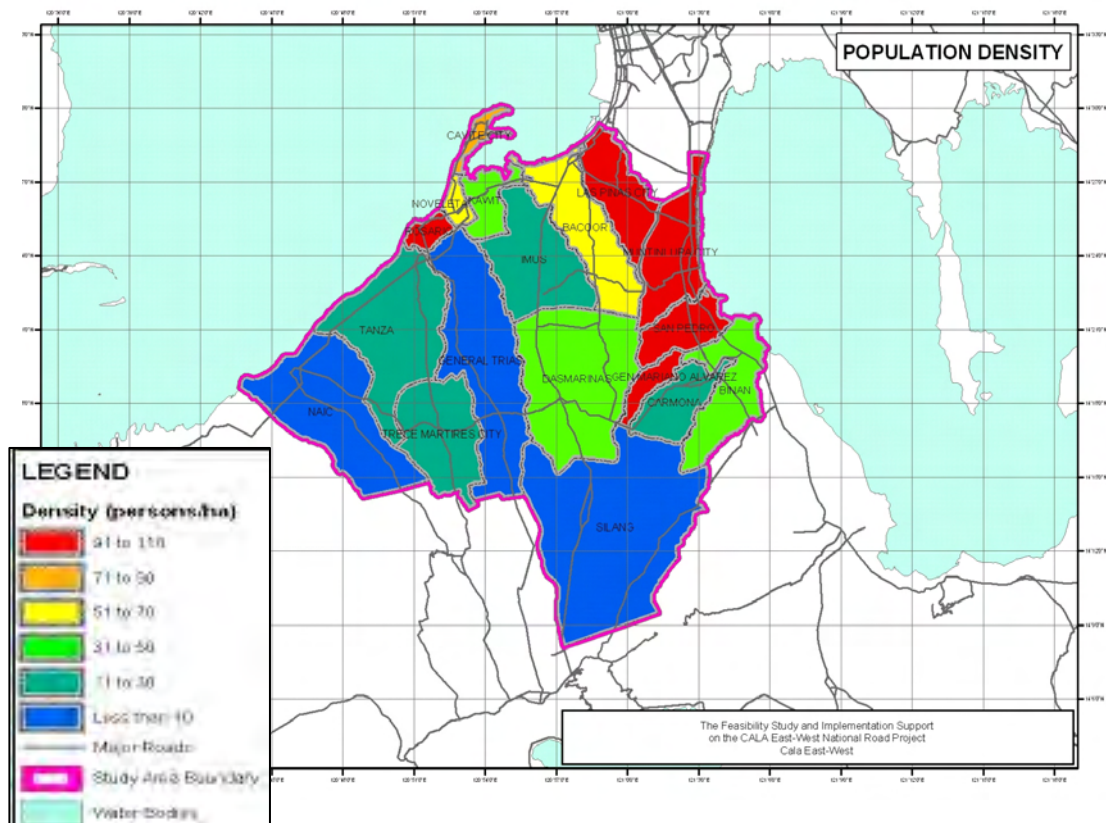**Figure 2.1.1   Population Concentration in the Study Area**

**Table 2.1.1   CALA in the National, Regional and Sub-Regional Context**

	Land Area (sq. km.)	Population			Average Annual Growth Rates (%)		Population Density (persons/ha)		
		1990	1995	2000	1990-1995	1990-2000	1990	1995	2000
PHILIPPINES	300,000	60,703,206	68,614,162	76,498,735	2.48	2.60	2.0	2.3	2.5
METRO MANILA	636	7,948,392	9,454,040	9,932,560	3.53	2.49	125.0	148.7	156.2
REGION IV	46,924	8,263,099	9,943,096	11,793,655	3.77	4.27	1.8	2.1	2.5
% to Philippines	16	14	14	15					
CALA	**3,186.6**	**2,522,766**	**3,241,406**	**4,029,033**	**5.14**	**5.97**	**7.9**	**10.2**	**12.6**
% to Region IV	7	31	33	40					

Sources: 2000 Census Population of NSO, and Calculations from PPFP and Phil Statistical Yearbook 2003

Manufacturing in CALA

The CALA area has introduced a number of industrial estates. Expectedly, employment is concentrated in municipalities that host major industrial estates.

Figure 2.1.2   Location of Industrial Estates in the Study Area, 2005
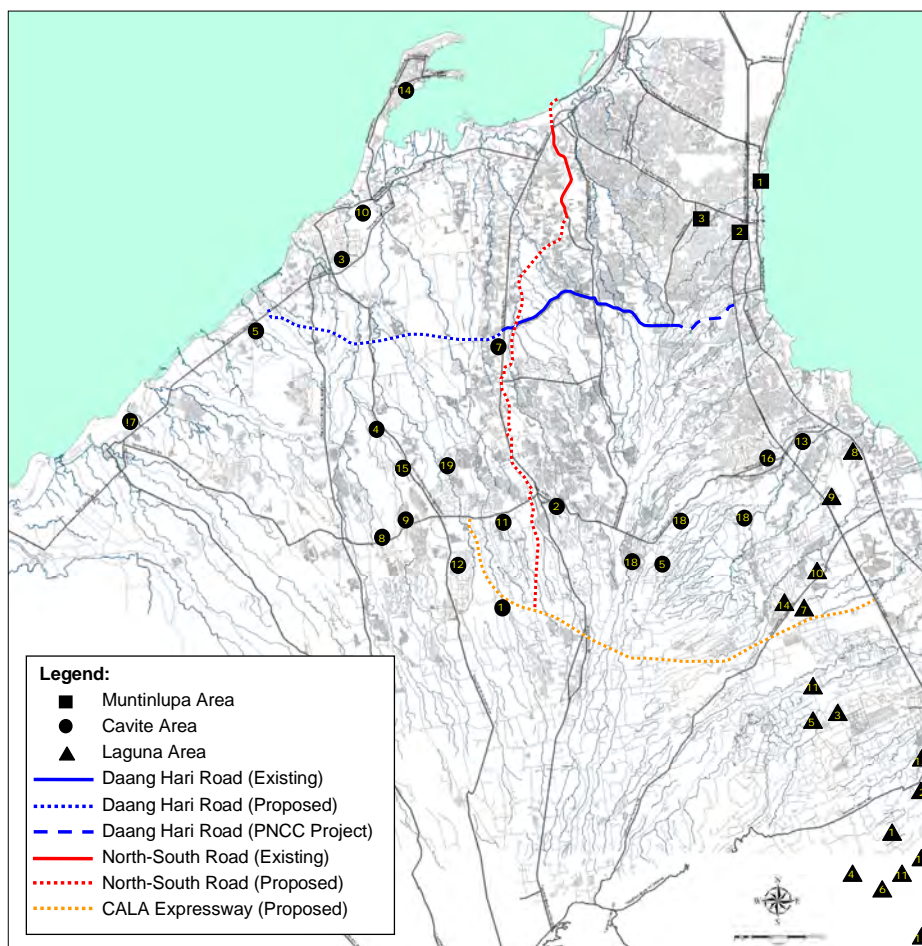
Source: Philippine Economic Zone Authority (PEZA) www.peza.gov.ph and Study Team.

