

Japan International Cooperation Agency (JICA)  
Yangon City Development Committee (YCDC)

# The Republic of the Union of Myanmar **A Strategic Urban Development Plan of Greater Yangon**

The Project for the Strategic Urban Development Plan of the Greater Yangon

## **FINAL REPORT II**

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January 2014

Nippon Koei Co., Ltd.  
NJS Consultants Co., Ltd.  
YACHIYO Engineering Co., Ltd.  
International Development Center of Japan Inc.  
Asia Air Survey Co., Ltd.  
ALMEC Corporation



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Japan International Cooperation Agency (JICA)  
Yangon City Development Committee (YCDC)

The Republic of the Union of Myanmar  
**A Strategic Urban Development Plan  
of Greater Yangon**

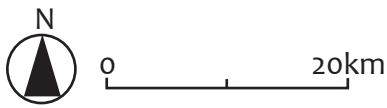
The Project for the Strategic Urban Development Plan of the Greater Yangon

**FINAL REPORT II**

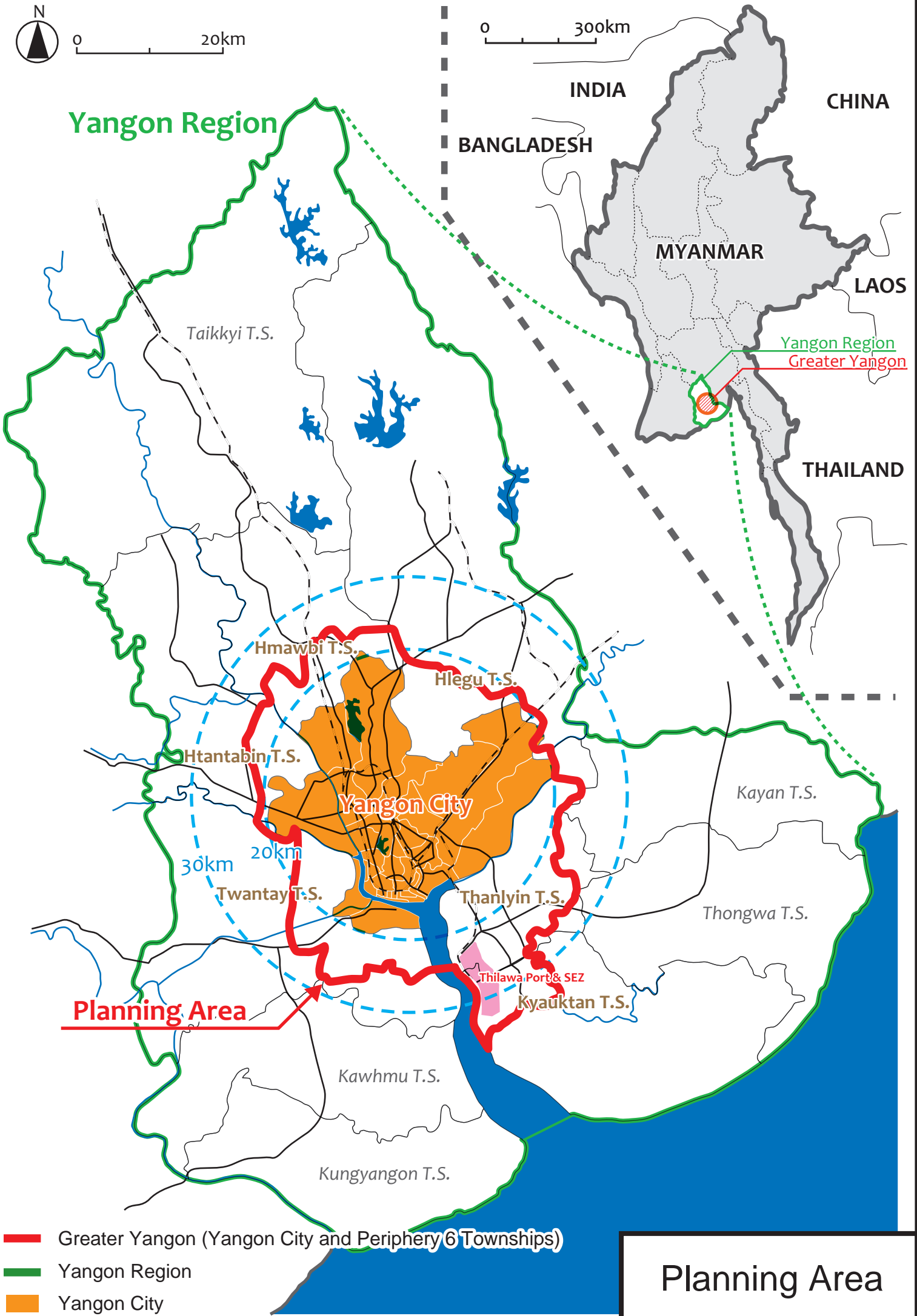
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ALMEC Corporation



# Yangon Region



- Greater Yangon (Yangon City and Periphery 6 Townships)
- Yangon Region
- Yangon City

Planning Area

**The Project for**  
**The Strategic Urban Development Plan of the Greater Yangon**  
**Final Report II**

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### **LIST OF ABBREVIATIONS**

AADMER	ASEAN Agreement on Disaster Management and Emergency Response
ASEAN	Association of Southeast Asian Nations
ADB	Asia Development Bank
ADPC	Asian Disaster Preparedness Center
ADRC	Asian Disaster Reduction Center
ATCS	Area Traffic Control System
AWPT	Asia World Port Terminal
BAW	Bo Aung Kyaw Wharf
BES	Business Establishment Survey
BOT	Build-Operate-Transfer
CBD	Central Business District
CBDRR	Community Based Disaster Risk Reduction
CBM	Compressed Bio Methane
CIDA	Canadian International Development Agency
CNG	Compressed Natural Gas
DCA	Department of Civil Aviation
DDA	Department of Development Affair
DEP	Department of Electric Power
DHSHD	Department of Human Settlement and Housing Development
DMH	Department of Meteorology and Hydrology, Ministry of Transport
DPMC	Disaster Preparedness Management Committees
DSW	Department of Social Welfare under the Ministry of Social Welfare
DWT	Dead Weight Tonnage
ECFA	Engineering Firms Association
EIA	Environmental Impact Assessment
FDS	Final Disposal Site
FSD	Fire Services Department
FY	Fiscal Year
GDP	Gross Domestic Products
GIS	Geographic Information System
GMS	Greater Mekong Subregion
GPS	Global Positioning System
GRDP	Gross Regional Domestic Product
HDPE	High Density Polyethylen
HHWL	Highest High Water Level
HIS	Household Interview Survey
ICD	Inland Container Depot
ID	Irrigation Department, Ministry of Agriculture and Irrigation
IPP	Independent Power Producer
ITS	Intelligent Transport Systems
ITU	International Telecommunication Union
IWT	Inland Waterway Transport
JETRO	Japan External Trade Organization
JICA	Japan International Cooperation Agency
JPY	Japanese Yen
LRT	Light Rail Transit

MAPDRR	Myanmar Action Plan on Disaster Risk Reduction
MCPT	Ministry of Communication, Posts and Telegraphs
MDPA	Myanmar Disaster Preparedness Agency
MEC	Myanmar Economic Corporation
MEPE	Myanmar Electric Power Enterprise
MES	Myanmar Engineering Society
METI	Ministry of Economy, Trade and Industry of Japan
MIP	Myanmar Industrial Port
MIPL	Myanmar Integrated Port Limited
MITT	Myanmar International Terminals Thilawa
MKRC	Mobile Knowledge Resource Centre
MLIT	Ministry of Land, Infrastructure, Transport and Tourism
MMK	Myanmar Kyat
MNPED	Ministry of National Planning and Economic Development
MOAI	Ministry of Agriculture and Irrigation
MOC	Ministry of Construction
MOE	Ministry of Education (in section 2.1.4)
MOE	Ministry of Energy (in section 2.3.7 and 4.7)
MOECF	Ministry of Environmental Conservation and Forestry
MOEP	Ministry of Electric Power
MOFA	Ministry of Foreign Affairs
MOH	Ministry of Health
MORT	Ministry of Rail Transportation
MOT	Ministry of Transport
MPA	Myanmar Port Authority
MPT	Myanmar Posts and Telecommunications
MR	Myanmar Railways
MRT	Mass Rapid Transit
MS	Myanmar Shipyards
MSPL	MPA-SMD Port Limited
MSWRR	Ministry of Social Welfare, Relief and Resettlement
MWL	Mean Water Level
MPA	Myanmar Port Authority
NDML	Natural Disaster Management Law
NGO	Non-Governmental Organization
NMV	Non-Motorized Vehicle
ODA	Official Development Assistance
PCCD	Pollution Control and Cleansing Department
PPP	Public Private Partnership
PS	Pumping Station
PTD	Post and Telecommunication Department
PwD	Persons with Disability
RET	Rangoon Electric Tramway and Supply Company
RHC	Rural Health Center
ROB	Road Flyover
RRD	Relief and Resettlement Department
R.S.	Railway Station
RTAD	Yangon Region Road Transport Administration Department

RTC	Road Transport Corporation
RTK	Real Time Kinematic
SEA	Strategic Environmental Assessment
SEZ	Special Economic Zone
SHM	Stakeholder Meeting
SLORC	the State Law and Order Restriction Council
SPW	Sule Pagoda Wharf
SRHC	Sub-Rural Health Center
SWM	Solid Waste Management
TOD	Transit Oriented Development
UFW	Un-accounted For Water
UMEHL	Union of Myanmar Economic Holding Limited
UMRT	Urban Mass Rapid Transit
UN	United Nations
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNOSAT	UNITAR's Operational Satellite Applications Programme
UPD	Urban Planning Division
US\$	US Dollar
USDA	Union Solidarity and Development Association
WHO	World Health Organization
WKRC	Water Knowledge Resource Centre
WTE	Waste to Energy plants
WTP	Water Treatment Plant
WV	World Vision
WWTP	Wastewater Treatment Plant
YESB	Yangon city Electricity Supply Board
YCDC	Yangon City Development Committee
YDDPMWC	Yangon Division Disaster Preparedness Management Working Committee

**CONVERSION RATE (AT DECEMBER 2013)**

1 MMK = 0.105 JPY

1 US\$ = 102.19 JPY

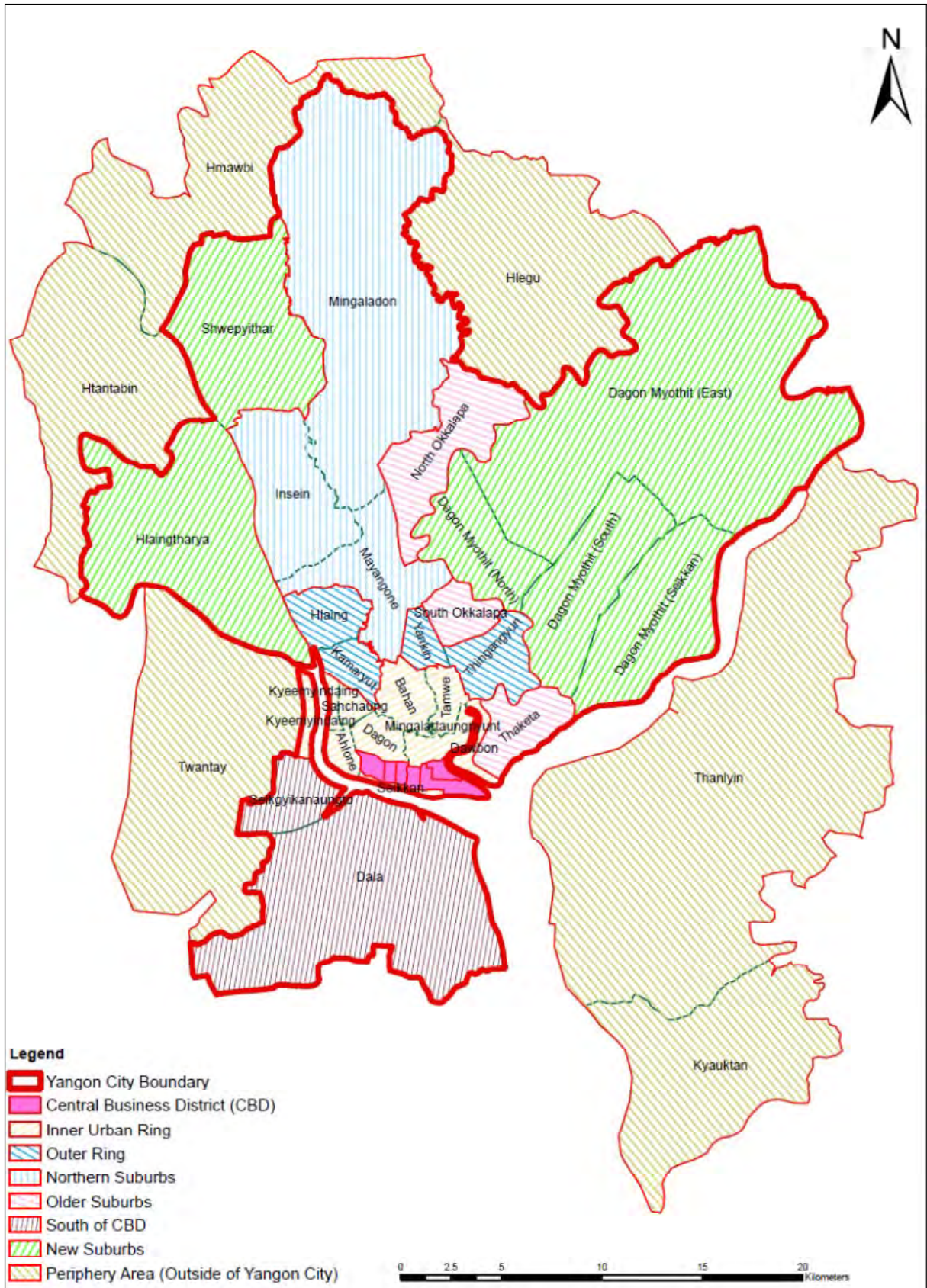
Source: JICA HP

**DEFINITION OF THE STUDY AREA AND YANGON REGION**

Administrative Boundary		Township Group	Township Name	Definition	
Yangon Region	Yangon City	CBD	Latha	Whole area of those townships belongs to the target area	The Greater Yangon (Target Area) Total 1,535 km <sup>2</sup>
			Lanmadaw		
			Pabedan		
			Kyauktada		
			Botahtaung		
			Pazundaung		
		Inner Urban Ring	Ahlone		
			Kyee Myin Daing		
			Sanchaung		
			Dagon		
			Bahan		
			Tarmwe		
			Mingalar Taung Nyunt		
			Seikkan		
		Outer Ring	Dawbon		
			Kamaryut		
			Hlaing		
			Yankin		
		Northern Suburbs	Thingangyun		
			Mayangone		
	Insein				
	Older Suburbs	Mingalardon			
		North Okkalapa			
		South Okkalapa			
	South of CBD	Thaketa			
		Dala			
	New Suburbs	Seikgyikhanaungto			
		Shwe Pyi Thar			
Hlaing Tharyar					
North Dagon					
South Dagon					
East Dagon					
Periphery Area (Outside of Yangon City)	Dagon Seikkan	Partial areas of each township belong to the target area			
	Kyauktan				
	Thanlyin				
	Hlegu				
	Hmawbi				
	Htantabin				
	Twantay	(Outside of the Target Area)			
	Taikkyi				
	Kawhmu				
	Kungyangon				
Kayan					
Thongwa					

Source: JICA Study Team

**DEFINITION OF THE STUDY AREA AND YANGON REGION**



Source: JICA Study Team

**THE STUDY IN PICTURES**



Seminar in NPT  
(3<sup>rd</sup> June 2013)



Seminar in YGN  
(5<sup>th</sup> June 2013)



Technical Transfer Field Work  
(Phase II Work)



Technical Transfer Workshop  
(Phase II Work)



The Final Steering Committee in YGN  
(26<sup>th</sup> November 2013)



The Final Seminar in NPT  
(29<sup>th</sup> November 2013)

Source: JICA Study Team



# ***CHAPTER 1***

*Introduction*

## **CHAPTER 1: INTRODUCTION**

### **1.1 Background**

Yangon City, the largest economic center of Myanmar, has a population of about 5.14 million (2011) and is experiencing rapid urbanization and accelerated development as the nation moves toward democracy. The current rapid urbanization is putting more pressure on the existing old infrastructures in Yangon City and concerns for the deterioration of its urban environment are growing.

The Yangon City Development Committee (YCDC) is the agency responsible for controlling and managing the city's development. However, insufficient data and lack of an integrated future plan limit its ability to respond to various urban issues. At the same time, improvement of the present capacity of YCDC is necessary in providing better public services for the citizens of Yangon City.

The Japan International Cooperation Agency (JICA) conducted a fact-finding survey in March 2012 and reviewed the present condition of Yangon City and its surrounding areas. The survey confirmed the need for a strategic urban development plan for Greater Yangon, which covers not just Yangon City but also the adjoining townships that are influenced by the urbanization of Yangon, to realize its sound and sustainable development.

Under such circumstances, the Yangon Regional Government and JICA agreed to start The Project for the Strategic Urban Development Plan of the Greater Yangon (hereinafter referred to as "the Study") to prepare a well-thought future vision and strategic urban development plan. Accordingly, it will achieve balanced, inclusive, and sustainable growth, and cater to a better supply of urban infrastructure and services for the urban inhabitants of Greater Yangon.

Since August 2012, the Phase I of the Study has commenced to formulate the master plan. With the holding of the seminars in Japan and Myanmar last March 2013 and June 2013, respectively, the work of Phase I has been completed and subsequent works were launched to implement the plan for Phase II.

### **1.2 Objectives**

The objectives of the Study are as follows. The work of Phase II focused on item 4) capacity development and technical transfer to the counterpart, while one of Phase I focus on items 1) to 3).

- 1) Present the comprehensive development visions of Greater Yangon, targeting the year 2040;
- 2) Formulate an urban development plan of Greater Yangon for the realization of the development visions;
- 3) Formulate a strategy for promoting development of urban infrastructure sectors; and
- 4) Present a strategy for promoting institutional improvement and administrative capacity development in the field of urban development and management.

In this context, the planning work of Phase II intends to exchange opinions among concerned organizations carefully, but not to be officially approved by Myanmar side, such as Yangon Region



Government and YCDC. Therefore the plans proposed in this report shall be approved by Myanmar side by themselves if necessary. Additionally an appropriate procedure of environmental and social consideration is necessary when subsequent projects are going to the next step for making realize.

### 1.3 Study Period

The Study period was from the beginning of August 2012 to December 2013 and was divided into two phases as shown in Table 1.3.1. The Phase II started in April 2013 and was completed in December 2013 as follows:

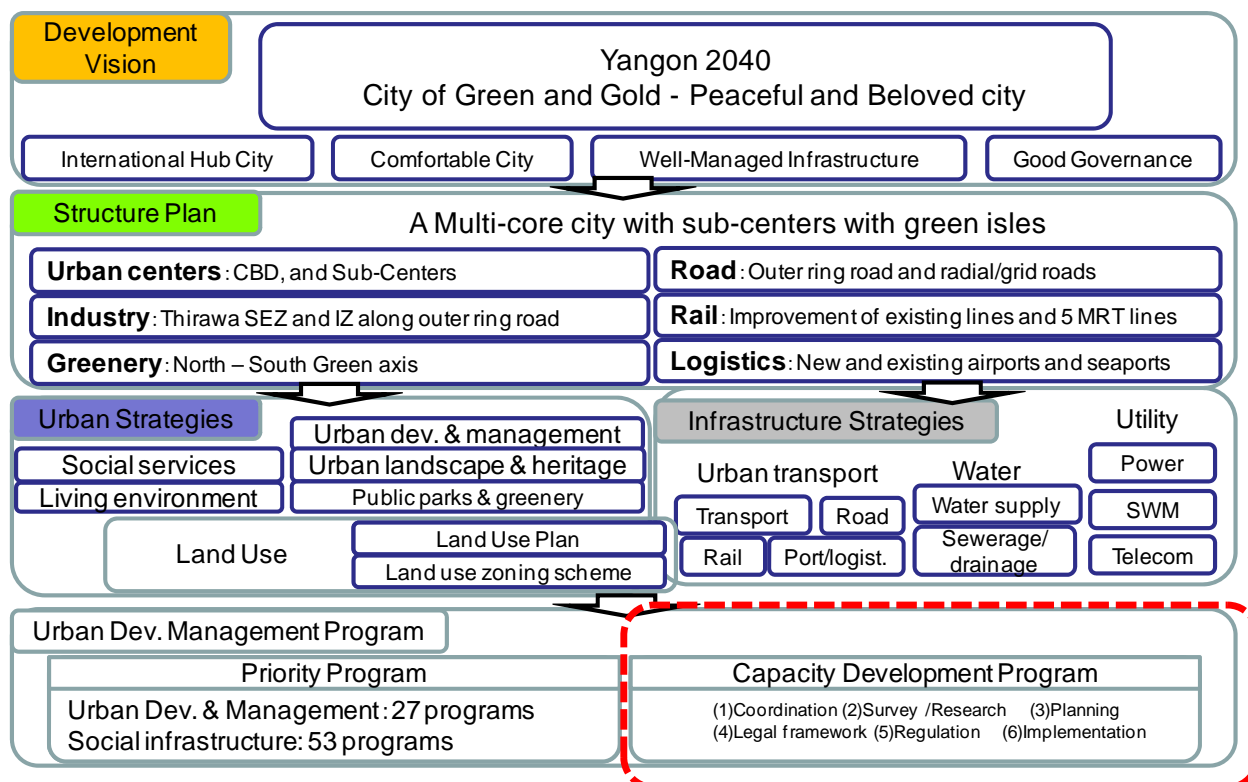
**Table 1.3.1: Phased Work Plan**

Phase	Study Period	Main Contents
1st Phase (Final Report I)	August 2012 – March 2013	<ul style="list-style-type: none"> <li>● Creation of Basic Urban Information Data</li> <li>● Formulation of Development Visions and Structure Plan</li> <li>● Formulation of Social Infrastructure Development Strategy</li> <li>● Formulation of Urban Development Master Plan</li> </ul>
2nd Phase (Final Report II)	April 2013 – December 2013	<ul style="list-style-type: none"> <li>● Conduct of Case Study and Formulation of Capacity Development Plan</li> </ul>

Source: JICA Study Team

### 1.4 Phase II Work (Case Studies of Detailed Planning)





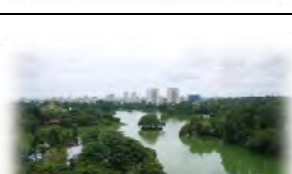
The subsequent works of the strategic urban development plan of Greater Yangon consist mainly of five components as discussed below. The works were conducted by the Urban Planning Division of YCDC and other relevant organizations in order to encourage coordination among organizations.



Source: JICA Study Team

**Figure 1.4.1: Structure of Strategic Urban Development Plan and Position of Phase II Work**

**Table 1.4.1: Phase II Work Contents**

Title	Aiming	Image Picture
Central Business District (CBD) Development	Interactive planning process for improvement, development, and conservation	
North-East Region Development	New urban development planning in suburban area as models for suburban development	
Transit Oriented Development (TOD)	Harmonizing urban development and public transportation	
Capacity Development	Improving and developing the capacity for sustainable urban development	
Strategic Environmental Assessment (SEA)	Strategic environmental assessment to be applied in the master plan formulation	

Source: JICA Study Team

### (1) Central Business District (CBD) Development

Currently, the urban central functions including administration, banking, business, and commerce are located mainly in the central business district (CBD). The importance of CBD in Yangon and consequently in Myanmar shall remain unchanged in the future, even if the proposed decentralization by the construction of sub-centers would be successful. In order to take countermeasures against existing problems, such as traffic jam, environmental pollution, raising of land prices, and deterioration or damage to heritage sites, detailed CBD development plans should be carried out as a case study.

Main outputs of this case study were set as (1) Formulation of CBD Conceptual Development Plan, (2) Formulation of CBD Land Use Zoning Scheme, and (3) Formulation of CBD Historic and Cultural Heritage Conservation Plan.

## (2) North-East Region Development

This work involves the formulation of a detailed development plan for the North-East Region in which new urban development will be undertaken to realize the proposed strategic urban development plan of Greater Yangon. Also technical transfer through good experience of cooperative planning works with YCDC, the townships, and the JICA Study Team was carried out in this work.

Main Outputs of this case study were set as (1) Map and Information Data of Current Conditions, and (2) Map and Information Data of Future Development Plan (long-term target of 2040).

## (3) Transit Oriented Development (TOD)

The policy of TOD is to achieve urbanization based on public transportation that intends high economical efficiency, environmental friendliness, and traveler friendliness.

To introduce TOD concept, the study of Yangon Circular Railway was conducted in the project. Although there are many things to upgrade regarding the level of service (LoS) and security, it has large potential for TOD on the grounds of station. Certainly, there is room for improvement. Specifically, the potential demand of station area development at the CBD area is huge. Thus, it is required to undertake a comprehensive development plan including area development planning, policy decision making, market expansion, and land price increase through railway LoS improvements.

## (4) Capacity Development

The Strategic Urban Development Plan is for future development in the Greater Yangon area. In order to realize the plan, it is necessary to establish an urban planning system for larger regions and a detailed plan for smaller area.

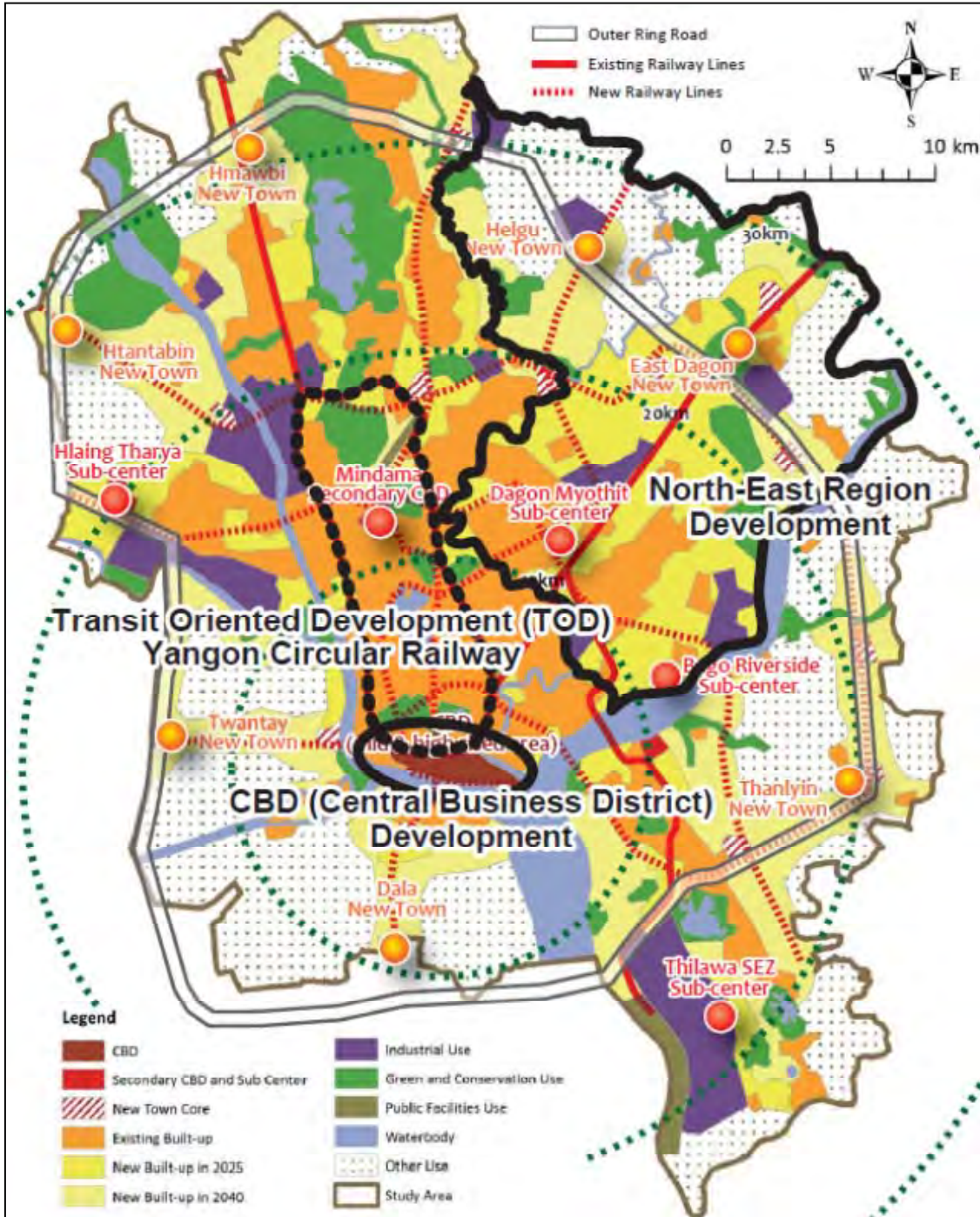
It is necessary to determine the outline of the urban planning system of Myanmar and demarcation of responsibilities and duties of related administrative organizations (i.e., union ministries, regional government, and local administrative offices: township and district). In this Study, it is difficult to conclude, since the counterpart organization (YCDC) is not an autonomous body, as defined in the Constitution. And the abovementioned matters are described as a proposal.

## (5) Strategic Environmental Assessment (SEA)

In the Phase II of the Study, the workshop on environmental and social considerations, which is necessary for the future development programs in Yangon, was conducted by the JICA Study Team in the course of technical transfer for the implementation of case studies.

## 1.5 Target Area of Phase II Work

Basically, the planning area covers Greater Yangon, including Yangon City (78,400ha; 784 km<sup>2</sup>) and parts of the six neighboring townships of Kyauktan, Thanlyin, Hlegu, Hmawbi, Htantabin, and Twantay (hereinafter referred to as “the Planning Area”), which has a total area of approximately 1500 km<sup>2</sup> as shown in the location map. In Greater Yangon, Phase II works are focused on CBD development, North-East Region development, and TOD of Yangon Circular Railway as shown in Figure 1.5.1.



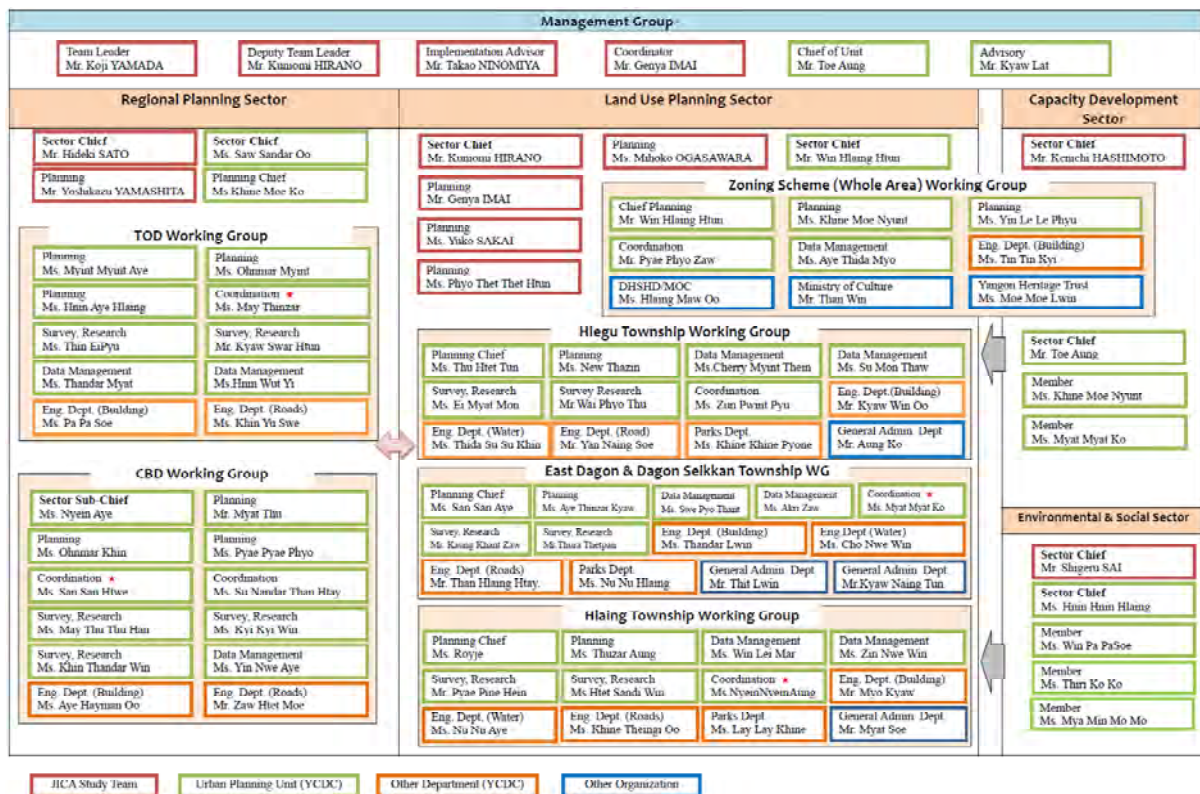
Source: JICA Study Team

Figure 1.5.1: Phase II Target Area in Greater Yangon

## 1.6 Organizational Structure for the Case Studies

To conduct the case studies, the JICA Study Team organized working groups consisting of the technical staffs from not only Urban Planning Division of YCDC but also other department of YCDC, townships, DHSHD/MOC, Yangon Heritage Trust in each sector as shown in Figure 1.6.1.

In regard with the zoning scheme working group, a new organization, namely “Yangon City Comprehensive Land use, Zoning and Urban Design Review Working Committee (hereinafter “Yangon City Zoning Committee)”” was established under the Mayor’s instruction during the Phase II, therefore it was shifted to conduct technical transfer directly to the organization under YCDC because the member of the organization was almost same as one of the working group of Phase II as shown in Figure 1.6.2.

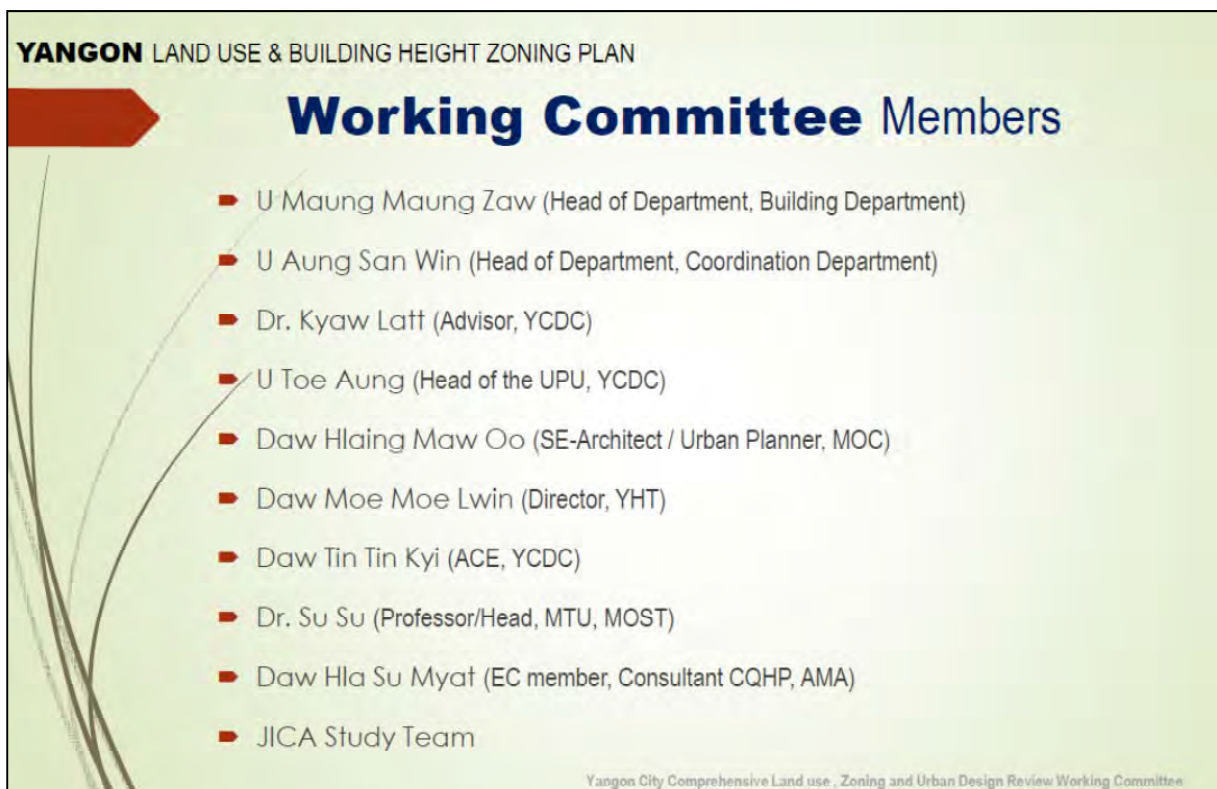


Source: JICA Study Team

Figure 1.6.1: Organized Sectors and Working Groups

“Yangon City Zoning Committee” consists of the representative members of relevant organizations as mentioned below. Yangon Heritage Trust is a NGO established in March 2012. Its mission is to protect and promote Yangon’s rich urban heritage within a cohesive urban plan by advocating for heritage protection and revitalisation of the historic city, advising the government and developers on heritage law and public policy, and undertaking research and public outreach on preservation projects, studies, conferences, and training.

- ✓ YCDC (Yangon City Development Committee)
- ✓ MOC (Ministry of Construction)
- ✓ YHT (Yangon Heritage Trust)
- ✓ MOST (Ministry of Science and Technology)
- ✓ AMA (Association of Myanmar Architect)
- ✓ JICA Study Team



Source: Yangon City Comprehensive Land use, Zoning and Urban Design Review Working Committee

**Figure 1.6.2: The Members of Yangon City Comprehensive Land use, Zoning and Urban Design Review Working Committee**

# ***CHAPTER 2***

*Phase II Work  
For Capacity Development  
On Urban Planning*

## CHAPTER 2: PHASE II WORKS FOR CAPACITY DEVELOPMENT ON URBAN PLANNING

### 1 Central Business District Development

#### 1.1 Introduction

##### (1) Objectives

Currently, the urban central functions including administration, banking, business, and commerce are located mainly in the central business district (CBD). The importance of CBD in Yangon and consequently in Myanmar shall remain unchanged in the future, even if the proposed decentralization by the construction of subcenters would be successful. In order to take countermeasures against existing problems, such as traffic jam, environmental pollution, raising of land prices, and deterioration or damage to heritage sites, detailed CBD development plans should be carried out as mentioned below. Figure 2.1.1 shows the map of CBD.

##### (2) Main Outputs

- ◇ Formulation of CBD Conceptual Development Plan
- ◇ Formulation of CBD Land Use Zoning Scheme
- ◇ Formulation of CBD Historic and Cultural Heritage Conservation Plan

##### (3) A Review of Proposed Development Policies in the Strategic Urban Development Plan

In the strategic urban development plan, development policies in CBD were proposed as follows:

##### 1) Development of Disaster-resistant CBD

- A city strong against earthquakes
- A city strong against fires
- A city strong against floods

##### 2) Functional Traffic System in CBD

- Improvement of parking lots
- Limitation of car traffic in CBD
- Development of new public transport systems



3) Formation of Attractive Urban Space

- Conservation and reuse of heritage buildings
- Promotion of tourism
- Development of waterfront

4) Implementation Method for Urban Regeneration

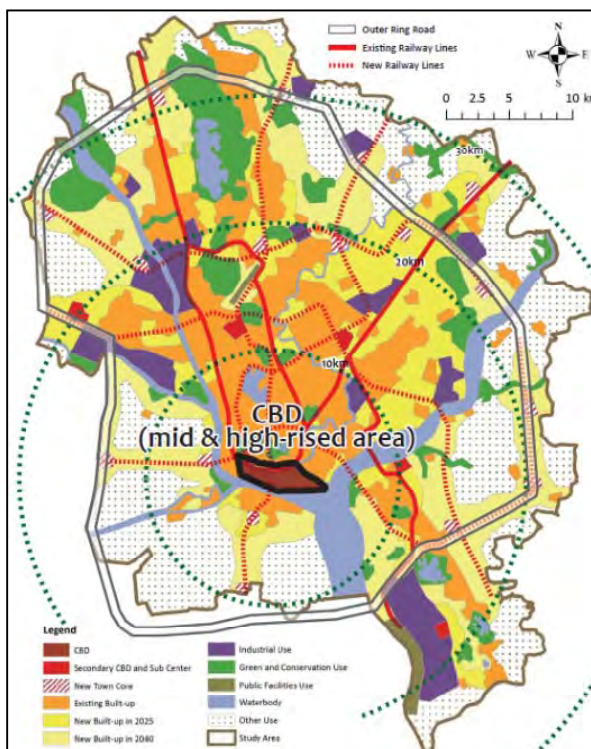
- Implementation of urban redevelopment
- District planning for city induction
- Transfer of development right (TDR) and funding

1.2 CBD Conceptual Development Plan

(1) Current Conditions

1) Traffic Conditions

Roads in a grid pattern generally cover the whole area of CBD. In the current traffic situation with inflow of a number of vehicles to CBD (refer to Figure 2.1.2), main gateways are limited at the north and west sides of CBD due to topographic conditions. The circular railway runs through the northeast-northwest of CBD with four stations. The Pansodan Ferry Jetty along the Yangon River is located at the southern central area of CBD.



Source: JICA Study Team

Figure 2.1.1: CBD Area



Source: JICA Study Team

Figure 2.1.2: Current Traffic Condition in CBD

2) Conditions of Main Facilities and Land Ownership

Many large-scale public buildings such as hospitals, schools, and religious facilities are located in the northwest area of CBD, which is more quiet and greener than the other areas; although it should be noted that there is only one public park in CBD. Currently, citizens are unable to enjoy much of the riverside spaces along the Yangon River as the Yangon Main Port

occupies the spaces facing the river. The southeast tip point of CBD known as “Monkey Point” and its surrounding area is controlled by the Myanmar Navy. Figure 2.1.3 shows the current conditions of main facilities and land ownership in CBD.



Source: JICA Study Team

**Figure 2.1.3: Current Conditions of Main Facilities and Land Ownership in CBD**

### 3) Heritage Condition

Setting up specific heritage zones in CBD was proposed by Myanmar, although these zones have not yet been defined by any law or regulation. There are 189 designated heritage buildings in Yangon, of which approximately 40% are located in CBD, as shown in Figure 2.1.4. Currently, many heritage buildings are not in good condition.

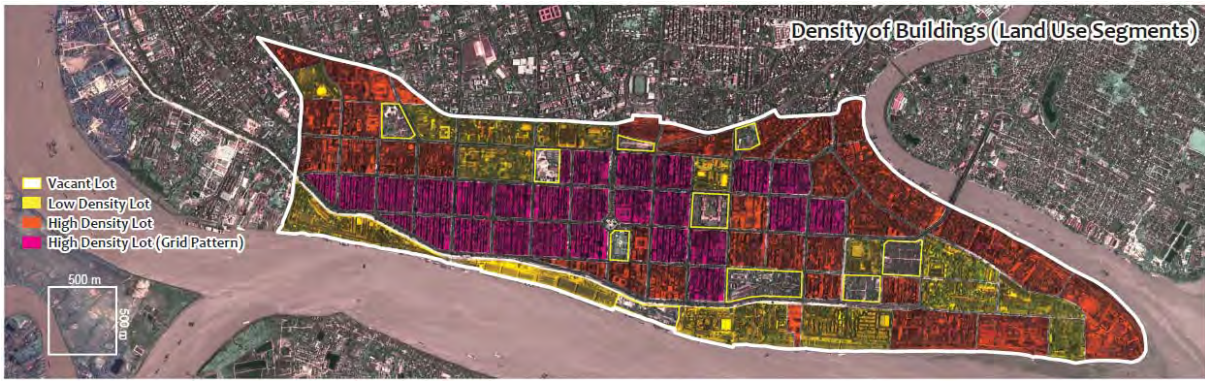


Source: JICA Study Team

**Figure 2.1.4: Current Conditions of Heritage Buildings in CBD**

### 4) Building Density Condition

The grid-pattern road network as seen in the present was formed during the British colonial period. Inner block units of the grid are densely occupied mainly by six- to eight-storey residential buildings. On the other hand, the northwest and southeast areas of CBD are used in relatively large-scale plots. Figure 2.1.5 shows the current building density condition in CBD.



Source: JICA Study Team

**Figure 2.1.5: Current Condition of Building Density in CBD**

### 5) Proposed Development Projects

Some of the new development projects are proposed in CBD (refer to Figure 2.1.6), although little consideration seems to have been made to harmonize with the heritage condition of Yangon.



Source: JICA Study Team

**Figure 2.1.6: Proposed Development Projects in CBD**

(2) CBD Conceptual Development Plan

The future CBD development concept was proposed as follows:

***“Improvement for a sophisticated and attractive urban center  
leading the business and commerce of Myanmar”***

In order to solve or mitigate outstanding problems, improvement and/or renovation of CBD must be considered for a better CBD in addition to the proposed decentralization by construction of subcenters.

To continue and enhance as the urban center strongly leading the business and commercial functions of Myanmar, and also as a main gateway for international business and tourism, sophisticated and attractive urban management should be carried out sustainably. Conservation of historic and cultural heritages and formulation of green and water networks will also be essential.

To realize the above, improvement of public transportation systems, control of vehicle traffic and parking vehicles, conservation and sustainable use of heritage buildings with protective care, provision of riverside spaces, construction of new parks, development of attractive tourism destinations, and other measures must be brought forward.