Family Income and Poverty

The ratio of poor families in the study area is low if compared with that of the Philippines which is 34.2% according to the National Statistical Coordination Board. It is probably because of the high income level of the study area. But there is no clear relationship between the income level and the poverty ratio among municipalities of the study area.

Table 2.1.2 Income Distribution in 2000 (%)

Income Class	Philippines	NCR	Cavite	Laguna
Under 10,000	0.002	-	-	-
10,000- 19,999	2.15	0.05	0.57	0.78
20,000- 29,999	5.48	0.10	0.12	0.50
30,000- 39,999	7.67	0.27	0.92	0.56
40,000- 49,999	9.09	0.64	2.88	4.91
50,000- 59,999	7.83	1.11	1.29	3.86
60,000- 79,999	12.99	4.27	11.17	12.00
80,000- 99,999	9.80	7.79	9.45	11.72
100,000-149,999	15.92	20.32	27.87	20.65
150,000-249,999	15.60	29.48	28.27	26.66
250,000-499,999	10.01	24.38	13.63	14.92
500,000 & over	3.22	11.59	3.73	3.43

Source: 2004 Philippine Statistical Yearbook

Table 2.1.3 Estimated Ratio of Poor Families by Municipalities (2000)

	Ratio of Poor Families (%)
Las Pinas	1.0
Muntinlupa	7.6
Bacoor	3.8
Dasmarinas	13.4
Imus	8.5
Binan	5.5
Calamba	7.2
San Pedro	9.5
San Pablo City	2.0

Note: The ratio is estimated on the assumption that income level of poor family is under ₱15,000 due to the limitation of data source. There is a possibility that most of estimated results are slightly below the accurate ratio.

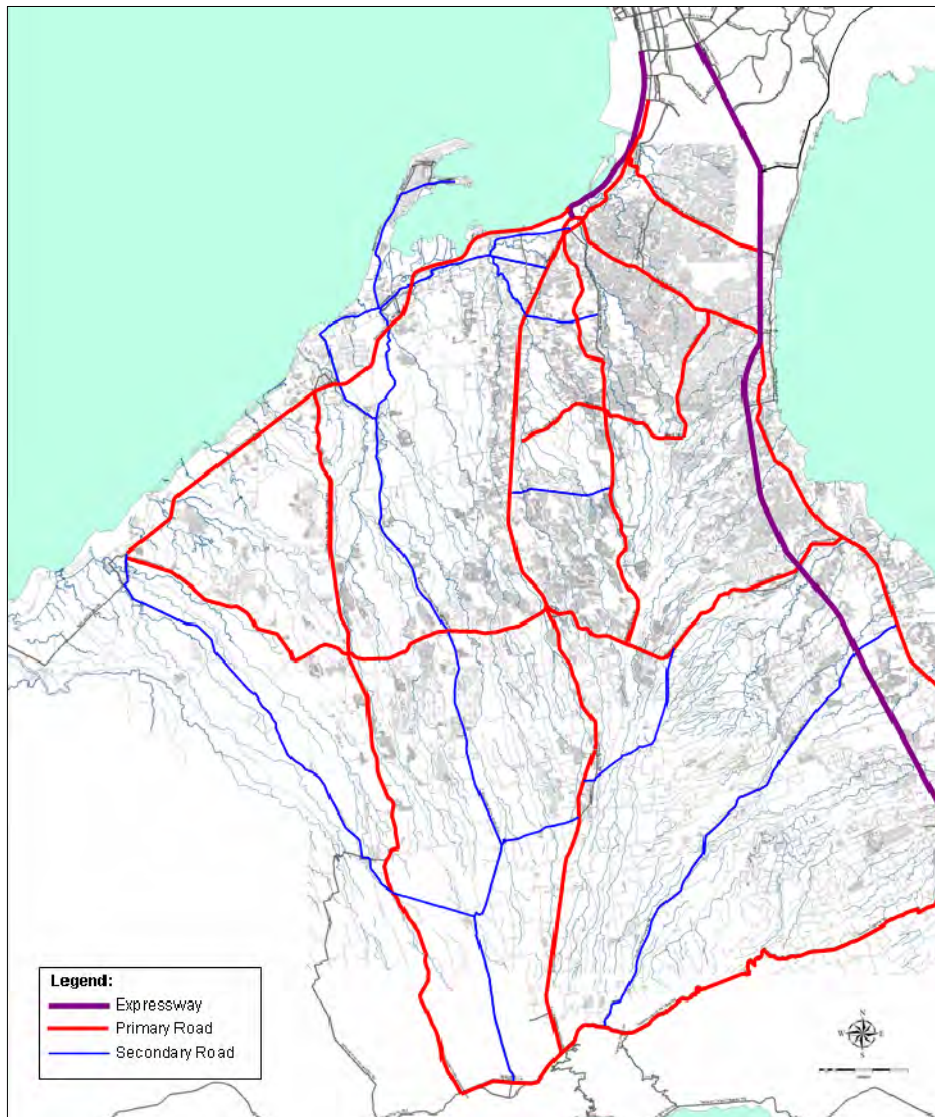## 2.2   Transport Situation

Transport Network

The transport network of the CALA area is predominantly of the roadways and highways and to a limited degree, of the rail and port/ferry. Present rail facilities are limited to the PNR service area (south line) running along the western and southern portions of the Laguna lakeshore. A railway line used to service the Cavite coastal areas but that has long been abandoned. The road network of the CALA area is composed primarily of paved two-lane roads, with the main corridors forming the basic road network structure (see Figure 2.2.1).This road network structure, however, is heavily oriented towards Metro Manila, particularly for the immediately adjoining areas. These corridors also link to other areas south of the CALA area, but are still structured in such a way as to link these outer areas with Metro Manila, through the CALA sub-region. The only major road corridor serving local road trips is Governor's Drive, an east-west concrete-paved road cutting across the mid-section of Cavite province, and linking them with the Manila South Road along the western shore of Laguna de Bay.

Figure 2.2.1   Road Network of the Study Area, 2005

Source: DPWH

Road Traffic

Traffic surveys were conducted in some locations to determine traffic volumes at certain time periods. Results of the traffic survey indicated that traffic volume has been continuously increasing every year at all locations, with varying growth ratios by location. At the northern boundary of the study area, while the increase in ratio of traffic volume is not so high, the congestion however becomes so serious because the volume is approaching the limit of road capacity during peak hours (Figure 2.2.2).

Figure 2.2.2   Result of Travel Speed Survey, 2005
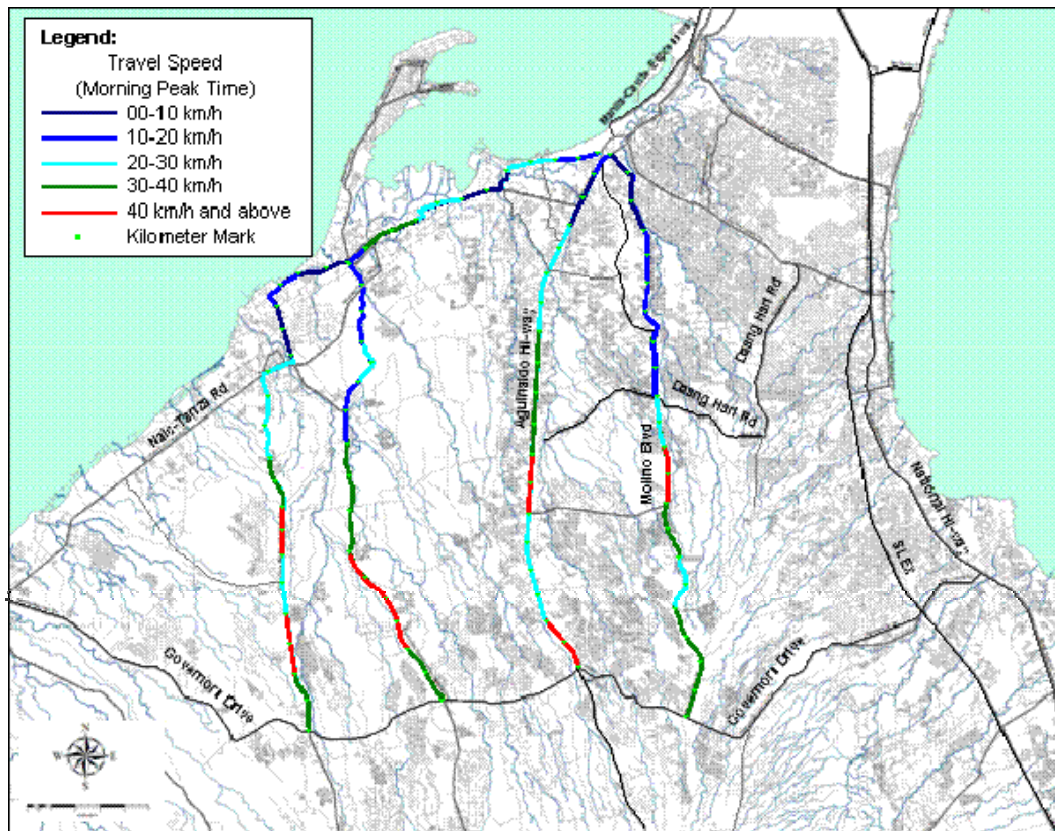
Source: JICA Study Team

Public Transport

In spite of the rapid growth of private vehicle use in the CALA subregion, public transport still has a predominant modal share, accounting for more than 70% of total motorized trips. The current public transport services in the region are mainly provided by road-based transport modes, and based on the results of the resident interview survey (RIS) conducted during February-March 2005, the main public transport modes in the CALA region are jeepney, tricycle and bus.

Bus service is provided on most of the arterial and secondary roads and jeepney services are provided in almost the same roads as the bus services. The only difference is the higher service frequency of the former, particularly on the arterials such as Aguinaldo Highway, Coastal Road and Governor's Drive. On the other hand, taxi including High Occupancy Vehicle (HOV) is not commonly used in CALA area except for the adjacent area of Metro Manila, from where particularly considerable number of Tamaraw FX (shuttle van services) is operated to central Manila for commuting services.