In line with the concept above, the following development plans were also proposed:

1) Zoning and Building Height

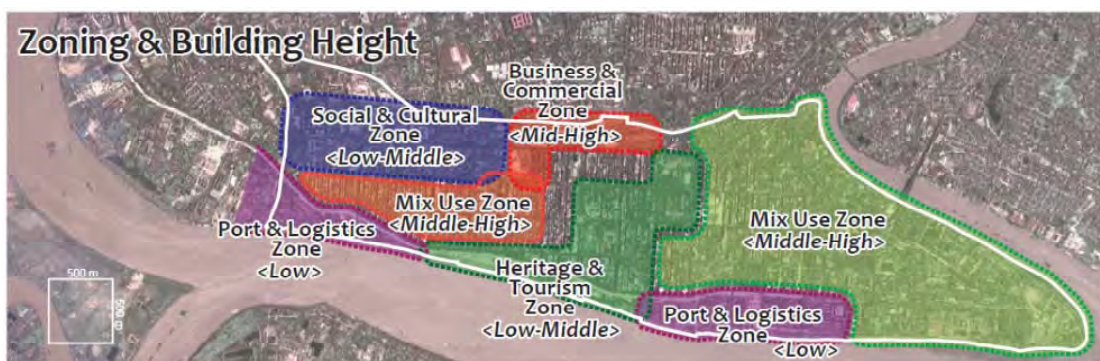
Aiming for transit-oriented development (TOD) in urban areas, which shall be accelerated in line with the modernization of the circular railway, the central north area of CBD including the Yangon Central Station and its surrounding area shall be promoted as a transit mode with business and commercial zones of middle- to high-rise buildings. On the other hand, the northwestern area where large-scale hospitals, schools, religious facilities and other public facilities are located shall maintain its current land use until the future.

In order to value and enhance the identity of Yangon and the whole of Myanmar, it is necessary to preserve and conserve heritage buildings and attractive townscapes that remain in some heritage zones of CBD, take measures for maintaining the current grid patterns, and control building height and volume. Apart from heritage zones, CBD shall generally accommodate new urban development and redevelopment with larger land use and taller buildings, especially along arterial roads and in both eastern and western parts of CBD.

As mentioned above, heritage buildings in the designated heritage zones must be preserved as much as possible, and must be properly used for historical, cultural, and tourism purposes. To keep such values of historical and cultural townscape in the future, the height of surrounding buildings should be kept at the same level as the current level in the heritage zones.

As Yangon Port will gradually transfer its main facilities and functions to Thilawa Area Port, riverfront open spaces will be developed to attract more users, citizens and tourists. In the port area, the current low-density land use and low-rise building use shall continue in the future.

The proposed zoning and building height in CBD is shown in Figure 2.1.7.



Source: JICA Study Team

**Figure 2.1.7: Proposed Zoning and Building Height in CBD**

## 2) Green and Water Network

More public parks and open spaces should be created in CBD as there is only one existing public park. With consideration of the high land prices in CBD, it is recommended to impose developers to create public open spaces in any large-scale urban development project under the rules and regulations of YCDC.

Along the riverside of the Yangon River, it is proposed that open spaces 25 yards from the shoreline to inland will be provided for the use of citizens, wherever possible. Greenery shall be promoted along arterial roads, too, in order to match with the riverside greens. This will help contribute to the formation of a green and water network that would provide comfortable townscapes and attractive avenues for pedestrians.



Source: JICA Study Team

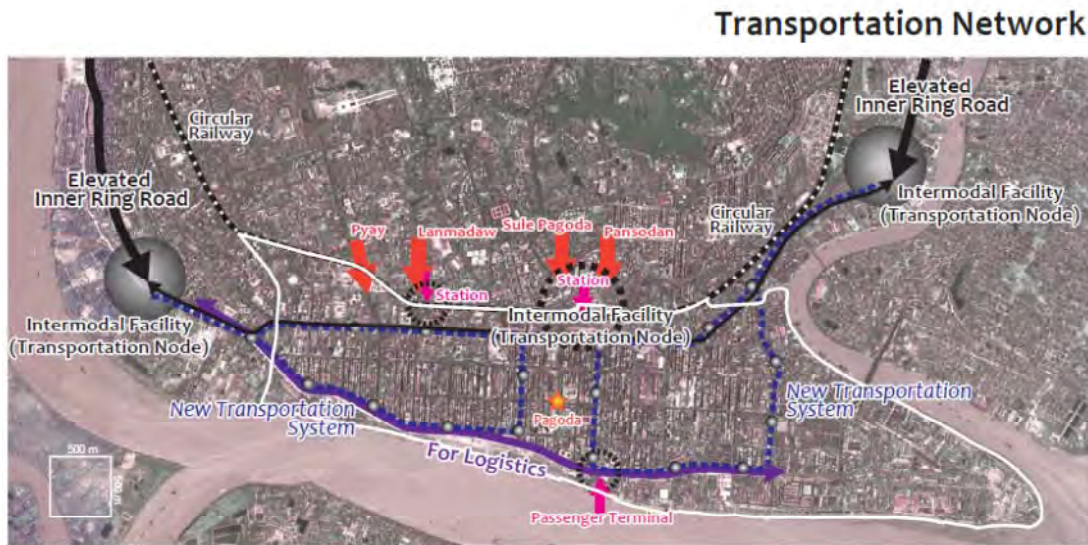
**Figure 2.1.8: Proposed Green and Water Network**

## 3) Transportation Network

To improve the railway's modal share, four railway stations which are located in or near CBD shall be developed as transit nodes. Of them, the Yangon Central Station, which has extensive lands and depots, some of which are underutilized, shall be developed with the most important intermodal facilities through the provision of parking lots, bus terminals, and transit stations for other new public transportation, commercial and business buildings, and so on.

The proposed inner ring road shall be connected with CBD at the western and eastern sides. To mitigate oncoming traffic volume from outside areas toward CBD, new intermodal facilities should be constructed at the western and eastern ends. To control the volume of vehicles going to CBD, it is recommended to introduce new public transportation systems,

such as light rail transit (LRT) and bus rapid transit (BRT). Figure 2.1.9 shows a map of the transportation network in CBD.



Source: JICA Study Team

Figure 2.1.9: Transportation Network in CBD

#### 4) Comprehensive Development Plan

In summary, the comprehensive development plan was proposed as follows:

- ✧ To promote commercial and business use in the central north area of CBD and to promote superblock development style in the east and west areas, which is able to use the land with high-value, to renew advanced function buildings, and to create new open spaces by large-scale urban redevelopment;
- ✧ To preserve heritage buildings and conserve historic and cultural townscapes in the designated heritage zones;
- ✧ To develop intermodal facilities at focal nodes of transportation, such as the Central Station and Ma Hlwa Gone Depot, in order to control the volume of incoming vehicles;
- ✧ To develop new transportation systems in CBD, such as LRT and BRT; and
- ✧ To develop open spaces where citizens can enjoy riverfront spaces by transferring the main functions of Yangon Port to Thilawa Port.

Figure 2.1.10 shows an illustration of the conceptual development plan for CBD.



Source: JICA Study Team  
**Figure 2.1.10: Conceptual Development Plan for CBD**

5) Future Images

Figure 2.1.11 to 2.1.13 shows simulated images of CBD from different perspectives.



Source: JICA Study Team

**Figure 2.1.11: Future Conceptual Image of CBD (Bird's-Eye View from Southeast to Northwest)**



Source: JICA Study Team

**Figure 2.1.12: Future Conceptual Image of CBD (Bird's-Eye View from Southwest to Northeast)**



Source: JICA Study Team

**Figure 2.1.13: Future Conceptual Image of CBD (Bird's-Eye View from Central South to Central North)**



### 1.3 Land Use Zoning Scheme

#### (1) Outline and Methodology

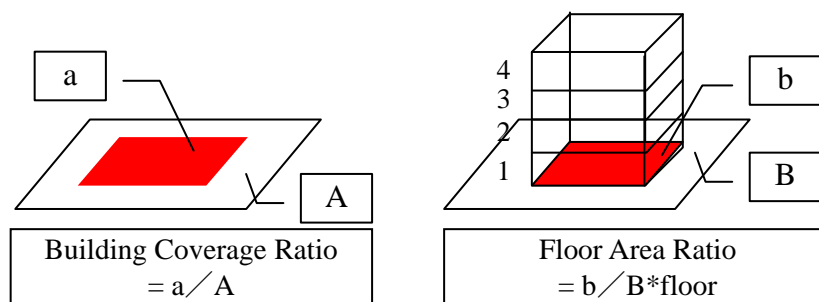
##### 1) Objectives

Innovating land use regulations will be essential for a balanced development of Greater Yangon. Looking at the recent trend of development proposals, a number of plans showed the intention to introduce high-density high-rise buildings. If such a plan will be formulated for the central part of CBD, the more concentrated traffic and increased demand for car parks would take place, and would worsen the already crowded CBD area. To achieve a balanced development in Greater Yangon, such development is not desirable in the central part of CBD, but will be implemented at subcenter areas or on the western or eastern fringes of CBD. In the JICA Report 'Strategic Urban Development Plan of Greater Yangon', the central part of CBD, where many heritage buildings exist, would be restrained and controlled under land use regulations such as those on coverage ratio and floor volume ratio. There is a discussion that some sort of limitation on building height around Sule Pagoda would be considered similar to that around Shwe Dagon Pagoda.

##### 2) Outline

For the land use zoning, the ratio of the site area of the building to the plot area (Building Coverage Ratio) and the ratio of total floor area of the building to the plot area (Floor Area Ratio) will be used, as shown in Figure 2.1.14.

Building Coverage Ratio (BCR) is term of the ratio of a building coverage area on ground floor to the size of the site. In the case of building coverage area of 0.5ha (a) in site area of 1ha (A), the BCR is 50% (or 0.5). Floor Area Ratio (FAR) is term of the ratio of a building's total floor area to the size of the piece of land upon which it is built. In the case of building coverage area of 0.5ha (b) with 4 stories in site area of 1ha (B), the FAR is 200% (or 2).



Source: JICA Study Team

**Figure 2.1.14: Building Coverage Ratio and Floor Area Ratio**

The rule of limiting building height will work well to achieve a more comfortable environment by ways of restricting traffic volume, preventing and controlling fire, noise, sunshine, lighting, and ventilation, or limiting the height of buildings as a district.

If this land use regulation will be applied, the whole area and the future image of Yangon could be managed in line with the land use plan proposed in the Strategic Urban Development Plan of Greater Yangon.

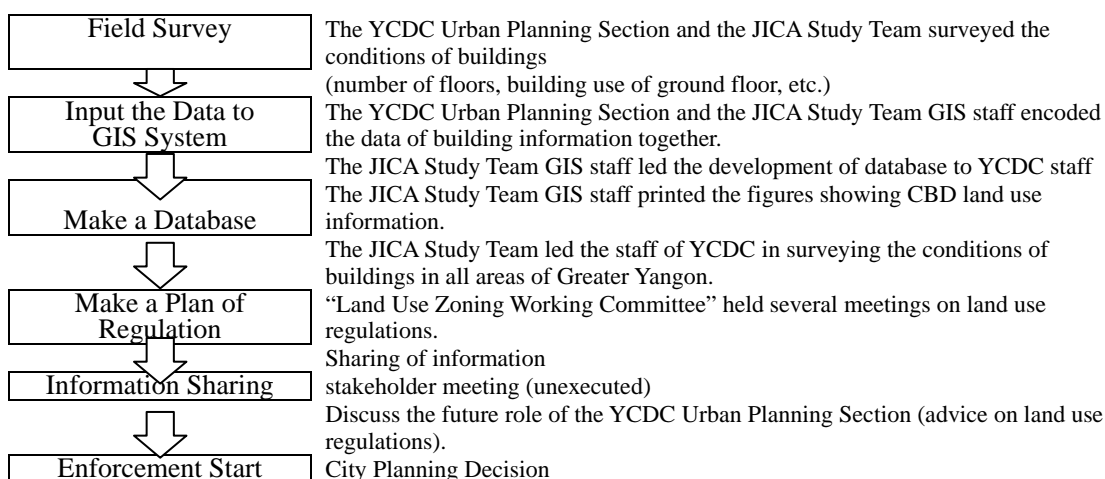
### 3) Methodology

For the CBD area, the JICA Study Team conducted a building investigation survey where the building coverage of the current situation of area and floor volume ratio of CBD has been completely studied. Based on the survey results, the JICA Study Team prepared a draft form of applicable land use regulation scheme in consideration of the present conditions of the buildings in the area. In addition, a simulation analysis of the landscape views of Sule Pagoda Road was carried out with changing building height limits. Such results will be used in establishing a comprehensive land use zoning scheme of CBD and other areas.

#### a) Process

- To survey the existing land use in CBD and propose the plan of the regulation
  - ✧ Conditions of buildings in CBD were surveyed, namely the 1) number of floors, 2) use of ground floor, 3) use of other floors, 4) number of housing unit, 5) establishment and height of building, 6) population (person), and 7) number of buildings (address).
  - ✧ Standards of regulation such as on coverage ratio and floor volume ratio have been checked with the identified number of non-compliant buildings under the regulation.
  - ✧ The YCDC Urban Planning Section and the JICA Study Team together surveyed and jointly recorded the data on buildings. The YCDC staff worked well on the confirmation of establishment.
  - ✧ The YCDC and the JICA Study Team cooperatively kept the results of field survey in a database. To secure the data of CBD from locking up, the JICA Study Team GIS staff guided how to print hard copies and update the data.
  - ✧ “Yangon City Comprehensive Land use, Zoning and Urban Design Review Working Committee (see details in Chapter 1, hereinafter “Land Use Zoning Working Committee”)” have discussed the plan of land use regulation. The flow of deciding regulations is shown in the next item.

#### b) Flow of Activities (Study on Land Use Regulations)



Source: JICA Study Team

**Figure 2.1.15: Flow of Study on Land Use Regulations**

c) *Basic Survey for Urban Planning*

The YCDC Urban Planning Section and the JICA Study Team have surveyed the existing building use in CBD. All buildings in five townships (Kyauktada, Pabedan, Latha, Botahtaung, and Lanmadaw) have been checked. Figure 2.1.16 shows the sample survey sheet that was used during the field work.

Zone No. \_\_\_\_\_

No.	Number of Floor	Ground Floor	Other Floors	Number of Houses	Establishment	Building Height	Population	House No.

Source: JICA Study Team

**Figure 2.1.16: Survey Sheet and Survey Points**

(2) Result of Survey

1) Result

Survey on the existing building use started in July 2013, and finished at the end of October 2013. The output of the survey are as follows:

a) *Qualitative Results*

- The YCDC Urban Planning Section staffs were allowed by land and building floor owners to get the information about the number of house units and establishments of each building through discussions and interviews with owners and residents. Information acquired from each building in CBD is of high quality.
- The YCDC Urban Planning Section and the JICA Study Team did not have enough time to survey all over Greater Yangon. After this Study has been finished, it is necessary for the YCDC staff to continue to survey the whole Greater Yangon . The JICA Study Team has already transferred the surveying techniques on land use.
- The YCDC Urban Planning Section staff have understood the existing condition of buildings in CBD. The YCDC staff will conjugate these survey results to make a plan.

b) *Quantitative Results*

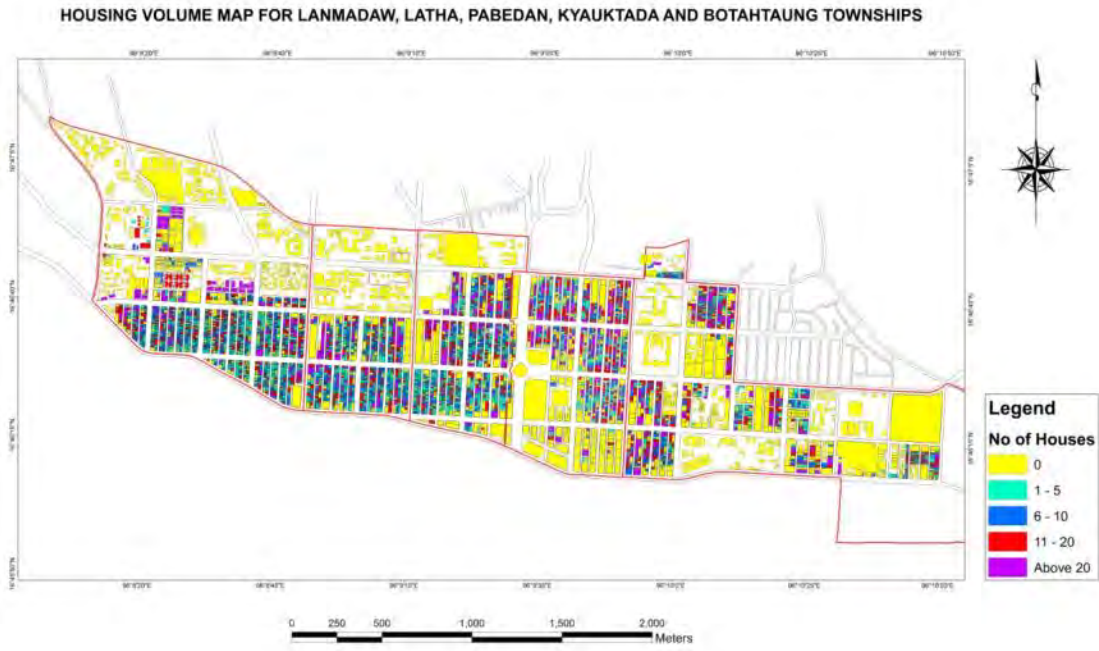
The results of the field survey are shown in Figures 2.1.17 to 2.1.22.

- Current Condition of Existing Building Use (see Figure 2.1.17): The central part of CBD has intensive use for commercial and business purposes along Sule Pagoda Street. Commercial and business land uses are also predominant in the roadside of Strand and Kon Zay Dan streets. The buildings in the central part of CBD follows a pattern where the lower floors of a building are for commercial and business uses, while the middle and higher floors are for residential use. However, as one moves away from Sule Pagoda Street to the east or west, the ratio of apartment buildings (no commercial use on the lower floors) becomes higher.
- Current Condition of the Number of Floor (see Figure 2.1.18): Even the high-rise buildings along the arterial roads, the building height is restricted to be less than twice on the front road width. The height ratio of the buildings to the front road within the inner blocks is regulated with a higher height limit of 2.5 times as that of the front road.
- Current Condition of the Number of House Unit (see Figure 2.1.19): Historical zone is not use for residence site. And over twenty families live in one building in CBD.
- Current Condition of Population (see Figure 2.1.20): Ratio of the numbers of buildings that Over 50 people live in is very high. But around YCDC building that area land use is almost office, no people live.
- Current Condition of the Building Establishment (see Figure 2.1.21): Around YCDC building and roadside of Strand Street, many heritage buildings established before 1947 are existing.
- Current Condition of Dangerous Building (see Figure 2.1.22): In YCDC, the section of building construction permit specifies 'Dangerous buildings'.



Source: JICA Study Team and YCDC

**Figure 2.1.17: Current Condition of Existing Building Use in CBD**



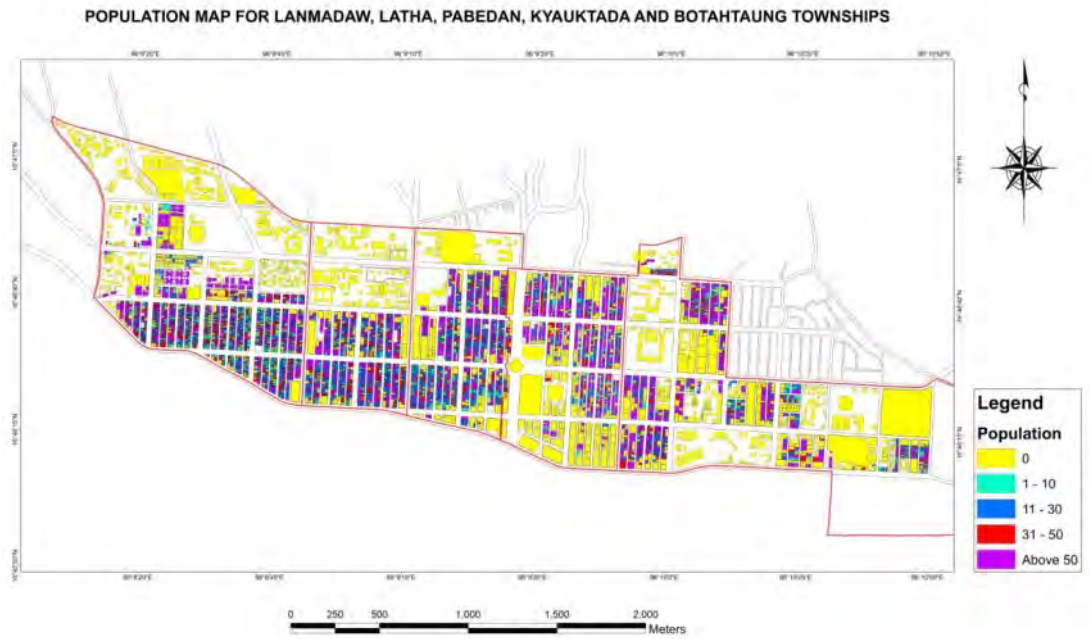
Source: JICA Study Team and YCDC

**Figure 2.1.18: Current Condition of the Number of Floors of Buildings in CBD**



Source: JICA Study Team and YCDC

**Figure 2.1.19: Current Condition of the Number of House Units in CBD**



Source: JICA Study Team and YCDC

**Figure 2.1.20: Current Condition of Population in CBD**



Source: JICA Study Team and YCDC

**Figure 2.1.21: Current Condition of the Building Establishments in CBD**



Source: JICA Study Team and YCDC

**Figure 2.1.22: Current Condition of Dangerous Buildings in CBD**

2) Database of Urban Planning (Building Information of CBD)

The database of building use in CBD used 1:10,000 scale map, which has been made by the JICA Study Team. The YCDC Urban Planning Section and the JICA Study Team have made a system of information of existing buildings in CBD. The YCDC Urban Planning Section plans to formulate land use regulation with this database. After the Study has been finished, YCDC is expected to continue the survey and update the database containing the condition of all existing buildings in Greater Yangon and formulate land use regulation.



Site Picture of Surveying CBD

Site Picture of Making Database

Source: JICA Study Team

**Figure 2.1.23: Site Pictures on the Development of Database for Urban Planning**

(3) Proposal of Land Use Regulation

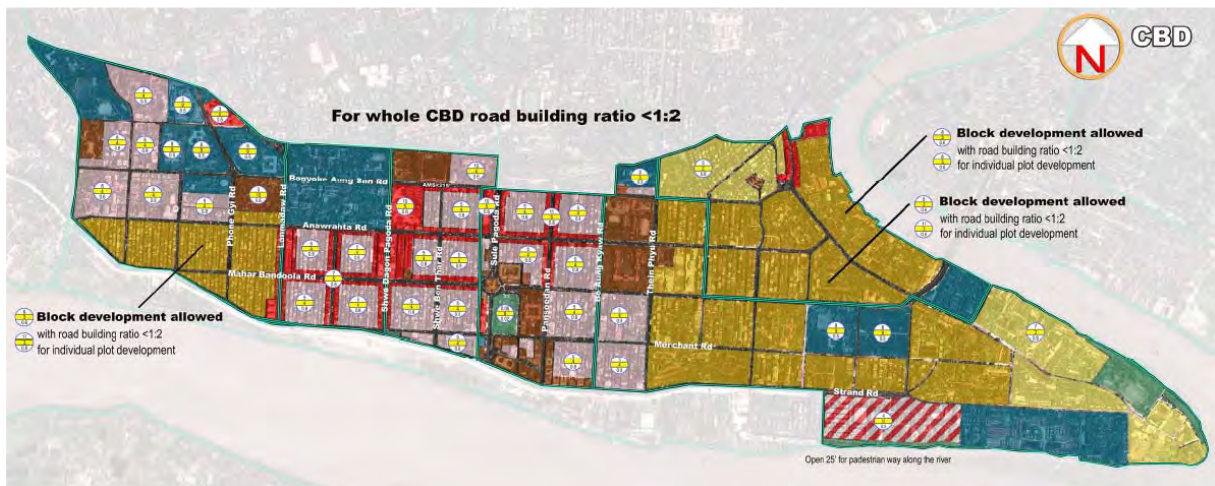
“Land Use Zoning Working Committee” gathered regularly to discuss the land use regulation scheme (coverage ratio, floor volume ratio, and building use). Through this consultation, a draft proposal of land use rules and regulations has been prepared by the committee. This regulation has been not enforced yet, and it shall be further refined and modified through public consultations by the committee without JICA Study Team after completion of this Study.

Figures 2.1.24 to 2.1.26 show the land use regulations maps in CBD drafted and proposed by Myanmar side, namely “Land Use Zoning Working Committee”.



Source: Yangon City Comprehensive Land use, Zoning and Urban Design Review Working Committee

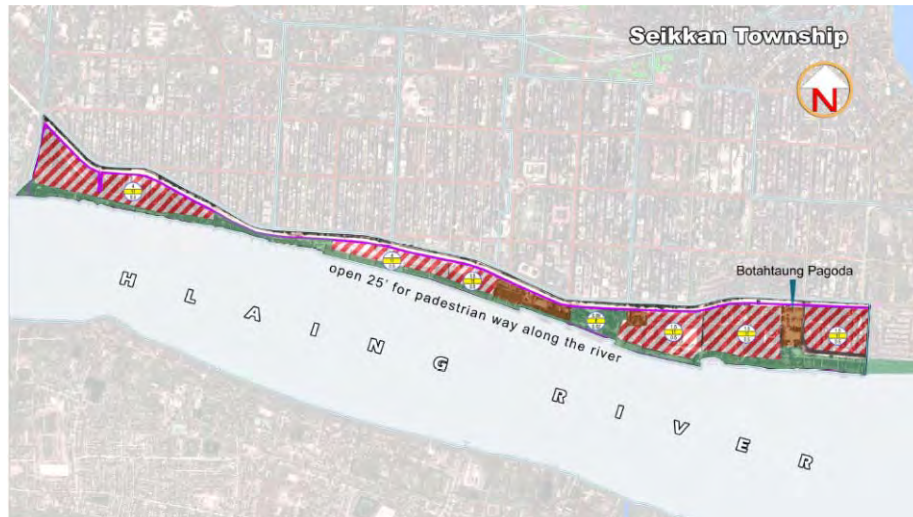
**Figure 2.1.24: Land Use Regulation in CBD  
【The First Draft from Myanmar Side “Working Committee”】**



Source: Yangon City Comprehensive Land use, Zoning and Urban Design Review Working Committee

**Figure 2.1.25: Land Use Regulation of CBD  
【The Draft from Myanmar Side “Working Committee” as of December 2013】**





Source: Yangon City Comprehensive Land use, Zoning and Urban Design Review Working Committee

**Figure 2.1.26: Land Use Regulation of CBD (Port Area)**  
**【The Draft from Myanmar Side “Working Committee” as of December 2013】**

Issues on enforcement of land use regulation are as follows:

- ✧ Landscape plan excludes the heritage zones.
- ✧ Currently, the center of CBD functions for business and commercial purposes. However, future stringent regulation on the height of new buildings may cause some negative effects for the economic development of Myanmar. Thus, the regulation has to be considered with caution.
- ✧ When constructing a new building, there is currently no standard for the mandatory parking space requirement, which will need consideration in the near future.
- ✧ With respect to the renovation of heritage buildings, only facilities that are on the list of the Heritage Buildings designated by YCDC have been the subject of conservation, while there is no policy on other old buildings.
- ✧ It is then necessary to formalize land use regulation in CBD as the existing regulation measures are insufficient.

## 1.4 Historic and Cultural Heritage Conservation

### (1) Outline and Methodology

#### 1) Outline

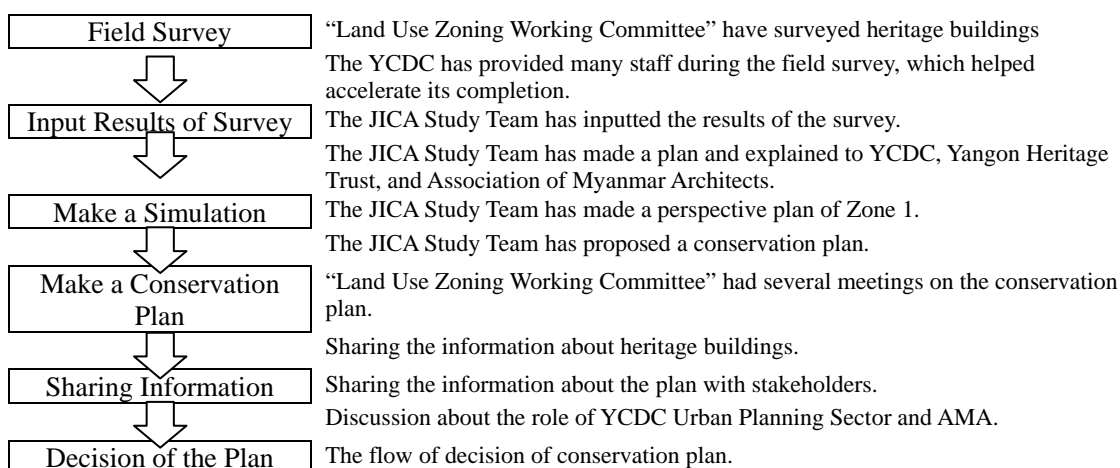
There were over 189 heritage buildings in Yangon City which YCDC designated, while other old buildings have not yet been listed by YCDC. These old buildings are of high importance for the identity of Yangon as a historic city, as well as for the source of tourist attraction and historical studies.

For these reasons, a district where a number of heritage buildings are accumulated must be kept in good condition and landscape. In the near future, such heritage buildings will be positively utilized for tourist attraction while maintaining the outlook of buildings. Respected private companies or organizations may utilize these heritage buildings for hotels or restaurants, while maintaining and preserving the buildings.

Thus, a district of historical heritages must be subject to strengthened regulations on the conversion of the buildings. Incentives to protect this regulation are proposed.

#### 2) Methodology

The process of formulating rules for cultural heritage conservation is as follows:



Source: JICA Study Team

**Figure 2.1.27: Process of Formulating Rules for Cultural Heritage Conservation**

#### a) Survey Area

Two survey areas have been selected, as shown in Figure 2.1.28, based on the following reasons:



Source: JICA Study Team

**Figure 2.1.28: Study Areas**

## (2) Existing Situation

The CBD area is located in the central part of Greater Yangon. Offices, commercial buildings, and residences are concentrated in this area, as well as many historical buildings. The existing situation of the historical buildings in CBD is presented below (refer to Figure 2.1.29 for some photographs):

- ✧ In the CBD area, there are many dilapidated buildings, which the Construction Bureau of YCDC has categorized as "dangerous buildings". However, despite this categorization, a number of buildings are continued for use, for example, the first floor is for shops while the second floor and above are for housing. The risk of these buildings collapsing by themselves or by earthquake is high.
- ✧ The existing building regulation is only for building height that is based on the road width in front of buildings, and no other regulations such as for coverage ratio and floor volume ratio are available at present. Therefore, the overall street landscape in urban areas is not regulated.
- ✧ There is no regulation for landscape carried out in Greater Yangon, therefore, the heritage buildings cannot be protected.
- ✧ There are no funds for the protection and repair of heritage buildings, and some of the old buildings have already decayed.
- ✧ There are some buildings with irregularly reduced floor heights to increase the number of floors.

◇ There are quite a few buildings in CBD owned by YCDC, some of which are vacant and very old.



Source: JICA Study Team

**Figure 2.1.29: Existing Heritage Buildings in CBD**

### (3) Issues of Heritage Buildings

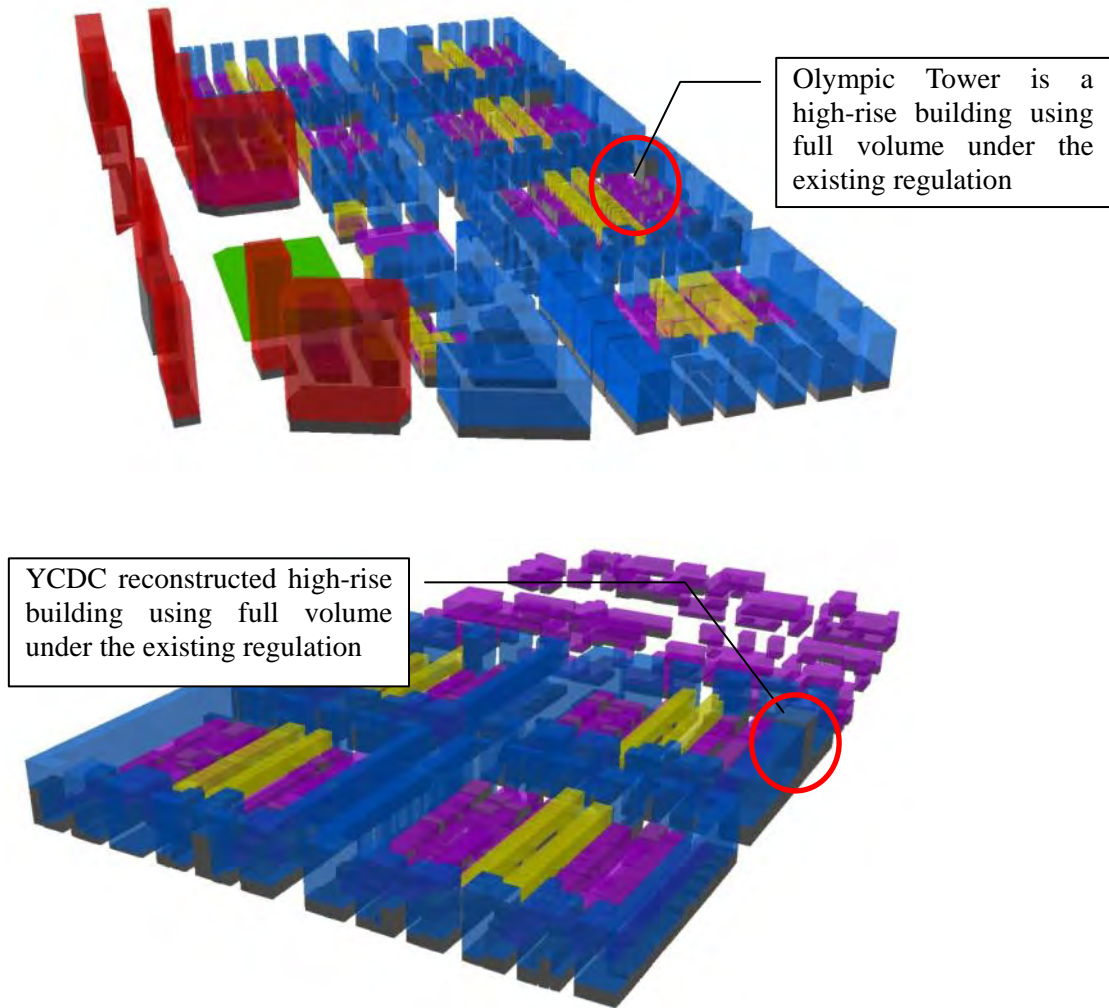
The condition of heritage buildings in CBD could be worse in the future. Some of the outstanding issues are as follows:

#### 1) Realignment of the list of heritage buildings in CBD

If heritage buildings are not used, these buildings will eventually decay. There is a need to create a way to make positive use of heritage buildings. Furthermore, YCDC, Yangon Heritage Trust, and Association of Myanmar Architects must make a list of buildings that are eligible for positive use.

#### 2) Introduction of new regulations (coverage ratio, floor volume ratio, and building height limitation)

The existing regulation based on the road width in front of the building must be revised to cover coverage ratio, floor volume ratio, and building height limitation. The difference in full volume of floor ratio of the existing regulation and existing building floor volume is large, as shown in Figure 2.1.30. In the future, if new buildings with full use of floor volumes will be built, it would be difficult to secure smooth traffic flow and maintain the landscape.



Source: JICA Study Team

**Figure 2.1.30: Difference in Existing Regulation and Existing Buildings**

(Gray buildings are the existing building height and other colors are full volume under regulation)

3) Proposal on getting funds for the repair of heritage buildings

For information on ensuring the renovation costs for heritage buildings in CBD, the JICA Study Team prepared a proposal from the point of view of urban planning to consider the possibility.

4) Promotion of reconstruction dangerous buildings categorized by YCDC in cooperation with land owners and floor owners

A strategy will be proposed to promote the reconstruction and cooperative management of dangerous buildings in CBD. This strategy will become the new role of the YCDC City Planning Section.

(4) Work and Discussion

1) Survey on heritage buildings

In the course of planning, the YCDC Urban Planning Section and the JICA Study Team discovered the importance to understand the existing conditions of heritage buildings, and thus started to carry out a survey on heritage buildings in Zones 1 and 2. The YCDC Urban Planning Section has organized a survey team for this activity. This survey team has checked four items of building information, namely number of floors, building use, year of establishment, and photographs. The survey team has also measured the road width in front of heritage buildings, as shown in Figure 2.1.31.

Some high-rise buildings may be over the existing limit of building height in relation to the road width in front. As Zones 1 and 2 are very important areas for tourism, the landscape of heritage zones will have to be carefully managed in the future.



Source: JICA Study Team

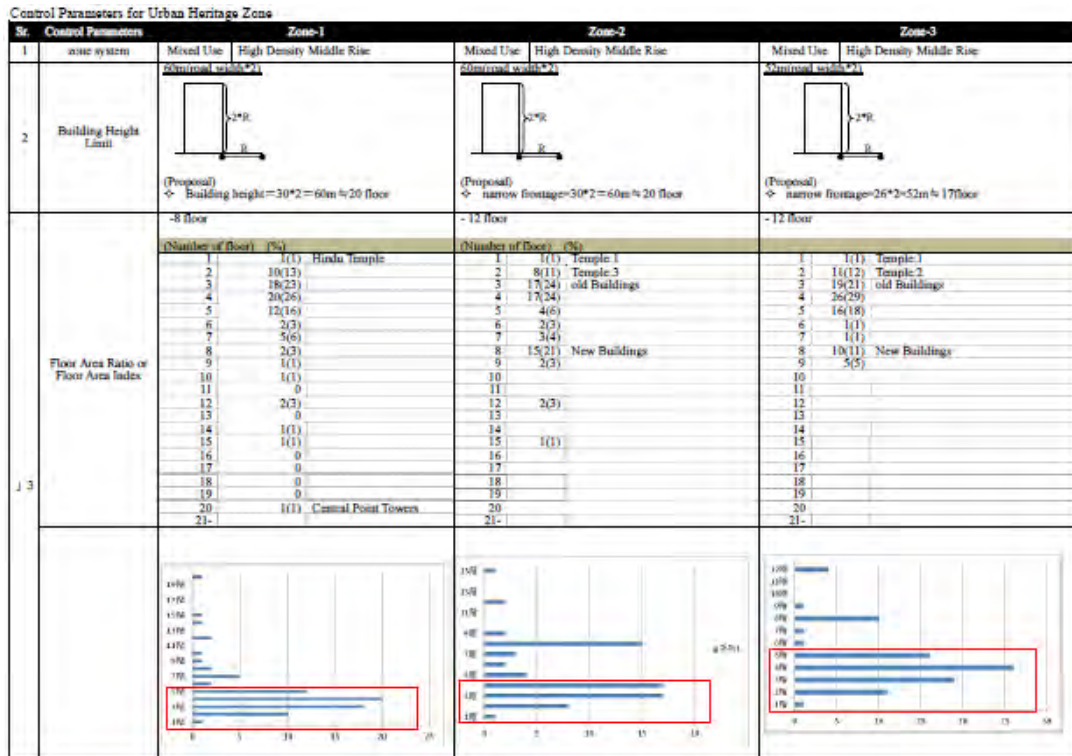
Figure 2.1.31: Field Survey on Heritage Zones

Result of Survey (1)

No.	1	2	3	4	5	6	7	8	9
Photo									
Houses (population)	-	28(140)	6(30)	7(35)	6(30)	2(10)	7(35)	6(30)	9(45)
Floor use	second-	Houses	Houses	Houses	Houses	Houses	Houses	Houses	Houses
	GF	-	Shop	Shop	Shop	House	Shop	Shop	Houses
Establishment	-	2000	-	-	-	-	-	-	1956
Road Width	7.45-15.3-7.45(30.2) Limit of Building high is about 60m								
Number of floor	-	8	3	9	3	3	8	3	4
Building High (*3.0)	-	24	9	27	9	9	24	9	12
Coverage(%)	-	100	100	100	100	100	100	100	100
Floor area ratio	-	800	300	900	300	300	800	300	400

Source: JICA Study Team

Figure 2.1.32: Survey Sheet of Heritage Area (Extract)



Source: JICA Study Team

Figure 2.1.33: Existing Situation on Number of Floors (Extract)

2) Contents

a) Existing Situation of Heritage Buildings

(i) Zone 1

There are 34 old buildings, which includes the Sule Pagoda, concentrated in the Central Heritage Zone (tentative name), or Zone 1. Figure 2.1.34 maps the location of heritage buildings and their corresponding names. Some heritage buildings are used for office or commercial purposes. For example, as seen in Figure 2.1.34, Building No. 2 is used as YCDC's office. Some of these old buildings have become dangerous. When formulating a conservation plan for this zone, an activity plan for heritage buildings must be considered.

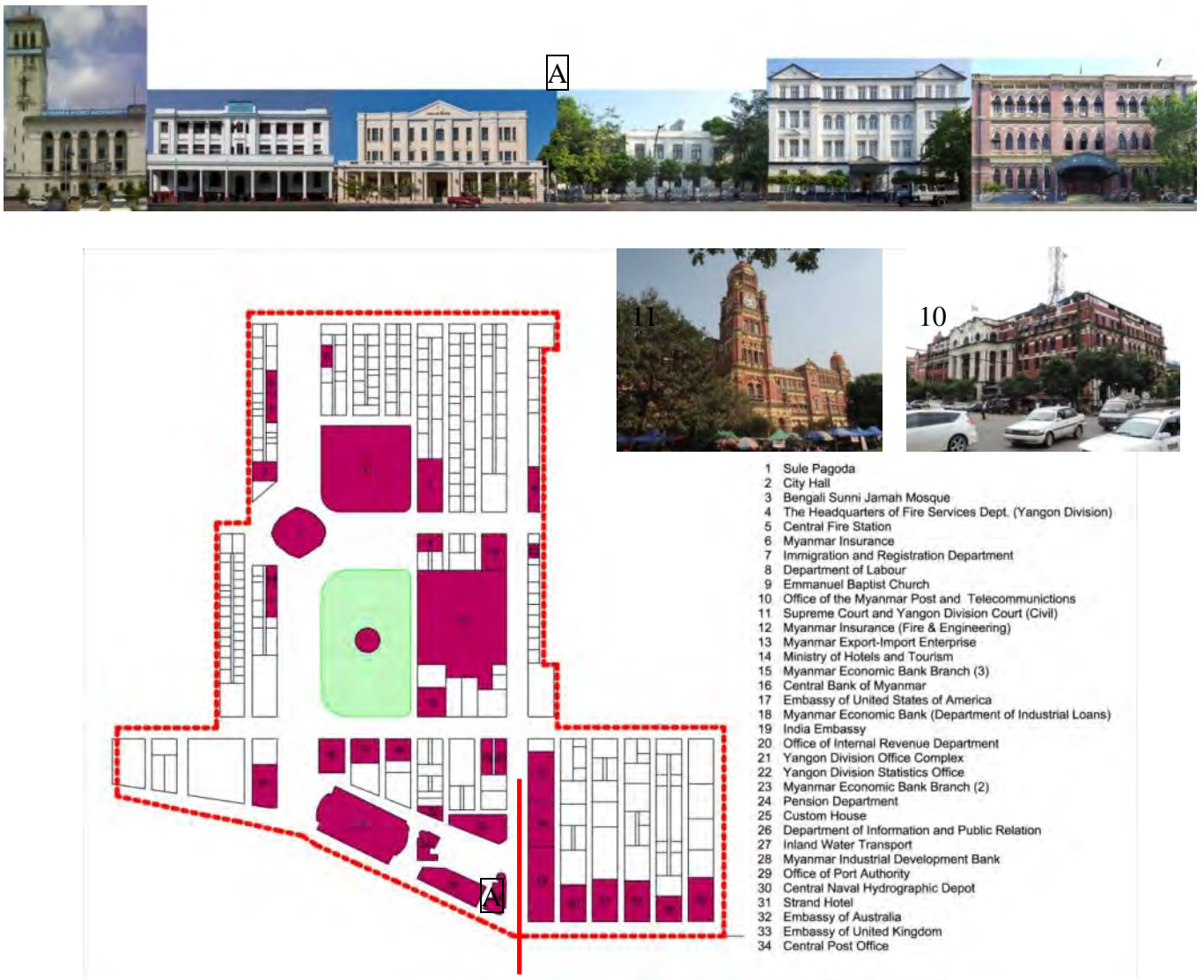


Figure 2.1.34: Distribution of Heritage Buildings in Zone 1



(ii) Zone 2

The Secretariat Heritage Zone (tentative name), or Zone 2, is located east of the Central Heritage Zone, and this area surrounds the secretariat building. This area is occupied by other buildings such as Saint Paul's Cathedral, schools, DHSHD building, and the Printing and Publishing Enterprise, as shown in Figure 2.1.35.