Figure 2.2.3 Public Transport Coverage in CALA Region
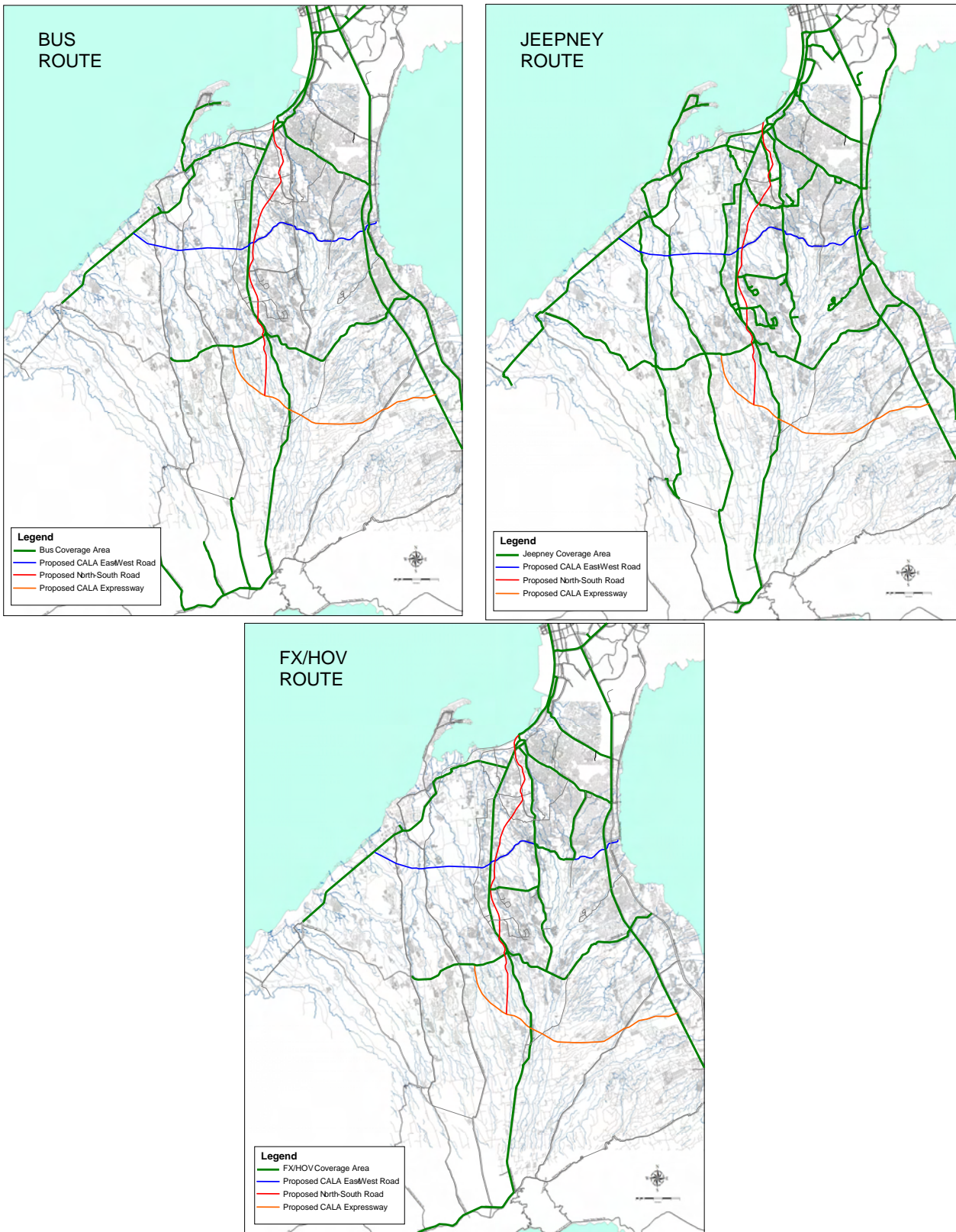
2.3   Land Use

Figure 2.3.1 shows the existing land use of the CALA subregion, land use characteristics of which are as follows:

(a) High density generally low to middle income residential areas are concentrated along major highways (behind strip commercial development) and in portions closest to/most accessible to and from Metro Manila. Informal housing has continued to intensify, particularly in the old urban cores along PNR and river rights-of-way.

(b) Strip commercial development occurs along major highways near town centers or *poblacions*. Major shopping centers have emerged along Aguinaldo Highway in Cavite as well as along or near the National Road in Laguna where population concentration is large.

(c) Industrial areas are found in the Rosario-Imus Industrial Area, Dasmariñas-Carmona Industrial Area along Governor's Drive in the south and Biñan-Calamba Industrial Area along the South Luzon Expressway and the National Road. This forms the industrial corridor from west Laguna to Central Cavite and down to Metro Batangas.

(d) Eco-tourism infrastructures such as resort subdivisions and leisure parks are found in Naic-Ternate, upland areas from Silang, Amadeo, Indang, Gen. Aguinaldo leading to Tagaytay and the Mt. Palay-palay and Mataas na Gulod National Park, including the plateau leading to Mt. Makiling, Mt. Banahaw-Cristobal and the other mountains, and the Seven Lakes of San Pablo City and resorts in Alaminos.

(e) At least eight world class golf courses are found in Cavite, particularly in the southern areas, and one in Laguna.

(f) Primary agricultural lands are abundant and marginal agricultural areas can still be found in some areas. More than half of the agricultural lands in Laguna are planted to permanent crops, about a third to temporary crops, and the rest are either pasture lands or meadows or merely lying idle.

(g) Fishponds are predominantly found along the coastal areas of Cavite and in the lakeshores of Laguna.

(h) Secondary and primary forests in the hills and mountains of Cavite and Laguna (specifically the municipalities of Maragondon, Magallanes and Ternate in Cavite and the mountainous areas of Laguna starting from parts of Calamba up till Los Baños in the study area) are environmentally critical areas.

Figure 2.3.2 Existing Land Use, 2005
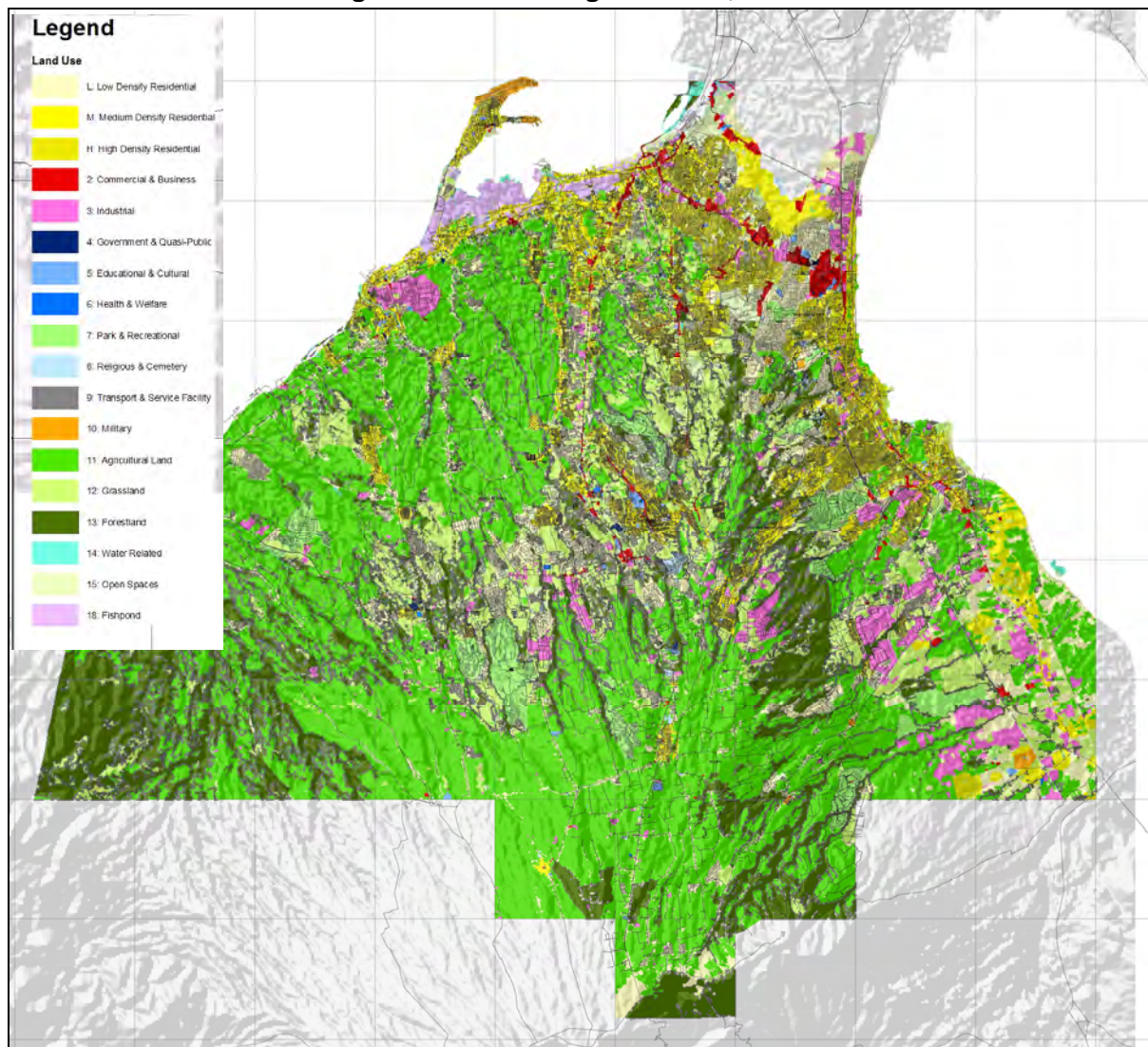
Source: NAMRIA, 2005