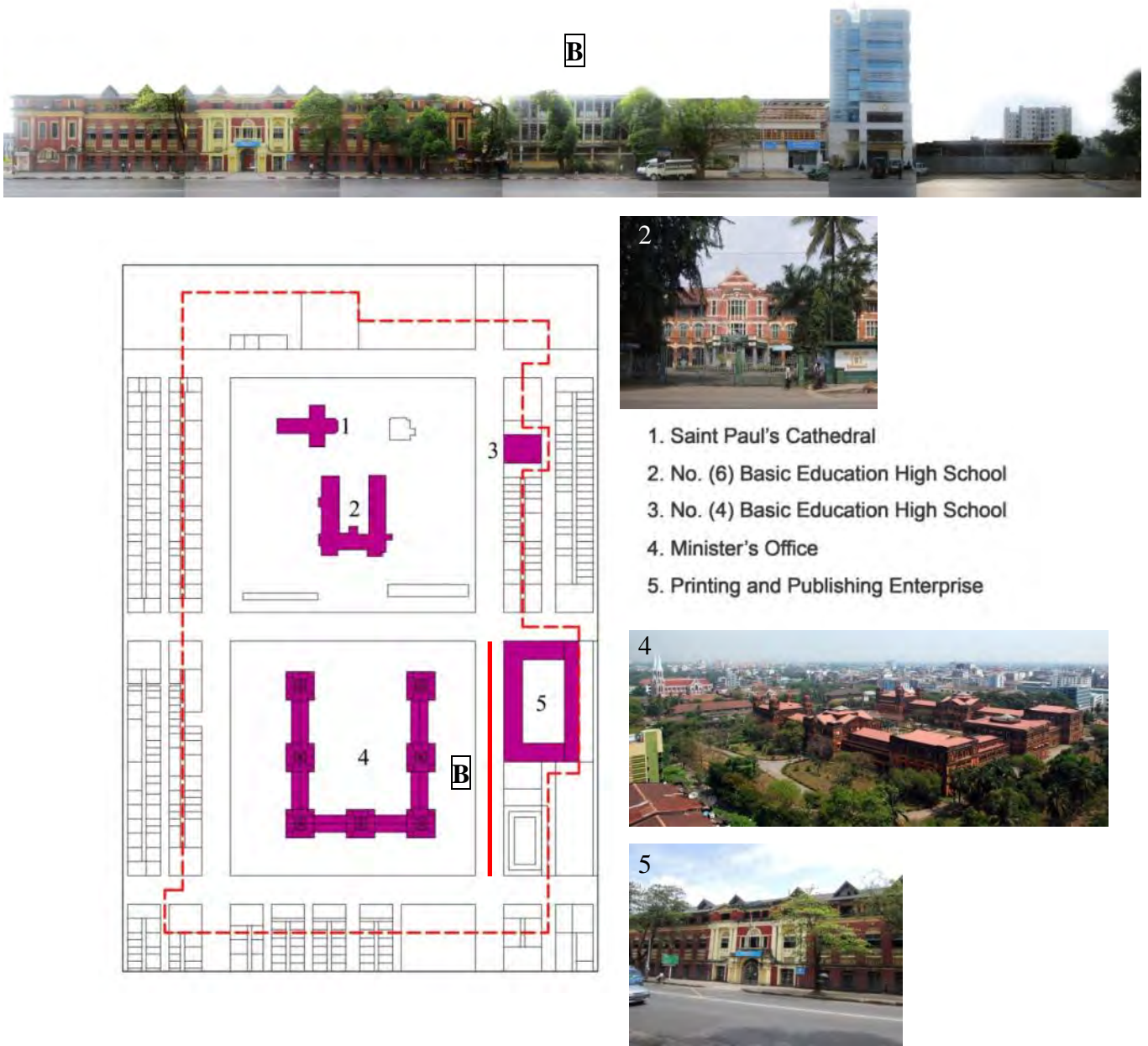


Figure 2.1.35: Distribution of Heritage Buildings in Zone 2

(iii) *Other areas*

The Sule Pagoda Road, which is located in the center of CBD, passing from north to south, has a width of over 60 m. Tall buildings such as Traders Hotel and Sakura Tower are located on the roadside of this road. While Sule Pagoda Road is symbolic in the Yangon urban areas, there are proposed plans for constructing new high-rise buildings along this street.

Sule Pagoda, together with Shwe Dagon Pagoda, is one of the most important landmarks in Yangon. Therefore, multi-disciplinary measures to maintain and preserve the landscape of Sule Pagoda must be considered in line with existing regulations in effect in the Shwe Dagon Pagoda area.

A sample sheet used in the survey is shown in Figure 2.1.36. A sample sheet showing control parameters of the survey is shown in Figure 2.1.37.



Source: JICA Study Team

**Figure 2.1.36: Current Landscape Section of Sule Pagoda Street**

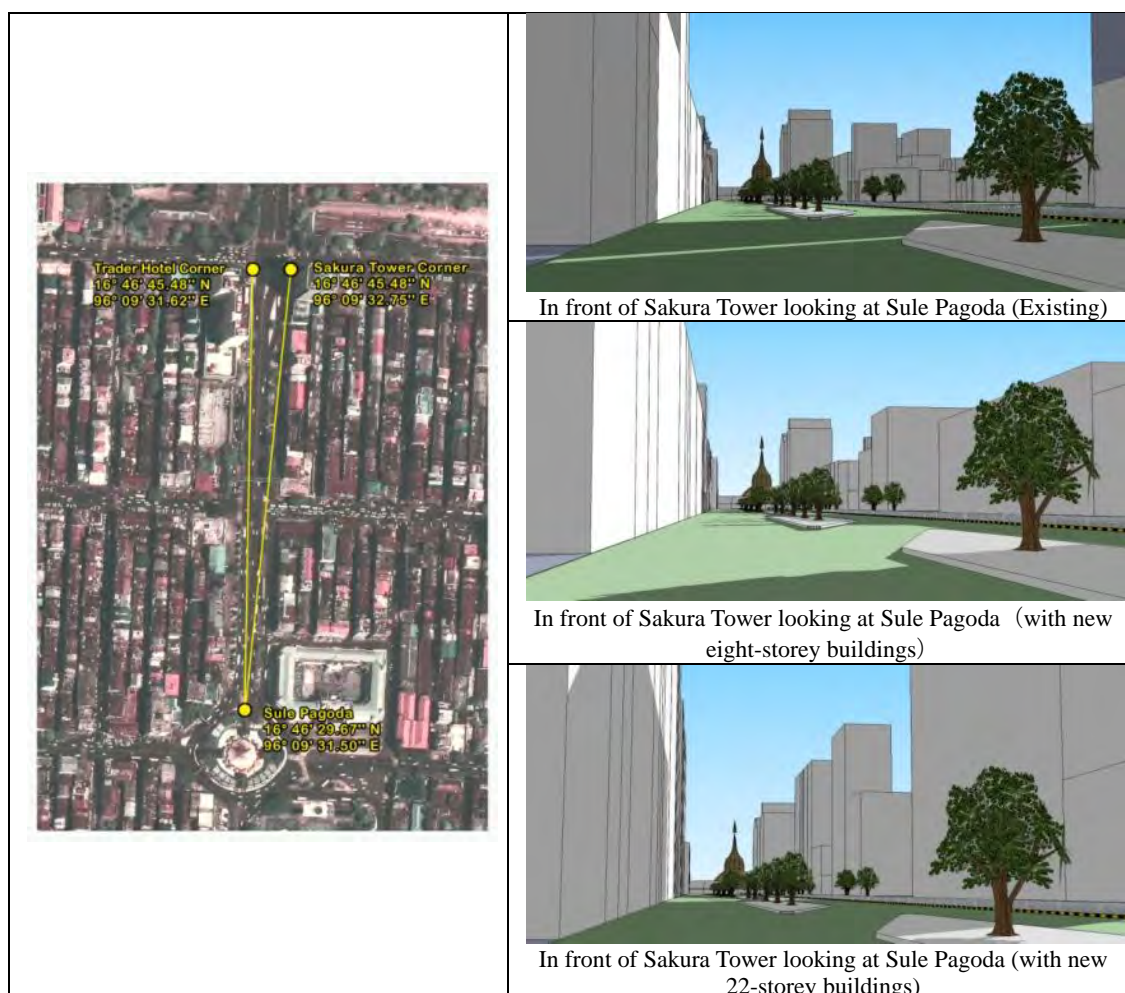
b) *Proposal for Heritage Zones 1 and 2 Conservation Plan*

“Land Use Zoning Working Committee” have proposed a heritage buildings conservation plan that focuses on the following:

- ✧ To decide on the heritage conservation zones;
- ✧ To introduce an urban planning system (coverage ratio, floor volume ratio, land use regulation);
- ✧ To introduce the code for controlling landscape and signboards/billboards; and
- ✧ To breakdown heritage buildings into three groups: 1) heritage buildings that are listed by YCDC, 2) buildings not included in YCDC’s list but have historical value, and 3) buildings without historical value. Afterwards, a plan for positive use of heritage buildings will be made.

c) *Conservation of Sule Pagoda Visual Axis*

As Sule Pagoda is symbolic in CBD, the view of the pagoda must be respected and considered in the future skyline of Yangon CBD. Figure 2.1.37 shows the simulated landscape views of Sule Pagoda.



Source: JICA Study Team

**Figure 2.1.37: Sule Pagoda Axis Landscape Simulations**

(5) Proposed Plan

For the urban planning and zoning scheme of CBD, “Land Use Zoning Working Committee” discussed and proposed a plan for the conservation of heritage zones, as follows:

1) Strengthening of floor area ratio and building coverage limits in heritage zones

The average number of building floors Zones 1 and 2 is about five stories. If taller building will be constructed, these high-rise building will inevitably impair the historical landscape of Pansodan and Strand streets. For this reason, ZUDRWC has discussed and proposed a plan to restrain the construction of high-rise buildings in excess of the average height of existing buildings in the two heritage zones.

2) Unification of floor height of buildings

The existing regulation on buildings is referenced to the width of the adjacent road. For this reason, some buildings were constructed with reduced floor heights in order to increase the number of floors, as shown in Figure 2.1.38. Such a case, if adopted for high-rise building, would mar the formation of a continuous facade. For this reason, ZUDRWC has discussed and proposed to align the floor height of the buildings.



Source: JICA Study Team

**Figure 2.1.38: Unification of Floor Height of Buildings**

3) Limit on the installation of billboards

Some buildings are posted with eye-catching outdoor advertisement covering the facade of buildings. Bright colors and materials used for outdoor advertisement may interrupt the continuity and integrity of the arterial roadside landscape, as shown in Figure 2.1.39. Particularly, using bright red or blue colors for advertisements may impair the landscape of the city. For this reason, ZUDRWC has discussed and proposed to limit the posting of outdoor advertising materials, such as billboards that cover buildings.



Source: JICA Study Team

**Figure 2.1.39: Limitation of Billboard Installation**

4) Prohibition of monotonous facade design of the and consideration of design on building side

Many heritage buildings stand at 3-5 floors. Some high-rise buildings align the design from the ground level up to the top of heritage buildings to ensure the continuity of the facade. In addition, buildings constructed on the front curtain wall are frequently seen in the CBD area. Such design of buildings impedes the continuity of the roadside landscape. For this reason, ZUDRWC has discussed and proposed that buildings to be constructed must consider the continuity of the façade design of nearby heritage buildings.

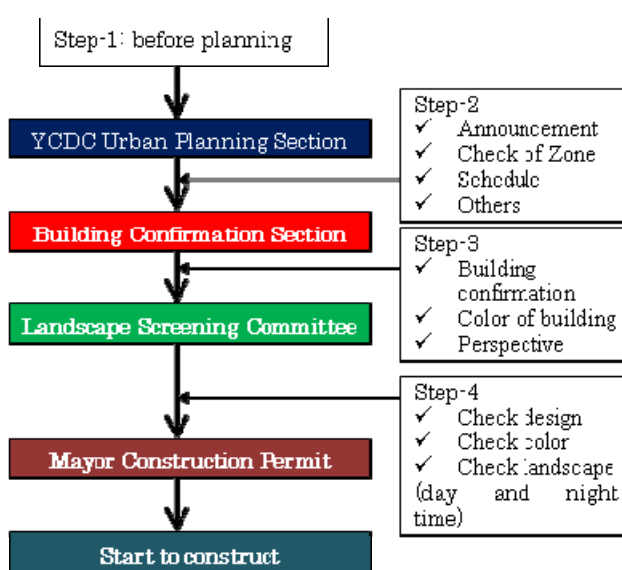


Source: JICA Study Team

**Figure 2.1.40: Monotonous Building Façade Design**

5) Establishment of the Yangon Landscape Council

For the review of building plans as mentioned in items 1) to 4) above, as well as the review of architectural design, color, etc., professional advice or consultation is needed. For this reason, the JICA Study Team proposed the organization of a landscape council that will be consisted of YCDC, Yangon Heritage Trust, Association of Myanmar Architects, and other professionals from related fields of learning and experience. The role of the proposed Yangon Landscape Council is as shown in Figure 2.1.41.



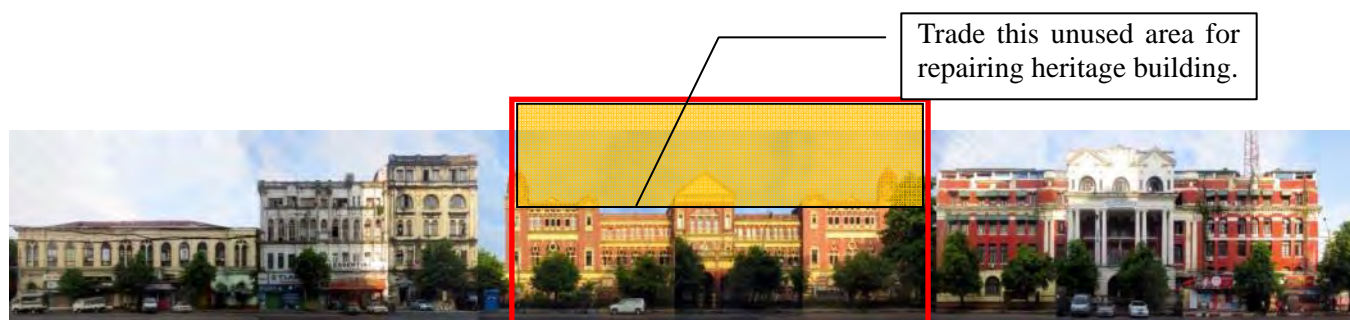
Source: JICA Study Team

Figure 2.1.41: Yangon Landscape Council

6) Transfer of development right (proposed)

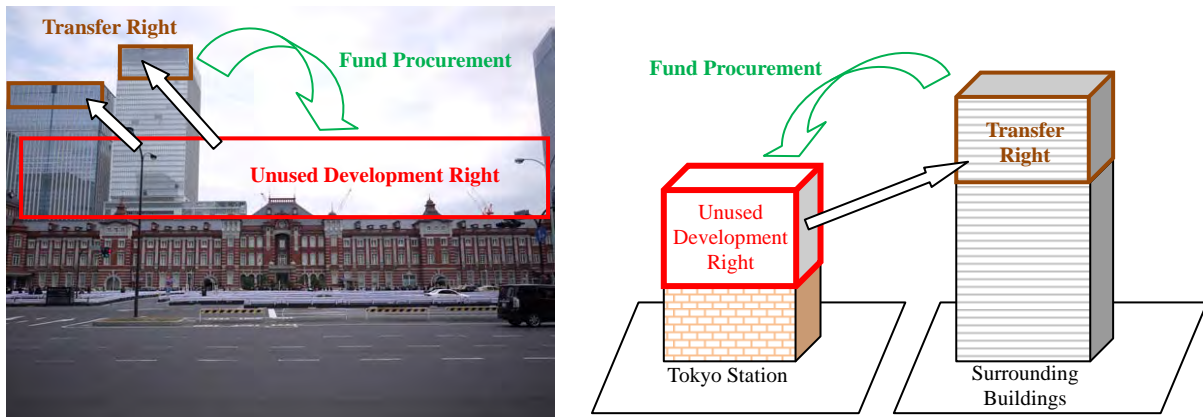
Most of heritage buildings in the CBD have been in existence for at least 100 years, and the aging of the buildings is serious in both the interior and exterior. Private firms and organizations that will utilize these heritage buildings for commercial or business purposes should consider seismic enhancement measures, air conditioning equipment refurbishment and lifting, and building renovation. In addition, heritage buildings often do not take full use of the floor volume ratio and coverage as specified for the future. For this reason, heritage buildings have a surplus of floor volume rate.

The TDR will allow surplus floor volume at heritage sites to be traded for money to other parties who intends to develop in other locations. For example, the owner of a heritage building who has agreed to restore heritage building and keep the landscape in good condition will be allowed to sell the surplus floor volume to a party seeking to develop in other areas. The owner of the heritage building will then obtain funds that can be used to perform restoration works on heritage buildings. As an example, for the heritage building on the west side of Pansodan Street, if the regional government will set a 600% volume floor ratio, it will be 300% or more in excess of the High Court building's surplus. This surplus will be traded in the market and funds will be generated for the repair of the building. Figure 2.1.42 illustrates the transfer of development right for heritage buildings.



Source: JICA Study Team

Figure 2.1.42: Transfer of Development Right (TDR)



Source: JICA Study Team

**Figure 2.1.43: An Example of Transfer of Development Right (TDR) in Japan (Tokyo Station)**

## 2 Regional Development (Urbanized Area and the North-East Region)

### 2.1 Introduction

#### (1) Objectives

The objectives for township land use planning are as follows:

- ✧ To formulate a detailed development plan for urbanized area, in which urban redevelopment will be taken in accordance with circular railway improvement and urbanizing area in the short term, and new urban development will be taken in the short term, in order to realize the proposed strategic urban development plan of Greater Yangon. The land use plans should be linked with the master plan made by the townships.
- ✧ To do technical transfer through good experience of cooperative planning works with YCDC, the townships, and the JICA Study Team.

#### (2) Main Outputs

- ✧ Map and Information Data of Current Conditions
- ✧ Map and Information Data of Future Development Plan (long-term target of 2040)

#### (3) Work Schedule

Step 1: May-June 2013 Works for Reviewing Current Conditions

Step 2: July-August 2013 Works for Planning Land Use and Infrastructure

#### (4) Main Players of the Planning Work

The works for both reviewing current conditions and planning land use and infrastructure have been conducted with close coordination among the following concerned organizations:

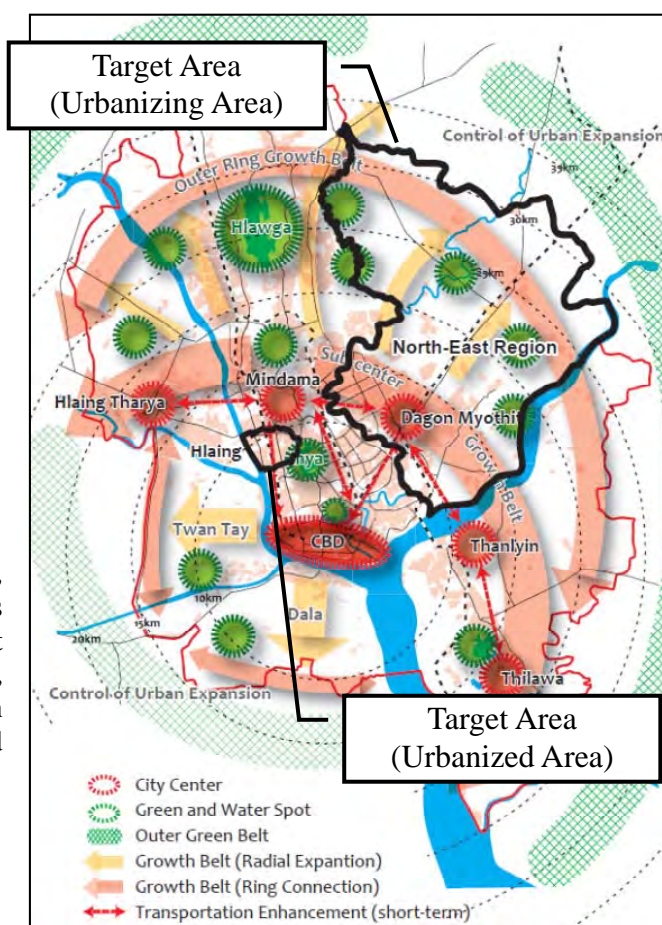
- ✧ General Administration Department, Township;
- ✧ Urban Planning Division, Engineer Department (Building), Engineer Department (Water and Sanitation), Engineer Department (Road and Bridge), Parks and Playground Department of YCDC;
- ✧ Urban and Regional Planning Division, Department of Human Settlement and Housing Development, MOC; and
- ✧ JICA Study Team.

#### (5) Target Area

The target area of these works consists of Hlaing Township as the urbanized area and the North-East Region of Greater Yangon as the urbanizing area in the short term. The target area consists of the following six townships:

- 1) Urbanized Area
  - ✓ Hlaing Township
- 2) Urbanizing Area in the Short Term
  - ✓ North Dagon Township
  - ✓ South Dagon Township
  - ✓ East Dagon Township
  - ✓ Dagon Seikkan Township
  - ✓ Hlegu Township

Regarding the works for urbanizing areas, discussions and works with the townships and YCDC were carried out only in East Dagon, Dagon Seikkan and Hlegu townships, and not in North Dagon and South Dagon townships due to limited manpower and time.



Source: JICA Study Team

**Figure 2.2.1: Target Area of the Works**

(6) A Review of Proposed Development Policies in the Strategic Urban Development Plan

1) Development Framework for 2040

(a) Urbanized Area of Hlaing Township

Currently, Hlaing Township has a population of 151,014 in 2011 and an area of approximately 1,000ha. According to the strategic urban development plan, the future population in 2040 is forecasted as 163,012 persons in the same area, which means a 108% growth of the current year.

**Table 2.2.1: Development Framework for 2040 in Hlaing Township**

Township	Area (ha)	Current Status (2011)			Future Forecast (2040)	
		Population	Population Density	Growth Rate	Population	Housing Units
Hlaing	1,000	151,014	151 persons/ha	-0.81%/year	163,012 (108%)	+2,400

Source: JICA Study Team

(b) Urbanizing Area in the Short Term of the North-East Region

Currently, the North-East Region has a population of 908,000 in 2011 and an area of approximately 37,600ha. According to the strategic urban development plan, the future population in 2040 is forecasted as 2,953,979 persons in the same area, meaning 325% growth from the current year.



**Table 2.2.2: Development Framework for 2040 in the North-East Region**

Township	Area (ha)	Current Status (2011)			Future Forecast (2040)	
		Population	Population Density	Growth Rate	Population	Housing Units
North Dagon	2,400	221,200	92 persons/ha	6.16%/year	287,188 (130%)	+13,000
South Dagon	3,800	370,403	97 persons/ha	7.75%/year	550,371 (149%)	+36,000
East Dagon	17,100	145,505	9 persons/ha	7.74%/year	1,183,320 (813%)	+208,000
Dagon Seikkan	4,200	120,161	29 persons/ha	15.59%/year	399,111 (332%)	+56,000
Hlegu (a part)	10,100	50,793	5 persons/ha	(no data)	533,707 (1,051%)	+97,000
Total	37,600	908,062	24 persons/ha	-	2,953,697 (325%)	+410,000

Source: JICA Study Team

## 2) Urban and Infrastructure Development Strategies

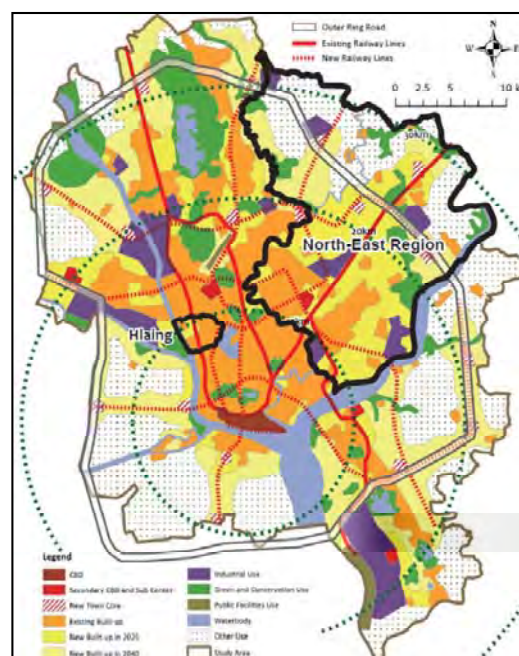
The following main urban and infrastructure development in the North-East Region are expected not only in the short term but also in the medium and long term:

### (a) Urbanized Area of Hlaing Township

- ✓ Improvement of the Inner Ring Road.
- ✓ Modernization of circular railway.
- ✓ Construction of a new Urban Mass Rapid Transit (hereinafter “UMRT”) line.
- ✓ Relocation of industrial zones in the suburbs.

### (b) Urbanizing Area in the Short Term of the North-East Region

- ✓ Construction of two subcenters, namely “Dagon Myothit” and “Bago Riverside”.
- ✓ Construction of two or three new industrial zones along the Outer Ring Road .
- ✓ A number of large housing projects.
- ✓ Construction of the Outer Ring Road using existing National Road No.7.
- ✓ Improvement of National Road No. 2.
- ✓ Construction of a new bridge across the Bago River.
- ✓ Upgrading of the existing Mandalay Railway Line.
- ✓ Construction of three new UMRT lines.
- ✓ Construction of expressway and railway connecting the new international airport.



Source: JICA Study Team

**Figure 2.2.2: Future Development Plan of Greater Yangon**

## 2.2 Urbanized Area Development (Hlaing Township)

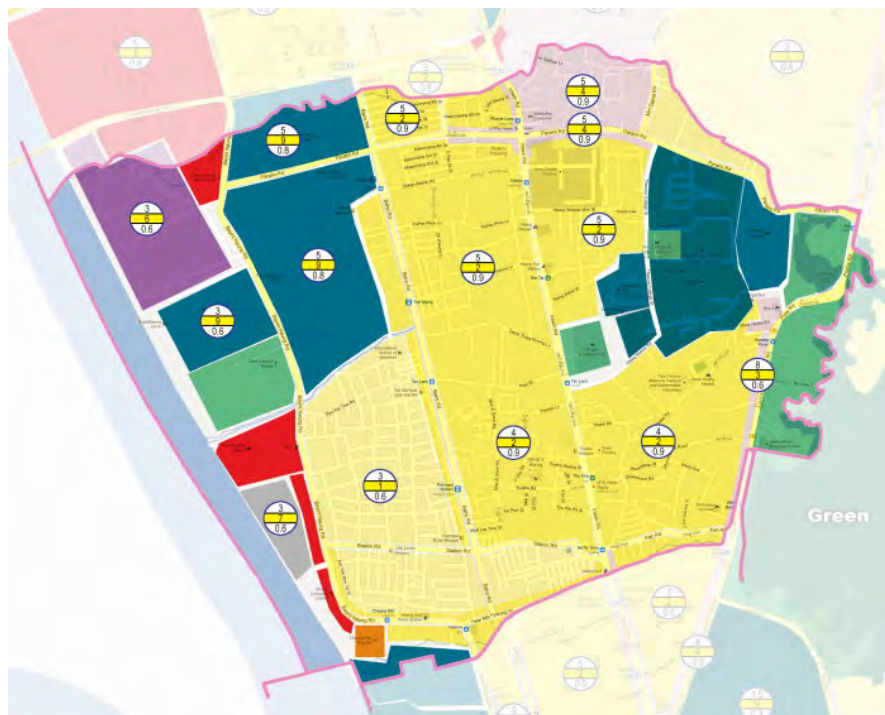
### (1) Work Process

#### 1) Outline

A series of discussion meetings was conducted among township officers, YCDC and the JICA Study Team in order to formulate the detailed future land use plan. YCDC has already made a land use plan for Hlaing Township. Based on this plan, the future land use plan was formulated by taking the following steps:

- ✓ Share the future land use plan of Yangon made in Phase I with the stakeholders, i.e., officers of Hlaing Township, YCDC, and the JICA Study Team.
- ✓ Achieve consensus among the abovementioned stakeholders on the need of a detailed future land use plan.
- ✓ Obtain from the township detailed data and information that are necessary for preparing the land use plan, such as current conditions of land use, service area of infrastructure and road network, and ongoing development projects and plans.
- ✓ Prepare a conceptual map, which includes future land use and road network, based on the land use plan made by YCDC considering the future population and designation of sub-arterial roads.
- ✓ Finalize the detailed land use plan based on the conceptual map and taking into account the results of discussions with the township and YCDC.

The land use plan prepared by YCDC is shown in Figure 2.2.3. This plan did not include the idea of a new public transportation system such as the upgrading the circular railway and the MRT proposed in the master plan.



Source: Yangon City Working Committee

**Figure 2.2.3: Land Use Zoning Scheme Proposed by the Yangon City Working Committee**

2) Records of Meetings

The schedule and contents of discussions of the meetings are summarized in Table 2.2.3 below.

**Table 2.2.3: Records of Meetings in Hlaing Township**

No.	Date (DD/MM/YY)	Main Topics	Attendees/ Organizations (No. of Persons)
1	16/May/2013	<ul style="list-style-type: none"> <li>To introduce the general procedure on township land use planning.</li> <li>To make a request for the preparation of basic information about the township area and township office, and introduce the contact person.</li> </ul>	YCDC (3) JICA Study Team (3) Township (2)
2	20/Jun./2013	<ul style="list-style-type: none"> <li>To obtain general information on the township.</li> <li>To confirm existing land use, infrastructure facilities and social service data.</li> </ul>	YCDC (3) JICA Study Team (2) Township (11)
3	9/July/2013	<ul style="list-style-type: none"> <li>To obtain the electricity service area map from the General Administration Department Office.</li> </ul>	GAD (1) YCDC (1) JICA Study Team (1)
4	31/July/2013	<ul style="list-style-type: none"> <li>To discuss basic ideas related to future land use and road network.</li> <li>To confirm future development of sub-arterial roads and high density residential area.</li> </ul>	YCDC (3) JICA Study Team (4) Township (3)
5	12/Aug./2013	<ul style="list-style-type: none"> <li>To explain about the draft concept map including future land use and road networks.</li> <li>To discuss about future vision.</li> </ul>	YCDC (3) JICA Study Team (3)
6	21/Aug./2013	<ul style="list-style-type: none"> <li>To explain about the concept map including future land use and road networks.</li> <li>To discuss about future land use.</li> </ul>	YCDC (3) JICA Study Team (2) Township (3)

Source: JICA Study Team



Source: JICA Study Team

**Figure 2.2.4: Photos of the Meeting in Hlaing Township**

(2) Results of the Works

1) Current Conditions

Hlaing Township is located in the middle of CBD and the Yangon airport. Urban land use of Hlaing Township has been progressing in the whole township due to its strategic location and good traffic conditions. The current conditions of Hlaing Township are summarized as follows:

- ✓ Population: Hlaing Township has a population of 151,014 persons (2011), and population density of 151 persons/ha.
- ✓ Natural Conditions: Hlaing Township is between the Hlaing River and Inya Lake, and its waterside has a good natural environment. Hlaing Township's land feature is

generally flat, except that its eastern side, the area surrounding Yangon University, is relatively high.

- ✓ **Industrial Structure and Land Use:** Hlaing Township has been developed as an urbanized area. Most of the urbanized area is exploited for residential use without any agricultural land use. Also, some industrial area has been identified along the Hlaing River. Since social and economic activities in Hlaing Township rely on the major arterial roads only, the lack of sub-arterial roads has not caused serious problems at the current traffic volumes. Major commercial facilities are concentrated along Bayint Naung Road including Thiri Mingalar Market and Yangon Insein Road.
- ✓ **Transportation and Infrastructure:** Four major arterial roads form the backbone of Hlaing Township stretching along the north and south directions, namely, Pyay Road, Yangon Insein Road, Baho Road, and Bayint Naung Road. Three railway stations of the circular railway exist; however no station plazas or large commercial facilities provided thereat.
- ✓ **Drainage and Flood:** There is concern that further land development would trigger serious flooding in the northern middle area of the township due to inadequate sewage system.
- ✓ **Living Condition, Social Services and Green & Park:** Hlaing Township's eastern area, which is to Yangon University, is recognized as a prestige residential area. In comparison with other townships, East Dagon Township provides education service in higher level, on the other hand, service level of community facilities and green & parks is relatively low.
- ✓ **Environmental and Social Matters:** Slums and squatters in this township are relatively small because urbanized area has been spread except areas along circular railway. A nature area near Inya Lake is conservation area as one of public parks in Yangon. There is no important natural area to be protected other than the Inya Lake.

**Table 2.2.4: Living Conditions, Social Services and Green & Parks (Hlaing Township)**

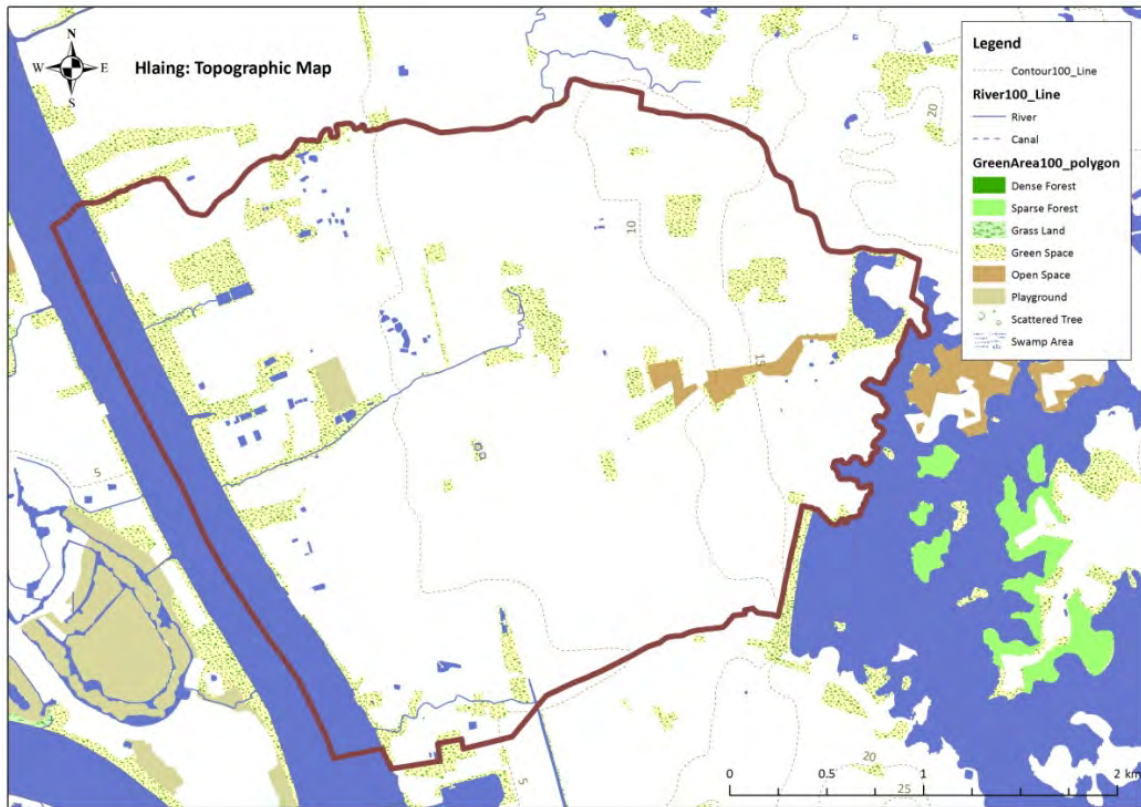
Item	Contents	Number
Education	No. of University & College/ No. Students	0
	No. of High School/ No. of Students	5/ 2,115
	No. of Middle School/ No. of Students	6/ 5,444
	No. of Primary School/ No. of Students	27/ 6,547
	No. of Pre School/ No. of Students	25/ 591
	No. of Monastery/ No. of Students	4/ 435
	Ratio of Students Eligible for University (%)	47.44
Health	No. of Hospital/ Clinic/ Maternity Center	0/ 114/ 1
	Death Rate during Child Birth (per 1,000)	3
Social Facility	No. of Pagoda/ Buddhist Temple	21/ 63
	No. of Church/ Mosque/ Hindu Temple/ Chinese Temple	0 / 0/ 0/ 0
	No. of Cinema/ Playground/ Park	0/ 0/ 0

Source: JICA Study Team



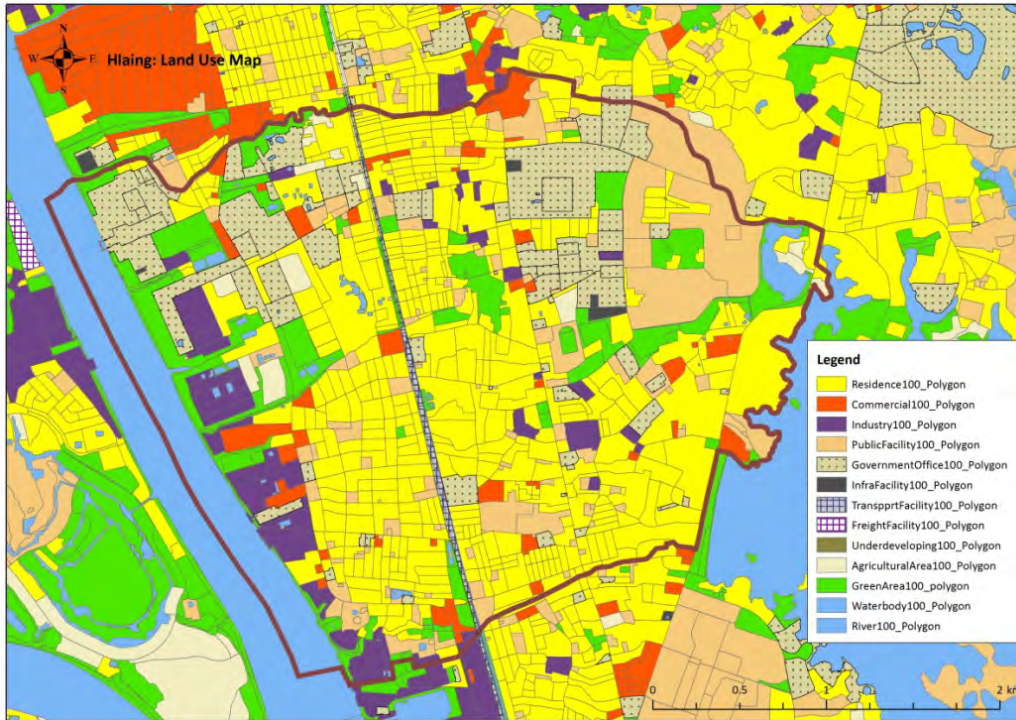
Source: JICA Study Team

**Figure 2.2.5: Photos of the Current Situation of Hlaing Township**



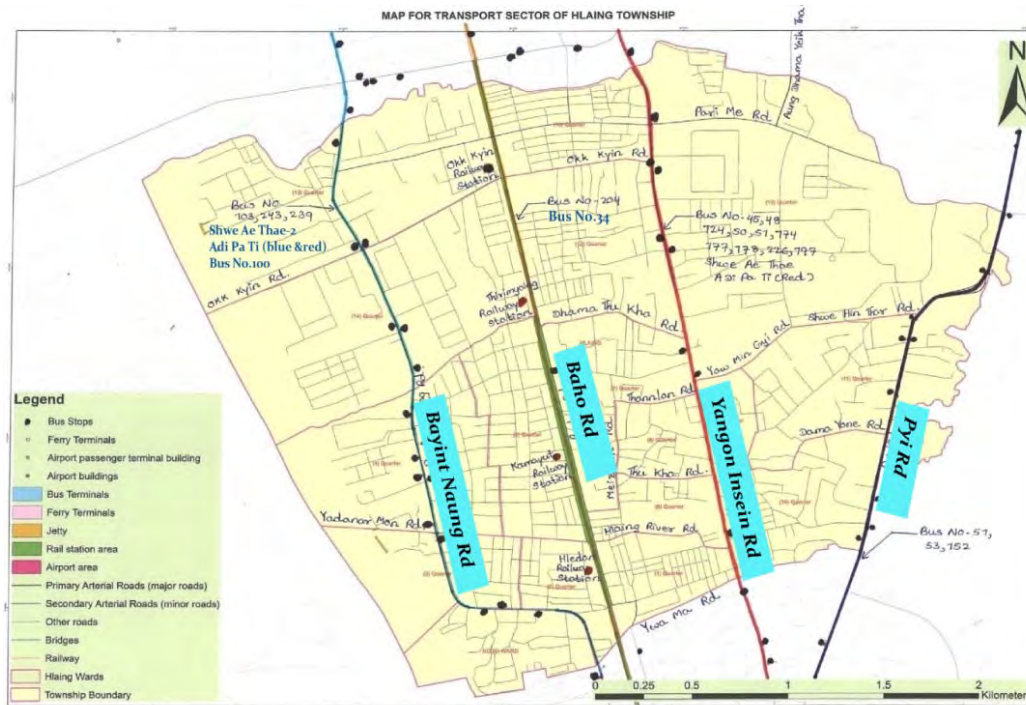
Source: JICA Study Team and the Working Team of Hlaing Township

**Figure 2.2.6: Current Topography of Hlaing Township**



Source: JICA Study Team and the Working Team of Hlaing Township

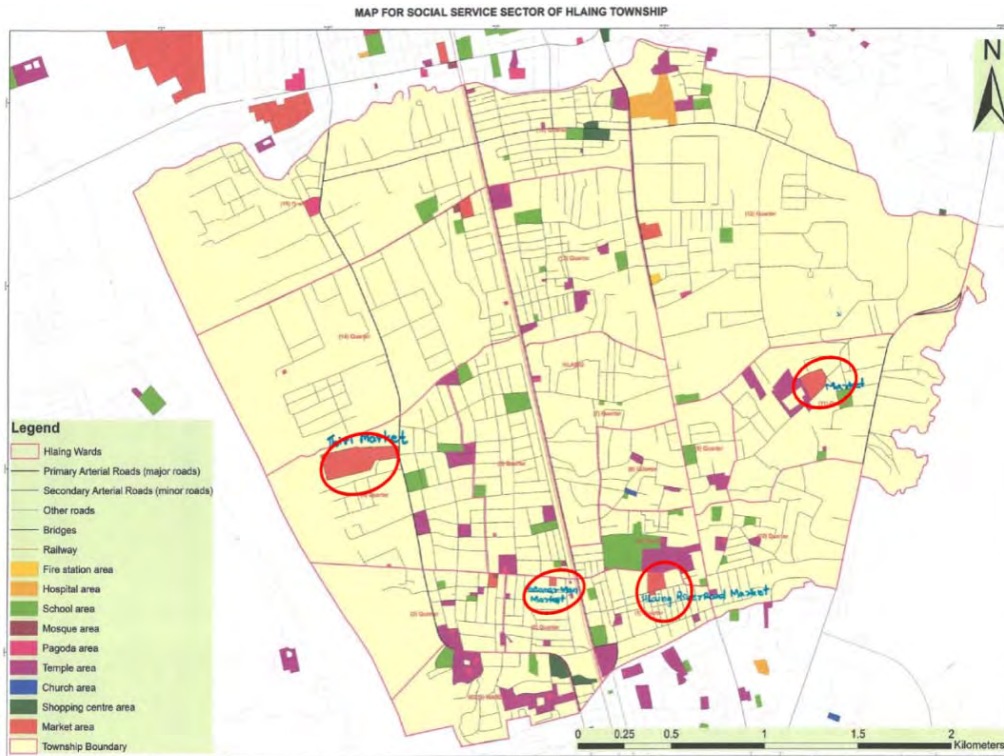
**Figure 2.2.7: Current Land Use of Hlaing Township**



Source: JICA Study Team and the Working Team of Hlaing Township

Note: As this map is the original map used by the working team in the meetings to understand the current situation as a sort of technical transferring work, it is noted that some written words are difficult to read.

**Figure 2.2.8: Current Road Network of Hlaing Township**



Source: JICA Study Team and the Working Team of Hlaing Township

Note: As this map is the original map used by the working team in the meetings to understand the current situation as a sort of technical transferring work, it is noted that some written words are difficult to read.

**Figure 2.2.9: Current Urban Utilities and Social Facilities of Hlaing Township**

## 2) Proposed Future Plan

Urban land use is already progressing in Hlaing Township. In order to upgrade Hlaing Township as a residential town taking advantage of its good location, formulation of a plan to make railway as a means of transportation for the people is needed.

In order to make an appropriate future plan for Hlaing Township, the following items need to be considered well:

- ✓ Improvement of railway stations and development of station plazas in accordance with the upgrading of the circular railway in order to increase railway users.
  - Improvement of facilities in the existing railway stations.
  - Development of commercial facilities and high density residences in the surrounding area of the railway stations.
  - Formulation of a city core with administrative functions near the railway stations.
- ✓ Development of new railway stations and station plazas for construction of a new UMRT line along Inya Lake.
  - Development of a new UMRT line (The new line was proposed in Phase I work. It is noted that continuous studies are necessary to make it realize)
  - Development of new railway stations.
  - Development of commercial facilities and high density residences near the new railway stations.
  - Formulation of a city core with administrative functions near the railway station.
- ✓ Formulation of a transport network corresponding to high density urbanization.

- Improvement of arterial and sub-arterial road networks in order to reduce traffic congestion.
- Upgrading the roads stretching from the east and west to sub-arterial roads in order to provide better access to the stations.
- ✓ Development of terminals for transferring between buses and private vehicles and railways in order to increase the efficiency of railway use.
  - Development of station plaza with parking facilities and access roads to the station.
- ✓ Long-term land use transformation from low density to medium or high density residential area in order to correspond with the increase in population.
  - Redevelopment of residential area with medium or high density population in order to provide good access to public transportation.
- ✓ Improvement of drainage facilities in order to prevent flood disaster.
  - Upgrading of drainage facilities using rivers and canals.
  - Development of urban parks and green spaces with flood control function.
- ✓ Sustainable urban development with mitigation of environmental and social negative impacts by means such as SEA concept
  - Technical transfer of SEA to the planners (in the Phase II the technical transfer workshop were taken place for SEA)

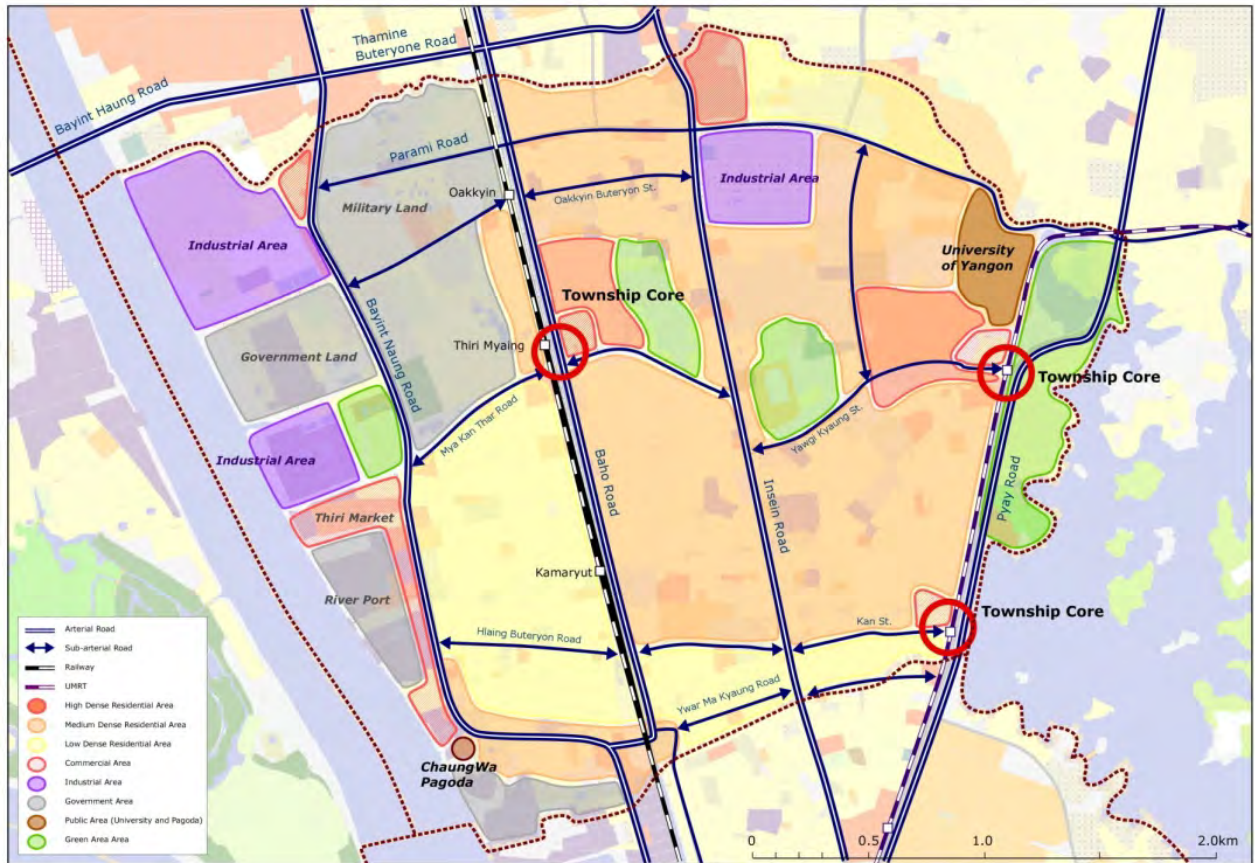
The conceptual map of future land use take into account the above ideas is shown in Figure 2.2.10 below. The red circles indicate the major centers of Hlaing Township. These three centers are planned in consideration of railway-based development for the expected development and upgrading of the railway system. It is proposed that the surrounding area of the center would be developed with station plaza with terminal space, commercial facilities, and high density residences.

Many areas are proposed to develop medium density residences in order to accommodate the future population. In particular, the west side of Yangon University is expected to be developed as a medium to high density residential area in order to exploit the advantages of its location and land features.

Besides, some existing roads are proposed to be developed as sub-arterial roads in order to connect them with the four major arterial roads mentioned above. The two-headed arrows in Figure 2.2.10 indicate these sub-arterial roads. These sub-arterial roads are expected to secure at least two-way traffic and restrict inappropriate roadside parking.

Due to current situation that Hlaing Township has already been urbanized relatively, land acquisition for new road development seems to be very difficult. The road traffic of the direction of east and west is community movement in Township except Parami Road, and is considered to perform function sufficient by widening the existing road. Moreover, in consideration of alleviation of traffic congestion, effective use of public transportation is expected as traffic access to the central part of Yangon.

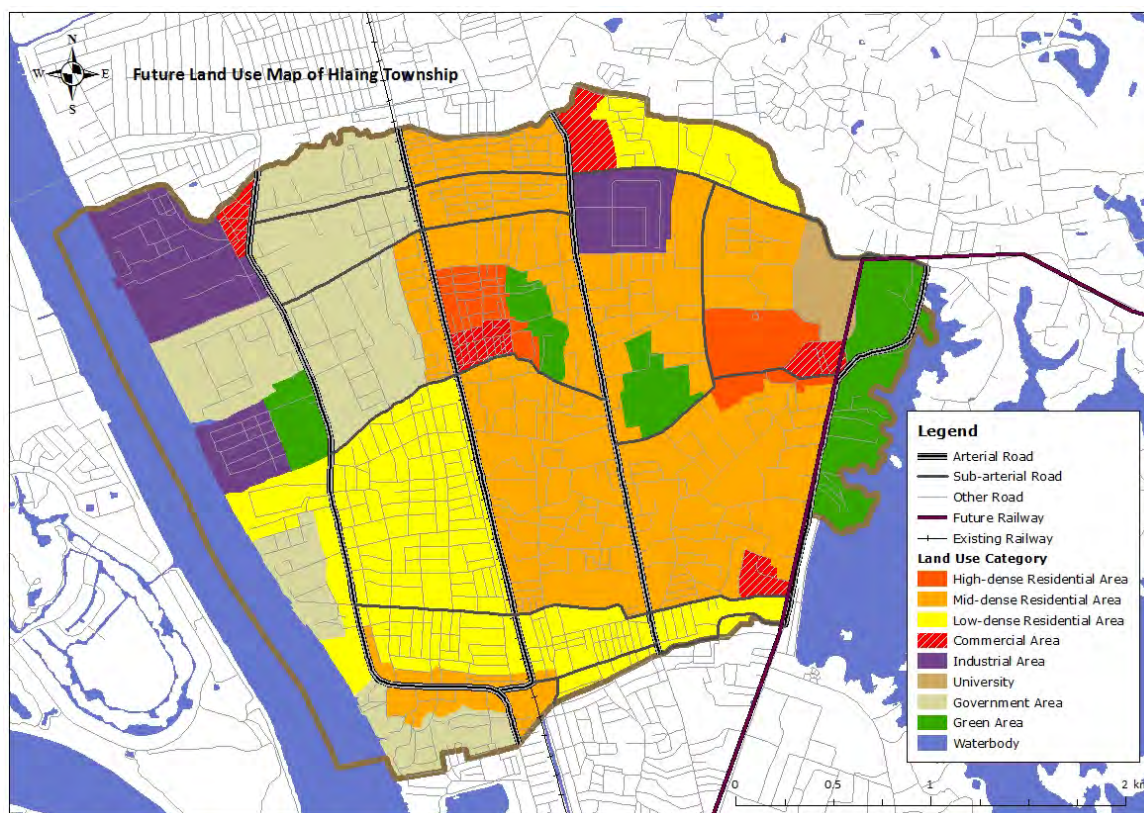




Source: JICA Study Team and the Working Team of Hlaing Township

**Figure 2.2.10: Future Conceptual Development Map of Hlaing Township**

Based on the conceptual map, the road network map and future land use map are developed in GIS format as shown in Figure 2.2.11. In addition, the future expected areas of each land use and the lengths of each categorized road were calculated based on GIS data. The calculated results are provided in Tables 2.2.5 and 2.2.6.



Source: JICA Study Team and the Working Team of Hlaing Township

**Figure 2.2.11: Future Development Map of Hlaing Township in GIS Format**

**Table 2.2.5: Future Expected Areas of Each Land Use Category (GIS Calculation)**

Category	Area (ha)
High Density Residential Area	40
Medium Density Residential Area	350
Low Density Residential Area	190
Commercial Area	30
Industrial Area	80
Government Area	160
University	10
Green Area	80
Water Body	70
Total	1,010

Source: JICA Study Team

**Table 2.2.6: Future Expected Lengths of Each Road Category (GIS Calculation)**

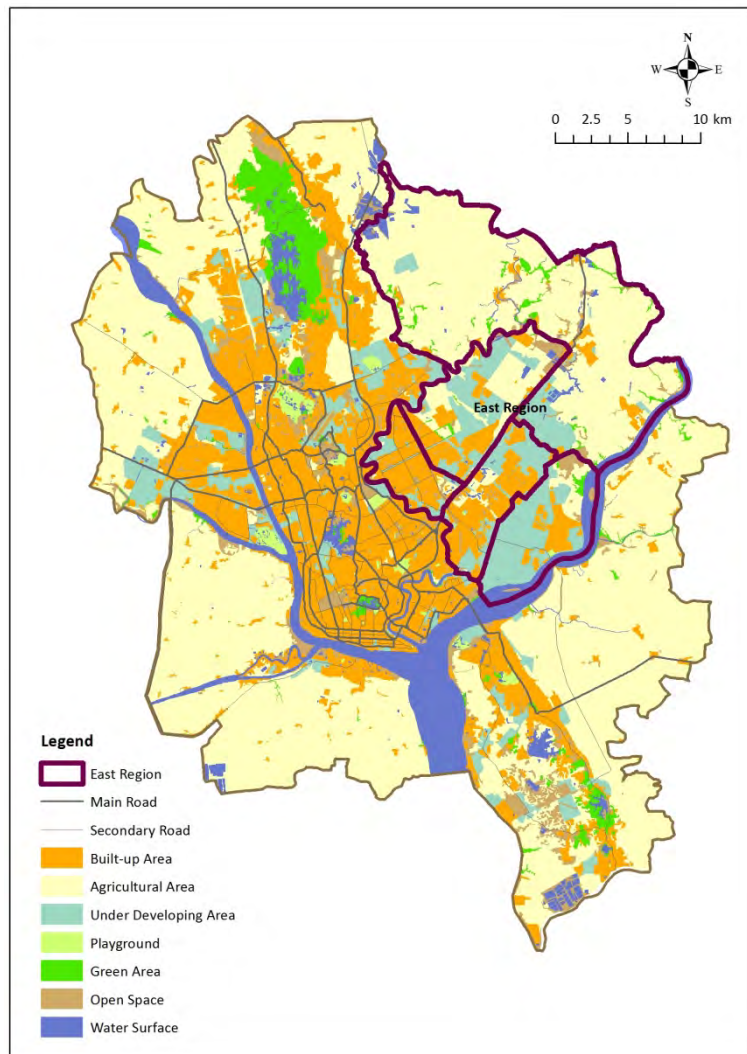
Category	Length (km)
Arterial Road	12
Sub-arterial Road	13
Total	25

Source: JICA Study Team

### 2.3 New Urbanizing Region Development (North-East Region)

The North-East Region includes three target townships in Phase II, namely, East Dagon Township, Dagon Seikkan Township, and the southern part of Hlegu Township, and two geographically close townships, namely South Dagon Township and North Dagon Township. This region lays in the northeast part of the Study area and acts as a gateway between Yangon and the northern area of Myanmar. In particular, after completion of the new international airport in the future, this region is expected to increase mobilization of people and cargo.

A comprehensive regional land use plan could contribute to realize efficient land use and comfortable transportation. For the East Region, this land use plan could guide in formulating an urbanized area, which includes residential and industrial areas, and in conserving potential agricultural lands. Regarding the agricultural industry, aside from growing crops, farm product industries are expected to expand because of two following major reasons: 1) the land has already been developed agriculturally with the use of well-planned irrigation systems; and 2) there are opportunities to have good access roads to other regions in the near future, such as the Ring Road and National Road No. 2.



Source: JICA Study Team

**Figure 2.2.12: Location Map of the North-East Region**

(1) Work Process

1) Outline

For the preparation of the future land use plan of the North-East Region, the JICA Study Team repeated some discussions with the three townships (East Dagon, Dagon Seikkan and Hlegu townships) and YCDC officers who are the targets of the survey of Phase II. Then, the JICA Study Team collected information on the land use plan decision of each township, and studied the future development concept. The work process of each township is discussed below. Furthermore, a study on the two townships (North Dagon and South Dagon townships) was carried out based on the collected information in Phase I. Finally, discussion with MOC was also carried out, and a development policy for the whole North-East Region was proposed.

2) East Dagon Township

(a) *Outline of Work Process*

A series of discussion meetings was conducted among the township officers, YCDC and the JICA Study Team in order to formulate the detailed future land use plan. The formulation of the future land use plan took the following steps:

- ✓ Share the future land use plan of Yangon made in Phase I with the stakeholders, i.e., officers of East Dagon Township, YCDC and the JICA Study Team.
- ✓ Achieve consensus among the abovementioned stakeholders on the need of a detailed future land use plan.
- ✓ Obtain from the township detailed data and information that are necessary for preparing the land use plan, such as current conditions of land use, service area of infrastructure and road network, ongoing development projects and plans, existing of slums and squatters, and important natural environment to be protected.
- ✓ Prepare a conceptual map, which include future land use and road network, considering the required residential area to accommodate the future population and designation of sub-arterial roads.
- ✓ Finalize the detailed land use plan based on the conceptual map and taking into account the results of discussions with the township and YCDC.

(b) *Records of Meetings*

The schedule and contents of discussions of the meetings are summarized in Table 2.2.7 below.

**Table 2.2.7: Records of Meetings in East Dagon Township**

No.	Date (DD/MM/YY)	Main Topics	Attendees/ Organizations (No. of Persons)
1	16/May/2013	<ul style="list-style-type: none"> <li>• To introduce the general procedure on township land use planning.</li> <li>• To make a request for the preparation of basic information about the township area, township office, and introduce the contact person.</li> </ul>	<p style="text-align: center;">YCDC (6) JICA Study Team (5) Township (5)</p>
2	23/May/2013	<ul style="list-style-type: none"> <li>• To obtain general information on the township.</li> <li>• To confirm existing land use, infrastructure facilities and social service data.</li> </ul>	<p style="text-align: center;">YCDC (4) JICA Study Team (4) Township (7)</p>
3	28/May/2013	<ul style="list-style-type: none"> <li>• To describe the service area of water supply and the commercial agricultural area by use of map.</li> </ul>	<p style="text-align: center;">YCDC (3) JICA Study Team (3)</p>

*NIPPON KOEI CO., LTD., NJS CONSULTANTS CO., LTD.  
YACHIYO ENGINEERING CO., LTD., INTERNATIONAL DEVELOPMENT CENTER OF JAPAN,  
ASIA AIR SURVEY CO., LTD., and ALMEC CORPORATION*

No.	Date (DD/MM/YY)	Main Topics	Attendees/ Organizations (No. of Persons)
		<ul style="list-style-type: none"> <li>To compare the maps used by the JICA Study Team and township office.</li> </ul>	Township (5)
4	27/Jun./2013	<ul style="list-style-type: none"> <li>To figure out the area occupied by slums and informal settlers by use of map.</li> </ul>	YCDC (3) JICA Study Team (1) Township (4)
5	30/July/2013	<ul style="list-style-type: none"> <li>To discuss basic ideas related to future land use and road network.</li> <li>To confirm future development of sub-arterial roads and high density residential area.</li> </ul>	YCDC (6) JICA Study Team (5) Township (5)
6	12/Aug./2013	<ul style="list-style-type: none"> <li>To explain about the draft concept map including future land use and road networks.</li> <li>To discuss about future vision.</li> </ul>	YCDC (5) JICA Study Team (4)
7	15/Aug./2013	<ul style="list-style-type: none"> <li>To explain about the concept map including future land use and road networks.</li> <li>To discuss about future land use.</li> </ul>	YCDC (5) JICA Study Team (2) Township (6)

Source: JICA Study Team



Source: JICA Study Team

**Figure 2.2.13: Photos of the Meeting in East Dagon Township**

### 3) Dagon Seikkan Township

#### (a) *Outline of Work Process*

A series of discussion meetings was conducted among township officers, YCDC and the JICA Study Team in order to formulate the detailed future land use plan. The formulation of the future land use plan took the following steps:

- ✓ Share the future land use plan of Yangon made in Phase I with the stakeholders, i.e., officers of Dagon Seikkan Township, YCDC and the JICA Study Team.
- ✓ Achieve consensus among the abovementioned stakeholders on the need of a detailed future land use plan.
- ✓ Obtain from the township detailed data and information that are necessary for preparing the land use plan, such as current condition of land use, service area of infrastructure, and road network, ongoing development projects and plans, existing of slums and squatters, and important natural environment to be protected.
- ✓ Prepare a conceptual map, which include future land use and road network, considering the required residential area to accommodate the future population and designation of sub-arterial roads.
- ✓ Finalize the detailed land use plan based on the conceptual map and taking into account the results of discussions with the township and YCDC.

(b) *Records of Meetings*

The schedule and contents of discussions of the meetings are summarized in Table 2.2.8 below.

**Table 2.2.8: Records of Meetings in Dagon Seikkan Township**

No.	Date (DD/MM/YY)	Main Topics	Attendees/ Organizations (No. of Persons)
1	16/May/2013	<ul style="list-style-type: none"> <li>To introduce the general procedure on township land use planning.</li> <li>To make a request for the preparation of basic information about the township area, township office, and introduce the contact person.</li> </ul>	YCDC (6) JICA Study Team (5) Township (6)
2	23/May/2013	<ul style="list-style-type: none"> <li>To confirm flood prone areas, industrial area, congested roads, service area of waste management, water supply and electricity.</li> </ul>	YCDC (4) JICA Study Team (4) Township(23)
3	31/May/2013	<ul style="list-style-type: none"> <li>To obtain soft and hard copies of the location map of electric lines, substations and transmission lines.</li> <li>To confirm development plans of health facilities and the fire department.</li> <li>To discuss the expected future township population.</li> </ul>	YCDC (4) JICA Study Team (3) Township (13)
4	21/Jun./2013	<ul style="list-style-type: none"> <li>To confirm locations of market, playground, park, bus route and waste tank</li> <li>To check area occupied by slums and informal settlers.</li> </ul>	YCDC (3) JICA Study Team (2) Township (1)
5	12/July/2013	<ul style="list-style-type: none"> <li>To explain land plot nos. 177 and 178 by use of map.</li> </ul>	YCDC (2) JICA Study Team (1) Township (1)
6	30/July/2013	<ul style="list-style-type: none"> <li>To discuss basic ideas related to future land use and road network.</li> <li>To confirm future development of sub-arterial roads and high density residential area.</li> </ul>	YCDC (6) JICA Study Team (5) Township (4)
7	12/Aug./2013	<ul style="list-style-type: none"> <li>To explain about the draft concept map including future land use and road networks.</li> <li>To discuss about future vision.</li> </ul>	YCDC (5) JICA Study Team (4)
8	15/Aug./2013	<ul style="list-style-type: none"> <li>To explain about the concept map including future land use and road networks.</li> <li>To discuss about future land use.</li> </ul>	YCDC (5) JICA Study Team (2) Township (4)

Source: JICA Study Team



Source: JICA Study Team

**Figure 2.2.14: Photos of the Meeting in Dagon Seikkan Township**

4) Hlegu Township

(a) *Outline of Work Process*

A series of discussion meetings was conducted among township officers, YCDC and the JICA Study Team in order to formulate the detailed future land use plan. The formulation of the future land use plan took the following steps:

- ✓ Share the future land use plan of Yangon made in Phase I with the stakeholders, i.e., officers of Hlegu Township, YCDC and the JICA Study Team.
- ✓ Achieve consensus among the abovementioned stakeholders on the need of a detailed future land use plan.
- ✓ Obtain from the township detailed data and information that are necessary for preparing the land use plan, such as current conditions of land use, service area of infrastructure and road network, ongoing development projects and plans, existing of slums and squatters, and important natural environment to be protected.
- ✓ Prepare a conceptual map, which include future land use and road network, considering the required residential area to accommodate the future population and designation of sub-arterial roads.
- ✓ Finalize the detailed land use plan based on the conceptual map and taking into account the results of discussions with the township and YCDC.

(b) *Records of Meetings*

The schedule and contents of discussions of the meeting are summarized in Table 2.2.9 below.

**Table 2.2.9: Records of Meetings in Hlegu Township**

No.	Date (DD/MM/YY)	Main Topics	Attendees/ Organizations (No. of Persons)
1	17/May/2013	<ul style="list-style-type: none"> <li>• To introduce the general procedure of township land use planning.</li> <li>• To make a request for the preparation of basic information about the township area, township office, and introduce the contact person.</li> </ul>	<p style="text-align: center;">YCDC (6) JICA Study Team (4) Township (8)</p>
2	23/May/2013	<ul style="list-style-type: none"> <li>• To obtain general information on the township</li> <li>• To confirm existing land use, infrastructure facilities and social service data.</li> </ul>	<p style="text-align: center;">YCDC (5) JICA Study Team (3) Township (5)</p>
3	30/May/2013	<ul style="list-style-type: none"> <li>• To obtain data related to green spaces, the natural environment conservation sector, and transportation.</li> <li>• To illustrate major data and information on the map based on the discussion.</li> </ul>	<p style="text-align: center;">YCDC (4) JICA Study Team (3) Township (6)</p>
4	2/July/2013	<ul style="list-style-type: none"> <li>• To introduce township land use planning.</li> <li>• To receive the map illustrated with major information.</li> </ul>	<p style="text-align: center;">YCDC (4) JICA Study Team (1) Township (6)</p>
5	1/Aug./2013	<ul style="list-style-type: none"> <li>• To discuss basic ideas related to future land use and road network.</li> <li>• To confirm future development of sub-arterial roads and high density residential area.</li> </ul>	<p style="text-align: center;">YCDC (7) JICA Study Team (4) Township (7)</p>
6	12/Aug./2013	<ul style="list-style-type: none"> <li>• To explain about the draft concept map including future land use and road networks.</li> <li>• To discuss about future vision.</li> </ul>	<p style="text-align: center;">YCDC (5) JICA Study Team (4)</p>
7	20/Aug./2013	<ul style="list-style-type: none"> <li>• To explain about the concept map including future land use and road networks.</li> <li>• To discuss about future land use.</li> </ul>	<p style="text-align: center;">YCDC (5) JICA Study Team (2) Township (7)</p>

Source: JICA Study Team



Source: JICA Study Team

**Figure 2.2.15: Photos of the Meeting in Hlegu Township**

(2) Current Conditions

1) The Whole North-East Region

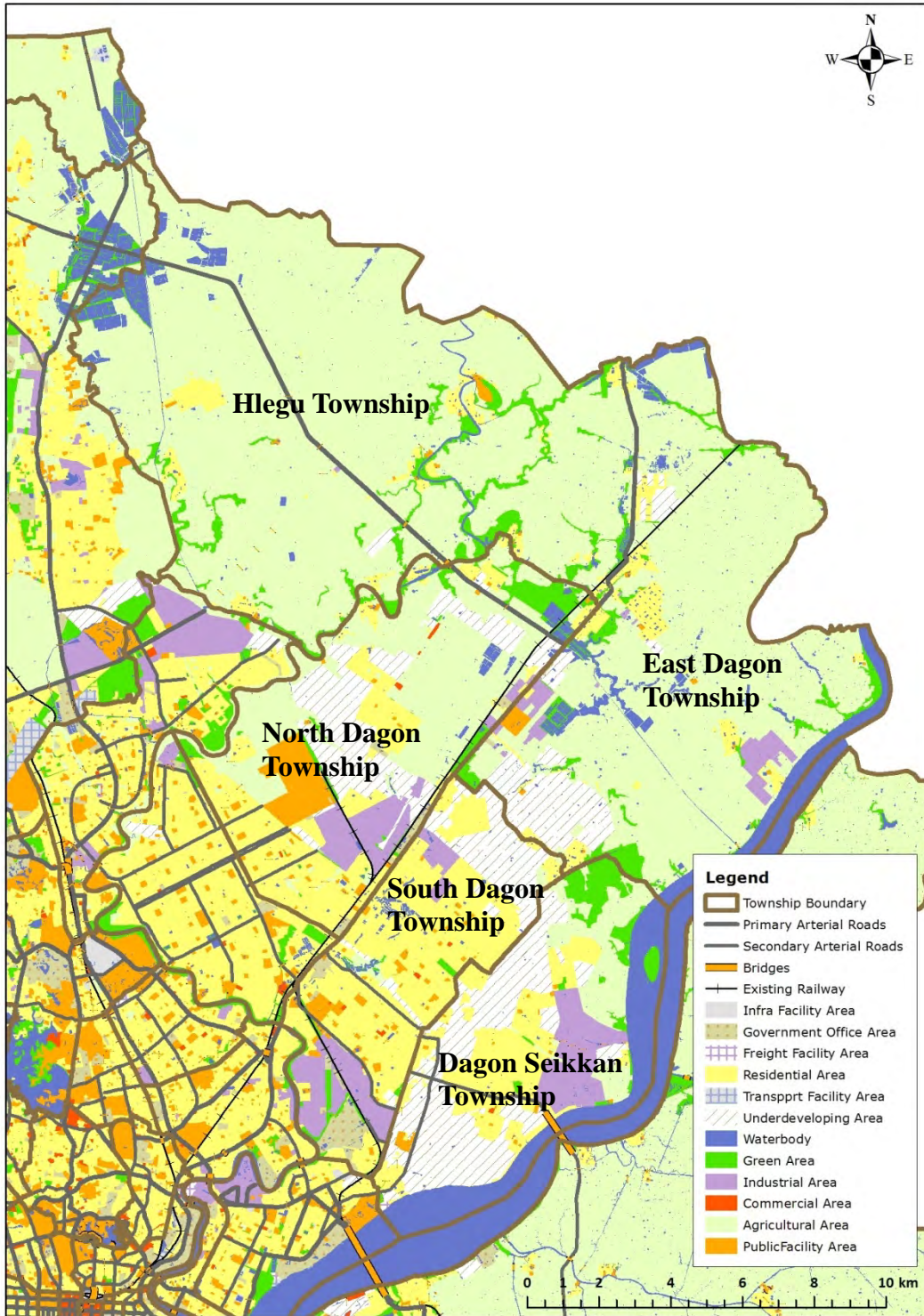
The North-East Region is constituted by five townships, namely, North Dagon, South Dagon, East Dagon, Dagon Seikkan, and Hlegu. This region is developing and urbanization is progressing from North Dagon and South Dagon near the central part of Yangon.

The current land use is as follows. The southern part of the region mainly consists of residential area, while the northern part of the region mainly consists of farm villages and agricultural land (paddy field). Moreover, industrial parks exist along National Road No. 2 and the Bago River, and industrial development of the region is progressing. Although main transport infrastructures, such as National Road No. 2, National Road No. 7, Yangon Mandalay Line, and Thilawa Line, exist in this region, most of these infrastructures are in a low level of development. Improvement is indispensable if effective use of these main traffic infrastructures is taken into consideration.

In order to correspond to the increase in population in the central part of Yangon, the North-East Region is the target area for suburban housing development, and a large-scale project is under development in Dagon Seikkan Township.

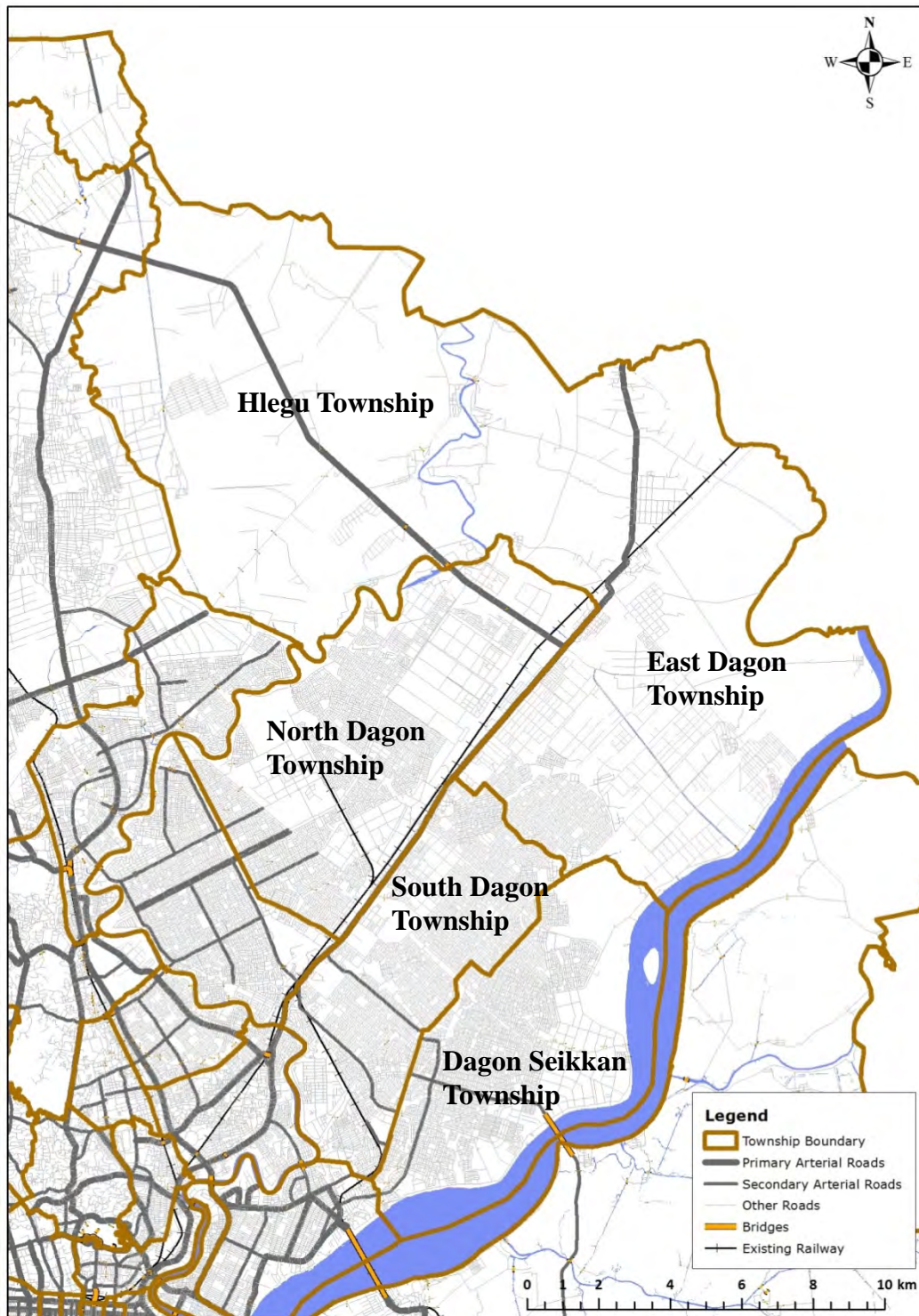
Although there is no prominent natural area to be protected strictly in this region, there are good natures, such as eco-tone area along the rivers, which has multi-function of flood control, water purification, and biodiversity.





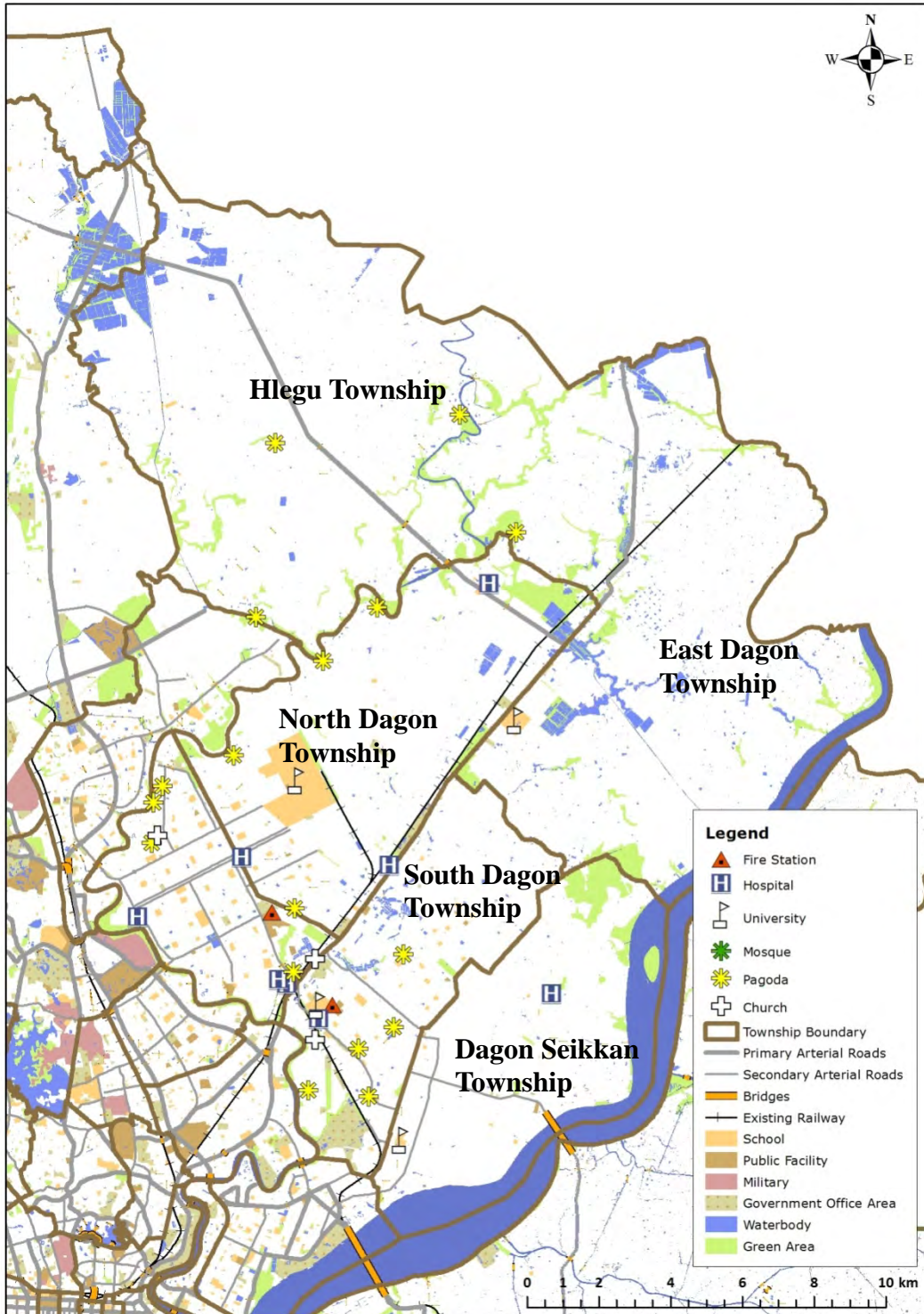
Source: JICA Study Team and the Working Team of the North-East Region

**Figure 2.2.16: Current Land Use Map of the Whole North-East Region**



Source: JICA Study Team and the Working Team of the North-East Region

**Figure 2.2.17: Current Road Network Map of the Whole North-East Region**



Source: JICA Study Team and the Working Team of the North-East Region

**Figure 2.2.18: Current Social Service Facility Map of the Whole North-East Region**

## 2) Current Conditions of East Dagon Township

East Dagon Township has geographical features of lowlands, and mainly has land use status of paddy fields. However, urban development is progressing from the southern part of the township due to city area expansion from the central part of Yangon in recent years. The current conditions of East Dagon Township are summarized as follows:

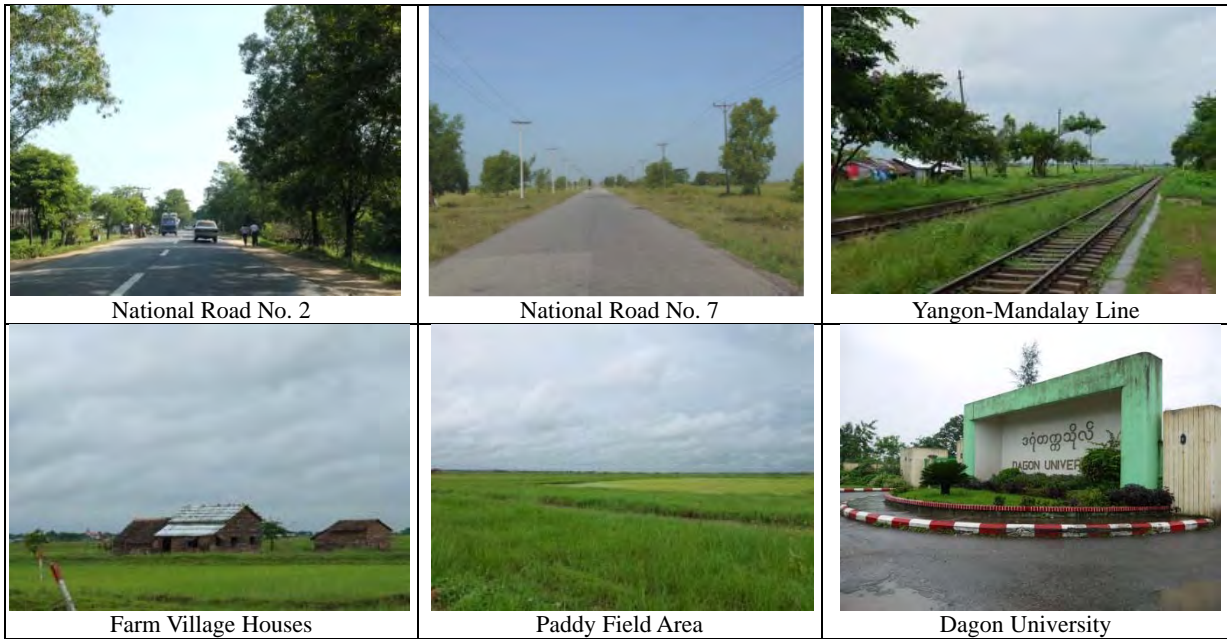
- ✓ **Population:** East Dagon Township has a population of 145,505 persons (2011), and population density of 9 persons/ha.
- ✓ **Industrial Structure and Land Use:** Two main roads form the backbone of East Dagon Township, namely, Min Ye Kyaw Sawar Road and National Road No. 2, which both stretch along the north and south directions. Min Ye Kyaw Sawar Road pass through the middle of the township and urbanized area including residential area. Areas under development are also spread out along this road. Industrial estates are located along National Road No. 2; however, the infrastructure seems to be inadequate for accommodating large-sized factories. In the northern part of the township, there are well-organized paddy fields with irrigation systems. These paddy fields and agricultural facilities are owned by private companies.
- ✓ **Transportation and Infrastructure:** Two railway stations on the existing railway neither have major commercial facilities nor station plaza. Basic infrastructure is being developed in line with residential development; however, the road network still needs improvement. If this goes on, traffic congestion is expected in the future due to lack of arterial road networks.
- ✓ **Drainage and Flood:** There is concern that further land development would trigger serious flooding due to inadequate drainage system.
- ✓ **Living Condition, Social Services and Green & Park:** Two universities are located in the township, namely, Dagon University in the southern area, and the Institute of Economics in the northern area. Accordingly, the surrounding areas of these schools are occupied by commercial facilities for students such as bookshops, etc. In comparison with other townships, East Dagon Township provides education service in higher level due to existence of Dagon University, however the ratio of students eligible for university is relatively low.
- ✓ **Environmental and Social Matters:** It can be seen that some slums and squatters exists near existing industrial zones. Since these slums and squatters is still small number, it shall be not big issues for future urban development. Even in such situation, it is necessary to pay attention to environmental and social consideration including appropriate EIA procedure when the development project goes forward. There is no important natural area to be protected in this area other than eco-tope area along the rivers.

**Table 2.2.10: Living Conditions, Social Services and Green & Parks (East Dagon Township)**

Item	Contents	Number
Education	No. of University & College/ No. Students	1/ 46,863
	No. of High School/ No. of Students	5/ 2,893
	No. of Middle School/ No. of Students	2/ 6,562
	No. of Primary School/ No. of Students	15/ 6,974
	No. of Pre School/ No. of Students	7/ 4,828
	No. of Monastery/ No. of Students	0
	Ratio of Students Eligible for University (%)	22.52
Health	No. of Hospital/ Clinic/ Maternity Center	2/ 31/ 0
	Death Rate during Child Birth (per 1,000)	2

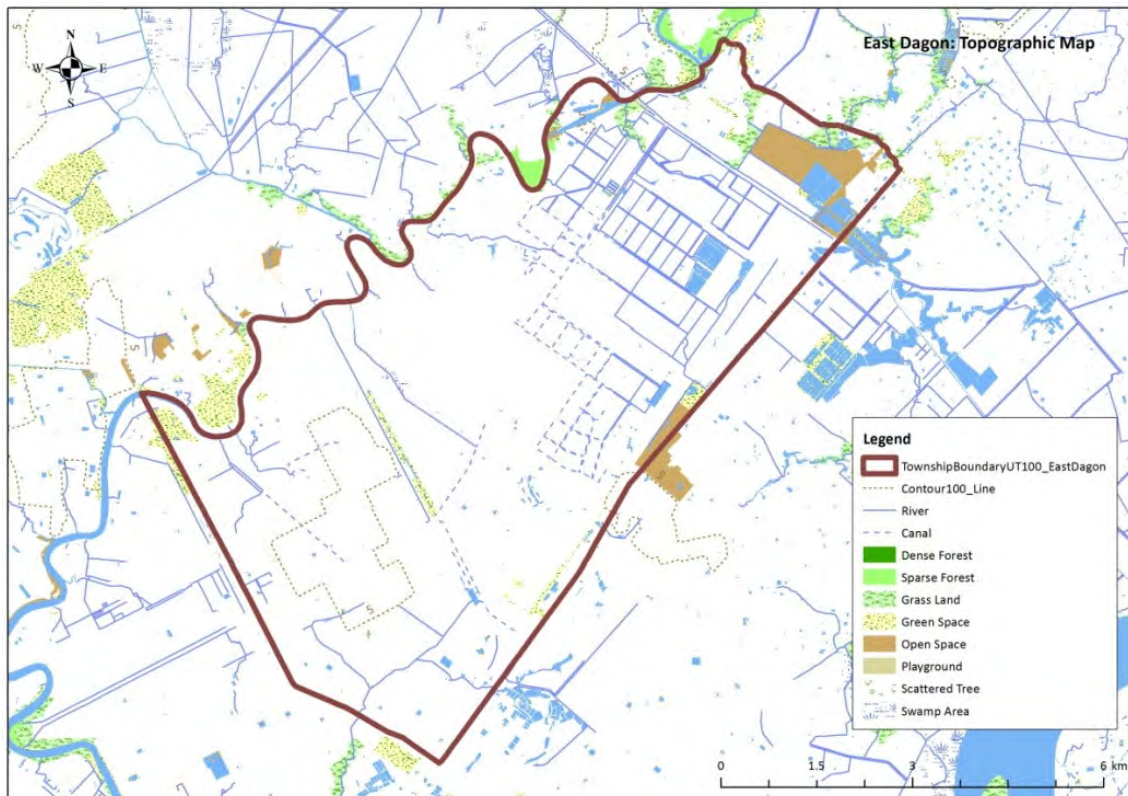
Social Facility	No.of Pagoda/ Buddhist Temple	1/ 152
	No. of Church/ Mosque/ Hindu Temple/ Chinese Temple	0/ 2/ 2/ 0
	No.of Cinema/ Playground/ Park	1/ 0/ 0

Source: JICA Study Team



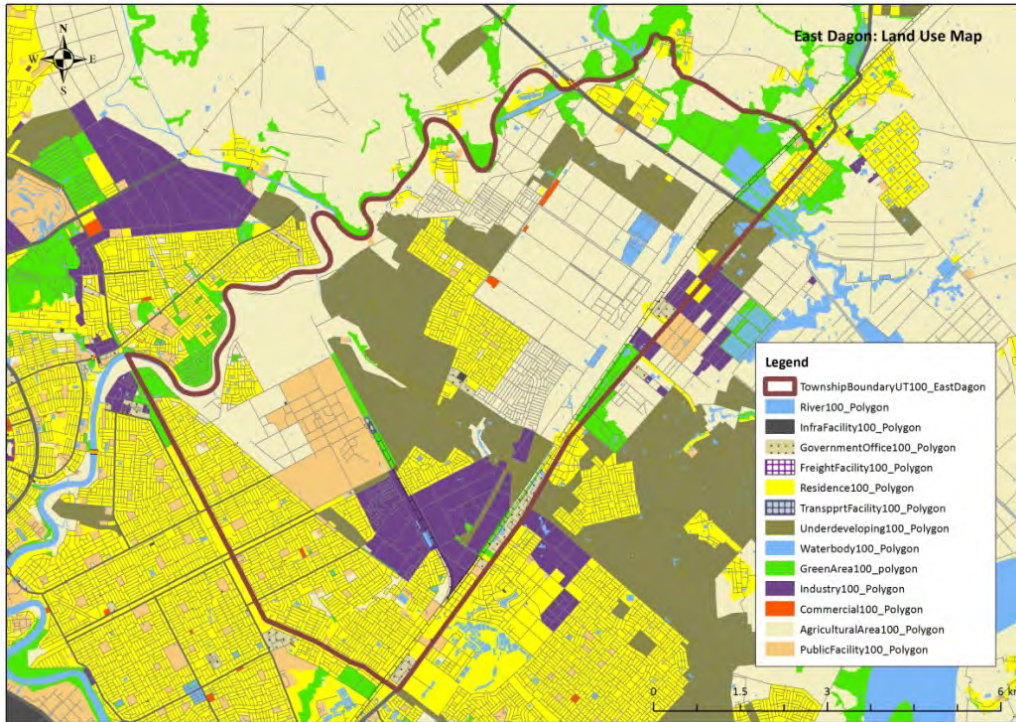
Source: JICA Study Team

**Figure 2.2.19: Photos of the Current Situation in East Dagon Township**



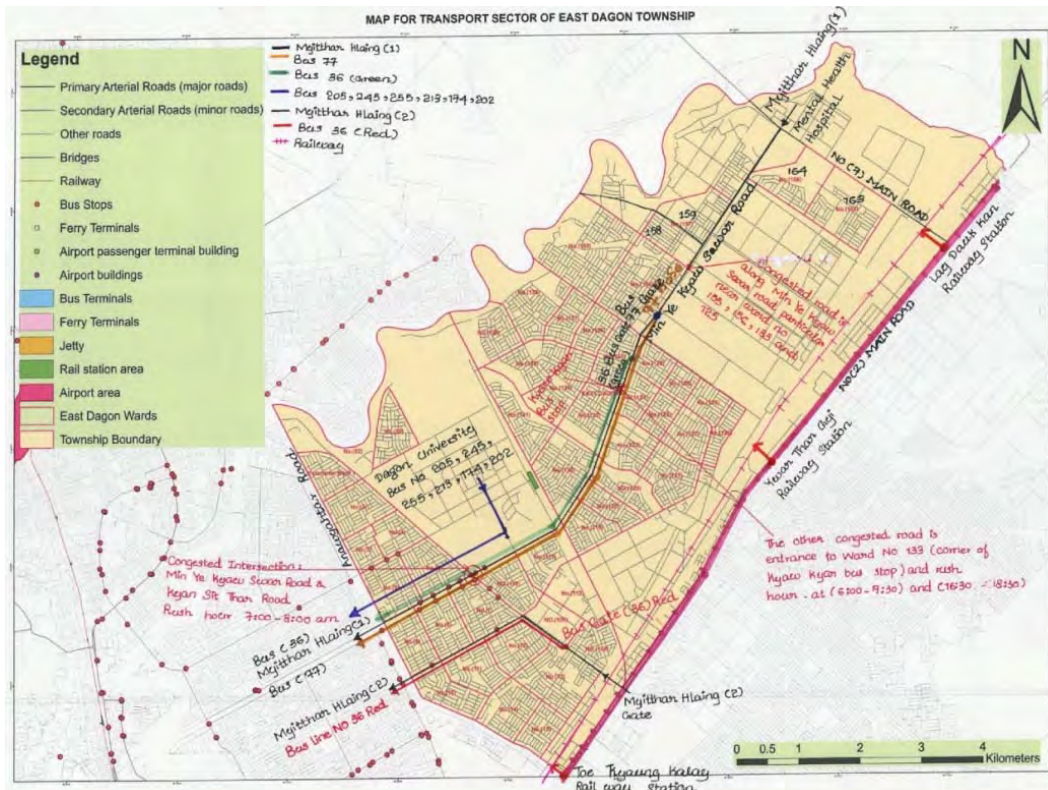
Source: JICA Study Team and the Working Team of East Dagon Township

**Figure 2.2.20: Current Topography Map of East Dagon Township**



Source: JICA Study Team and the Working Team of East Dagon Township

**Figure 2.2.21: Current Land Use Map of East Dagon Township**



Source: JICA Study Team and the Working Team of East Dagon Township

Note: As this map is the original map used by the working team in the meetings to understand the current situation as a sort of technical transferring work, it is noted that some written words are difficult to read.