2.4   Existing Plans and Projects

The existing plan of the government that has direct implication to this study in light of its objectives is the DPWH Medium Term Public Investment Program Region IV (2005-2010). The program covers mainly improvements and widening of existing National roads and bridges under the jurisdiction of DPWH. Highway projects proposed for foreign financing includes the CALA East-West Road in the amount of ₱ 1.574 Billion and the CALA North-South Road with ₱ 4.079 Billion, both starting in year 2008.

Other highway projects under DPWH implementation not included in the MTDP but funded from CDF are the ongoing construction of Molino Blvd. and the Daang Hari Road extensions to Aguinaldo Highway and to San Pedro along the SLEX.

3   ALTERNATIVE DEVELOPMENT SCENARIOS OF THE STUDY AREA

3.1   Alternative Development Scenarios

Based on past trend and current situation of CALA regional growth, we can surmise that, in general, industrialization and urbanization has propelled the rapid regional growth of CALA.

The Provincial Physical Framework Plan of Cavite (Planning Period: 2005-2010) proposes the three alternative spatial strategies, as follows: 1) Multi Center Development; 2) Rural Industrialization and 3) Primary Industrial and Urban Growth. The Provincial Framework Plan of Laguna (Planning Period: 1993-2002, not updated yet as of May 2005) does not include spatial development strategy. However, it points out that manufacturing and trading were two major growth factors for the provincial economy, and the growth of the two aforementioned sub-sectors in association with construction, real estate and finance, will continue to lead the provincial economy.

In consideration of this present development scenario and the respective provinces' framework plans, the Study has developed the future socio-economic framework within the following three development scenarios, as follows:

Scenario 1: Trend (Metro Manila Dependency Development)

This scenario adopts the "let it go" policy. The current development trend will continue and the NCR conurbation area (the north of the study area), shall lead regional growth and development activities will tend to take place in existing urban centers such as Bacoor, Imus, San Pedro, Biñan, and Santa Rosa, among others. The less-developed southern area will remain as it is. The intra-regional disparity will increase.

Scenario 2: Urban Core Development

Based on the urban center network proposed in the WB CALA study, this Study placed more emphasis on urban center network hierarchy, which is expected to create a new regional structure for CALA. The highest hierarchy cores are Dasmariñas and Calamba, referred to in the WB study as Secondary Metro. In addition to the two growth poles, 8 primary urban centers, 17 primary urban centers B, 1 secondary urban center A, and 25 secondary urban centers B are proposed to grow in Cavite and Laguna. In view of balanced urban core development, it is assumed that the same class of urban hierarchy municipalities will grow to be the same size in terms of population. Various urban functions and services are expected to accommodate population as well as to create job opportunities. The new network and hierarchy of urban center shall emerge in the future.

Scenario 3: Industrialization-Driven Development

The role of the industry sector in CALA is to be the growth engine of the region.

Specifically, the manufacturing sub-sector continues to be the most dynamic part of its economy. It will increase job opportunities not only in terms of direct employments but also in various indirect employments. It will strengthen the sustainable growth mechanism of CALA. In view of CALA's sound and regionally-balanced development, such industrialization should be located in the middle belt area and the southern area. It is therefore important that the less-developed mid- to southern areas will get on track of steady development.