**Figure 2.2.22: Current Road Network Map of East Dagon Township**

### 3) Current Conditions of Dagon Seikkan Township

Dagon Seikkan Township has geographical features of lowlands, and mainly has land use status of paddy fields. However, in order to correspond to the increase in population in the central part of Yangon, housing development in the suburbs is carried out widely, and many projects under development exist. Good traffic access to CBD is mentioned as a reason which suburban housing development concentrates. The current conditions of Dagon Seikkan Township are summarized as follows:

- ✓ Population: Dagon Seikkan Township has a population of 120,161 persons (2011), and population density of 29 persons/ha.
- ✓ Industrial Structure and Land Use: Industrial estates are located along the Bago River; however, the infrastructure seems to be inadequate for accommodating large-sized factories. Housing development near the industrial and built-up areas has been ongoing. High density housing development projects are underway near Yuzana Garden City, which was developed as a medium density residential area consisting of six-storey apartments.
- ✓ New Urban Development Project : In Dagon Seikkan township, a huge housing project, namely “Ayeyarwun-Yadanaar High-rise Building”, which shall accommodate a population of 100,000 by providing 19,600 units in an area of 89ha, is on-going by DHSHD, MOC. Additionally a sub-center development initiated by YCDC is under-consideration which is located nearby the project site of MOC.
- ✓ Transportation and Infrastructure: Basic infrastructure is being developed in line with residential development; however, the road network still needs improvement. If this goes on, traffic congestion is expected in the future due to lack of arterial road networks. Due to the absence of railway service, the residents heavily rely on road transportation.
- ✓ Drainage and Flood: There is concern that further land development would trigger serious flooding due to inadequate drainage system.
- ✓ Living Condition, Social Services and Green & Park: Social service level is basically low relatively because this township is not urbanized well. On the other hand, social facilities, such as pagoda and temples, seem to be located more.
- ✓ Environmental and Social Matters: Slums and squatters in this township are relatively small because urbanized area has been spread except areas along circular railway. A nature area near Inya Lake is conservation area as one of public parks in Yangon. There is no important natural area to be protected other than the Inya Lake.
- ✓ Environmental and Social Matters: It can be seen that some slums and squatters exists near existing industrial zones for accommodating workers. It is necessary to pay attention to environmental and social consideration including appropriate EIA procedure, especially in the areas near the industrial zones. There is no important natural area to be protected in this area other than eco-tope area along the rivers, such as the Bago River.

**Table 2.2.11: Living Conditions, Social Services and Green & Parks (Dagon Seikkan Township)**

Item	Contents	Number
Education	No. of University & College/ No. of Students	1/ 443
	No. of High School/ No. of Students	4/ 8,575
	No. of Middle School/ No. of Students	3/ 4,322
	No. of Primary School/ No. of Students	9/ 1,365

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YACHIYO ENGINEERING CO., LTD., INTERNATIONAL DEVELOPMENT CENTER OF JAPAN,  
ASIA AIR SURVEY CO., LTD., and ALMEC CORPORATION*

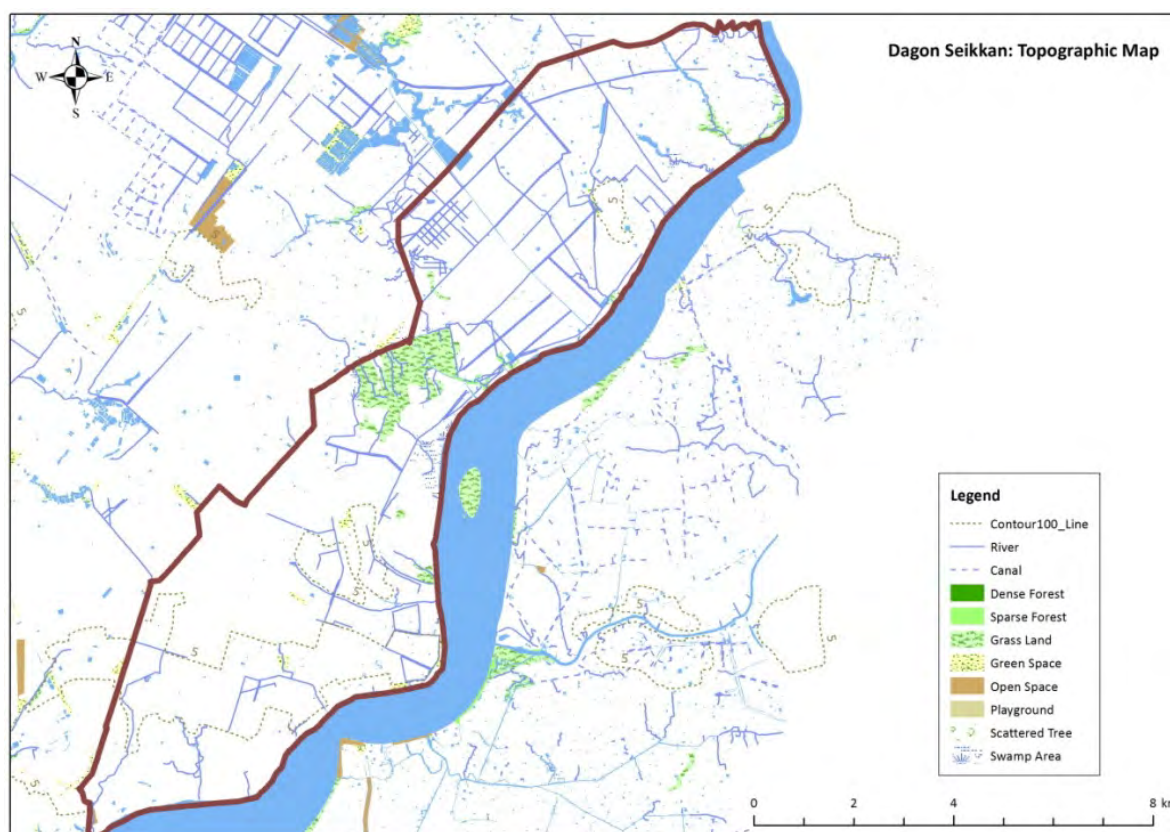
	No. of Pre School/ No. of Students	7/ 166
	No. of Monastery/ No. of Students	6/ 2,112
	Ratio of Students Eligible for University (%)	31.00
Health	No. of Hospital/ Clinic/ Maternity Center	1/ 22/ 0
	Death Rate during Child Birth (per 1,000)	3
Social Facility	No. of Pagoda/ Buddhist Temple	14/ 49
	No. of Church/ Mosque/ Hindu Temple/ Chinese Temple	2/ 1/ 8/ 0
	No. of Cinema/ Playground/ Park	0/ 1/ 0

Source: JICA Study Team



Source: JICA Study Team

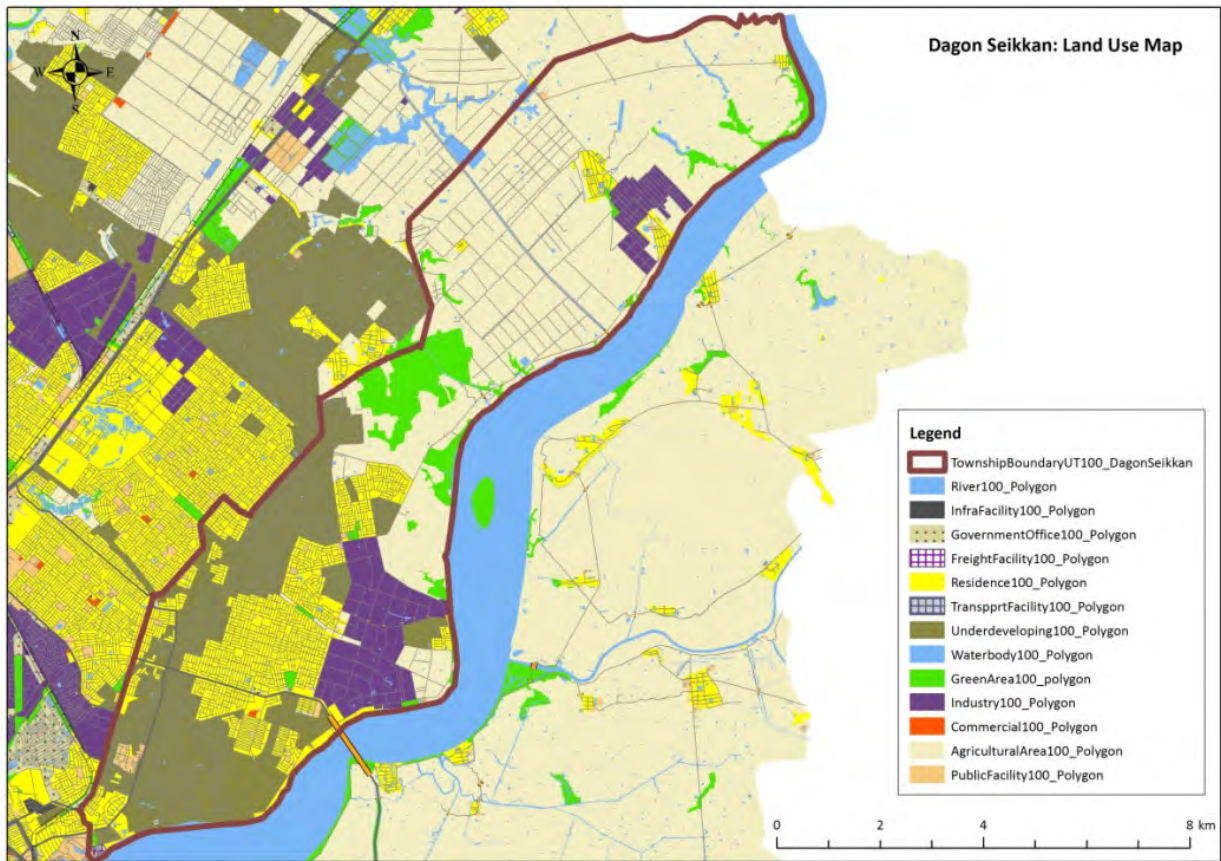
**Figure 2.2.23: Photos of the Current Situation in Dagon Seikkan Township**



Source: JICA Study Team and the Working Team of Dagon Seikkan Township

**Figure 2.2.24: Current Topography Map of Dagon Seikkan Township**





Source: JICA Study Team and the Working Team of Dagon Seikkan Township

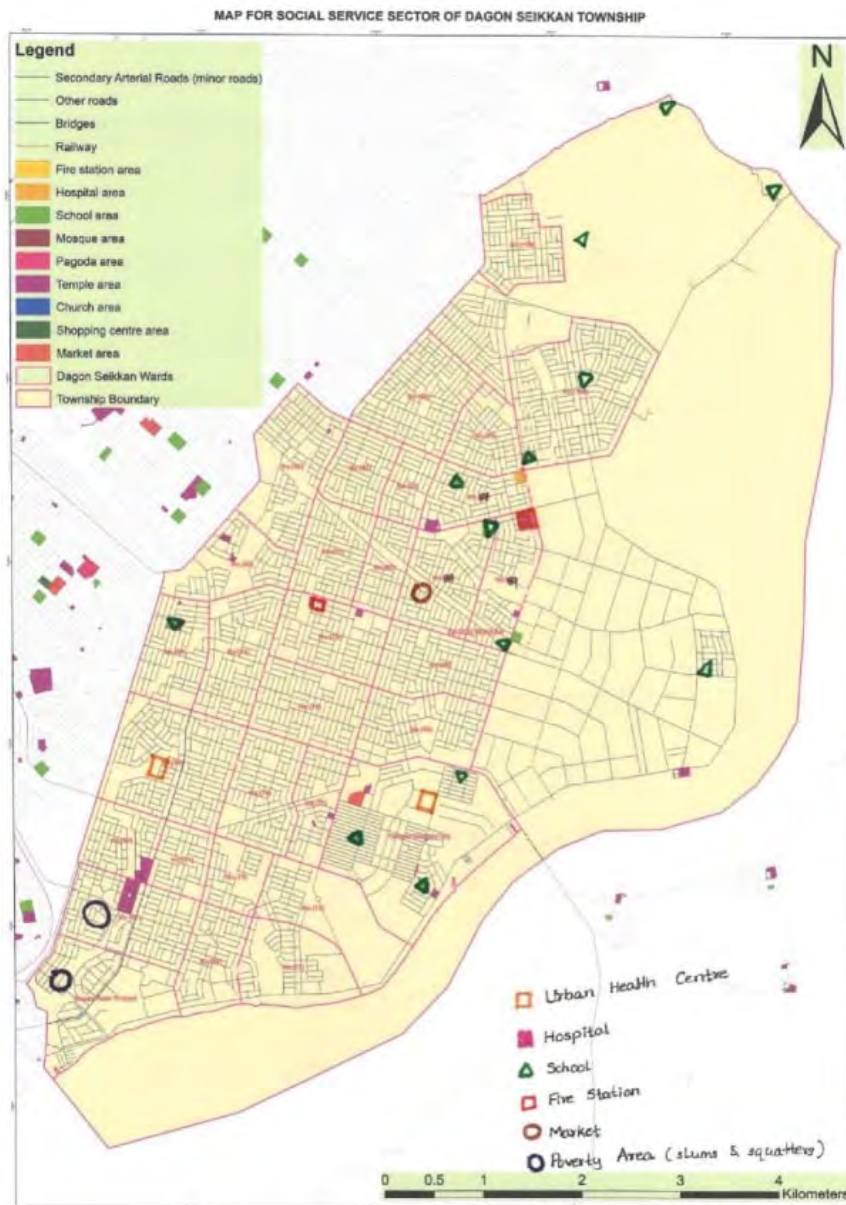
**Figure 2.2.25: Current Land Use Map of Dagon Seikkan Township**



Source: JICA Study Team and the Working Team of Dagon Seikkan Township

Note: As this map is the original map used by the working team in the meetings to understand the current situation as a sort of technical transferring work, it is noted that some written words are difficult to read.

**Figure 2.2.26: Current Road Network Map of Dagon Seikkan Township**



Source: JICA Study Team and the Working Team of Dagon Seikkan Township

Note: As this map is the original map used by the working team in the meetings to understand the current situation as a sort of technical transferring work, it is noted that some written words are difficult to read.

**Figure 2.2.27: Major Urban Utilities and Social Facilities Map of Dagon Seikkan Township**

#### 4) Current Conditions of Hlegu Township

The target area of this Study includes a part of the southern area of Hlegu Township. This area generally consists of lowlands, and its land use is paddy fields equipped with irrigation facilities. The current conditions of the southern part of Hlegu Township are summarized as follows:

- ✓ Population: Hlegu Township has a population of 50,793 persons (2011), and population density of 5 persons/ha.
- ✓ Industrial Structure and Land Use: Most of the area of the southern part of the township is covered by prime agricultural lands with well-developed irrigation systems, including paddy fields and orchid gardens. Some of the area is used as fishponds. A number of small villages are scattered along rivers, and small-scale housing are partly developed.
- ✓ Transportation and Infrastructure: Development of urban infrastructure is limited, mainly along National Road No. 7.
- ✓ Drainage and Flood: There is concern that further land development would trigger serious flooding due to inadequate of drainage system. In case of heavy rain in the rainy season, residents need to be evacuated.
- ✓ Living Condition, Social Services and Green & Park: Social service level is basically low relatively because this township is not urbanized well. On the other hand, social facilities, such as pagoda and temples, seem to be located more.
- ✓ Environmental and Social Matters: Slums and squatters in this township are relatively small because urbanized area has been spread except areas along circular railway. A nature area near Inya Lake is conservation area as one of public parks in Yangon. There is no important natural area to be protected other than the Inya Lake.
- ✓ Environmental and Social Matters: There are a few slums and squatters in this township, because the township has still a large area of paddy field, not urbanized area. Even in such situation, it is necessary to pay attention to environmental and social consideration including appropriate EIA procedure when the development project goes forward. There is no important natural area to be protected in this area other than eco-tope area along the rivers. On the other hand, maintenance of high-valued agricultural area is important aspect.

**Table 2.2.12: Living Conditions, Social Services and Green & Parks (Hlegu Township)**

Item	Contents	Number
Education	No. of University & College/ No. Students	2/ 676
	No. of High School/ No. of Students	15/ 4,335
	No. of Middle School/ No. of Students	15/ 13,881
	No. of Primary School/ No. of Students	148/25993
	No. of Pre School/ No. of Students	6/ 80
	No. of Monastery/ No. of Students	12/ 1,905
	Ratio of Students Eligible for University (%)	21.64
Health	No. of Hospital/ Clinic/ Maternity Center	4/ 25/ 2
	Death Rate during Child Birth (per 1,000)	7
Social Facility	No. of Pagoda/ Buddhist Temple	22/ 298
	No. of Church/ Mosque/ Hindu Temple/ Chinese Temple	15/ 5/ 1/ 1
	No. of Cinema/ Playground/ Park	0/ 1/ 1

Source: JICA Study Team



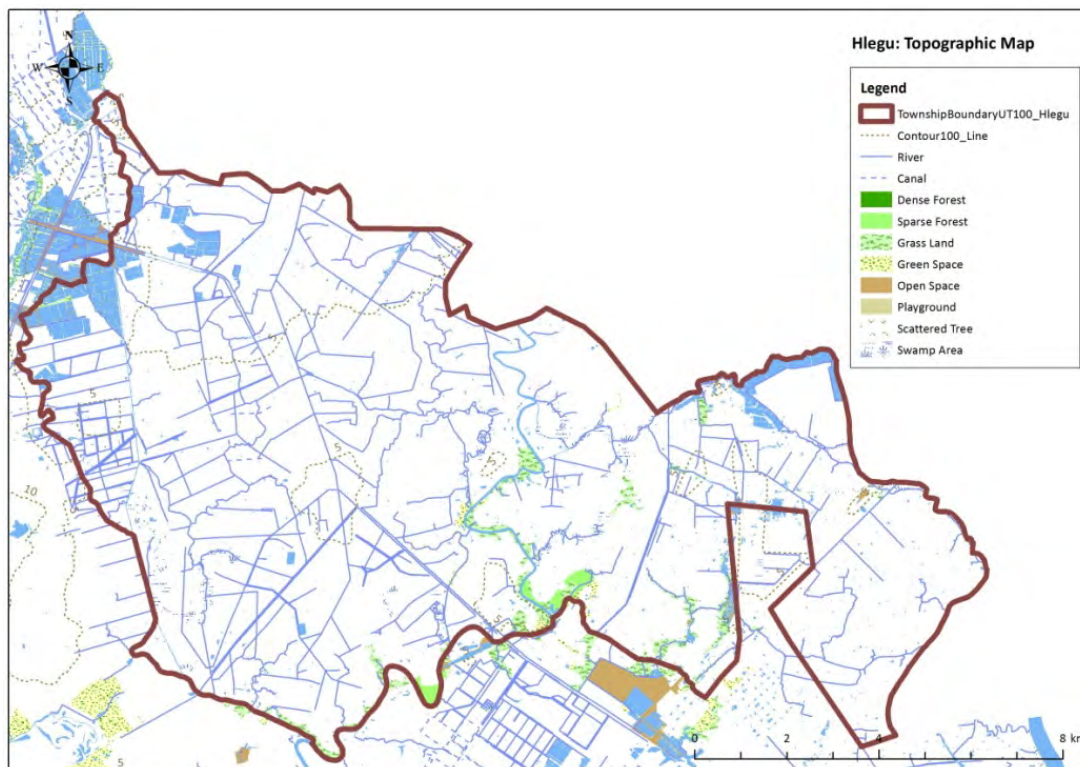
Source: JICA Study Team

**Figure 2.2.28: Photos of the Current Situation in Hlegu Township**



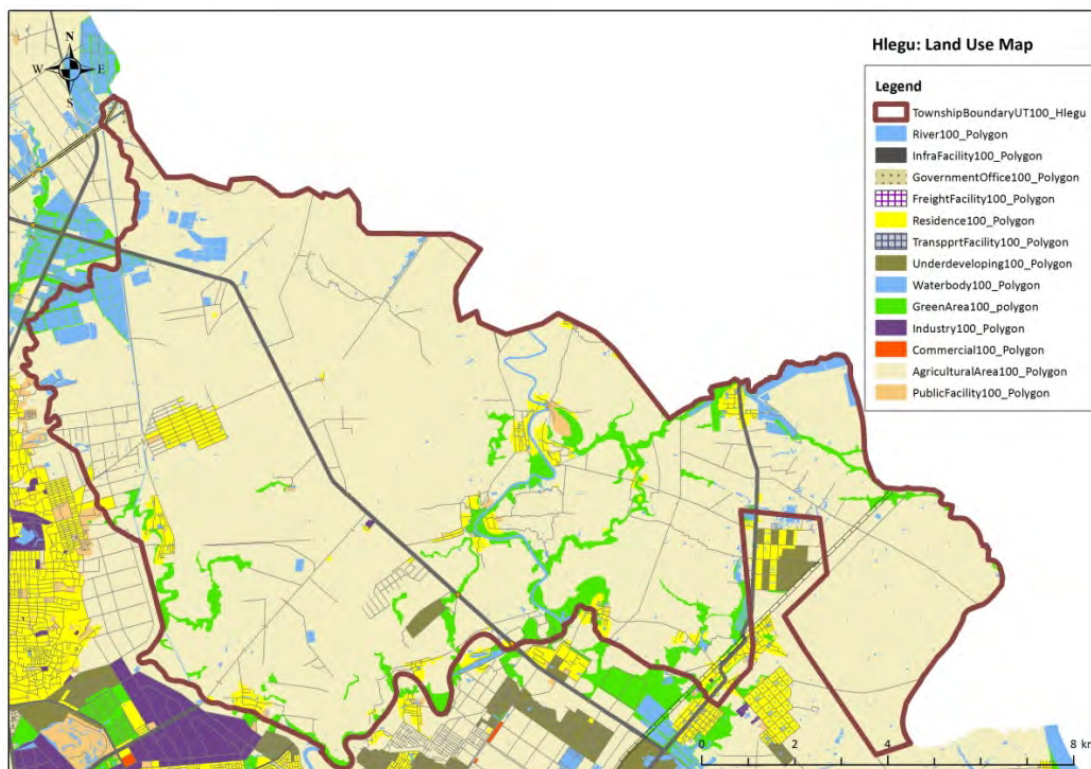
Source: Hlegu Township

**Figure 2.2.29: Study Area in the Whole Hlegu Township**



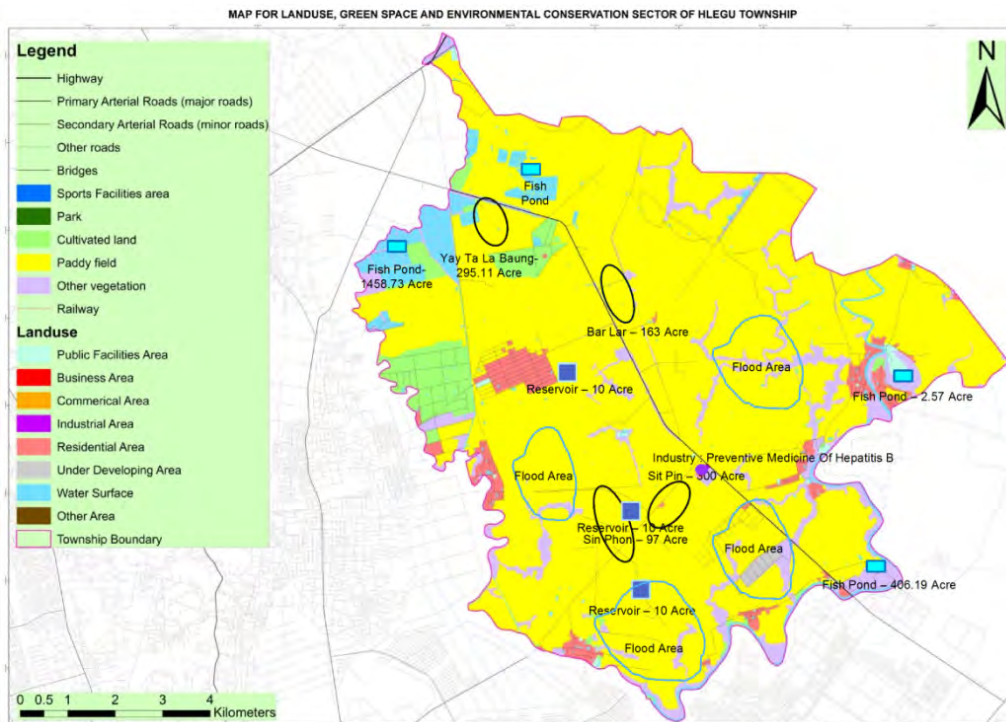
Source: JICA Study Team and the Working Team of Hlegu Township

**Figure 2.2.30: Current Topography Map of the Study Area in Hlegu Township**



Source: JICA Study Team and the Working Team of Hlegu Township

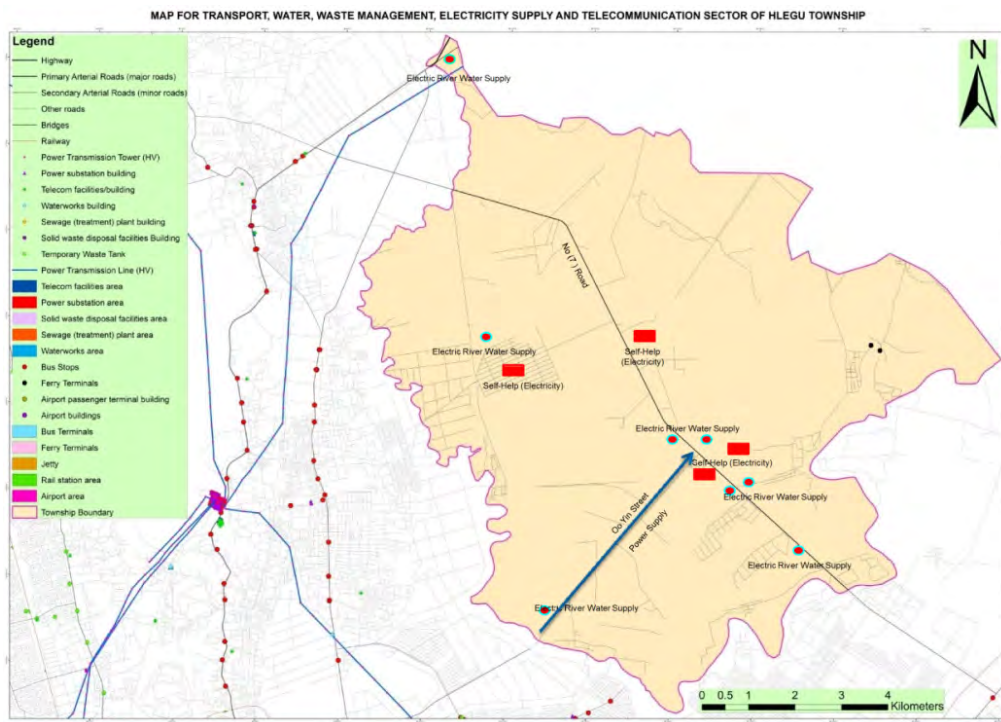
**Figure 2.2.31: Current Land Use Map of the Study Area in Hlegu Township**



Source: JICA Study Team and the Working Team of Hlegu Township

Note: As this map is the original map used by the working team in the meetings to understand the current situation as a sort of technical transferring work, it is noted that some written words are difficult to read.

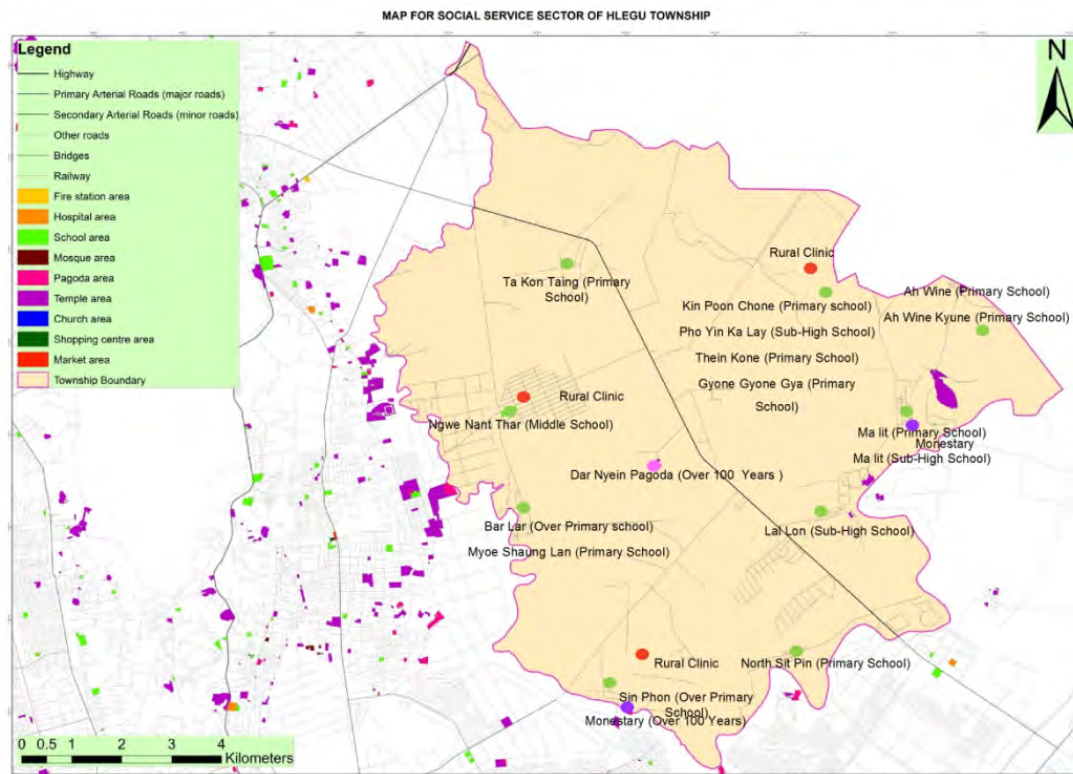
**Figure 2.2.32: Commercial Agricultural and Flood Areas Map of the Study Area in Hlegu Township**



Source: JICA Study Team and the Working Team of Hlegu Township

Note: As this map is the original map used by the working team in the meetings to understand the current situation as a sort of technical transferring work, it is noted that some written words are difficult to read.

**Figure 2.2.33: Current Transport Network Map of the Study Area in Hlegu Township**



Source: JICA Study Team and the Working Team of Hlegu Township

Note: As this map is the original map used by the working team in the meetings to understand the current situation as a sort of technical transferring work, it is noted that some written words are difficult to read.

**Figure 2.2.34: Major Urban Utilities and Social Facilities Map of the Study Area in Hlegu Township**



(3) Proposed Future Plan

1) The Whole North-East Region

(a) *Development Policy*

In order to achieve "Realization of Eco-friendly New Town Development with Complex Urban Function", the following development policies should be considered:

- ✓ Infrastructure development taking advantage of good access between CBD and Thilawa SEZ, and gateway function of northern Yangon.
  - Formulation of an arterial road network corresponding to the increase of vehicular traffic.
  - Railway development to alleviate traffic congestion, and urban development in the suburbs.
  - Center development of the traffic nodal point with integrated functions of residential, commercial, and industrial.
- ✓ Housing development near industrial park and commercial business area for low- and middle-income people.
  - Acceleration of new industrial and commercial business development.
  - Creation of housing environment considering proximity between residences and offices.
  - Allocation of population from CBD.
- ✓ Development and conservation for sustainable urban environment.
  - Development of drainage system for flood control.
  - Development of parks and green spaces for environmental symbiosis.
  - Conservation of prime agricultural lands with well-developed irrigation systems.
  - Conservation of natural green areas for the purpose of flood control.
- ✓ Sustainable urban development with mitigation of environmental and social negative impacts by means such as SEA concept
  - Conservation of natural environment, such as riverside area, which contributes on multi function such as flood control, water purification, biodiversity.
  - Consideration of slums and squatters near the industrial zones, and provision of low income houses
  - Technical transfer of SEA to the planners (in the Phase II the technical transfer workshop were taken place for SEA)

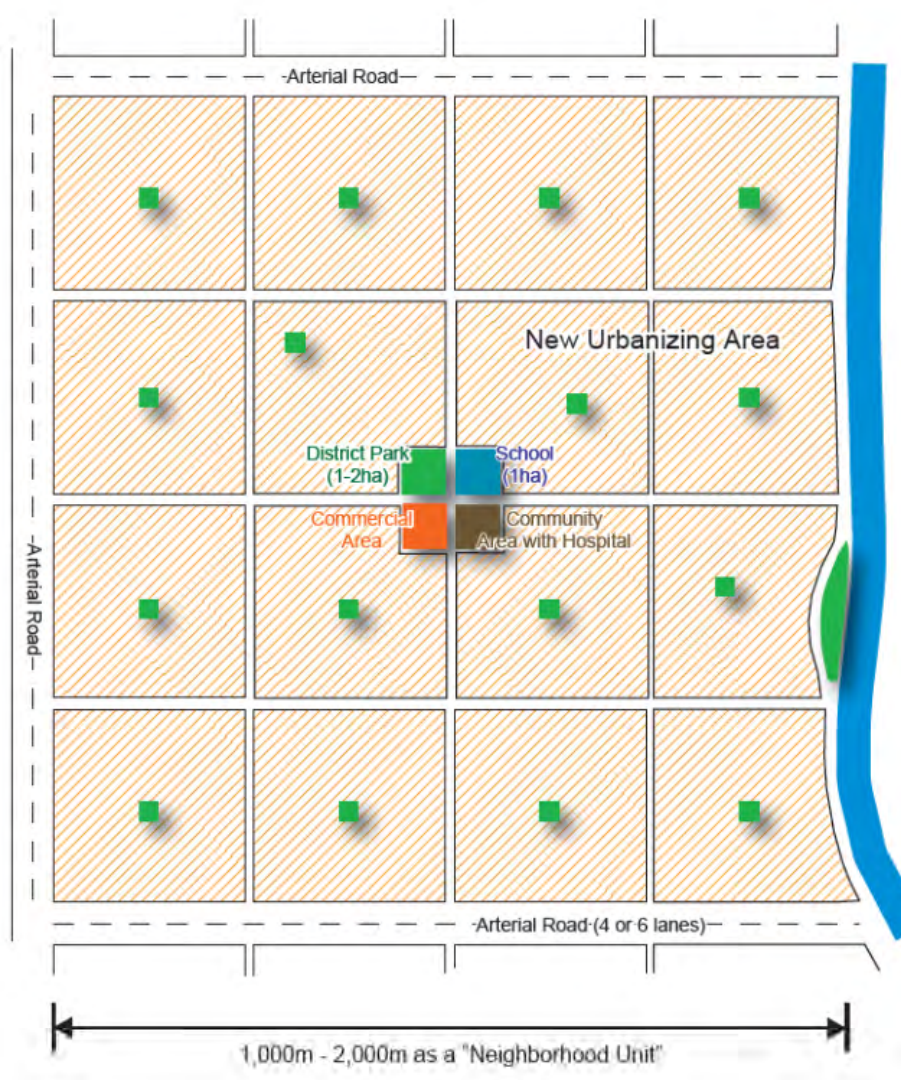
(c) *Concept of Supplying Urban Utilities and Social Services*

In order to secure a better living environment, it is necessary to provide urban utilities and social services, such as public parks, schools, hospitals, community facilities, among others for new urban development areas that satisfy standard supply levels, which are to be defined. The JICA Study Team proposed the following standard supply levels for each neighborhood unit (hereinafter referred to as "one unit") which shall have an area of 100-400ha.

- ✓ Elementary School: One school (1 ha) per one unit. Currently there are 27 schools in East Dagon township, 9 schools in Dagon Seikkan township, 148 schools in Hlegu

township (the whole area, not limited at target are). As urbanizing progress, provision of schools is necessary with unit concept.

- ✓ Large-scale Hospital: One hospital with 50 beds per one unit. Currently there are 2 hospitals in East Dagon township, 1 hospitals in Dagon Seikkan township, 4 hospitals in Hlegu township (the whole area, not limited at target are). Since current level of medical service is low, more provision of hospitals and clinics is necessary.
- ✓ Public Parks: One district park (2 ha) per one unit and one pocket park (0.2ha) per one small unit which has an area of about 25ha. Currently public parks are quite few in suburbs. In consideration with criteria for making new parks, the number of public parks in the future is expected to be 183 in this region in maximum level.
- ✓ Community Area (library, community building, post office and hospital): One area per one unit. The current level of these service fields is very low. It is expected to promote these services more.



Source: JICA Study Team

**Figure 2.2.35: Concept of Supplying Urban Utilities and Social Services**

## 2) Proposed Development Policy of East Dagon Township

In order to make an appropriate future plan for East Dagon Township, the following items need to be considered well:

- ✓ Formulation of a transport network corresponding to the increase in the volume of automobile traffic accompanying urbanization.
  - Improvement of arterial and sub-arterial road networks in order to reduce traffic congestion.
  - Upgrading of Min Ye Kyaw Sawar Road as a sub-arterial road to take on the role of bypass for National Road No. 2.
- ✓ Enhancement of regional economy as triggered by large-scale industrial development in order to realize urban growth and creation of employment.
  - Formulation of a regional center at the intersection of the Ring Road and National Road No. 2 by attracting large-scale industrial development.
  - Industrial urban development including development of nearby residences and offices.
- ✓ Development of residential area by means of transport infrastructure that would accommodate the increasing population accompanying urbanization.
  - Development of a new UMRT line (The new line was proposed in Phase I work. It is noted that continuous studies are necessary to make it realize)
  - Formulation of a township center, which is smaller than the regional center, at the new railway station of UMRT
  - Development of medium density residential area taking into account the transport network.
- ✓ Improvement of drainage facilities to prevent flood disasters.
  - Upgrading of drainage facilities using rivers and canals.
  - Development of urban parks and green spaces with flood control reservoir.

## 3) Proposed Development Policy of Dagon Seikkan Township

In order to make an appropriate future plan for Dagon Seikkan Township, the following items need to be considered well:

- ✓ Formulation of the transport network corresponding to the increase in the volume of automobile traffic accompanying urbanization.
  - Improvement of arterial and sub-arterial road networks in order to reduce traffic congestion.
  - Upgrading of Aye Yarwon Road as a sub-arterial roads to take on the role of bypass for National Road No. 2.
- ✓ Development of residential area by means of transport infrastructure that would accommodate the increasing population accompanying urbanization.
  - Development of two new UMRT lines (The new line was proposed in Phase I work. It is noted that continuous studies are necessary to make it realize)
  - Formulation of a township center for improvement of transportation access such as development of UMRT and Bago River Road.
  - Development of a township center at the new railway station of UMRT.
  - Development of medium density residential area with the advantage of being located

near CBD, Thilawa Special Economic Zone, and the industrial area along the Bago River.

- ✓ Enhancement of regional economy as triggered by large-scale industrial development in order to realize urban growth and creation of employment.
  - Encouragement of further industrial development by expanding the area along the Bago River.
  - Industrial urban development including development of nearby residences and offices.
- ✓ Improvement of drainage system to prevent flood disasters.
  - Upgrading of drainage facilities using rivers and canals.
  - Development of urban parks and green spaces with flood control reservoir.

#### 4) Proposed Development Policy of Hlegu Township

In order to make an appropriate future plan in the Study area of Hlegu Township, the following items need to be considered well:

- ✓ Conservation of prime agricultural lands with well-developed irrigation systems for agriculture-based industrial development.
  - Development of a model for urban neighborhood agricultural industry in the Study area.
- ✓ Urban development taking advantage of the development potential along the Outer Ring Road.
  - Encouragement of land use transformation of areas along Outer Ring Road into residential and industrial use.
  - Attracting factories of farm crop industry.
  - Housing development for workers in the industrial area and for farmers.
  - Urban development including development of nearby residences and offices.
- ✓ Formulation of the transport network corresponding to the increase in the quantity of automobile traffic accompanying urbanization.
  - Improvement of arterial and sub-arterial road network in order to reduce traffic congestion.
  - Development of two new UMRT lines (The new line was proposed in Phase I work. It is noted that continuous studies are necessary to make it realize)
  - Development of access roads to new railway station of UMRT
  - Expansion of village roads.
- ✓ Improvement of drainage system for preventing flood disaster.
  - Upgrading of drainage facilities using rivers and canals.
  - Development of urban park and green with flood control reservoir.

#### 5) Future Land Use Plan of the North-East Region

Taking into account the above ideas, the future conceptual development map of the North-East Region was created, as shown in Figure 2.2.36 below. The two large red circles in the figure indicate the regional centers, while the small red circles indicate the township center and new town core in the North-East Region. The regional center is defined to have functions of intermodal transport and economic and social activities. Therefore the regional center would

include a transfer railway station, intersection of arterial roads, administrative offices, high density residential area, large-scale commercial and business centers, and/or industrial zone. On the other hand, the township center and new town core are defined to have functions of smaller scale as compared to the regional center. Such township center and core have a railway station, intersection of arterial and sub-arterial roads, administrative offices, commercial area, and high and medium density residential area.

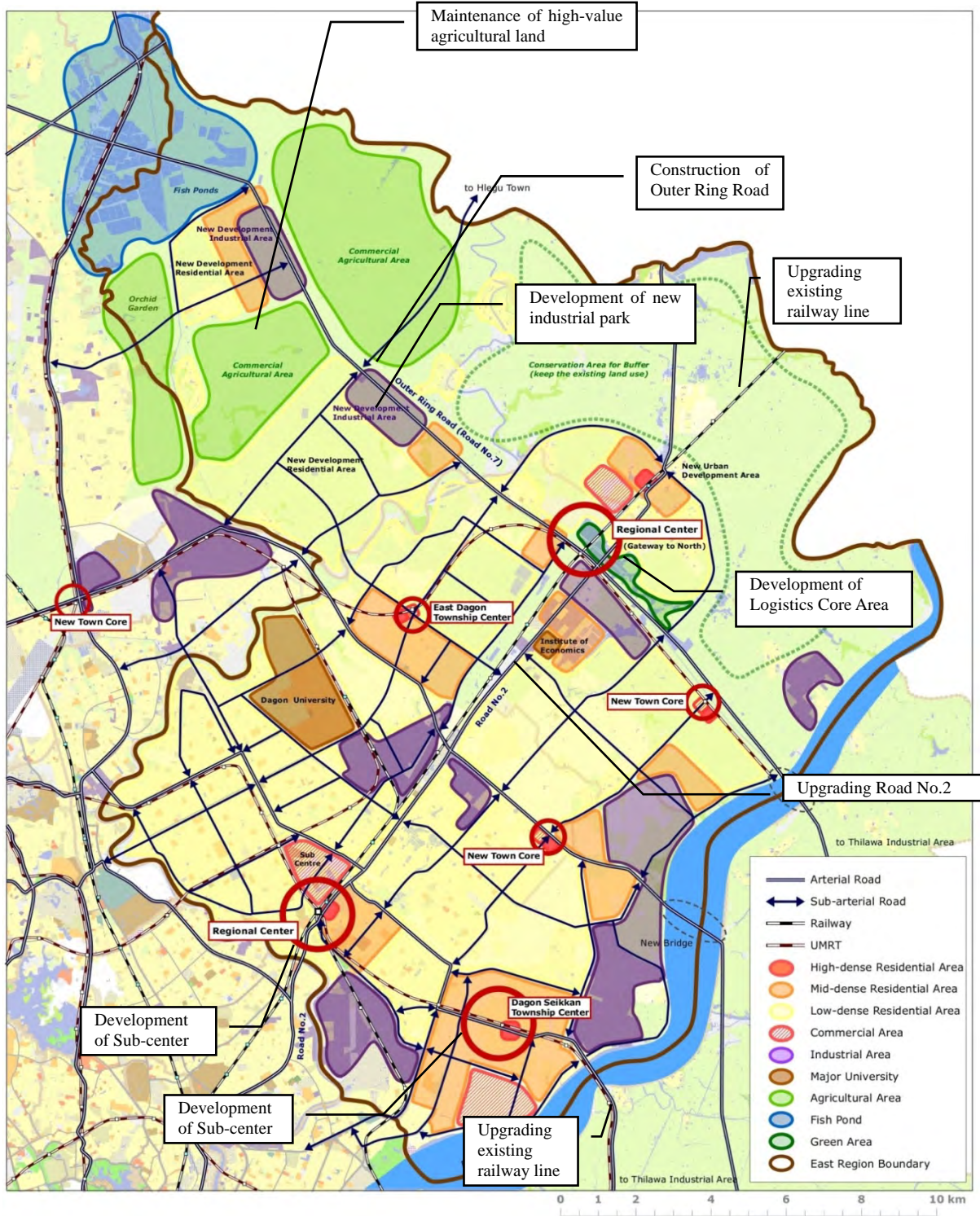
In the North-East Region, one regional center is located next to the subcenter. This area is supposed to have a crossing of several railway lines. In addition, National Road No. 2 runs just beside the subcenter. Taking such advantages of transport access, this area is considered to have the potential to be a regional center. The other is located at the intersection of National Road No. 2 and the Ring Road. This area also has the potential for good transport access especially the crossing of major arterial roads and the railway line. This area is expected to be the gateway center linking YCDC and the northern regions.

The distribution of the township centers was based on discussions with the township officers. These two township centers are located in the middle of each township and close to the existing or planned built-up area. Also these township centers are expected to have railway stations of the UMRT. On the other hand, the new town cores are allocated in the middle of new development areas for residences. The selection of the locations of the new town cores took into consideration the intersection of arterial and sub-arterial roads and/or railway stations.

Regarding land use, residential areas have been designated within the area surrounded by the Ring Road in order to conserve potential agricultural and green areas beyond the Ring Road. Moreover, these green areas are not only for urbanization control, but also to promote urban neighborhood agricultural industry. Looking at the residential plan, high density housing areas are allocated near the regional centers, township centers and new town cores. These areas target business people whose offices are located in CBD, subcenters and regional centers. Medium density housing areas are basically allocated next to the township centers, new town cores, and industrial zones in order to enhance integrated development of housing areas and factories which then contribute to the formation of an efficient urban system. Low density housing areas are distributed in existing residential areas and the surrounding area of agricultural lands. These houses are considered for farmers and workers in industrial zones.

With regard to industrial area, three new development areas are proposed along the Ring Road in consideration of opportunities for industrial development, including farm crop industry and good road transportation access. In addition, some areas along the Bago River and next to the existing industrial zone have been considered for development taking into account the ongoing plan for Dagon Seikkan Township.

On the other hand, some existing roads are proposed as sub-arterial roads that would connect with the four major arterial roads, such as National Road No. 2 and the Ring Road. The two-headed arrows in Figure 2.2.36 indicate these sub-arterial roads. These sub-arterial roads are expected to secure at least two-way traffic and improve drainage.



Source: JICA Study Team and the Working Team of the North-East Region

**Figure 2.2.36: Future Conceptual Development Map of the North-East Region**



Source: JICA Study Team

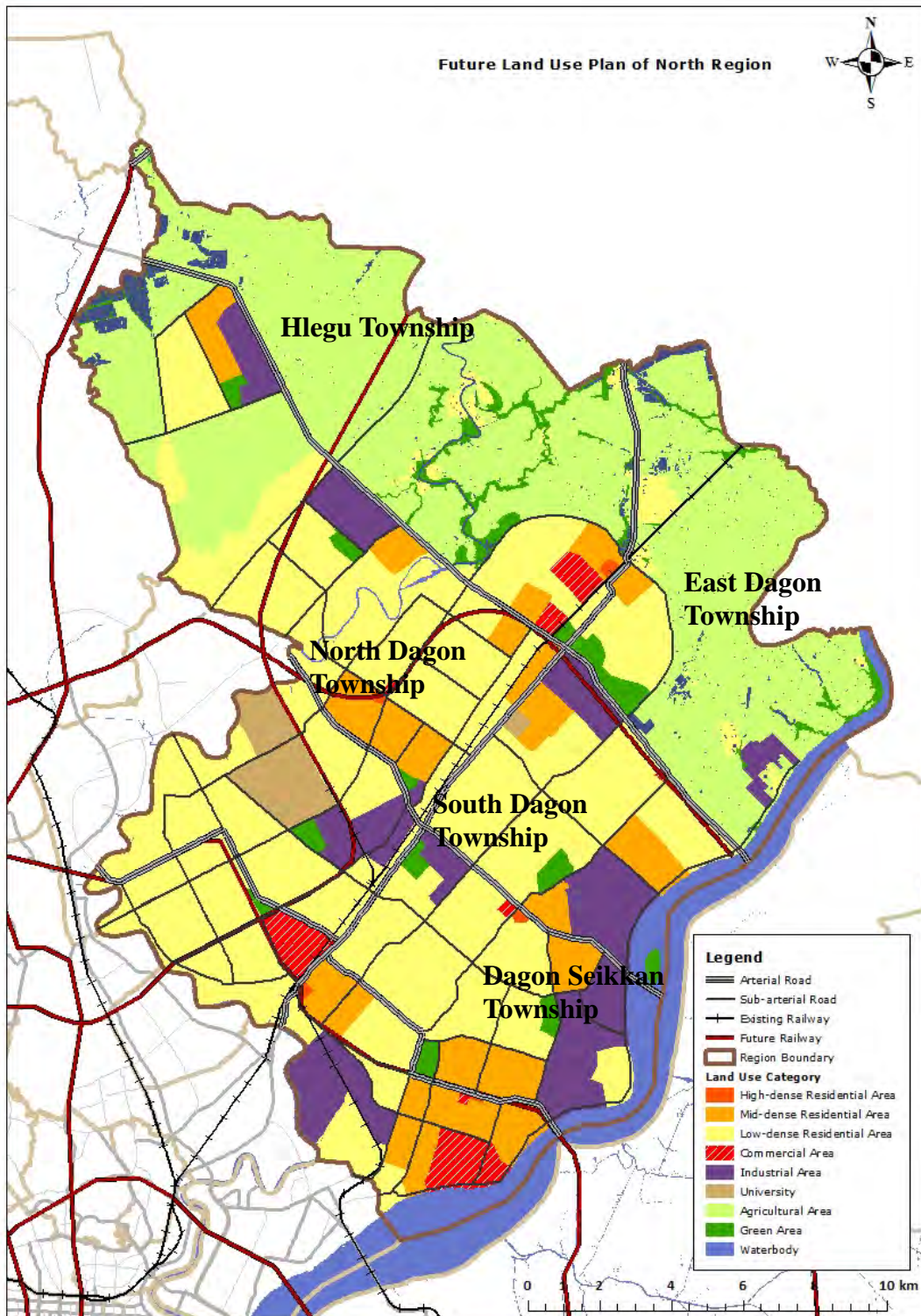
**Figure 2.2.37: Future Conceptual Image of the North-East Region (Bird's-Eye View from South to North)**



Source: JICA Study Team

**Figure 2.2.38: Future Conceptual Image of the North-East Region (Bird's-Eye View from West to East)**

Based on the conceptual map, the road network map and future land use map were developed in GIS format, as shown Figure 2.2.39 below. In addition, the future expected areas of each land use and the lengths of each categorized road were calculated based on GIS data. The calculated results are provided in Tables 2.2.13 and 2.2.14.



Source: JICA Study Team and the Working Team of the North-East Region

**Figure 2.2.39: Future Development Map of the North-East Region in GIS Data**



**Table 2.2.13: Future Expected Areas of Each Land Use Category (GIS Calculation)**

Category	Area (ha)
High Density Residential Area	90
Medium Density Residential Area	3,480
Low Density Residential Area	14,820
Commercial Area	740
Industrial Area	3,160
University	670
Agricultural Area	12,370
Green Area	1,270
Water Body	2,210
Total	38,810

Source: JICA Study Team

**Table 2.2.14: Future Expected Lengths of Each Road Category (GIS Calculation)**

Category	Length (km)
Arterial Road	84
Sub-arterial Road	213
Total	298

Source: JICA Study Team

## 2.4 Review of the Works

### (1) Outcomes and Issues on the Works

- ✧ In order to formulate, revise and manage the future land use plan, relevant information and data including the urban master plan, current conditions, social data, and ongoing projects need to be managed by YCDC themselves, led by Urban Planning Division, in close relation with relevant organizations such as MOC, townships, Yangon Region Government and so on. To achieve this, YCDC is expected to share and update the information or data at all times with other relevant organizations.
- ✧ Townships tended to focus mainly on infrastructure issues, such as on sewage and road infrastructure, in their township even the discussion topic was on future land use planning. Capacity development on urban development and management for officers would be useful.
- ✧ Improvement of the sewage system is essential for land development. In addition to the improvement of the drainage system, the development of flood control reservoir and rainwater drainage systems by utilizing rivers and canals also need to be considered for urban development.

### (2) Way Forward (Proposals)

- ✧ For the capacity development of YCDC and township, a job exchange, workshop, and seminar programs with relevant organizations, such as MOC, university and NGO, could be effective for sharing information, techniques, and knowledge about urban development and management. The improvement of such training program and system is recommended.
- ✧ Under the current situation that the role and function of Urban Planning Division, YCDC is not clear, it is recommendable to make sure and to share it among relevant department of YCDC in consideration with proposed capacity development plan in the other section of this Phase II. The urban planning division is expected to play the core role in the field of Yangon urban development management in good relation with other departments of YCDC, DHSHD of MOC, Yangon region government, townships and others.
- ✧ For capacity development, YCDC could do a case study on urban and infrastructure development and management in advanced countries. When taking into account similarities in geographical

and social features, ASEAN countries shall be appropriate. A case study on the development of urban systems considering the effects of flooding is one effective way to solve this issue.

### 3 Transit Oriented Development (TOD)

#### 3.1 Introduction – Basic Information of Transit Oriented Development (TOD)

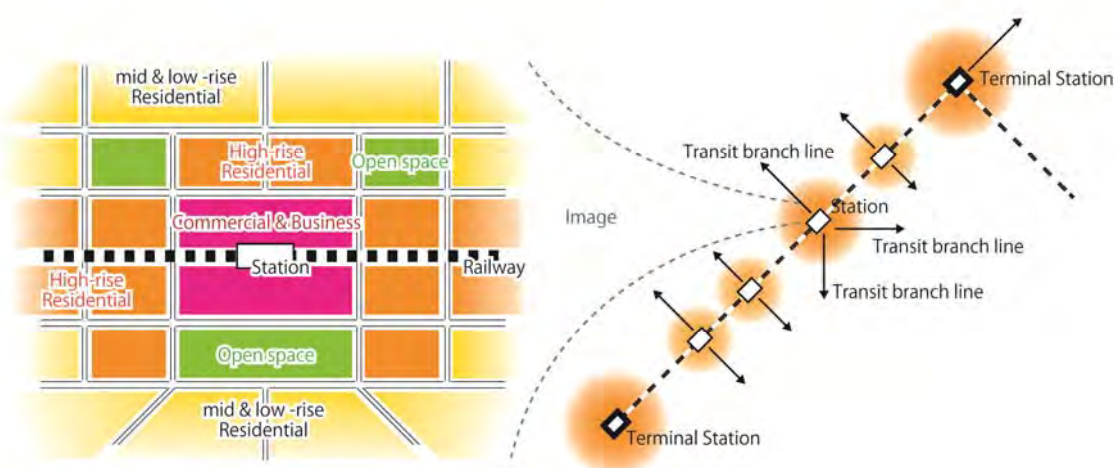
(1) What is TOD?

Transit oriented development, abbreviated as TOD, intends to achieve urbanization based on public transportation systems. This has been proposed by Peter Calthorpe, an urban planner in the United States in the 1990s.

In recent years, it has been demonstrated and verified beyond doubt that the increase of uncontrolled private vehicles cause serious traffic problem, which results in huge economic loss and environmental degradation. Generally, TOD can be considered as the total solution to escape from a private vehicle-dependent society. In a narrow sense, TOD is referred herein as an aggregated urbanization at the public transport station area. Station area development is the typical implementation method.

The TOD is an idea to solve several urban problems resulting from a private vehicle-dependent lifestyle, such as urban sprawl, traffic congestion, traffic pollution, and “ghettoism” at urban core. Conventionally, transportation has been assigned a complementary role just to connect the living, working, and resting areas. But in the TOD concept, urban core should be set upon a public transportation terminal and the terminal area would be preferentially and collectively developed.

The TOD intends to achieve preferable urban functions like high economic efficiency, living convenience, and environmental friendliness by conjugating urban development with public transportation so that urbanization will become socially, economically, and environmentally sustainable, and will not carry the burden forward to future generations. Thus, appropriate TOD implementation is a key for sound and sustainable urban growth.



Source: JICA Study Team

**Figure 2.3.1: TOD Image of Station Area Development**

1) TOD Policy

The policy of TOD is to “achieve urbanization based on public transportation that intends high economic efficiency, and environmental and traveler friendliness”. The approach to achieve this TOD policy is classified into the following three major perspectives<sup>1</sup>:

*(a) Develop an urban core at the railway station area*

Developing public transportation hub as the urban core is apparently an effective method from the perspective of both supporting urban development through efficient transportation and promoting public transportation use for smooth transit and environmental friendliness. The Shinjuku Station in Tokyo is the biggest of this kind all over the world as its passenger volume is 3.6 million passengers/day. Moreover, the station area has aggregated urban facilities of business, commercial, and entertainment. It is the typical example of station area development. The success of this TOD approach is based not only on the construction of attractive facility buildings but also on planning appropriate layout of facilities and urban functions considering the mobility of passengers.

*(b) Connecting residential areas to urban cores with public transportation network*

As residence is the base of urban function, connecting residential area to urban core like central business district (CBD) by mass rapid transit (MRT) or bus rapid transit (BRT) is a key approach for TOD. In order to implement this approach efficiently, it is necessary to comprehend that every public transport is a collective transportation system. Collective transport system requires high traffic density for achieving high efficiency in terms of energy and environment. Without enough level of traffic density, it will lose not only its strong point but also the availability of sustainable operation management eventually. Thus, it is necessary to sustain high traffic density for MRT and BRT to make this approach successful. Constructing medium-rise or high-rise apartments close to the station terminal is a general approach. The Tama New Town Development Project is a typical example of this kind. Additionally, the method, called traffic demand management (TDM), e.g., road pricing and park and ride, will generate synergistic effect with this TOD approach for strengthening public transportation. Singapore is a good case that implements TDM with TOD for urban development.

*(c) Efficiency in area accessibility by light public transportation system*

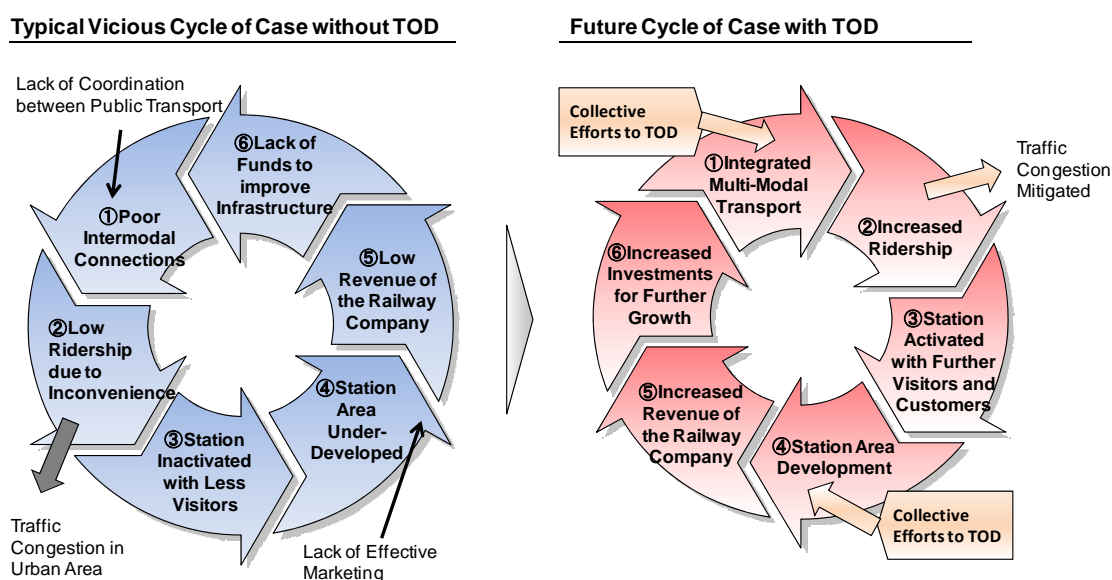
The background of this approach is the decline of city center that happened in recent years. Conventional city center markets have been losing their customers after large suburban-type stores have appeared with huge parking space with its lower land prices and increase of private vehicle use where people can access easily using their private cars. Specifically, this problem has been critical for regional towns and cities in developed countries. Based on the TOD policy, activating city center is one of the most prominent issue where public transportation should play an important role. Public transportation system can raise attractiveness of the city center by improving both accessibility towards and within the area. Medium-capacity system like LRT, tram, and minibus are suitable for easy travel as people can get access directly and easily. The typical cases of this approach are Portland in the United States, Strasbourg in France, and Toyama in Japan.

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<sup>1</sup> Hitoshi Ieda, Namiki Oka, and International Association of Traffic and Safety Sciences, “Toshi saisei – kotsugaku kara no kaito”, 2002

## 2) Strength and Benefit

As stated above, TOD will achieve sustainable city by improving economic efficiency, social convenience, and environmental friendliness. On the other hand, TOD will bring benefit to the operator of public transportation system by increasing the passenger demand. Specifically, approaches like intermodal facility improvement and station area development, which are categorized in A, can create a virtuous cycle of investments and benefits as shown in the following Figure 2.3.2. Without TOD, the railway operator will decrease its share of passengers, lose the funds for investment, and face difficulty against sustainable operation. Finally, the cycle will become vicious.



Source: JICA Study Team

**Figure 2.3.2: Vicious Cycle without TOD versus Virtuous Cycle with TOD**

### (2) TOD Example in the World

TOD has been major approach developed country cities but also developing country cities like Seoul, Bangkok, and Jakarta, where people suffer from traffic congestion and air pollution caused by rapid motorization. Thus, TOD has become one of the key strategies with a view to managing those problems.

On the other hand, Japanese urban development historically has tied with railway transportation development. It has appeared on that high modal share of public transportation and high value of land near railway stations. Especially, there are many success stories of private railway cooperation who have received world-wide reputation represented by Tokyu Railway in Tokyo metropolitan and Hankyu Railway in Hanshin metropolitan. They have implemented a TOD policy called Ensen Kaihatsu, which bases on creating fascinated space along their railway line by developing undeveloped area, instead of setting stations at developed aggregated area.

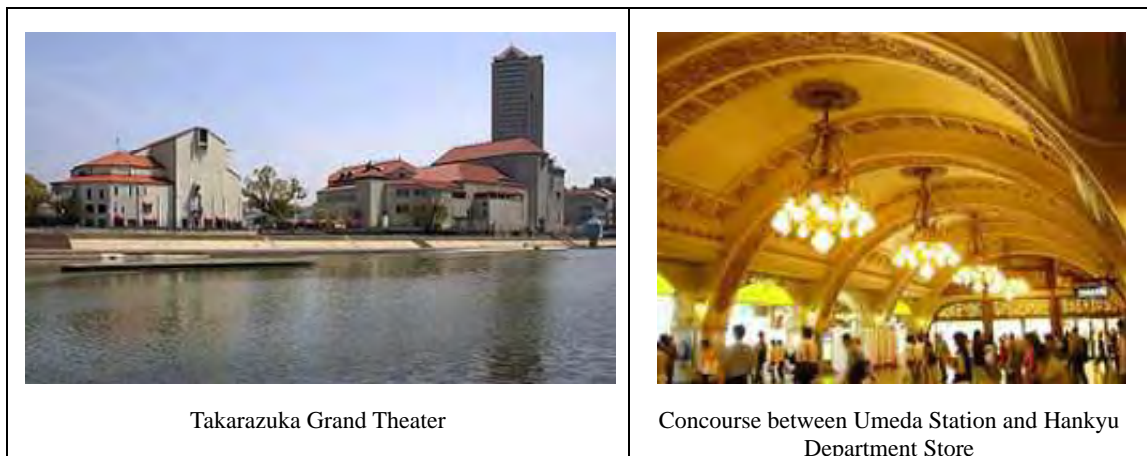
Although YCR is existing line, Most of the station area is low-residential building area and undeveloped. It is feasible to develop such area by the measure of land replotting in future. Thus, the experiences of Tokyu and Hankyu would be referred so usefully for YCR TOD.

1) Comprehensive Railway Line Development

Ensen Kaihatsu is a method of TOD which has been typical policy of Japanese railway cooperation. Here, implementation method of Hankyu railway is referred as Ensen Kaihatsu example. The founder of Hankyu railway, named Ichizo Kobayashi, has learned a garden city plan of England and applied it on Hankyu railway development as Ensen Kaihatsu. The policy of Ensen Kaihatsu is boosting the demand for multiplier effect by building commercial buildings, entertainment facilities, and residential apartments. The major measures are as follows;

a) *Takarazuka Grand Theater*

For urban railway connecting CBD and suburban area, the peak PPHPD (Passenger Per Hour Per Direction) comes in commuter hour, towards CBD in morning and towards suburban in evening. It had been an issue to obtain passenger demand other than commuter. Kobayashi has established a facility for attracting customers, Takarazuka Grand Theater, at suburban terminal station. The theater created new passenger demand on opposite direction from commuters. LoS (Level of service) of Hankyu railway has advanced by passenger increase and led to attractiveness improve on the line area.



Source: homepages

**Figure 2.3.3: TOD Examples (Comprehensive Railway Line Development)**

b) *Hankyu Department Store*

Hankyu Department Store opened in 1929 at Hankyu Umeda Station, which was the first department built on railway terminal station. This facility created higher passenger convenience going to shopping by railway, especially for off-peak hour. This measure also contributed brand strength of Hankyu railway with providing entertainments such as shopping and amusements. As the measure has achieved great success, many other railway companies has incorporated it into their strategy and developed terminal department stores.


c) *Inviting Universities*

Hankyu railway invited lots of universities along the line. The major universities are Kobe Women University, Kansei University, and Konan University. This measure increase not only young railway passenger but also sales of commercial facilities and markets located along the line with taking in consumption activities of the youth.

## 2) Station and Destination Area Development

There are many growth pole development examples of TOD all over the world and some of them are mentioned above sentences. Here, two cases are picked up for examples, one is Docklands at London for sub center development, and the other is Tama New Town at Tokyo for residential town development.

**Table 2.3.1: TOD Exapmle (Station and Destination Area Development)**

	Docklands London, England	Tama New Town, Japan
Picture		
Type	Subcenter	Residential Town
Scale	56 ha	2,884 ha
Population	90,000 (2005)	216,400 (2010)
Public Transport	<ul style="list-style-type: none"> <li>• Docklands Light Rail</li> <li>• London Metro Jubilee Line Extension</li> </ul>	<ul style="list-style-type: none"> <li>• Tama Monorail</li> <li>• 3 Urban Railway Line (Keio, Odakyu, JR)</li> </ul>
Urban Function	<ul style="list-style-type: none"> <li>• Business District</li> <li>• Commercial Center</li> </ul>	<ul style="list-style-type: none"> <li>• Satellite City</li> <li>• Residential Town with Commercial Facility</li> </ul>

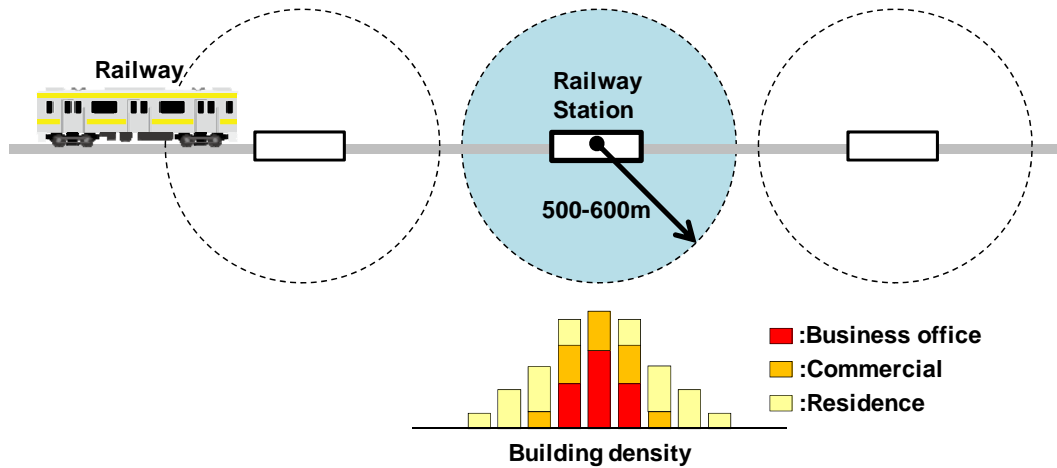
Source: <http://www.ur-net.go.jp/syutoken/nt/housing.html>

## (3) TOD Strategy

As stated in Chapter 3.1.1, although TOD has several approaches depending on the purpose and situation, it is herein referred, in a narrow sense, as an aggregated urbanization at a public transport station area. The major strategies are: (1) station area development, (2) multimodal facility integration, and (3) role division and distribution of each station area.

### 1) Station Area Development

This strategy intends that the railway station area is developed as an urban core where urban functions are aggregated including business, commercial, and public administration. The residential area will be set surrounding the city center. The aggregation area should be walkable, up to 500-600 m if possible, in consideration of easy accessibility.

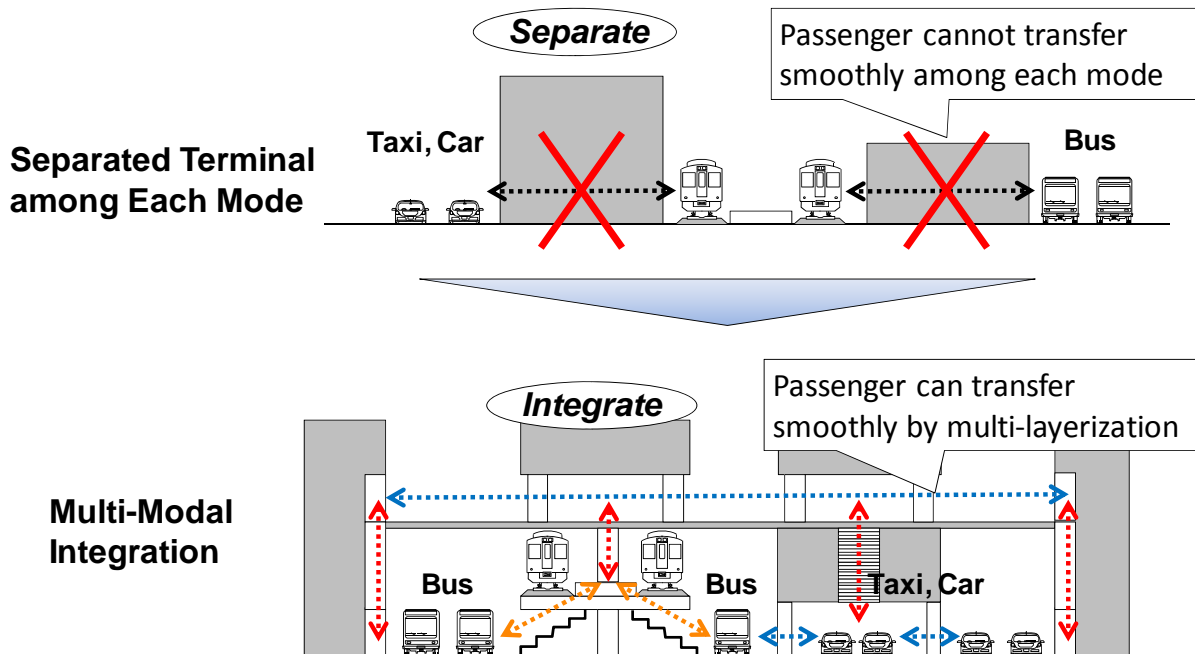


Source: JICA Study Team

Figure 2.3.4: Station Area Development

2) Multimodal Facility Integration

Integration of each transport mode would be essential for TOD because basically, public transportation system cannot provide direct access from origin to destination and should require modal combination. Thus, non-integration will cause time loss and uncomfortable transfer for passengers. The integration should be designed through a combination of horizontal movement and vertical movement using sky deck and accessway so that passengers can move smoothly during transfer.



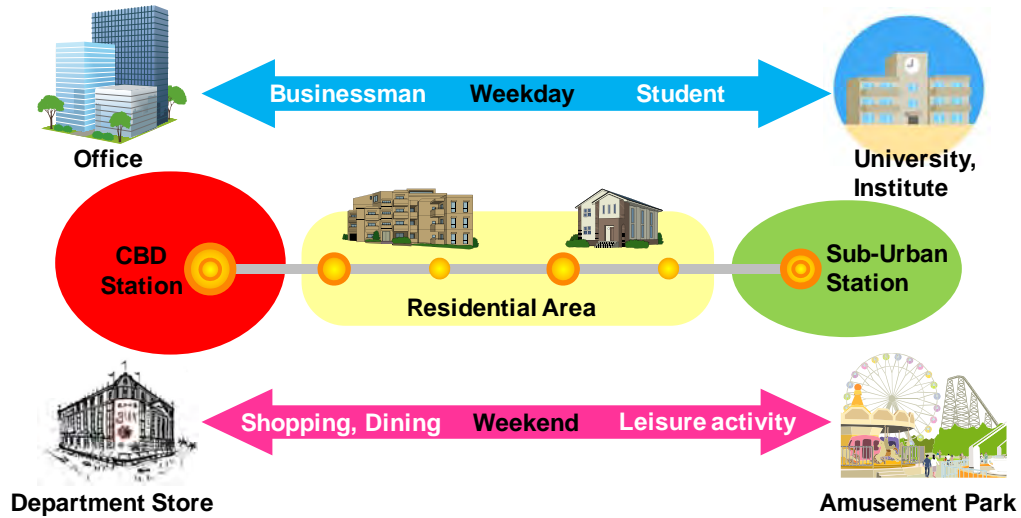
Source: JICA Study Team

Figure 2.3.5: Multimodal Facility Integration



### 3) Role Division and Distribution between Station Areas

Uniform development in every station area does not bring sufficient effect. Dividing roles and distributing each function along the railway line would attract further passenger demand by activating every station area, and will produce synergistic effect as a whole. It is necessary to consider the characteristics of the region and passenger flow.






Source: JICA Study Team

**Figure 2.3.6: Role Division and Distribution between Station Areas**

### (4) Urban Public Transportation System for TOD

Urban public transportation system plays a key role for TOD. Generally, the system is required to be capable of mass and rapid transit like MRT, LRT, and BRT. The characteristics of each system are summarized in following Table 2.3.2. The system will be selected depending on the development policy, level of service, potential room for development, traffic demand in the future, dedicated lane availability, and investment cost. In case of introducing different systems at one site, multimodal integration is a critical issue.

**Table 2.3.2: Urban Public Transportation System**

System	MRT	LRT/Monorail/AGT	BRT
Image			
Traffic Capacity (passengers/hour)	30,000-85,000	10,000-30,000	??? - 25,000
Scheduled Speed (km/hour)	25-55	20-35	15-30
Station Pitch (km)	0.8-2.0	0.8-1.5	0.4-1.5
Initial Cost (USD million/km)	50-320 (Underground) 50-100 (Viaduct)	10-50	0.5- 15
Advantage	<ul style="list-style-type: none"> <li>• Large-scale impact on decongestion</li> <li>• High energy efficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Balanced development</li> <li>• Passenger friendliness</li> </ul>	<ul style="list-style-type: none"> <li>• Low initial cost</li> <li>• Flexible development</li> </ul>
Disadvantage	<ul style="list-style-type: none"> <li>• High cost</li> <li>• Long time for project implementation</li> </ul>	<ul style="list-style-type: none"> <li>• Integration problem</li> <li>• Many crossings with road</li> </ul>	<ul style="list-style-type: none"> <li>• Interference on road traffic</li> <li>• Low capacity limit</li> </ul>

Source: JICA Study Team

In the above table, although BRT has a maximum capacity of 23,000 passenger/hour/direction, only few examples such as the Transmillenio in Bogota can reach this level. Generally, the maximum capacity of normal BRT system is around 10,000 passenger/hour/direction.

### 3.2 TOD on Yangon Circular Railway (YCR)

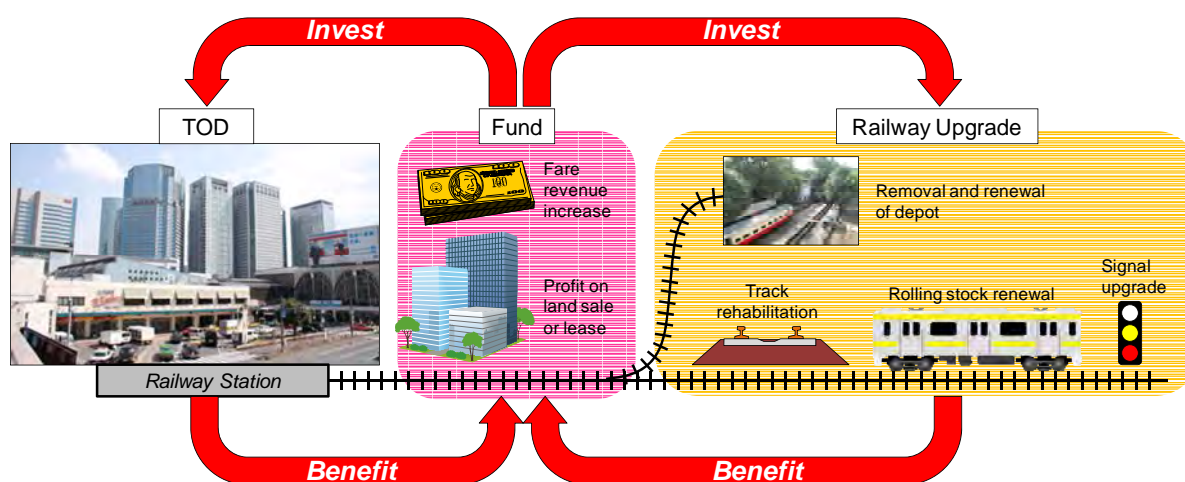
#### (1) Strategy of YCR TOD

##### 1) Existing Condition of YCR

The Yangon Circular Railway (YCR), which has a length of around 47.5 km and 38 stations, belongs to Myanmar Railway (MR). It carries 100,000 passengers for both directions. Also, the number of daily operation train reaches 200 including suburban section lines. Although there are many things to upgrade regarding the level of service (LoS) and security, it has large potential for TOD on the grounds of station. Certainly, there is room for improvement. Specifically, the potential demand of station area development at the CBD area is huge. Thus, it is required to undertake a comprehensive development plan including area development planning, policy decision making, market expansion, and land price increase through railway LoS improvements.

##### 2) Basic Strategy

As stated in Chapter 3.1.1.2, TOD has benefit for railway operator in terms of demand projection. The demand increase will bring both fare revenue increase and investment capability expansion through the increase of land value near the station area. Thus, MR will gain larger revenue with TOD scenario and could make full use of the added revenue for other investments in railway LoS improvements such as operation system upgrades, track maintenance, rolling stock renewal, and electrification in the future. The LoS improvement will enhance the effect of TOD and further investment in TOD will be expected. In short, the benefit of TOD can build virtuous cycle and synergistic effect with railway LoS improvement.



Source: JICA Study Team

**Figure 2.3.7: Role Division and Distribution between Station Areas**

The promising areas for TOD include existing stabling yards, depot, and workshop next to each station owned by MR. These areas have aged facilities which need to be replaced and upgraded. The strategy is to replace and transfer these old facilities to suburban area and utilize the former site for TOD. It is controversial how to prepare the funds for the facility replacement under this strategy. It is required to identify a scheme to utilize the potential value of the site at the maximum. Especially, stations in the CBD area have substantial potential for

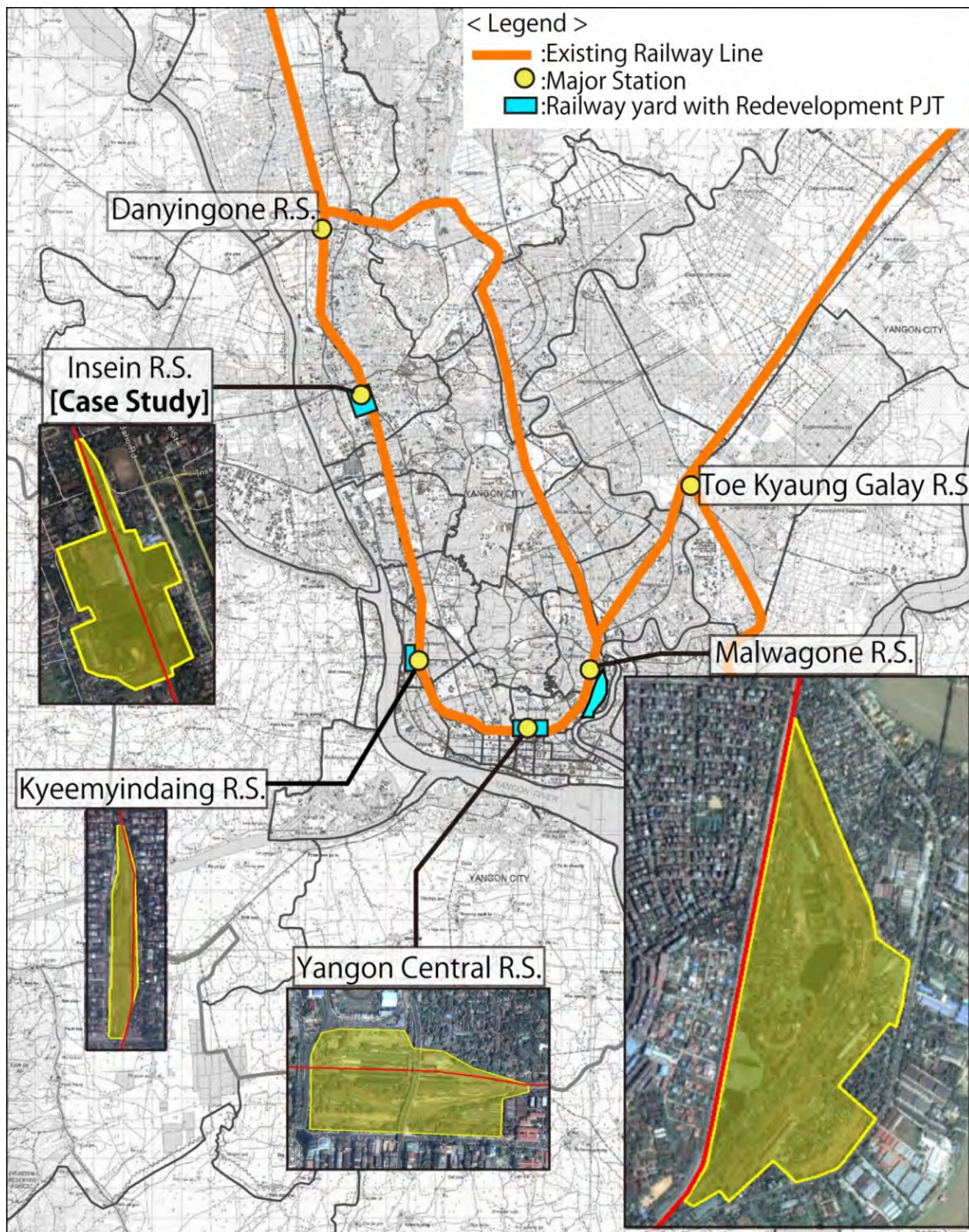
development. The development plan in each station should carefully consider the future land value increase.

The major issue for this strategy is how to reflow the benefits from TOD towards railway upgrades and further developments. The fund is originally brought by urban development, and one of the investments is public transportation development. So, it is essential to prepare a proper project scheme to implement TOD under existing laws and regulations. The scheme should consider public-private partnership (PPP) that attracts private finance and know-how for the development. Because neither MR nor Yangon City Development Committee (YCDC) has experience of TOD, it is preferred that Japanese railway operator or consultants will assist in building the plan and scheme for the TOD implementation.

### 3) Scope of Preliminary TOD Implementation

As studied in both the Phase I of this study and the Project for Comprehensive Urban Transport Plan of the Greater Yangon (YUTRA), the first step of YCR upgrade focuses on the west half loop where population has been aggregating and the development potential is bigger. Accordingly, preliminary TOD also focuses on the stations on the west half loop in harmony with railway LoS improvements. There are four stations where MR owns the nearby site, namely: Yangon Central, Malwagone, Insein, and Kyeemyindaing. These stations can be the first target for TOD on account of the unnecessary land acquisition. After completion, they will become the model case of YCR TOD. Moreover, it is expected that the success of the model case will promote further TOD at other stations with land acquisitions.

The following Figure 2.3.8 shows the locations of the four stations. Insein Station is selected for the case study and the details are described in Chapter 3.2.4.



Source: JICA Study Team

**Figure 2.3.8: Preliminary Target Area for YCR TOD**

(2) Business Structure

1) Clarification of Rules and Regulations

Rules and regulations regarding the development of the station plaza and adjacent property along the YCR line of MR in the Yangon Region need to be classified according to the nature of development.

The Myanmar Railway Act (1890) does not cover all aspects concerning the participation of the private sector, including its leasing of property. Any restrictions for TOD under this act and/or other regulations shall be verified for smooth implementation.

Utilization of land of MR by foreign company is acceptable under Clauses 31 and 32 of the Foreign Investment Law (FIL) dated November 2, 2012. Moreover, Notification No.1/2013 under FIL specifies the types of economic activities and business under the ministry. Still, nothing is stated concerning the Ministry of Rail Transportation (MORT) and MR. Therefore, the legality of any TOD project which involves foreign investment shall be checked with the Myanmar Investment Committee.

Laws, clearances, rules, and regulations concerning the development (real estate, design, construction, etc.) shall be clarified. Whether existing in Myanmar laws at the present or not, the following items, among others, shall be clarified:

- ◇ Process of urban planning
- ◇ Restriction of land use in YCDC and concerned township
- ◇ Rules and regulations for leases of air right
- ◇ Basic zoning plan for Yangon City
- ◇ Restriction on land transaction for particular city planning
- ◇ Law on land readjustment project
- ◇ Integrated railway development and land readjustment law
- ◇ Law on urban redevelopment project

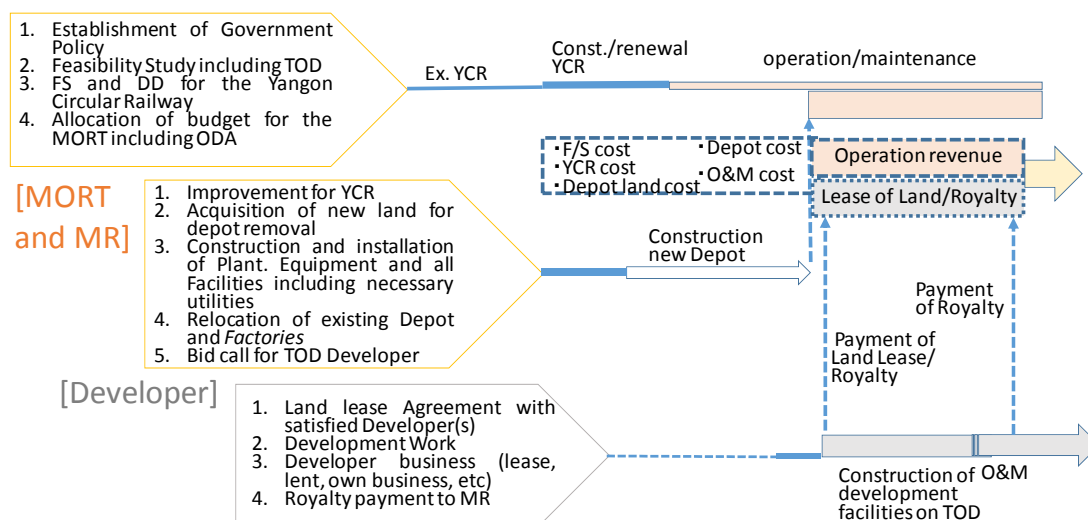
The assumed action plan for the above items is stated in Chapter 3.2.3.

2) Financial Arrangement

Financial merits of TOD for MR include the revenue from the lease of depot, possible royalty by developers, and increased commuters. In order to maximize the TOD impact, the progress of the TOD project should keep pace with the railway improvement projects.

The replacement of depot/workshop will be included of YCR improvement (Non-electrified) Phase-2 or will be implemented in parallel with the Phase-1. Under the circumstances, MR and MORT has been suffering from lack of funds by low passenger revenue. However the alternative consideration may be necessary to study the feasibility of the improvement of Myanmar Railway, for example, Versement Transport of France which withhold tax from payroll of citizen and fiscal budget/subsidy to Myanmar Rail for the massive scale improvement of circular line including electrification. But utilizing their own lands will make further improvements feasible, including electrification in the future, by the other hand, subsequent improvement will generate the additional income which will enable for the independence of Myanmar Railway.

The following Figure 2.3.9 shows the tasks of MORT, MR, and the developer for the YCR TOD.



Source: JICA Study Team

**Figure 2.3.9: Project Implementation Structure for YCR TOD**

There are several issues on the financial arrangement for TOD. MORT and MR will face the following uncertainties:

- ❖ Uncertainty on the availability of fiscal budget in terms of amount and timing; and
- ❖ Uncertainty on the financial contribution from the development of depots and factories in terms of amount and timing.