Figure 3.1.1 Outline of Development Scenarios
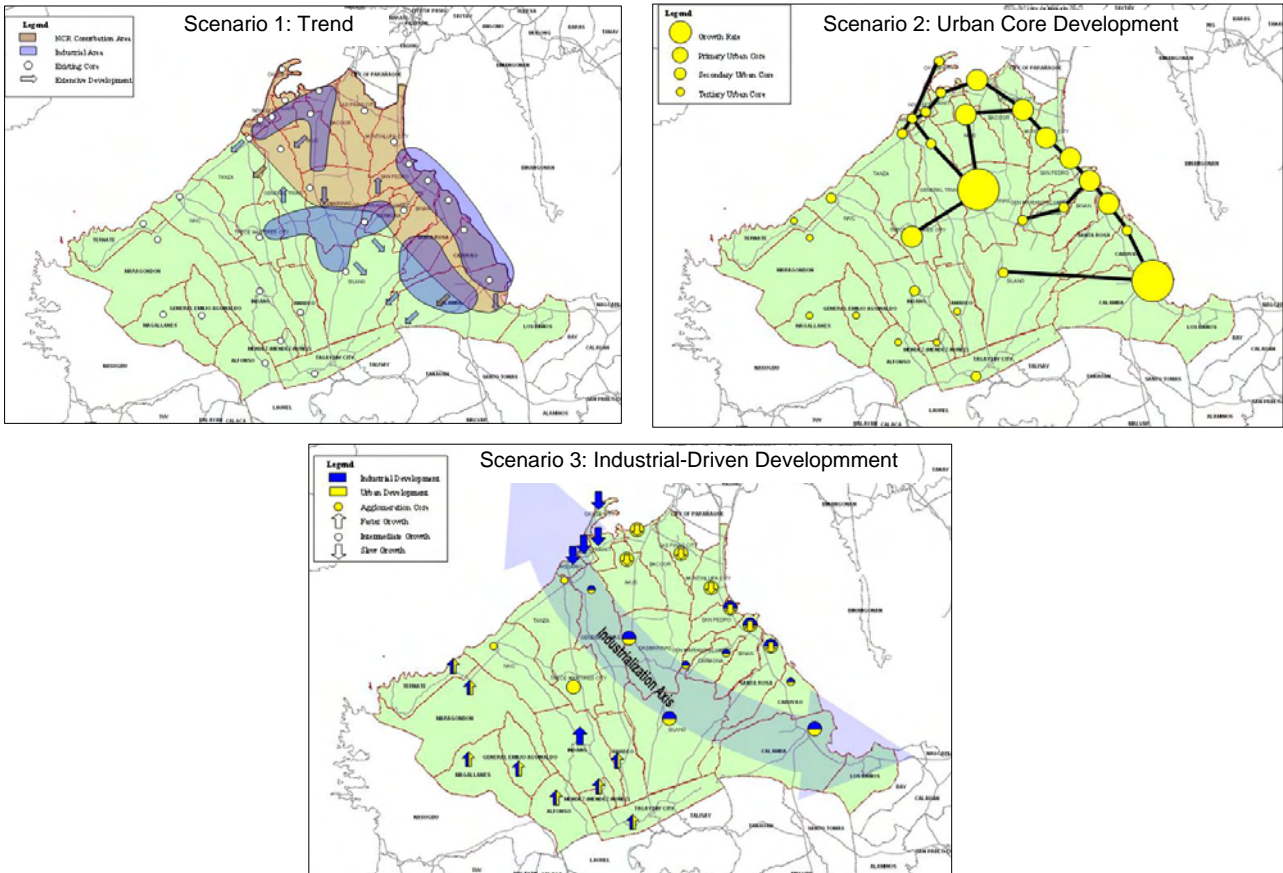
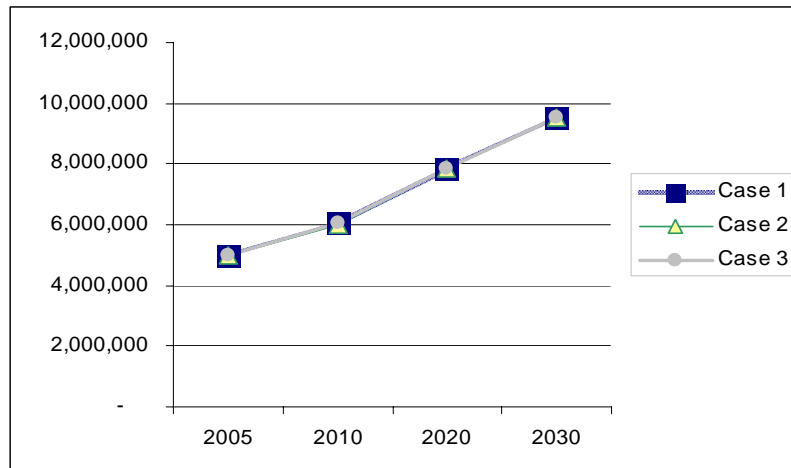

Figure 3.1.2 Case Comparison In terms of Population

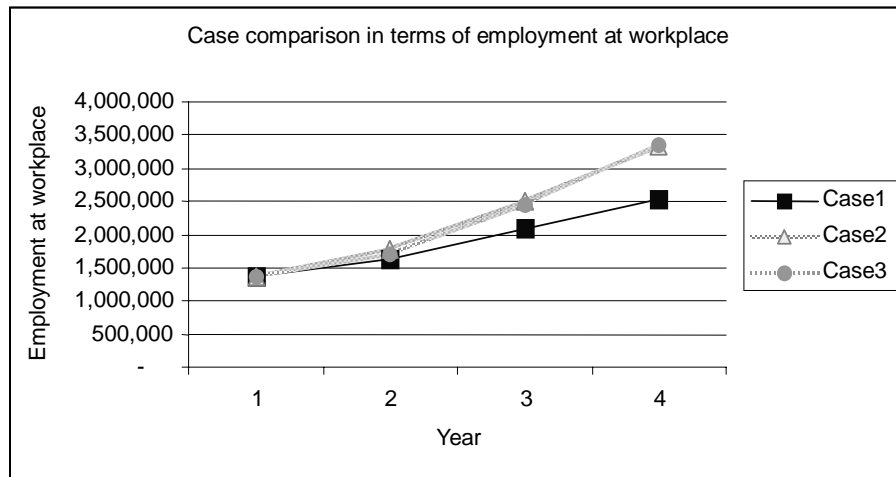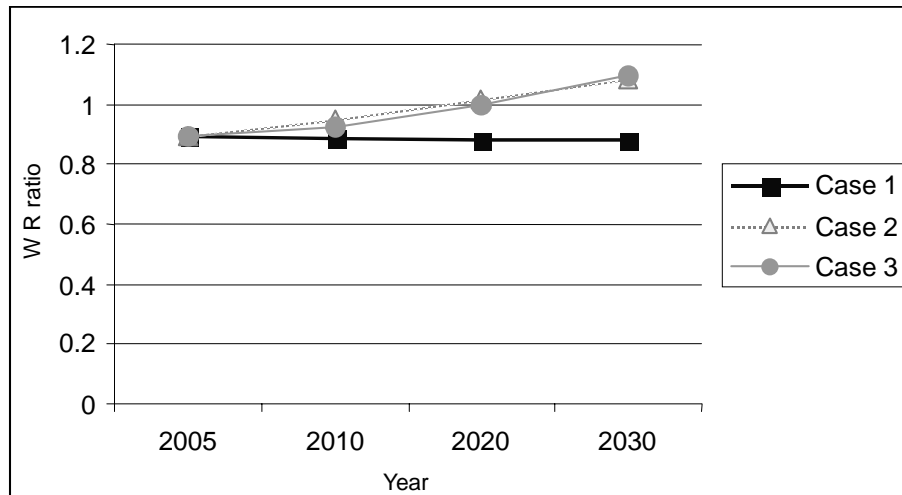**Figure 3.1.3 Case Comparison in Terms of Employment at Workplace**