On the other hand, the developer will have the following concerns:

- ❖ Difficulty of determining the land value at the present situation owing to the absence of rules and regulations for land use/building code/incentives/etc. and future market outlook.
- ❖ Risk of advanced payment to MR for several years for the development right of depots/factories, which becomes burden for developers and would not be realistic under their financial arrangement.

Implementation plan should include the affordable rate of ticket for commuter following the Versement Transport, government undertaking of subsidy and the method of hedging the above risks and uncertainties.

### 3) Assumed Business Structure

The following Table 2.3.3 shows the description of projects under the YCR TOD and their feasibility and assumed business structure.

**Table 2.3.3: Projects of YCR TOD**

Project	Description	Qualitative Feasibility	Business Structure
1) Transit related to railway	Yangon Circular Railway Improvement (Non-electrified) Phase1: Western Half Loop. Project includes the improvement of civil facilities, change of rail, signal system, and improvement of station/facilities.	Since the work is fundamental improvement of facilities, conventional public work by government budget (ODA inclusive) will be suitable.	Public construction, Public operation (MR's work)
	New Integrated Depot and Workshop Construction Project (Integration and Relocation of Current Depots and Workshops to Yangon Suburban Area): Phase1	Since the project shall be carried out prior to the lease of existing depot to developers, conventional public work shall apply.	Public construction, Public Operation (MR's work)
	All stations shall be redeveloped and upgraded to accommodate the increased capacity and modernization of the railway throughout Yangon Circular Railway line. MR shall grant the concession right to developer to utilize the ROW of MR.	Redevelopment/renewal of station can be feasible provided that increased frequencies of train operation, shuttle train, and BRT are implemented.	BOT and/or Joint Venture (Developer and/or JV w/MR)
2) Transit related to other public transportation (BRT etc.)	Other public transportation system such as shuttle BRT will be developed between Insein Station and the passenger terminal building (PTB) of Yangon International Airport (YIA) with approximate distance of 4 km.	Under the expansion plan of YIA, the number of passengers will rapidly increase. Subject to the improvement of West Yangon Circular Railway of Yangon line, this will give a good image to visitors.	Private Operation or PPP (Concession, BOT)
3) Transit related (BRT)	BRT system will be implemented to enhance the railway commuter. YCDC shall grant the concession to invest and operate for a certain period. YCDC/concerned ministry shall build/improve the road.	BRT shall be feasible on the conditions that improved road, balanced fare with railway, and frequency of operation time, are implemented.	PPP (Concession)
4) Commercial area development	Any station plaza and neighboring area shall be developed as the policy of TOD including park and ride (P&R) facilities. MR shall lease the land of depot/factory adjacent to the existing station.	Development shall be economically viable and financially feasible for various purpose including dedication of public area and car park for P&R.	Normal private business, or PPP
5) Public area development	Developer shall build the green area (public area) and car park (park and ride) dedicated to YCDC or for the SPC (O&M company).	Non-commercial development. However, operator (SPC or YCDC/regional government) may carry out commercial events if applicable.	YCDC construction and operation or PPP

Source: JICA Study Team

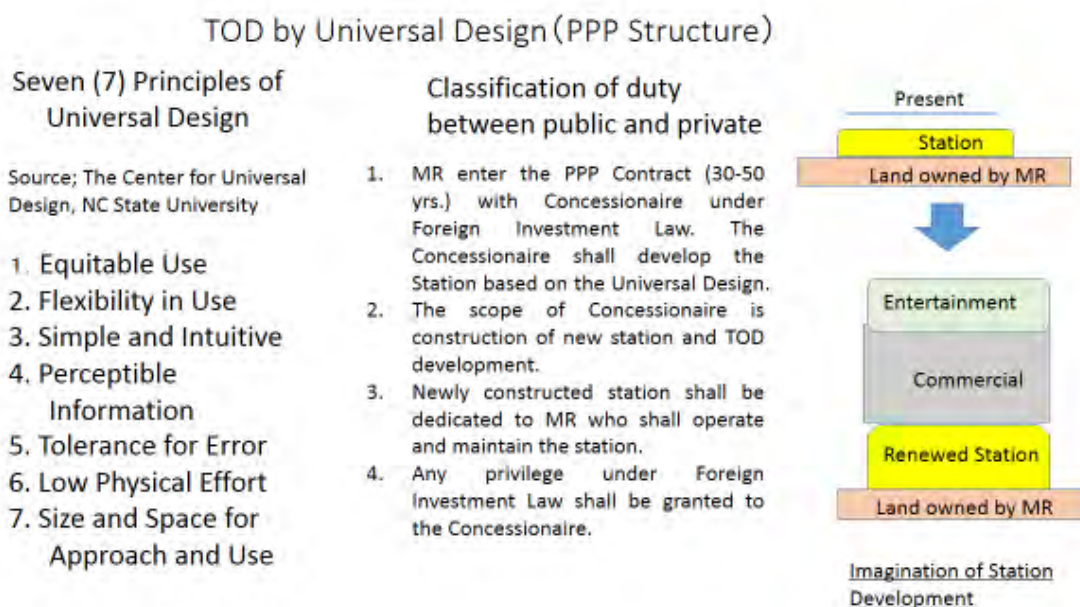
In this Study, the schemes for major TOD projects, which include the following: a) commercial development of station, b) comprehensive development initiative, and c) incremental development Initiative, were examined.



(a) Commercial Development of Station

Station development as TOD shall be to aim the conveniencies for commuter and to create the comfortable public space in addition to the commercial development. Existing Station is simple and low rise buildings only except for Central station. MR will grant the right to use the right of way for the developer. MR will enter the [30-50 years (Foreign Investment Law)] PPP agreement with the developer for the development of station and the above/adjacent for commercial use. MR shall require the development plan based on the “Univeral Design”.

The scope of developer includes the construction of new station which shall cope with improvement of YCR and the construction of commercial buildings based on the “Universal Design”. There are options for development, one is the development of station adjacent area, or the development of area above station..



Source: JICA Study Team

**Figure 2.3.10: Project Scheme for TOD Station**

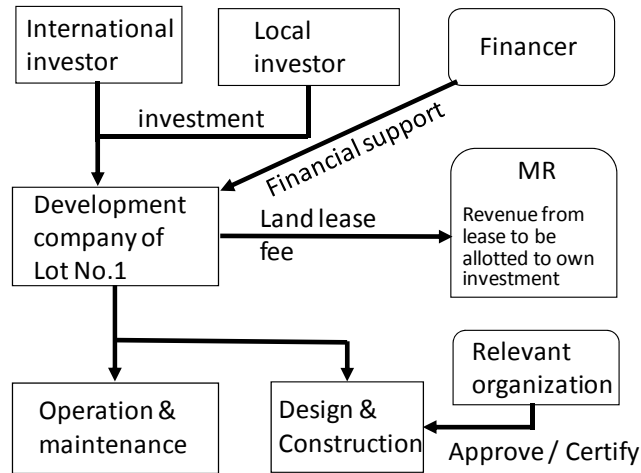
In any case, the newly constructed station area shall be dedicated to MR in consideration of the concession right. MR shall operate and maintain the station at its own cost. It is recommended to provide building permit and any incentives under existing rules and regulations to the concessionaire.

(b) Comprehensive Development Initiative at the Station Area

Under the scheme of comprehensive development initiative, MR issues the request for proposal (RFP) for the development of the depot and/or workshop adjacent to the station. The proposal shall comply with the development plan of YCDC, Yangon Regional Government, and/or any relevant rules and regulations.

The developer shall submit the master plan including all necessary infrastructure and zoning of the area. Any developer who submits a proposal shall be responsible for undertaking all the necessary finance including the land utilization fee of the depot area and the design, construction, operation, and maintenance of the facilities and premises.

In addition to the above, the developer shall be responsible in forming the investment entity for the development and operation of the public area.



Source: JICA Study Team

**Figure 2.3.11: Project Scheme for Comprehensive Development Initiative at the Station Area**

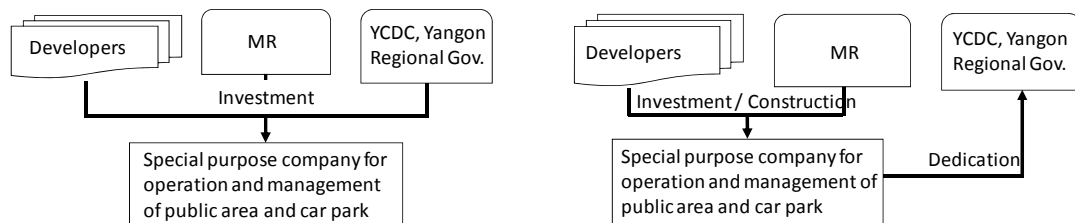
There are two options for the selection of the developer of the public area development, park and ride facility, and station plaza.

*[Case-1]*

A certain area shall be developed as a public area which will contain green area, public event square, and parks for the comfort and recreation of people gathered in the TOD. Due to this publicity, this area will be beneficial to all concerned participants of TOD. Therefore, developers and MR shall contribute a certain amount to the special purpose company (SPC) which may be established from among the concerned parties, through a third party, or by YCDC and/or Regional Government of Yangon. The principal objective is to sustain the operation and maintenance of the non-commercial area (public area).

*[Case-2]*

As an alternative, the concessionaires and MR shall transfer the completed public area and car park to YCDC, and in some cases, to the Regional Government of Yangon as a permanent public property. YCDC and local government shall operate and maintain these areas at their own cost. Parking fee may be waived for park and ride cars as an incentive to use the railway.

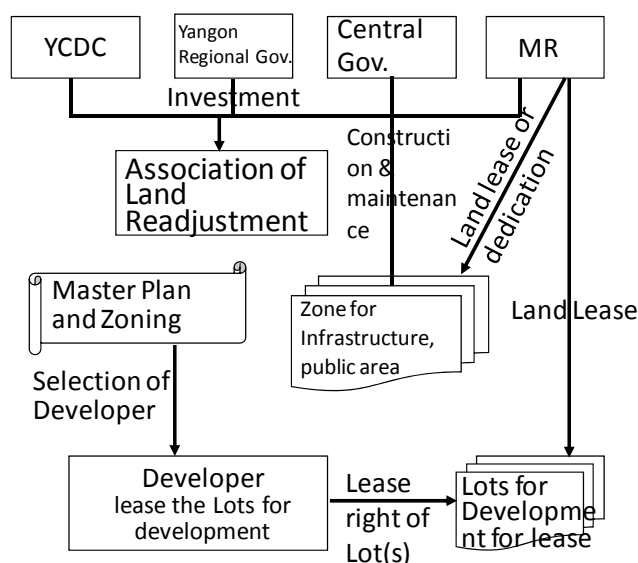


Source: JICA Study Team

**Figure 2.3.12: Project Scheme for Public Area Development in Comprehensive Development Initiative (Case-1 (left) and Case-2 (right))**

(c) Incremental Development Initiative at Station Area

Under the scheme of incremental development initiative, a land readjustment association (association) shall be established to undertake the initiative of developing the depot and factories adjacent to the station. The association will be composed of MR, YCDC, Yangon Regional Government, and any concerned ministry of the central government. The association shall produce the master development plan of the depot/factories including zoning. All responsible members of the association shall acquire the necessary land for the infrastructure as shown in the zoning plan, such as roads, parks, bus terminal, and any public area from MR. Alternatively, MR may dedicate such land. Any cost incurred to construct and maintain such infrastructure shall be borne by their own fiscal budget. The association will issue the RFP to the potential developer and the latter will submit the development plan proposal which includes the land lease offer to MR. MR with the assistance of the association will then select the developer(s) for each lot as shown in the master plan.



Source: JICA Study Team

Figure 2.3.13: Project Scheme for Incremental Development Initiative at the Station Area

(3) Major Issues for TOD Implementation

As the following policies, stable summarize major issues and measures for TOD implementation.

< Policy for TOD Implementation >

- ✧ For urban facilities, to carry out the limitations of architecture action in the site to be planned and well-known target of the plan to stakeholders.
- ✧ To create a system that will be borne by the beneficiary (road users if the road) the expenses for servicing the urban facilities.
- ✧ Regulation of land use is established. And, the development of a planned town is performed. I make regulations on the advanced use of peripheral (near the train station and sub-core) areas of higher potential in the future, the system.
- ✧ System of urban development by local residents and landowners are made.
- ✧ To create incentives and restrictions on rights holders in order to facilitate the redevelopment project.

◇ Suppressing mechanism is created a rise in land prices.

**Table 2.3.4: Major Issues for TOD Implementation**

Category		Issue	Assumed Action Plan
Field	Group		
Urban Planning	Urban Structure	a) The budget for a new road is not secured. The budget is only for road maintenance. The beneficiaries will develop the new road by themselves.	a)-1: Preparing funds for road development as public investment by incremental budget in the Yangon Development Plan for 20 years. a)-2: Establishing special tax for road development like setting aside revenue source for road construction. a)-3: Establishing subsidy scheme for diverting funds from private development profit to public infrastructure investment.
		b) The demarcation and cost sharing ratio between the public and private sectors are not clearly prescribed for high profile urban development projects.	b)-1: Clarifying the demarcation and cost sharing ratio in investments for railway station access road and station plaza. b)-2: Clarifying the demarcation and cost sharing ratio in investments for station free passage and park/green area.
		c) The processes for planning urban railway, roads, and station plaza are not confirmed.	c)-1: Establishing the process of urban planning and decision making concerning urban railway, road, and station plaza, which is composed of policy making, feasibility study (including traffic demand forecast and cost-benefit analysis), fundamental drawing, and conceptual design.
		d) There are no building restrictions concerning road alignment, railway alignment, and station plaza planning line.	d)-1: Establishing the regulations to control constructions, street stall, and squatters in future road space. d)-2: Establishing the rules of land acquisition for road development and improvement.
		e) The regulation for setting parking with building is not clearly prescribed.	e)-1: Establishing the regulations to obligate setting enough parking space with residential buildings and submitting building use declaration at the time of application. e)-2: Installing the development charge system to prepare investment funds for public works in township and wards like water supply and sewerage works, and school buildings.
		f) There are no prescriptions securing space for parks and green lands.	f)-1: Establishing the regulations to control green ratio for land development above certain squares.
	Land Use	g) There are no land use restrictions about building use, building-to-land ratio, and floor space ratio. There is only a restriction to regulate building height by its front road.	g)-1: Implementing the land use control for the whole Yangon City area. g)-2: Installing a "floor area ratio trading system".
		h) In the Yangon rural area, bus terminal has become a commercial hub. There are no cases that railway station area has become an efficient utilization district.	h)-1: Establishing the integrated transportation system plan, which intends to ease and facilitate traffic of all transportation modes. It includes reorganizing feeder bus networks for promoting railway use, and flow line installation for smooth transfer between bus and railway. h)-2: Revising the fare system for promoting railway

Category		Issue	Assumed Action Plan
Field	Group		
			use such as fare reduction for transferring passengers. h)-3: Providing the commutation ticket and school seasonal ticket in collaboration with private corporations.
		i)	There are few commuters to use railway stations. i)-1: Improving the flow line between railway station and commercial area for higher ability to attract customers. i)-2: Developing the commercial aggregation facilities like shopping mall at the station area.
	Regional Planning	j)	Building redevelopment projects based on purchase and sale of entitled floor. There are no methods for cooperative development through collaboration among small landowners and investors. j)-1: Establishing a comprehensive system concerned with orderly land arrangement, land and building sharing, and site ownership. j)-2: Promoting the institutionalization of land-based participation into development project.
Redevelopment	Promotion Area	k)	There are no legislative systems to assign an efficient utilization district on major railway station and the second CBD. k)-1: Establishing a section assignment system in redevelopment area with tax break incentive for efficient utilization districts. k)-2: Establishing the regulations to set deck and vacant space at an efficient utilization district.
		l)	There are no rules to deregulate building-to-land ratio and floor space ratio. l-1): Promoting the institutionalization concerned with efficient utilization districts.
Land	Price	m)	Land price is valued through the purchase and sale records at surrounding area, which is not consistent with theoretical land price. m-1): Incorporating the concept of theoretical land price into business planning.

Source: JICA Study Team

(4) TOD Case Study at the Insein Station Area

In this study Insein Station was selected as a target area for case study of station development. It should be noted that this case study is just one of the desired future images through the technical transferring works, therefore, it is necessary to further discussion and coordination by Myanmar side, EIA procedures in environmental and social consideration and other required matters to make it realize.

1) Present Condition at Insein Station

Insein station is located at north-west of YCR. The passenger volume is third in YCR, first one is Central station and second is Kamayut station according to MR Fact Sheet 2011. The most passengers belong to low-income level.

At present, the station building is located at not west side, but just east side, which is a plain one story building. There is a small station plaza next to the building where playgrounds and pond surrounds. Although the plaza has access road connecting to principal road, there is neither bus terminal, taxi terminal, nor car parking facility. Because there is no station building at west side, passenger have to use a narrow pedestrian overpass in order to access west side. At west side, railway related facilities occupy the most space near the station, which is mainly composed of workshop, staff apartment houses, hospital, and training school. In short, Most of Insein station area is undeveloped area and railway industrial related area.



Source: JICA Study Team

**Figure 2.3.14: Present Condition at Insein Station (Left: East Side, Right: West Side)**

2) TOD Plan at Insein Station

As described above, the user-friendliness of Insein station is not high at present condition. Additionally, the station area is not developed yet. However, the area of railway-related facilities such as workshop would turn out to be large developed area by passenger increasing due to YCR modernization and upgrade. Strengthening the intermodal function between Mindama new urban center and Insein station will enhance the passenger increasing.

In the future, Insein Station will become the city center of the region that will grow rapidly in the next decades. In addition, it should be a hub connecting YCR and Mindama new urban center and Yangon airport. Thus, TOD at Insein Station shall consist of not only aggregated developments but also terminal facility of BRT or shuttle bus connecting with the Mindama new urban center.

The proposed development policies of Insein Station TOD are described as follows:

*(a) Proposed Short-term Development Policies*

- ✧ In the short-term plan, office buildings will be constructed in the existing station plaza space.
- ✧ Bus terminal for feeder transportation will be prepared.
- ✧ The layout of buildings and access roads should be in accordance with the long-term plan.

*(b) Proposed Long-term Development Policies*

- ✧ In the long-term plan, commercial facilities, residential apartments, and park and ride facilities will be developed at the site of the depot and workshop in addition to business facilities.
- ✧ The plan assumed the access bases on public transportation modes composed of railway, BRT, and feeder buses with extremely low modal share of private vehicles.
- ✧ Whole space is planned to give priority to pedestrians. Likewise, parking at the area entrance is promoted for private vehicles with a view of segregating vehicle traffic from pedestrian flow.
- ✧ The entrance of railway station is set between the ground level and elevated platform level. Both the BRT terminal and pedestrian deck are set at the same level for intermodal integration. Additionally, every facility building can be accessed through the deck.
- ✧ BRT lane heads north from the station and connects to Lanthit Road.
- ✧ In order to save enough green space, most of the space beneath the deck shall become green areas or parks for recreation and relaxation except for the bus terminal.
- ✧ Every building should have some parking space inside for private vehicle accessibility.
- ✧ It is assumed that the development in the next area will follow the above plans and policies.

In line with proposed development policies as mentioned before, the following Figures 2.3.15 to 2.3.19 were prepared to present the layout and image of the Insein Station TOD. It should be noted that this case study is just one of the desired future images through the technical transferring works, therefore, it is necessary to further discussion and coordination by Myanmar side, EIA procedures in environmental and social consideration and other required matters to make it realize.



Source: JICA Study Team

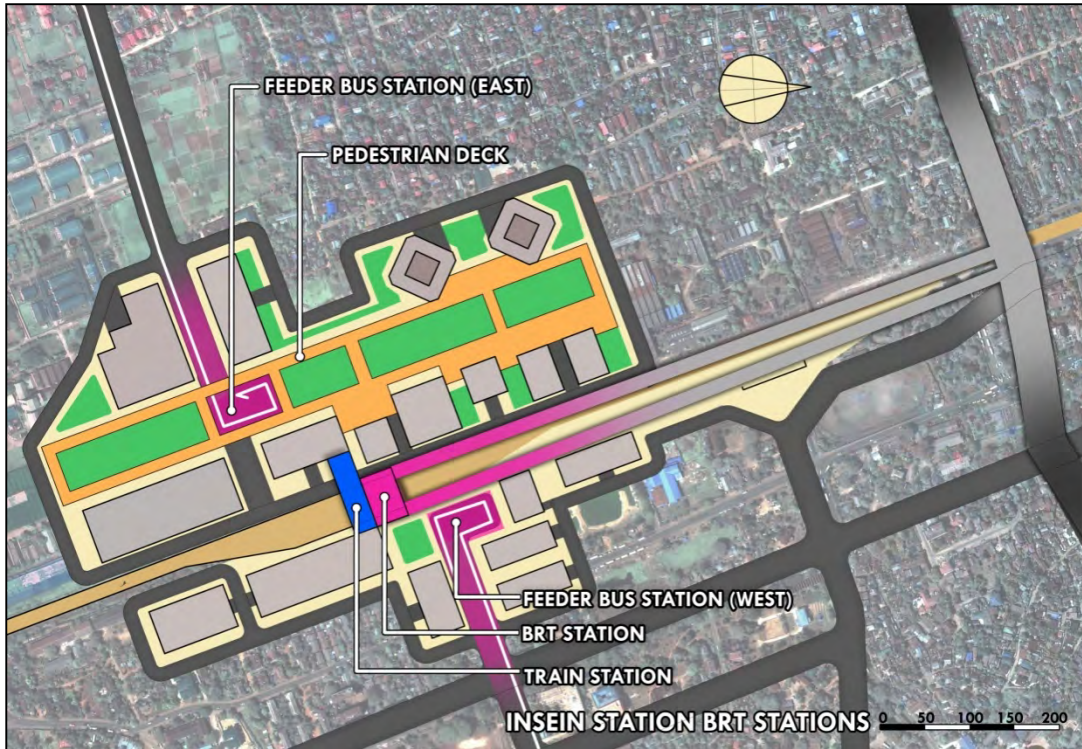
**Figure 2.3.15: Building Layout of Insein Station TOD under the Short-term Plan**  
<A Future Image in the Case Study Work>



Source: JICA Study Team

**Figure 2.3.16: Facility Layout of Insein Station TOD under the Long-term Plan**  
<A Future Image in the Case Study Work>





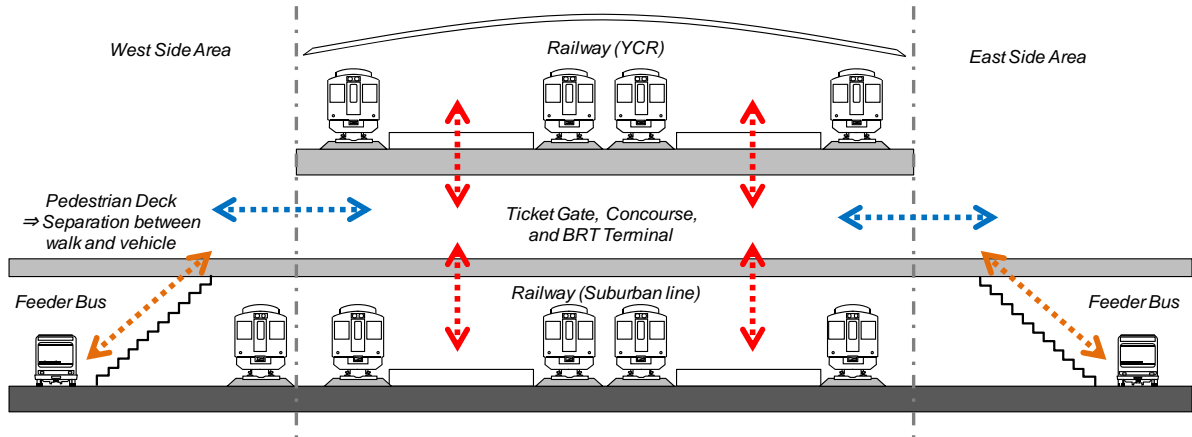
Source: JICA Study Team

**Figure 2.3.17: Public Transport Facility Layout of Insein Station TOD under the Long-term Plan**  
<A Future Image in the Case Study Work>



Source: JICA Study Team

**Figure 2.3.18: Vehicle Access and Parking Layout of Insein Station TOD under the Long-term Plan**  
<A Future Image in the Case Study Work>



Source: JICA Study Team

**Figure 2.3.19: Long term plan of station section sketch at Insein station TOD**  
**<A Future Image in the Case Study Work>**

## **4 Capacity Development Plan**

*- Proposal for planning, related legal system, urban planning management system, and capacity development plan -*

### **4.1 Current Situation of Urban Planning System in the Yangon Area**

Myanmar stands at the dawn of urban planning system. Most of the urban planning and development as well as implementation of infrastructure facilities are considered individual planning, except for some housing development projects. Even for integrated new housing development projects, coordination among related infrastructure sectors seems insufficient which resulted in unbalanced land use, development progress and its realization. Also, most of these development projects are considered to be planned as a “District Development Plan” whose planning was not fully formulated in relation to the established policy of urban planning for the city-wide area.

Reflecting on these situations, understanding the idea of urban planning differs among urban planning engineers. It is the first time for the staff of the Urban Planning Division of YCDC (UPD-YCDC) to understand the fundamental relationship between related sectors through the JICA Study (2012-13). The understanding of engineers of related organizations (i.e., union ministry, regional government, and local administration offices) on urban planning is the same as that of the YCDC staff. Few engineers in Myanmar have knowledge on urban planning including its system in other countries, but this is quite exceptional.

This situation is caused by the undeveloped urban planning system, few formulated plans, realized projects to be referred to, and the lack of experienced specialists. The following matters seem to be very difficult for the specialists and engineers of Myanmar to understand and recognize as fundamental issues:

- ✧ Building control measures such as building use control, building coverage ratio (BCR), and floor area ratio (FAR), which have not been introduced in Myanmar;
- ✧ Restriction of construction works and land acquisition in the site for future urban planning facilities (e.g., right of way for future roads);
- ✧ Spatial control and guidance measures on individual building and development activities;
- ✧ Administrative roles and duties on spatial control;
- ✧ Administrative roles and duties on urban development activities; and
- ✧ Role sharing and coordination about urban planning among related administrative organizations.

It is necessary to determine the outline of the urban planning system of Myanmar and demarcation of responsibilities and duties of related administrative organizations (i.e., union ministries, regional government, and local administrative offices: township and district). In this Study, it is difficult to conclude, since the counterpart organization (YCDC) is not an autonomous body, as defined in the Constitution. And the abovementioned matters are described as a proposal.

In order to implement urban planning in Myanmar as well as in the Yangon City area, it is necessary to establish the following administrative systems:

- ✧ Legalization of urban planning;
- ✧ Restriction on private property rights on land use;

- ✧ Demarcation of administrative authorities among related ministries and organizations;
- ✧ Disbursal of expenses for the implementation and realization of urban planning;
- ✧ Allocation of necessary staff and engineers; and
- ✧ Direction to related administrative organizations about urban planning.

In order to execute the abovementioned systems, its legalization, as a result of the discussions among related ministries, is obligatory. Under the current legal system, which is defined by the Constitution of Myanmar, only union ministries can take the initiative on these matters.

Most of the proposals in this chapter were finalized based on the result of the discussions with the counterpart organization (YCDC) of this Study without conferring with corresponding administrative organizations, because some issues are beyond the authority of the counterpart organization. Moreover, the administrative system in Myanmar is still underdeveloped.

## **4.2 Proposal for the Planning, Legal, and Management Systems of Urban Planning**

### **(1) Urban Planning System to be established in Myanmar**

The proposal on general urban planning system in Myanmar and its corresponding organization system are described in this section, based on the knowledge obtained through this Study.

At present, the urban planning system in Myanmar is underdeveloped. The following are the fundamental administrative matters to be considered:

#### **1) Administrative Hierarchy**

Administrative hierarchy concerning urban planning is not clearly defined. Continuous hierarchy in the planning area, planning matters, procedures for execution, and authorities of related organizations should be integrated in an urban planning system from the national level to the local level.

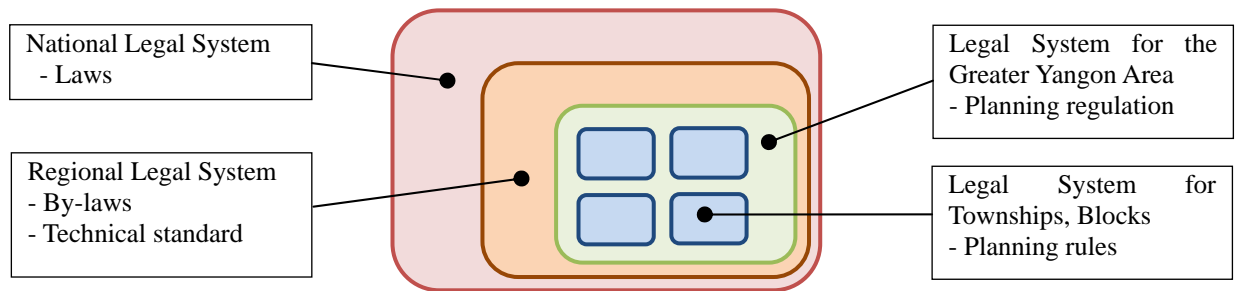
#### **2) Administrative Management Systems**

The following administrative management systems are necessary to be established in order to realize urban planning and its projects:

- ✓ Legal system;
- ✓ Personnel arrangement;
- ✓ Duties of related organizations;
- ✓ Coordination system within the related organizations; and
- ✓ Project management system.

### **(2) Urban Planning System to be established in Myanmar**

Plural legal systems, which cover general matters and specifics, are applied according to its situation. Figure 2.4.1 shows the legal hierarchy and its relations.



Source: JICA Study Team

**Figure 2.4.1: Hierarchy of the Legal System and its Relations**

Considering the current situation of the legal system in Myanmar, union level fundamental laws should be formulated first. Furthermore, the legal hierarchy system should be secured and formulated under these union laws.

### 1) Fundamental Laws and Regulations

#### a) *Legalization of the urban planning master plan*

In order to effectuate the planning policies and matters, which is described in the urban master plan, approval of the union and regional governments are necessary. The following procedures are considered:

- ✓ Legal authorization on urban planning policy
  - Authorization by the Yangon Regional Government (including the *Pyidaungsu Hluttaw*) regarding planning. (Acceptance of the urban planning report was confirmed by the regional government in May 2013).
  - Authorization and announcement by the union government (including the *Pyidaungsu Hluttaw*) regarding planning in order to define clearly the roles and duties of related organizations.
- ✓ Development of the detailed design for the implementation and establishment of a spatial management system
  - Establishment of the spatial control system on development and land use activities.
  - Formulation of related legal system, which secures legitimacy of control (\*).

(\*): Control restrictions on private property rights. For this reason, involvement of the union government is required in order to secure legitimacy of control.

#### b) *Formulation of the building code and related laws (legal systems)*

The contents of the current legal system, which is applied in the construction of buildings in the Yangon City area, regulates the building capacity through maximum height and setback distances.

A draft document of the national building code was prepared by the Department of Human Settlement and Housing Development (DHSHD) of the Ministry of Construction, under the assistance of the United Nations Human Settlements Programme (UN-Habitat). The draft

document was handed over to the Government of Myanmar. The document includes several technical subjects such as structural design and building facilities. It describes matters mainly for individual building design but relatively few matters on area-based building regulations and urban planning, such as land use zoning system and building capacity.

Apart from the building code, the YCDC and related organizations (i.e., Union Ministry of Construction, Engineering Department of YCDC, UPD-YCDC, and Yangon Heritage Trust) set up the “Land Use, Zoning, and Urban Design Committee”. The committee studies the detailed regulations for the implementation of urban planning such as floor area ratio, building coverage ratio, and maximum height of buildings. The result of the study is expected to be legalized and to function as a legal system.

*c) Establishment of the urban planning law*

It is said that the urban planning law is under preparation, but the JICA Study Team could not obtain detailed information in spite of several requests made to the Ministry of Construction and its current progress is still unclear.

The following are the proposed issues to be included in the urban planning law:

- ✓ Area-based building regulations;
- ✓ Regulating procedure within the boundary of future urban planning facilities (restriction on construction works in future urban facility planning sites); and
- ✓ Regulating system for development areas (city planning area, urbanization promotion area, and urbanization control area) (\*)

\*: This development regulating system is expected to be integrated with the current legal system such as development permission scheme in agricultural fields by the Ministry of Agriculture and Irrigation.

*d) Establishment of the permission system on a large-scale development (expected to be managed by the regional government)*

Few legal systems are established in permitting large-scale area development and urban development based on technical examination. In order to solve the current problems in the city center (e.g., insufficient parking spaces, heavy traffic jams, and insufficient drainage capacity), it is necessary to guide the development towards an appropriate manner and capacity according to defined technical standards.

Related legal systems should be established as legal basis for regulating measures.

2) Legal Measures for Spatial Improvement

*a) Introduction of the incentive (subsidy) scheme for desirable developments according to the development plan incentive*

Development and construction activities in Yangon are rapidly growing, and it is difficult to establish legal systems in advance. In some areas in Yangon City, it is desired to accommodate the development speed corresponding to the progress of construction of infrastructure and public facilities in order to avoid deteriorated spatial environment.

Before completion of the establishment of a legal system and related laws, the introduction of an incentive scheme for desirable development could be a tentative initial measure to

accelerate the master plan's development policy. The following developments are considered as examples in achieving desirable development;

- ✓ Development in strategic urban center areas; and
- ✓ Spatially balanced development with necessary public functions.

*b) Introduction of the incentive (subsidy) scheme for the installation of public facilities in development projects*

The introduction of incentives for building construction/development with public facilities could be an accelerating measure for the construction of public facilities and infrastructure.

The following public facilities are considered insufficient in the current urban area, for example:

- ✓ Parking facilities: ex. providing subsidies or relaxing development regulations for (public/ private) parking equipped building.
- ✓ Parks/Open spaces: ex. providing subsidies or relaxing development regulations for public park/ open space equipped development.
- ✓ Flood retarding basins: ex. providing subsidies or relaxing development regulations for development with flood retarding basins for neighbouring area.

*c) Conservation of heritage buildings and historic quarters*

The Land Use, Zoning, and Urban Design Committee studies the conservation system for historical heritages. It is necessary to establish a budget contribution system for the protection, restoration, use, and management of these historical heritages.

*d) Landscape design and protection*

After the establishment of a fundamental legal system, a scheme for landscape management and its design management should be considered in mid/long term.

Examples of possible landscape subjects are as follows:

- ✓ Delineation of landscape protection and management area; and
- ✓ Landscape regulations to control building design and its colors.

*e) District planning (expected to be managed by the regional government)*

District planning is composed of specific and detailed regulations which will be applied in certain planned areas.






It is necessary to formulate the planning process and regulating measures as a legal system in order to use effectively this planning system.

3) Administrative System and Project Management

The abovementioned legal systems should define the responsible organizations, their management, coordinating procedures among related laws and matters, and necessary budget contribution.

(3) Matters to be improved for Appropriate Urban Development and Management

As a result of the survey on the current situation and activities of related administrative organizations, the following are mentioned as matters to be improved. Individual matters are described with its corresponding administrative organizations.

(Legend:  Union Ministry  Regional Ministry  District  Township  
 YCDC)

- 1) Determination of the responsible organization and its roles on building permit and development permit systems

The roles and duties on building permit and development permit services of each administrative organization should be clearly determined in a legal framework. The current function of the Engineering Department of YCDC on building permit services should be reviewed and reorganized according to the whole administrative system.

- 2) Allocation of necessary personnel

Allocation of necessary personnel for technical examination and in giving advice on application documents for development projects is required.

- 3) Formulation of procedure and management systems for budget contribution

- 4) Ensuring the transparency of building permit and development permit procedures and their technical requirements

- 5) Conducting basic urban planning survey and social survey

It is necessary to complete the basic urban planning survey items by conducting supplemental surveys and surveys in unexecuted areas (e.g., land use and building use survey).

- 6) Preparation of cadastral map and land property database

It is necessary to establish a digitized information system and its management system.



- 7) Introduction of a defrayal scheme for the construction cost of public facilities and infrastructure by developers



- 8) Taking necessary spatial control and guidance measures during the preparation of a legal system and its introduction period



It is necessary to consider countermeasures to existing nonconforming buildings and building/development at the last minute before the introduction of a legal spatial control system.

- 9) Evaluation and monitoring on environmental impact which is caused by progress of the development

**Table 2.4.1: Matters to be improved for Appropriate Urban Development and Management**

Matters to be improved for Appropriate Urban Development and Management	Corresponding administrative organization			
1) Determination of the responsible organization and its roles on building permit and development permit systems	✓	✓		
2) Allocation of necessary personnel	✓	✓	✓	✓
3) Formulation of procedure and management systems for budget contribution	✓	✓	✓	✓
4) Ensuring the transparency of building permit and development permit procedures and their technical requirements	✓	✓	✓	✓
5) Conducting basic urban planning survey and social survey	✓	✓		✓
6) Preparation of cadastral map and land property database	✓			✓
7) Introduction of a defrayal scheme for the construction cost of public facilities and infrastructure by developers	✓	✓		✓
8) Taking necessary spatial control and guidance measures during the preparation of a legal system and its introduction period	✓	✓		✓
9) Evaluation and monitoring on environmental impact which is caused by progress of the development	✓	✓		✓

Source: JICA Study Team

- (4) Proposal for the Future Boundary of Yangon City and its Township Composition

- 1) General Concept

The YCDC is a public service executing organization, and is not designated as an organization of self-government under the amendment of the 2008 Constitution.

Therefore, it is appropriate to consider the boundary of Yangon City corresponding to its service providing area, instead of an area under some administrative system.

It is considered that the future boundary of Yangon City could be changed due to the progress of urbanization, extension of service area of infrastructure (e.g., water supply and solid waste management), and the geographical allocation of its network.

2) Candidate Extension Area for the Future YCDC Service Area

Figure 2.4.2 shows the current Yangon City area (YCDC service area, orange color area) and the Greater Yangon area (defined by the Study, its boundary shown in red).

The boundary of the Greater Yangon area mostly follows the planned alignment of the future ring road. The inner part of the boundary includes several townships, which is out of the current Yangon City area and YCDC's service provided area. These areas could be considered candidates of the extension area.

Parts of following townships are included in the Yangon City area:

- ✓ Htantabin Township
- ✓ Hmawbi Township
- ✓ Hlegu Township
- ✓ Twante Township
- ✓ Thanlyin Township
- ✓ Kyauktan Township



Source: JICA Study Team

**Figure 2.4.2: Yangon City and Surrounding Townships**

3) Current Urbanization and Prospect of the Candidate Extension Area

As mentioned above, the future Yangon City area should be considered in relation to its public services. The following sectors are related future public services which should be provided in the future Yangon City area.

a) *Roads and bridges*

It is desired that roads and bridges, that connect several townships, are planned, constructed, and maintained comprehensively in order to secure its continuity and to manage them strategically.

The YCDC provides construction and maintenance services for roads and bridges. In the Yangon area, YCDC is the sole organization which has enough construction equipment for roads and bridges, except overseas companies.

From this point of view, YCDC is expected to play public service functions in future urbanized areas in the surrounding areas of Yangon City.

*b) Water supply*

Some of the current water resources and transmission pipe lines are located in the surrounding townships of Yangon City, and managed by YCDC. Therefore, water supply services are expected to be offered by YCDC in future urbanized areas in the surrounding townships of Yangon City. Especially that water resource development is required for future industrial development in Than Lyin and Kyauk Tan townships. Also, YCDC is the sole organization in the Yangon area which has development and management experiences in this sector.

*c) Sewage*

The sewage system is constructed only in the central business district (CBD) area and is operated by YCDC. The major issue of this sector is the development of the sewage system in the current Yangon City area and its future service is planned to cover 50% of the population in 2040.

On the other hand, advanced sewage water treatment system is expected to be installed in the future industrial development in Than Lyin and Kyauk Tan townships in securing its competitiveness. The sewage systems in these areas do not need to be connected to other sewage networks and could be operated independently.

Other public service operators other than YCDC can also provide sewage services. From this point of view, the sewage service which is related to the future of the Yangon City area is not a critical matter.

*d) Solid waste management*

Some of the current dumping sites are located in the surrounding townships of Yangon City, and waste collection services are also provided. Future dumping sites are also planned in the surrounding townships of Yangon City.

The YCDC do not need to provide these public services in the surrounding townships of Yangon City if the Yangon Regional Government would coordinate its regional operation system with related local administrative offices.

*e) Summary of the current situation and future prospect of candidate areas*

The current public service situation and future prospect of candidate areas are summarized in Table 2.4.2 below.

**Table 2.4.2: Current Situation and Future Prospect of the Surrounding Townships of Yangon City**

Evaluation Item/ Township	Htan Ta Bin	Hmaw Bi	Hle Gu	Twan Te	Than Lyin	Kyauk Tan
Area included the Greater Yangon area	Partially included	Partially included	Partially included	Partially included	Most of the township area is included in Greater Yangon	Partially included
Remarkable Development	Large-scale new town is planned (Proposed by the Urban Development Plan)	Large-scale new town is planned (Proposed by the Urban Development Plan)	New town (Proposed by the Urban Development Plan)	New town (Proposed by the Urban Development Plan)	- Large-scale new town is planned (Proposed by the Urban Development Plan) - Thilawa development area	- Large-scale new town is planned (Proposed by the Urban Development Plan) - Thilawa development area
Bridge/Road	Ring road (future)	Ring road (future)	Ring road (future)	Ring road (future)	- Ring road (future)	

					- Connection between the city center were planned earlier	
Water Supply	Proposed reservoir, transmission	Current reservoir, transmission	Current reservoir, transmission	Proposed reservoir, transmission	Need water supply according to industrial development	Need water supply according to industrial development
Sewage			Out of consideration of the centralized processing	Out of consideration of the centralized processing	Water treatment equipment would be expected	Water treatment equipment would be expected
Solid Waste Management	- Disposal site is planned in the future (medium term)		-Disposal site is planned in the future (medium term) -Current service provided	- Disposal site is planned in the future (medium term)	Current disposal site	Current disposal site

Source: JICA Study Team





















### 4.3 Capacity Development Plans for the Urban Planning Field

In this section, the capacity development plan in the urban planning field of YCDC is proposed based on its expected function in the future and its necessity to improve the technical skills of the organization.

#### (1) Expected YCDC's Function for the Execution of Urban Planning

Table 2.4.3 shows the current principle of urban planning and development of the administrative organizations in Myanmar.

**Table 2.4.3: Current Administrative Works for Urban Planning and Development**

Working Categories	Working Details for Urban Planning
1. Coordination	  Coordinate with related  Discuss with ministries.   Conduct PIC discussion. Discuss with developers.
2. Survey/ Research	  Possess basic social information.  Conduct basic urban planning survey and social survey.
3. Planning	 Formulate the national and regional plans.    Formulate development policies and subprojects.  Formulate the Urban Development Master Plan (with the JICA Study Team).
4. Establishing a Legal System	 Formulate the National Building Code.   Study land use control system.
5. Control	   Examine application for building construction.  Provide recommendation letters for building construction.
6. Realization	(No specific urban project except for small-scale individual construction works)

Source: JICA Study Team (Reference: A Strategic Urban Development Plan of Greater Yangon, Final Report I)

Legend:

 Union Ministry  
  Regional Ministry  
  District  
  Township  
  YCDC

(2) Expected Administrative Function for the Execution of Urban Planning

Table 2.4.4 shows the proposed urban planning and development works of the administrative organizations in Myanmar. It is necessary to discuss and formulate the demarcations of related works among related organizations.

**Table 2.4.4: Proposed Administrative Works for Urban Planning and Development**

Working Categories	Working Details for Urban Planning
1. Coordination	  Coordinate with related ministries. Arrange necessary budget.   Conduct planning discussion with related stakeholders.  Provide technical assistance for planning discussion.
2. Survey/Research	  Formulate survey/research format.  Conduct urban planning survey and monitoring.
3. Planning	   Formulate implementation plan with subprojects.  Provide consultancy services and technical advices for planning.
4. Establishing a Legal System	  Formulate necessary laws, regulations, and regional regulation.    Formulate detailed plan for land use control.
5. Control	  Assess and provide permits for development activities.  Assist technical examination. Provide consultancy services.
6. Realization	   Advance urban projects for public welfare.  Support public-oriented development/spatial improvement projects.

Source: JICA Study Team (Reference: A Strategic Urban Development Plan of Greater Yangon, Final Report I)

Legend:



(3) Expected YCDC's Works for the Execution of Urban Planning

Appropriate current duties for urban planning works, future prospect, and main works of the Urban Planning Unit of YCDC are summarized into the following three categories:

- ◇ Survey and Research;
- ◇ Planning; and
- ◇ Control and Realization of Projects.

1) Survey and Research

In order to identify urban planning issues, make corresponding urban plan, and execute project, it is necessary to conduct the basic urban planning survey continuously and periodically. The following survey and research items are expected to be conducted by UPD-YCDC, in collaboration with the district and the township offices.

- ✓ Basic survey for city planning;
- ✓ Specific urban planning survey;  
(e.g., survey on the situation of infrastructure facilities)
- ✓ Environmental survey; and

- ✓ Monitoring the progress of urban planning.

With regard to these abovementioned items, the union government is expected to establish the composition of the basic survey items and format based on a careful analysis of its application in the whole country.

2) Planning

The UPD-YCDC is expected to assist in the planning works which will be conducted by the regional government, and the district and township offices.

- ✓ Updating and revision of the urban master plan;
- ✓ Technical support in planning the detailed spatial plan;
- ✓ Technical support in the formulation of the regulatory land use plan; and
- ✓ Technical support in planning the development for public purposes.

3) Control and Realization of the Projects

The UPD-YCDC is expected to execute control and realization of the urban development projects related to urban planning which will be conducted by the regional government, district offices and the township offices, and other departments of YCDC.

- ✓ Technical assessment of large-scale development projects for the issuance of permits;
- ✓ Advise on infrastructure implementation planning;
- ✓ Advise on project implementation; and
- ✓ Assistance to accelerate development and spatial improvement for public purposes.

For the realization of the abovementioned matters, it is necessary to establish coordination system among related organizations and departments.