Figure 3.1.4 Case Comparison in Terms of W/R Ratio
(Employment at Workplace/Employment at Residence)

Case Comparison in terms W/R Ratio

	2005	2010	2020	2030
Case 1	0.893	0.888	0.884	0.882
Case 2	0.893	0.951	1.015	1.082
Case 3	0.893	0.925	1.001	1.095

3.2   Integration and Harmonization of the Three Scenarios

Advantages and Disadvantages of the Three Scenarios

Advantages and Disadvantages of Scenario 1

The advantage of Scenario 1 is that this scenario is the most likely to occur in the short-term (at least in the next five years). However, since the situation is continuously changing, the trend case will not always be the most possible case in the long-term (20 or 30 years from now). Thus, taking into consideration the recent tendencies, the development pattern of Scenario 1 is very much northern area-biased and is strongly reflected by "Dependency on Metro Manila". The future pattern of industrialization and urbanization is likely to change the regional development pattern of CALA from northern-area-bias to more-regionally balanced

structure.

Advantages and Disadvantages of Scenario 2

Scenario 2 is based on the urban center network plan proposed in the WB CALA study report. It is hypothetically conceived so that the hierarchy of urban center network may be realized in the future. Because of its characterization in comparison with the other scenarios, Scenario 2 is considered an extreme case. It does not give due consideration on the industrialization factor which is at present evidently taking place and thus strongly influencing regional development of CALA. In addition, in this scenario, the W/R ratio is forecasted to exceed 1 and reach 1.082 in 2030, a rather very optimistic forecast in terms of realizing regional independency.

Advantages and Disadvantages of Scenario 3

Scenario 3 is also a hypothetical case. It is a scenario in which the industrialization factor is to work very strongly. Since industrialization tends to take place in the middle to southern areas, which still has ample vacant land and not as congested as compared with the northern area, it is expected to result to a "regionally-balanced development." However, Scenario 3 has an extreme tendency to suppress the further growth of existing urban centers and has very optimistic forecast of rapid growth of the less-developed southern area.

Figure 3.2.1 Traffic Demand Forecast at the Junction Part of Metro Manila and CALA

	Screen Line Location	Traffic Volume crossing the Screen Line (000PCU/day)
Scenario I		1,084
Scenario II		786
Scenario III		778

However, with the availability of green and good arable land in the southern area, environmental consideration requires that rapid development in southern area should be carefully planned. In addition, this scenario indicates the W/R ratio to exceed 1 and reach 1.095 in 2030. Again, such forecast of regional independency is very optimistic.

Regional Development Vision

The foreseen regional development vision is the interplay of various growth components which are basically found in the first three scenarios discussed. Several sectors are regarded to contribute in the symphonic development of the area rather than just one or two particular sectors leading growth in the study area. Thus, elements of scenarios 1 to 3 are combined to formulate this future vision of regional growth of the CALA Region.

In addition, it is important to consider the spatial development policies and strategies of the provincial governments concerned on the foreseen regional development vision. In the case of Cavite, for example, the Provincial Government advocates for development strategies which addresses the improvement of intra-regional disparities within Cavite Province, and endeavors to promote growth of less-developed area rather than already-developed area.

In view of reflecting these spatial development policies and strategies onto the regional development vision as well as integrating the three scenarios, the future regional development of the CALA Region in terms of spatial development is envisioned as shown below:

Figure 3.2.2   Holistic Development (Scenario 4)
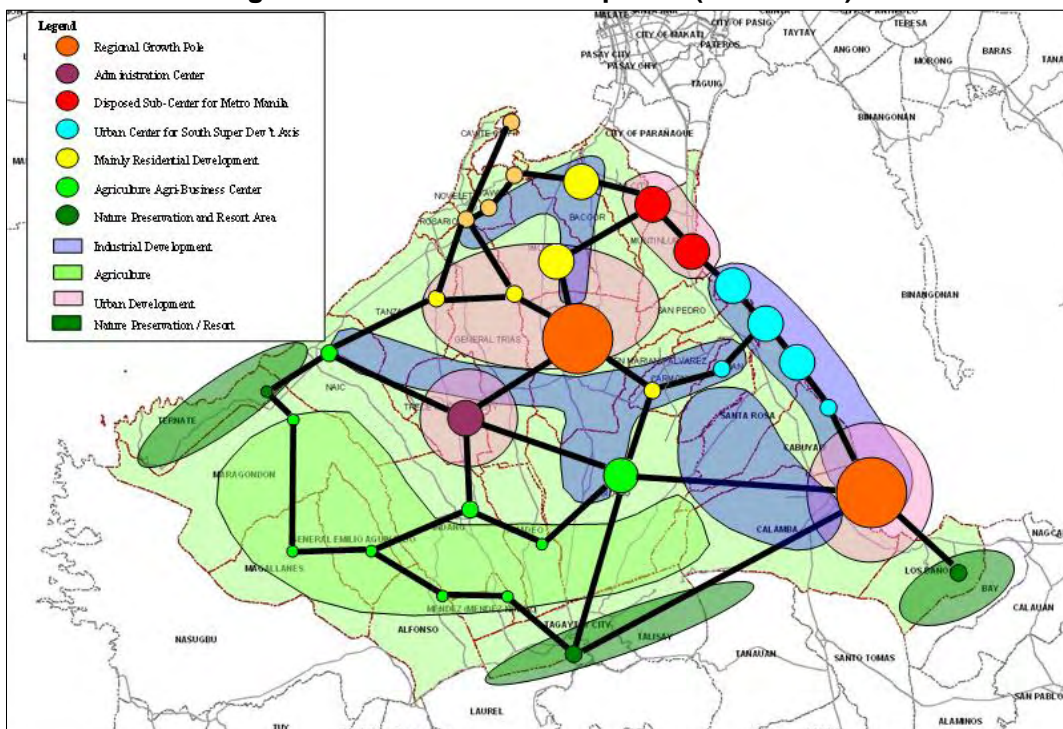
3.3 Alternatives for Regional Transport Network

The alternative network scenarios have been prepared based on the physical and socioeconomic conditions so as to quantitatively analyze the advantages and disadvantages of each alternative scenario.

Existing Network Zero-option (Alternative 0)

Zero-option is Do-nothing Case. There is no improvement from current road network except for ongoing projects.

Arterial Grid-Pattern Economic Road Structures and Balanced Development (Alternative 1)

Based on MMUTIS and WB CALA Study, grid-pattern road network system is provided, which will be consisted of arterial roads with 4 to 6 lanes. Due to the low class of design standards (compared with expressway), the construction cost will be lower and the alignment will be more flexible to minimize the impacts to the existing built-up areas.

### Metro Manila – Laguna Transport Corridor Enhancement (Two North-South Axis) (Alternative 2)

Alleviation of traffic congestion on North-South Corridor and enhancement of the network in the corridor by providing a new north–south axis (high-standard highway including expressway) parallel to the South Luzon Expressway, forming the ladder pattern in the corridor.

East-West and North-South Axis Scenario (Strategic Industrialization and Urbanization in the region) (Alternative 3)
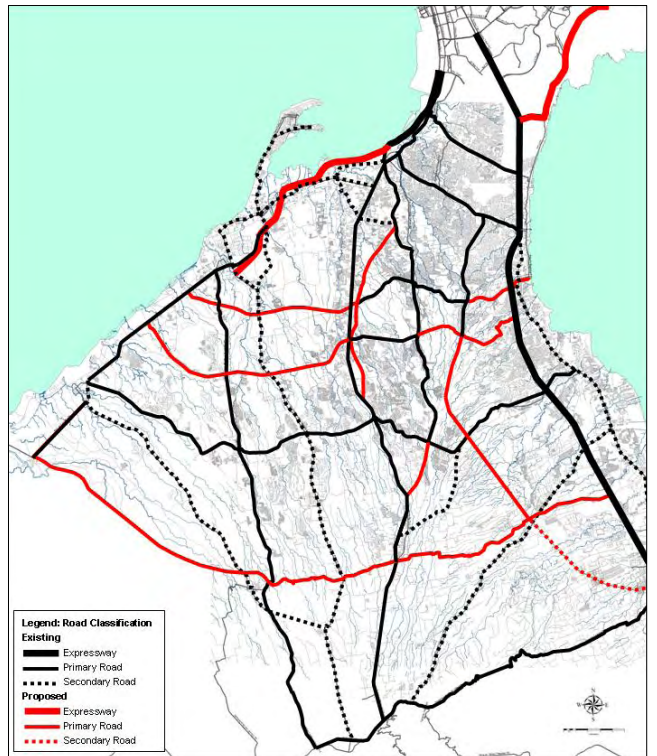
High-standard highways will be provided for East-West and North-South axis. The urbanization and industrialization in the region will be promoted according to the hierarchy of the road network system.

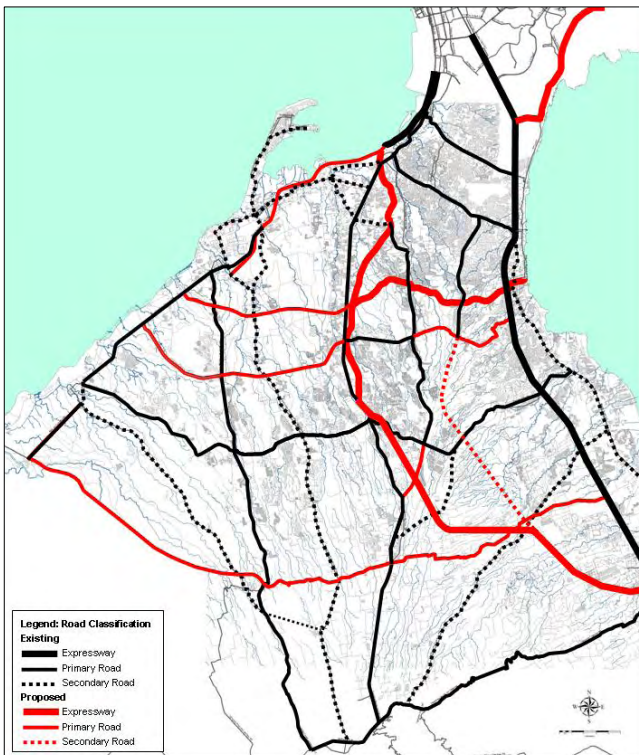## Figure 3.3.1 Alternative Transport Network Scenarios

Alternative 0
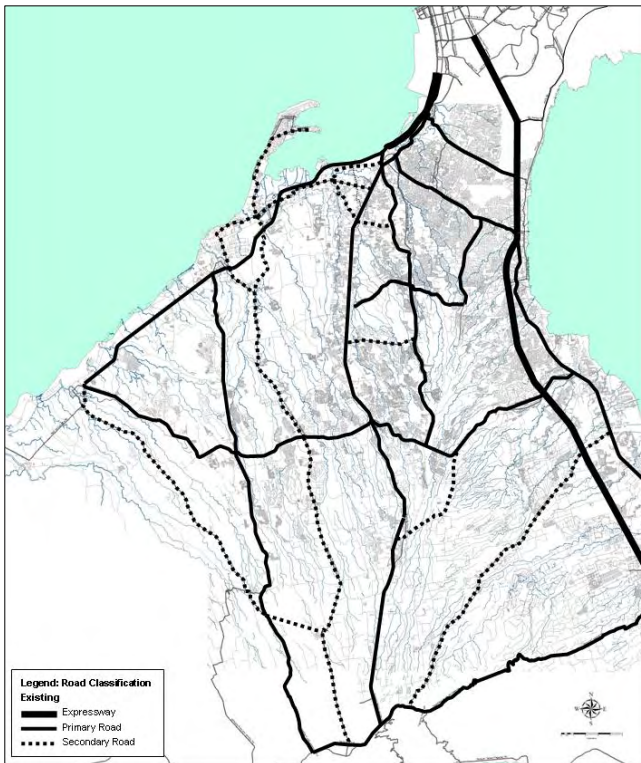
Alternative 1

Alternative 2

Alternative 3