Moreover, in determining YCDC works and duties, it is necessary to take into consideration that YCDC is required to collaborate with other organizations for the realization of projects because of its non-administrative status and limited independent financial resources.

4) Other Works

The following are considered as works which are mainly conducted by other organizations other than YCDC. However, part of these works could be conditionally executed with the assistance and collaboration of YCDC.

*a) Coordination*

Administrative coordination would be carried out by the union and regional ministries. Moreover, as the current practice, coordination with residents would still be conducted by the township office.

It is assumed that YCDC might require consultancy services for these subjects in the future.

*b) Establishing a legal system*

It is believed that the organization responsible for legal matters would be the union ministries and regional government, due to the competence described in the constitution.

However, YCDC might be requested to study and draft district rules and drawings, which are applied within a limited area.

*c) Application of a legal system and control*

If the related legal system is formulated, YCDC could be considered as the executing agency that would handle spatial control as well as the engineering department that would cover building examinations for building permit applications.

(4) Possible Implementation Process for Urban Infrastructure Facilities

According to the information obtained through the trial technical transfer of the Study, the process of urban infrastructure facilities and related YCDC's functions are described as follows:

1) Present State Analysis and Investigation

A basic survey and its analysis were conducted in this Study. Additional surveys in the surrounding areas and detailed survey in the townships should be conducted.

The surveys on water supply, sewage, drainage, and solid waste management would be executed in collaboration with related departments of YCDC.

Collaboration with related administrative organizations is also needed in the surveys of other subjects.

Furthermore, for the detailed survey, it is necessary to collaborate with the township offices.

2) Identifying Urban Problems in Particular Areas

The Study identified urban problems in several townships for the trial study.

It is necessary to conduct a detailed interview survey in the township offices of other areas.

3) Making Development Policy

An initial development policy was formulated by the Study and its main points were reported.

It is necessary to provide the widest possible publicity to related organizations.

4) Coordination with Related Departments of YCDC

It is necessary to coordinate discussion with related departments and formulate the implementation process.

5) Coordination for Project Implementation

Projects of the individual sector are expected to be implemented by the current responsible organizations.

However, for multi-sector development projects, the implementation process and responsible organizations are still unclear.

## 6) Budget Planning and Management

The budget plan should be studied with its management scheme and other possible financial resources (e.g., private fund for PPP scheme).

## (5) Issues for Planning and its Implementation

As mentioned in “(3) Expected YCDC’s Works for the Execution of Urban Planning”, major urban planning roles of YCDC are considered, i.e., (i) survey and research, (ii) planning, and (iii) control and realization of the projects.

However, the roles and responsibilities of UPD-YCDC are still unclear and have not been formulated. Before solving the issues regarding the roles of YCDC, it is necessary to formulate their responsibilities and duties based on the discussion with related organizations, including the union ministries, regional government, and local administrative offices.

The following issues are described on the supposition of the expected roles of UPD-YCDC in the future:

### 1) Issues on Survey and Research

Through the Study, some basic urban planning surveys were conducted and some of the YCDC staff were involved in the process. For the continuation of similar surveys in the future, the following matters are pointed out as issues to be improved:

- ✓ It seems that most of the concerned staff do not understand the purpose and objective of the survey, because they do not understand the whole urban planning system;
- ✓ As a result, the staff can conduct and execute surveys, but it is difficult to make a survey plan corresponding to urban planning problems; and
- ✓ It seems that the knowledge of YCDC staff in analyzing the process and their ability in policy making is insufficient. Therefore, it is necessary to transfer the process of analyzing survey results and its application to the policy making of urban planning.

### 2) Issues on Planning

With regard to planning, the UPD-YCDC has two groups, i.e., (i) land use and zoning group and (ii) urban and district planning group. The former is engaged in making general land use plans and current land use surveys while the latter is engaged in making proposals of development plans with building plans and designs.

For the land use and zoning group, the following issues are considered as critical activities:

- ✓ Plans drawn are not based on executing measures due to lack of realization on the whole urban planning system and idea on urban spatial control system;
- ✓ Knowledge about the whole urban planning system and spatial control system is expected to be transferred first; and
- ✓ These issues concern not only YCDC, but also the union government, regional government, and local administrative organizations (district and township). The knowledge transfer has to be done with the abovementioned organizations according to the progress of formulation of the legal systems and procedures.

For the urban planning and district planning group, the following issues are considered as critical activities:



- ✓ The urban planning and district planning group is engaged in spatial planning and design which includes building design. This activity prepares spatial image drawings and related documents (e.g., housing plans and perspective images);
- ✓ The planning study is mostly within the realm of the fundamental study. It lacks financial and management studies and the possible project implementing body is still not clear. Consequently, some of the planning activities are not considered as practical ones;
- ✓ Corresponding to abovementioned issues, it is necessary to transfer knowledge on planning with essential management abilities. However, the latter activities would not be considered effective if it lacks discussion process with possible project implementation body, financial scheme, and planning requirements;
- ✓ Even after execution of the necessary capacity building process, this kind of planning and design activity is considered to compete with private consultants and architectural design companies. Therefore, it is recommended to consider possible planning subject as public service organization. For example, planning for public oriented development (e.g., social housing development) and spatial improvement of current urban district would be considered as a suitable planning subject (\*); and
- ✓ In case of future competencies with private firms, it is necessary to improve the working management and manners of the organization and its staff. Considering these assumed situation, the functions and roles of the field workers should be formulated. (\*\*)
- \* *In other countries, some former administrative organizations provide planning and design services after administrative organization reform. For example, the former planning department of the city hall in China has been privatized and provided design and planning services to public and private clients. In case of YCDC, to provide the same service in a similar scheme, it is necessary to consider the provision of planning services to other departments (e.g., engineering department of building, department of road and bridges, and water department).*
- \*\* *Some YCDC personnel are public field workers. If YCDC will compete with private firms in the planning and design services, the current work awareness, working efficiency, and discipline of the staff need to be improved..*

### 3) Issues on Control and Realization of the Projects

The present engineering departments of YCDC have roles in the execution and construction of infrastructure facilities and these functions are expected to be conducted by YCDC in the future.

For the control and realization of the projects on urban planning, the roles of these departments and the UPD-YCDC need to be coordinated and integrated. Moreover, the following should to be improved:

- ✓ Staff of the UPD-YCDC does not have sufficient technical knowledge and experiences. Initially, the technical knowledge should be shared among related organizations of YCDC. Furthermore, additional technical transfer of individual sectors should be programmed for the group of related departments (and other organizations, if necessary).
- ✓ Realization and management of urban planning projects need business and financial planning and project management functions. For these functions, it is recommended to

consider collaboration with other departments of YCDC, which manage the city's properties and buildings. In addition, the necessary knowledge should be transferred to the group of related departments.

(6) Results of the Personal Interview for Needs Assessment

1) Outline of the Interview Results

In order to identify the issues on capacity development and level of understanding about urban planning, the personal interview survey was conducted to a total of 62 staff. Below is the outline of the interview:

Interview date:	July 16 to 29, 2013
Respondent:	Staff of the UPD-YCDC
Interview time:	About 30 minutes to one hour per respondent
Questionnaire:	<ul style="list-style-type: none"><li>➤ Personal information (Name, Age, and Gender)</li><li>➤ Affiliation (Group), Position</li><li>➤ Educational background</li><li>➤ Working experience and business career</li><li>➤ Work contents in UPD</li><li>➤ Views on the functions and roles of urban planning</li><li>➤ Views on the functions and roles of UPD-YCDC</li><li>➤ Acquired knowledge about urban planning through activities and lectures in UPD-YCDC</li><li>➤ Desired knowledge about urban planning to be transferred in the future</li><li>➤ Suggestions, opinions, and comments</li></ul>

The answers were tallied and summarized below.

2) Educational Background of UPD-YCDC Staff

Table 2.4.5 shows the educational background of the staff of UPD-YCDC.

There are 24 engineers, who have majored in civil engineering or architecture, comprising 39% of the staff. They are assigned in the infrastructure and urban amenity group, road network and urban transportation group, and urban design and district planning group. However, they are not assigned in the environmental group, social and economics group, social survey group and land use and zoning group.

About 52% of the staff, which totalled to 32 engineers, has majored in other scientific courses. Some of them are assigned according to their specialization (e.g., Mechatronics and Electrical Engineering); however, others are assigned without reference to their specialization.

Moreover, nine people (15%) graduated from the humanities branch of studies. Except the staff of the administration group, only four people are assigned to the survey and planning group. It is assumed that lack of personnel in this field will cause insufficient skills on economic planning, policy making, and legal documentation.

**Table 2.4.5: Educational Background of UPD-YCDC Staff**

Group/ Educational Background	Administration	Infrastructure, Urban Amenity	Environment	Social, Economics	Social Survey	Road Network, Urban Transportation	Urban Design, District Planning	Land Use, Zoning	Total
[Humanities Branch of Studies]									
Master Course									
Myanmar					1				1
Undergraduate School									
Myanmar	3								3
History	1								1
Economics	1								1
International Relationship					1			1	2
LLB									
Legal						1			1
[Scientific Course]									
Master Course									
Civil Engineering						2	2		4
Remote Sensing and GIS								1	1
Physics	1								1
Undergraduate School									
Civil Engineering		1				4	6		11
Architecture							4		4
Information Technology								1	1
Statistics								1	1
Computer	1								1
Mechatronics		4		1	1			1	7
Mechanical				1	1				2
Electrical Engineering		1							1
Geology	1		1					2	4
Botany	2								2
Physics		1							1
Chemical			1	1	3				5
Textile					1				1
Art								1	1
Zoology								2	2
Mathematics								1	1
AGTI									
Civil Engineering		3	1						4
Electric Power		1							1
Other Education / Course									
Computer Science	1							1	2

Source: JICA Study Team

### 3) Work Experience and Business Career of UPD-YCDC Staff

Table 2.4.6 shows the work experience and business career of the UPD-YCDC staff.

For 26 people (42%), the UPD-YCDC is their first work experience, which means most of the staff needs training for new employees as well as training on technical matters.

About 21 staff (34%) has business careers in other departments of YCDC and other administrative organizations. These staff belonged to departments which are related to urban planning such as the engineering of building department, city planning and land administration department, and other departments of the infrastructure sector. They understand the organizational structure and roles and have experienced coordination among related departments. Consequently, they are expected to achieve coordination functions. Most of them are assigned in the administrative group. However, there is not one staff who has worked in the engineering department of roads and bridges, and pollution control and cleansing department, which are related to urban planning.

Experience in private construction companies are expected to be reflected in the engineering works of UPD-YCDC.

**Table 2.4.6: Work Experience and Business Career of UPD-YCDC Staff**

Group/ Work Experience, Business Career	Administration	Infrastructure, Urban Amenity	Environment	Social, Economics	Social Survey	Road Network, Urban Transportation	Urban Design, District Planning	Land Use, Zoning	Total
<b>YCDC</b>									
City Planning and Land Administration	4	1	1		1			4	11
Administration	3	1				1		2	7
Market	4								4
Building			1		1	1	1		4
Production	1					1		1	3
Water Sanitation	1	1							2
Finance Management	1								1
Promotion	1								1
Water Treatment	1								1
Revenue					1				1
<b>Administrative Organization</b>									
Ministry of Construction		1							1
Ministry of Foreign Affairs								1	1
Other Union Government					1				1
Township Office					1				1
University, Educational Institution								1	1
<b>Other Organization, Private Company</b>									
Construction Company		1				2	6		9
Central Bank	1								1
Structure Design Office		1							1
Accounting Office					1				1
Vehicle Factory					1				1
Operator					1				1
Beverage Company					1				1
Lawyer's Office						1			1
Factory								1	1
First Workplace	2	6	1	3	2	3	4	5	26
Part-time Work (in school)							1		1

Source: JICA Study Team

#### 4) Understanding about the Roles in Urban Planning

The following box shows the results of understanding the roles about urban planning by the UPD-YCDC staff.

Many staff mentioned the implementation of development as roles of urban planning. But these are mostly realization of the individual sector and the different roles in urban planning projects are not clearly defined. The staff recognized that urban planning should concern about the realization of infrastructure facilities; however, the demarcation between the urban planning unit and infrastructure departments on their implementation is unclear.

The staff thinks that planning works are the major roles of urban planning. But most of the staff mentioned individual sector planning while a few mentioned the general view of urban planning system, integration of several sector planning, and spatial planning (e.g., continuous working flow from planning to controlling and implementation).

The role of coordination among related organizations and the role of execution planning with financial planning were hardly mentioned.

<p>Understanding the roles in urban planning by UPD-YCDC staff</p> <p>Strongly aware:</p> <ul style="list-style-type: none"><li>➤ Implementation of development (37, 60%) e.g., Implementation of infrastructure facilities, housing development, transportation facilities, and electrical facilities</li><li>➤ Making plans (31, 50%) e.g., General urban planning, infrastructure facilities' planning, land use planning, and housing development planning</li></ul> <p>Aware:</p> <ul style="list-style-type: none"><li>➤ Survey and research (13, 21%) e.g., Collection of information, information mapping, and conducting social survey</li></ul> <p>Lack of awareness:</p> <ul style="list-style-type: none"><li>➤ Coordination (8, 13%) e.g., Coordinating with related organizations and generalizing related organizations</li><li>➤ Control and guidance (4, 6%) e.g., Control and guidance on land use and control of the traffic system</li><li>➤ Business program (2, 3%) e.g., Project formulation and creation of an implementation program (about land use, urban space)</li></ul>
---

#### 5) Ideas on the Duties of UPD-YCDC

Shown in the following box are the ideas on the duties of the Urban Planning Division by UPD-YCDC staff:

Identical to the understanding on the roles of urban planning, many staff mentioned implementation and planning works as the important roles of UPD-YCDC. At present,

implementation and planning works are executed by the engineering departments of YCDC. The UPD staff believes that these roles should be carried out by UPD because these departments do not have the capacity on planning works. However, UPD staff does not have sufficient technical knowledge.

In contrast with the result on the general idea of urban planning, the role of survey and analysis is recognized as the stronger role of UPD-YCDC. Also, more staff mentioned coordination with related works as the principal role of UPD-YCDC.

The role of control is not strongly mentioned as well as the recognition of general urban planning idea.

Ideas on the Duties of the Urban Planning Division by UPD-YCDC staff

Strongly aware:

- Implementation of development plan (33, 53%)  
e.g., Implementation of infrastructure (electricity, water supply, sewage system, road, transport, etc.) and residential development
- Making plans (26, 42%)  
e.g., Infrastructure planning and design, residential area planning, land use planning, integration of related plans, district plan, and community planning

Aware:

- Survey and research (20, 32%)  
e.g., Data collection, conducting survey and analysis, and providing information
- Coordination (19, 31%)  
e.g., Coordinating with related organization and departments, technical consultation service for other organizations, and project management

Lack of awareness:

- Control and guidance (7, 11%)  
e.g., Land use control and guidance such as control of traffic
- Business program (1, 2%)

6) Acquired Knowledge about Urban Planning through Urban Planning Activities and Lectures in UPD-YCDC

Shown in the following box are the mentioned acquired knowledge about urban planning through activities and lectures in UPD-YCDC.

Technical and planning matters are highly mentioned. Particularly, the following topics were thought to give new views to Myanmar engineers:

- ✓ Infrastructure network in large areas (e.g., transport network and drainage network);
- ✓ Development and its social value (e.g., affordable housing development);
- ✓ Public facility planning; and

✓ Historical heritage planning.

Also, urban planning activities triggered the staff to discover the actual situation of the city, urban problems, and unperceived spatial value. The current status of poor residential areas and historical values of old buildings are mentioned as examples.

About the practice of urban planning works, the need of collaboration with related organizations, issues on conducting social survey, and knowledge of actual construction works are mentioned as new subjects.

Acquired knowledge about urban planning through activities and lectures in UPD-YCDC

- Technical knowledge for planning and design
  - ◇ Technical matters for planning and design (55, 89%)  
e.g., Infrastructure design and planning, land use planning, transportation system design, industrial planning, and public facilities
  - ◇ Integrated planning matters among several sectors (19, 31%)  
e.g., District planning protection of historical heritages, EIA, and planning process based on result of urban survey
- Current situation of Yangon City, views of residents
  - ◇ Current situation of Yangon City (23, 37%)  
e.g., Actual urban problem of Yangon City, quality of residence, and insufficient condition of infrastructure
  - ◇ Views of residents (4, 6%)
- New perspective on urban planning (17, 27%)  
e.g., Value of historical heritages, value of green space, spatial quality of residential area, urban planning management system, and development by private investment
- Practical works of urban planning (12, 19%)  
e.g., Urban planning survey, interview survey, communication with related organizations, and actual situation of implementation works
- Others
  - ◇ Urban planning situation in other countries (8, 13%)
  - ◇ Implementation and realization of urban planning matters (2, 3%)
  - ◇ Urban planning system (1, 2%)

7) Desired Knowledge Transfer of UPD-YCDC Staff about Urban Planning in the Future

Shown in the following box are the desired knowledge transfer of UPD-YCDC staff about urban planning in the future.

Many staff mentioned necessity of training on technical and planning matters that are not covered by the European Union (EU) training program. Particularly training on land use planning (six people) and building planning and design (nine people) are desired by many. The staff of the Urban Design and District Planning Group works for individual building planning and design but

this kind of works is considered to be handled by private architect offices in long term. Contents of the training course on this subject should be carefully considered, and its appropriateness should be reviewed. Other technical matters are mostly related to individual working duties (e.g., transport, railway, water supply, sewage, and solid waste). Each technical topic is mentioned by a few (1-3 person) staff, therefore, it is advisable that its training will be programmed for a group of related engineers of the sector.

Training on survey and analysis, implementation and realization of the project and operation of computer-aided design (CAD)/geographic information system (GIS) are worth executed with actual operation through the on-the-job training (OJT) scheme.

Few mentioned the necessity of training on general urban planning system, but its dissemination is necessary in early stages in order to formulate the scheme of basic planning system in Myanmar.

Desired knowledge transfer of UPD-YCDC staff about urban planning in the future

- Technical knowledge on planning and design
  - ◇ General planning matters (33, 53%)  
e.g., Residential district planning, building design, business planning, environmental planning, and urban space improvement
  - ◇ Infrastructure planning and design (30, 48%)  
e.g., Road design, transport planning, power (electrical) planning, water supply, sewage, drainage, solid waste, and planning standards
- Survey and analysis (18, 29%)  
e.g., Survey design, survey process, and analysis
- Implementation and realization of urban planning projects (16, 26%)  
e.g., Business planning, project implementation and management, protection and restoration of historical heritages, and control and guidance
- Use of planning tools and software (15, 24%)  
e.g., GIS and CAD operation
- Urban planning system (7, 11%)  
e.g., General urban planning system, planning process, and process understanding through small-scale pilot project
- Others
  - ◇ Communication and coordination (6, 10%)
  - ◇ Data and information management (4, 6%)
  - ◇ Study of foreign languages (4, 6%)

## 8) Suggestions, Opinions, and Comments

The following box shows suggestions, opinions, and comments raised by UPD-YCDC staff.

Issues on organizational management and realization of the projects are recognized as notable subjects to be improved.



Suggestions, opinions, and comments

- Necessity of personnel training
  - ◇ It is necessary to have training opportunities;
  - ◇ It is necessary to have OJT with experienced engineers;
  - ◇ It is necessary to learn the urban planning system; and
  - ◇ It is desired to take training courses in Japan.
- Issues in organization and its management
  - ◇ Current organization lacks skilled engineers and equipment;
  - ◇ Current organization lacks practical and systematic management;
  - ◇ It is necessary to establish relationships with related organizations; and
  - ◇ It is necessary to establish competence in the current organization.
- Issues of realization in urban planning
  - ◇ It is necessary to understand the implementation process and its management;
  - ◇ National and regional plans are necessary; and
  - ◇ A 20-year planning period is considered too long. It is necessary to consider a short-time plan.
- Necessity of urban planning in overseas

9) Necessary Capacity Development Subjects

- ✓ Understanding about general urban planning system
- ✓ Specific technical knowledge corresponding to sectors
- ✓ Technical knowledge transfer through OJT programs

(7) Frameworks of Capacity Development Program

The EU has been providing capacity development programs to UPD-YCDC since August 2013. The contents and results of the program closely relate to the demand of future frameworks of capacity development. However, the results of capacity development programs should be reevaluated and modified.

The EU capacity development program plans are continuously executed for 24 months (until July 2015). It has only been two months since it started, therefore, it is early to evaluate its results and identify problems and future needs.

Outline of EU capacity development program is described in this section. Also, subjects to be considered in addition to the EU program are listed.

1) Outline of the EU Capacity Development Program

The EU takes indirect corporation scheme for capacity development assistance to UPD-YCDC, instead of direct assistance to the organization. The training assistance was executed by three NGOs and EU provided for the expenses (\*).

*\* According to the presidential address on June 20, 2013, assistance from international donors is requested to be coordinated by the union government. Since YCDC is not an autonomous organization of Myanmar, starting new activities of the organization under the donor's support would be difficult. Therefore, EU provides the necessary expenses to NGOs and charges them with the execution of the education program.*

The program is executed for two years and considers the following four subjects:

- i. Training on project management (desk study);
- ii. Training on public policy making and urban planning techniques (details of the program unfixed);
- iii. Urban planning information and statistical information; and
- iv. Training on practical urban planning and social impact assessment (on site, OJT).

All UPD-YCDC staff (about 60 staff) is requested to take at least two subjects from abovementioned four courses for knowledge acquisition. Each course is prepared for five to ten half days per week. As a result, most of their working time is considered to be spent on this capacity development program for two years.

2) Necessary Capacity Development Subjects which is not included in EU Program

The abovementioned subjects are considered to be related to the future roles of YCDC. Their programs are clear and accurate, therefore, future training programs will be planned according to the degree of mastery and results of the training.

On the other hand, the content of the second subject is unclear, particularly on urban planning techniques, although many staff wishes to learn the technical part. Engineering matters are out of scope in the EU capacity development program. In case of execution of the capacity development program regarding engineering in the future, it is necessary to establish the relation between the legal and organization system and its responsibilities. Subsequently, it is recommended to provide capacity development programs with other related organizations corresponding to the following items:

- ✓ Electricity and public transportation planning which is the responsibility of the union ministry or regional government.
- ✓ Road construction works, water supply and sewage planning and management which is the responsibility of other departments of YCDC.
- ✓ Land use, its control, urban planning policy making and management; however, the responsible organization is not clearly defined in the legal system.

(8) Roles of the Union Ministries to Support Urban Planning Activities by Local Government

At first, the union ministries need to determine the urban planning roles and responsibilities of related organizations. Then appropriate and effective support can be executed by adequate and appointed organizations. Only the union government can establish the organizational system, legalize necessary

laws and regulations, coordinate with related ministries, and execute necessary budget. These matters are necessary conditions for the execution of planning activities. Below are the recommended activities of support by the union government for urban planning activities of local organizations:

1) Formulation of the Urban Planning System, Standard and its Management System

It is necessary to define related urban planning procedures and their details. They have to be planned in consideration of their application and dissemination to other regions, states, and cities. Below are the supposed activities:

- ✓ Formulation of basic urban planning survey process, survey contents, and recording format;
- ✓ Legalization and standardization of building code and urban planning systems; and
- ✓ Formulation of technical requirement and permission system for urban/district development activities.

2) Human Resource Development and Disposition of Staff for Urban Planning

It seems that recognition of many urban planning officials, staff, and engineers is underdeveloped. And they are not fully aware of the purpose of urban planning, administrative roles, and implementing measures.

These situations are not caused by personnel talent and capacity, but it is assumed that lack of realized urban planning systems and implemented projects in the interior of Myanmar makes their understanding of urban planning difficult.

Particularly, intensive capacity development of senior and managerial officials is essential and urgent, in order to accelerate their understanding about administration roles in urban planning system and to stimulate their advancement of their administrative functions. Correspondingly, the union ministries have to position human resources to related union ministries, regional/state government, and local administrative offices. Below are the considered initial activities for this issue:

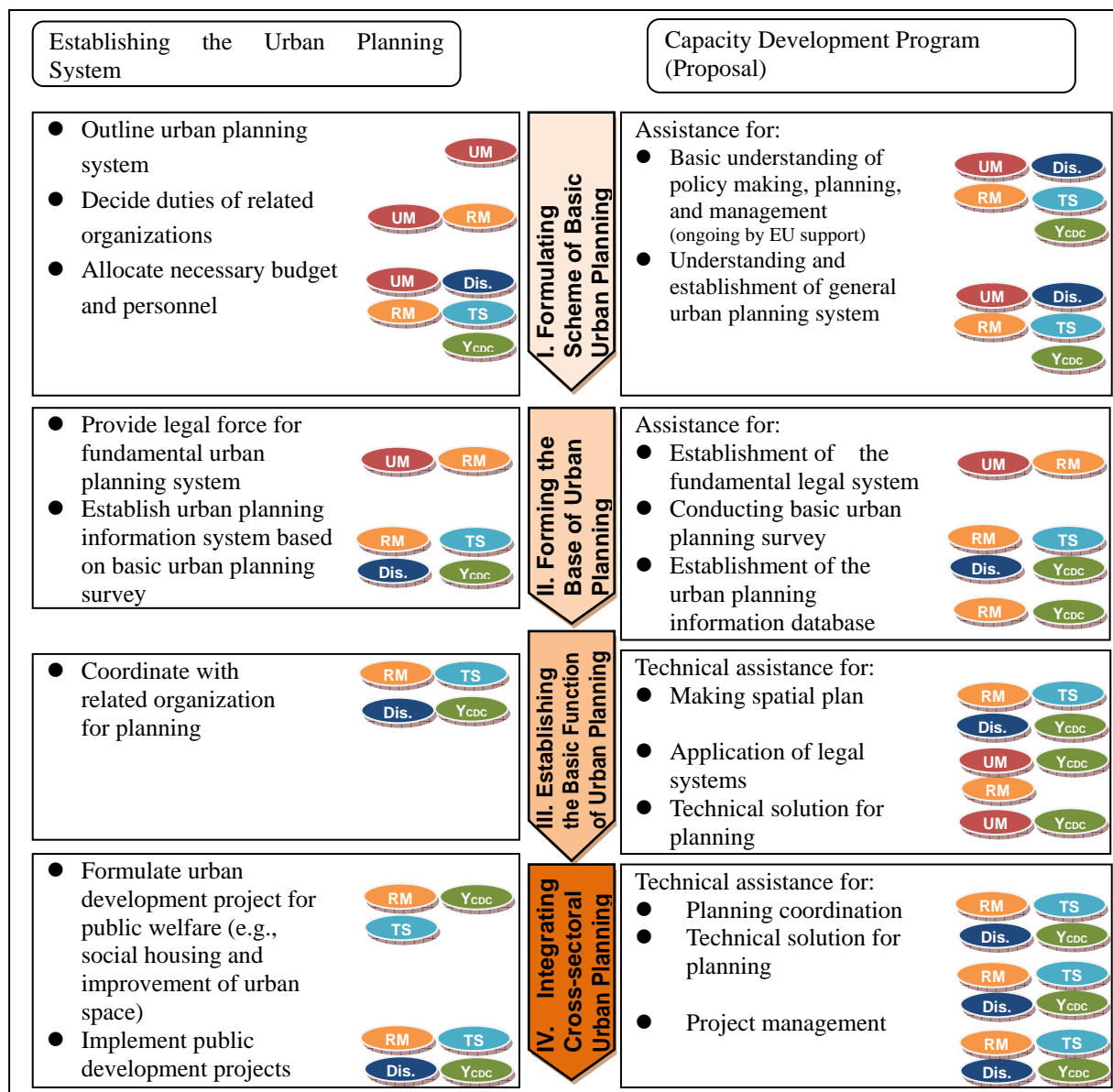
- ✓ Overseas training on urban planning systems targeting senior and managerial officials; and
- ✓ Spread of urban planning systems by systematic knowledge transfer (e.g., Training of Trainers (TOT) method)

(9) Capacity Development Plans for UPD-YCDC

Considering the current situation of related organizations and issues about urban planning, as discussed in this chapter, critical subjects for the execution of capacity development programs to YCDC about urban planning are resumed as follows:

- ◇ Capacity development program of UPD-YCDC needs to be formulated according to the result of EU's capacity development program;
- ◇ Necessary legal and organizational urban planning system should be formulated corresponding to the subjects of the capacity development program; and
- ◇ Cooperative relation among related organizations and departments should be established for urban planning activities.

Assuming the abovementioned issues, phased capacity development program is proposed with its conditions as shown in Figure 4.3. In the figure, the right figure shows the proposed capacity development program and the left figure shows the corresponding legal and organizational conditions. Organization mark shows the assumed organization and its responsibility.



Source: JICA Study Team

Legend:



**Figure 2.4.3: Urban Planning Phased Capacity Development Plans in Myanmar**

The training subjects are grouped into four stages according to the progress and development of the urban planning system.

1) Formulating Scheme of Basic Urban Planning System

In the early stage, it is necessary to make the fundamental urban planning system widely known and to urge establishment of the administrative system. Below are the necessary subjects:

- ✓ Basic understanding of policy making, planning, and management

The program on this subject is ongoing as EU support program for UPD-YCDC staff. It is necessary to spread the knowledge with related administrative organizations in the union, region/state, and local level.

[Assumed measure of capacity development]

- ◇ Intensive lectures and exercises

- ✓ Understanding and establishment of the general planning system

This subject is necessary especially to the persons in the managerial position who work for the formulation of basic urban planning system. In order to establish the framework of urban planning system, it is necessary to understand the general urban planning system and related systems. As a result, the framework of urban planning system is expected to be formulated by Myanmar.

[Assumed measure of capacity development]

- ◇ Intensive lectures and exercises; and
- ◇ Urban planning training course and inspection in oversea countries.

2) Forming the Base of Urban Planning System

In this stage, it is necessary to formulate a basic legal system which would be applied in the whole Myanmar. According to the established legal framework, preparatory survey will be conducted with responsible organizations.

- ✓ Establishment of a fundamental legal system

The urban planning system should be backed up by legislations. It should include not only physical planning matters and systems, but also the roles of each administrative organization. Moreover, procedures and realization measures should be clarified.

[Assumed measure of capacity development]

- ◇ Dispatch of experts of legal matters and urban planning system (collaborative works on the formulation of a legal system)

- ✓ Conducting basic urban planning survey

- ✓ Establishment of the urban planning information database

The Study conducted an initial survey in the Yangon area. Looking at the nationwide survey's application, the survey is expected to be conducted under a unified survey contents and procedures. Its result is expected to be integrated and shared in the urban planning database related information.

[Assumed measure of capacity development]

- ◇ Dispatch of experts for survey design

- ◇ Dispatch of experts team for the conduct survey and information management (collaborative works)
- ◇ Support for diffusion of survey (TOT)

### 3) Establishing the Basic Function of Urban Planning Activities

This stage intends to formulate the detailed urban plans and tools for the implementation and realization of projects described in the urban master plan. It is expected that practical planning process, spatial control measures, and integrated planning process are applied and refined through the following activities in this stage:

#### ✓ Creation of a spatial plan

Capacity development through practical works on the formulation of a detailed spatial plan is considered. For the administration officials, the ability to set a spatial framework, evaluation of plan, and guidance are major issues.

[Assumed measure of capacity development]

- ◇ Dispatch of experts team for technical assistance (collaborative works, OJT);
- ◇ Support for dissemination of administrative roles for planning (TOT); and
- ◇ Formulation of a guiding document of procedures (collaborative works).

#### ✓ Application of legal systems

Capacity development through practical works on the review of an application plan is considered.

[Assumed measure of capacity development]

- ◇ Dispatch of experts team for technical assistance (collaborative works, OJT);
- ◇ Support for dissemination of the review process (collaborative works, OJT); and
- ◇ Formulation of a guiding document of procedures (collaborative works).

#### ✓ Technical solution for planning

In order to formulate implementation plans, technical knowledge on infrastructure planning and design needs to be transferred. These trainings are executed targeting at the infrastructure sector groups of related organizations.

[Assumed measure of capacity development]

- ◇ Dispatch of technical coordinator experts; and
- ◇ Dispatch of experts for technical assistance (collaborative works).

### 4) Integrating Cross-sectoral Urban Planning

Training in this stage intends to practice organizational collaboration for urban planning projects and identify necessary issues to be improved. OJT through public welfare projects is considered for this training. The following projects are considered appropriate for this matter:

- Social housing development and supply;

- Improvement of urban space (disaster prevention, fire, and flood);
- Heritage building and townscape upgrading; and
- Urban redevelopment with public facilities' supply.

Below are the considered training subjects:

- ✓ Planning coordination  
[Assumed measure of capacity development]
  - ◇ Dispatch of experts team for technical assistance on the project (collaborative works, OJT)
- ✓ Technical solution for planning  
[Assumed measure of capacity development]
  - ◇ Dispatch of technical coordinator experts; and
  - ◇ Dispatch of experts for technical assistance (collaborative works)
- ✓ Project management  
[Assumed measure of capacity development]
  - ◇ Dispatch of experts team for technical assistance on the project (collaborative works, OJT)

(10) Management and Updating Procedure of the Spatial Plan and Master Plan

The current spatial plan and master plan, which are made through the Study, are under formulation and legalization. Its formulation process is being developed. Possible management and updating procedure of these plans are proposed in this section.

The current master plan contains various plans as shown in Table 2.4.7.

**Table 2.4.7: Proposed Administrative Works for Urban Planning and Development**

	Main Contents	Remarks
Master Plan	A Strategic Urban Development Plan of Greater Yangon ➤ Development plan up to year 2040 ➤ Future urban development plan corresponding to forecasted population and number of households ➤ Plan mainly contains infrastructure development plans	◇ The plan was confirmed by the Yangon Regional Government Cabinet

Source: JICA Study Team

1) Necessary coordination for management and updating of the plan

Proposed projects in the master plan were planned for the development and construction of infrastructure facilities corresponding to the forecasted population in 2040. These plans show

the future outline of development goals. Moreover, each project needs feasibility study and environmental and social consideration, including EIA procedure, and further study on the implementation body. After this Study, the proposed project outlines could be changed and some projects reorganized.

The planning department of the regional government needs to adjust the master plan together with the preparation of their own regional development plan, which is being prepared independently. This formulation process of the master plan as the Yangon Region Development Plan is necessary in order to secure corresponding budget allocations and its implementability.

2) Executor for updating and managing the plan

In updating and managing the plan, the planning department of the Yangon Regional Government is considered as the appropriate executor for updating the plan. It is necessary to discuss with the union ministries (specifically the Ministry of Finance) about the budget for this role.

Simultaneously, establishment of the planning committee for general planning of the Yangon Region is recommended. The committee is expected to make, manage, and conduct plans for infrastructure and public facilities (educational and medical facilities) as well as to coordinate with related organizations.



## **5. Strategic Environmental Assessment**

### **5.1 General**

As a rule, JICA requests project proponents to pay appropriate environmental and social considerations when implementing an ODA project, based on the “JICA Guidelines for Environmental and Social Considerations (April 2010)” (JICA Guidelines).

According to the JICA Guidelines, strategic environmental assessment (SEA) will be applied in conducting a master plan study to integrate appropriate environmental and social considerations at an early stage of the proposed project.

In the Master Plan for Greater Yangon, SEA was carried out in the examination of development vision and basic policy for development in the future under this Study. The result of SEA is reflected in the development master plan.

In the Phase II of the Study, a workshop on environmental and social considerations, which will be necessary for future development programs in Yangon, was organized by the JICA Study Team in the course of technical transfer for the implementation of case studies. The attendees in the workshop were key persons in the planning department of YCDC.

Environment Conservation Law of Union of Myanmar was promulgated on 30th March 2012. As of November 2012, the regulations and guidelines etc. which will be necessary for implementation of the provisions including conducting EIA mentioned in this law are still under preparation by MOECF. Note that SEA is not required to conduct in the “Environment Conservation Law”. At the moment, the role of the Urban Planning Unit of YCDC for the environmental and social considerations on the development project in Yangon is not clear.

The attendees in the workshop were key persons in the planning department of YCDC. It was expected that the attendees were not familiar with the environmental and social issues. Therefore, the JICA Study Team made an effort to conduct plain and straightforward presentation focusing not only on technical matters in terms of environmental and social considerations but also on the reason why these considerations are necessary in conducting environmental impact assessment (EIA) and/or SEA for the development projects.

As the attendees play the role of chief of case studies in Phase II, JICA Study Team intended that the attendees make good use of technical knowledge to be obtained in the workshop at the field of the actual works of case studies.

The workshop was carried out in a participatory manner. A time for question and answer was allocated during the presentation. At the end of every session, attendees were requested to make comments and remarks on the presentation.

## 5.2 Strategic Environmental Assessment

### (1) Definition of SEA

The SEA is understood as a tool for integrating the appropriate environmental and social considerations based on sufficient environmental and social information into the process of development through *Policy, Plan and Program*, or PPPs.

“*Policy*” involves the administrative policies of the government which will show the basic principle of plans and/or projects in the whole policy system but will not decide the necessities and/or concrete contents of each project. Therefore, policies are generally abstract and not concrete.

“*Plan and Program*” explain the methodologies and schedules to implement projects systematically. However, the details of the projects are not decided. In this sense, “*Plan and Program*” is more concrete than “*Policy*” but more abstract than projects.

The Project for the Strategic Urban Development Plan of the Greater Yangon is considered to belong under “*Plan and Program*”.

### (2) Significance of SEA

In relation to the national development and environmental context, SEA is said to have two important significances as follows:

- ✧ To integrate appropriate environmental and social considerations into the process of decision making.
- ✧ To supplement the limitation of conventional environmental impact assessment that will be carried out during the implementation stage.

### (3) Methodologies

At the moment, no single best SEA process has been established yet. Different techniques or methodologies have thus been applied in various stages and activities of SEA. The choice of techniques depends on a whole range of factors, including the purpose of SEA, availability of data, local environmental assessment capacity, decision making structure, culture, and resource constraint.

The SEA for the Project was carried out during the process of establishment of development visions and structure plans for Greater Yangon.

The detailed methodologies for SEA are as follows:

#### 1) Review the Process of Preparation of Draft Structure Plans

Three draft structure plans were carefully reviewed first. During the review, confirmation was made on the contents of each structure plan as well as the process of establishment of development visions. Note that the process of establishment and the description of the alternatives are referred to in “3.4.4 Urban Structure of Greater Yangon (2) Alternatives of Urban Structure” (Final Report I, p3-40 to p3-42).

Also note that the established development visions are referred to in “3.1.3 The Development Visions of Greater Yangon for 2040” (Final Report I, p3-8).

2) Discussion on the Present Environmental Issues in Yangon City

Present environmental issues in Greater Yangon were discussed in the course of preparation of the SEA study. The master plan has the target year of 2040, and therefore, it will be useful to discuss present environmental issues in Greater Yangon in consideration of the future environmental issues.

3) Preliminary Stakeholders Meeting through Interviews with Related Townships

It is essential in the SEA procedure to incorporate opinions of related stakeholders into plan formulation as early as possible. Therefore, interviews were carried out with all the related 39 townships as preliminary stakeholders meeting to find out their preferences on the proposed structure plans. At the same time, opinions on various topics such as environmental concerns and socioeconomic issues were discussed between the chief of townships and the JICA Study Team.

4) Environmental Scoping

Anticipated actions necessary to realize the proposed four development visions were clarified first. Then, the environmental impact items which should be considered in the realization of the development visions were selected using environmental checklist. In the process, the results of discussion for the present environmental issues in Greater Yangon and opinions in the preliminary stakeholders meetings with the related townships were considered.

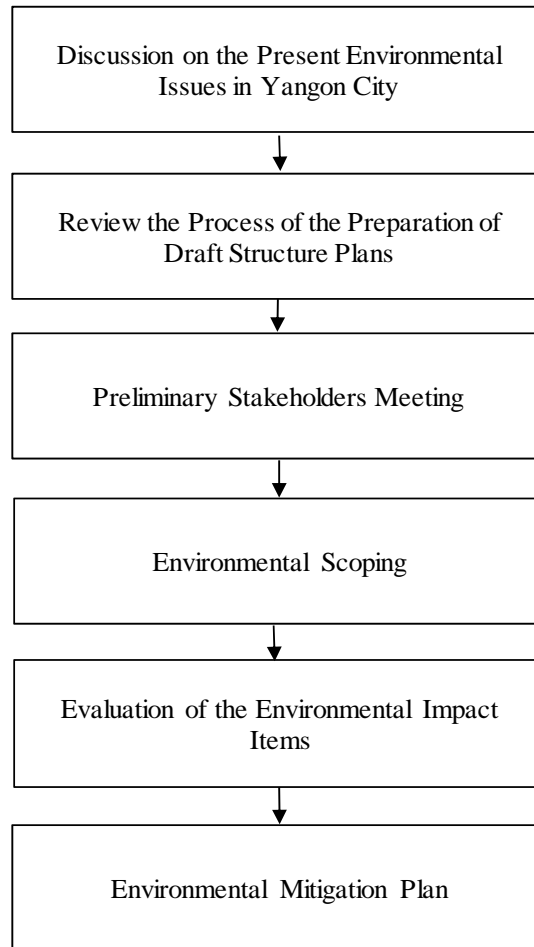
5) Evaluation of the Environmental Impact Items

Anticipated environmental impacts to be caused by each alternative were evaluated in the form of a matrix.

6) Establishment of Environmental Mitigation Plan

An environmental mitigation plan necessary during the implementation stage was prepared for the optimal alternative selected based on the evaluation of the environmental impact items.

The work flow for SEA is shown in Figure 5.1.



Source: JICA Study Team

**Figure 2.5.1: Work Flow for the Strategic Environmental Assessment**

### 5.3 Workshop for Strategic Environmental Assessment (Appendix.1-4)

(1) 1<sup>st</sup> Workshop (August 26, 13:00-14:30)

The 1st Workshop was held on August 26, 2013. Discussion in this workshop included the summary of SEA conducted in the Study including explanation of the process in establishing development visions, preliminary stakeholders meeting through interviews with related townships, selection of environmental impact items, and evaluation using the matrix.

1) Presentation (Summary of SEA Conducted in the Study)

**Table 2.5.1: Agenda of the 1<sup>st</sup> Workshop**

Items	Presenter / Facilitator
Introduction	Mr Sai (JICA Study Team)
Summary of SEA Conducted in the Study	Mr Sai/ Environmental and Social Sector Group
Environmental Issues from the Viewpoint of District Planning(Case Study on Mindama Development Area)	Mr Sai Mr Yamashita
General Aspects of Environmental Social Considerations for the Project	Mr Sai
Questions/Answers	Mr Sai
Comments from Attendees	Attendees
Closing Remark	Mr Sai

Source: JICA Study Team



Source: JICA Study Team

**Figure 2.5.2: Pictures of the 1<sup>st</sup> Workshop**

2) Summary of Comments/Questions

- ✓ I completely could not understand the difference between SEA and EIA. I would like to ask you to explain the SEA procedures again. (Participant)
- ✓ Although some terms were not familiar to me, I could grasp some knowledge of environmental and social consideration. (Participant)

The JICA Study Team noted the comments with appreciation.

(2) 2<sup>nd</sup> Workshop (September 2, 13:00-14:30)

The 2<sup>nd</sup> Workshop was held on September 2, 2013. Discussion in this workshop included the explanation on the experiences of environmental and social considerations in Myanmar by a local consulting company.

1) Presentation (Experiences of Environmental and Social Consideration in Myanmar)

**Table 2.5.2: Agenda of the 2<sup>nd</sup> Workshop**

Items	Presenter/Facilitator
Development in Legislation Concerning Environmental and Social Conditions in Myanmar	Mr Soe Thura Tun (Local Consultant)
ESIA in Myanmar in the last decades	Mr Soe Thura Tun
Recent ESIA work in Myanmar, Problems, Constraints, and Effectiveness	Mr Soe Thura Tun
EIA for Urban Development, Expectation for Next Decade	Mr Soe Thura Tun
Questions/Answers	Mr Sai (JICA Study Team)
Comments from Attendees	Attendees
Closing Remark	Mr Sai

Source: JICA Study Team



Source: JICA Study Team

**Figure 2.5.3: Pictures of the 2<sup>nd</sup> Workshop**

2) Summary of Comments/Questions

- ✓ The explanations on EIA procedure were very interesting to me. Especially, I appreciate your explanation on EIA flowchart. (Participant)
- ✓ The EIA system should be introduced to Myanmar because the system will be helpful for appropriate environmental and social considerations for development projects. (Participant)

The JICA Study Team noted the comments with appreciation.

(3) 3<sup>rd</sup> Workshop (September 9, 13:00-14:30)

The 3<sup>rd</sup> Workshop was held on September 9, 2013. Discussion in this workshop included the explanation of EIA regulation by the local consulting company.

1) Presentation (Explanation of EIA Regulation)

**Table 2.5.3: Agenda of the 3<sup>rd</sup> Workshop**

Items	Presenter/Facilitator
Laws Concerning Environmental Conservation in Myanmar	Mr Zaw Naing Oo (Local Consultant)
Introduction to Environmental Conservation Law (2012) and EIA Regulations in Myanmar	Mr Zaw Naing Oo
Standards on Environmental and Social Assessment and Management, Proposition for the Future	Mr Zaw Naing Oo
EIA as a Solution for Development of Myanmar	Mr Zaw Naing Oo
Questions/Answers	Mr Sai (JICA Study Team)
Comments from Attendees	Attendees
Closing Remark	Mr Sai

Source: JICA Study Team



Source: JICA Study Team

**Figure 2.5.4: Pictures of the 3<sup>rd</sup> Workshop**

2) Summary of Comments/Questions

- ✓ I could not understand the contents of the presentation because this was the first experience for me to listen about EIA. I want to learn more about EIA. (Participant)
- ✓ What kind of standards/guidelines did apply to the practices of EIA in Myanmar? (Participant)
- ✓ The environmental guidelines of World Bank, ADB were referred to in the EIAs. (Local consultant)

The JICA Study Team noted the comments and questions with appreciation.

(4) 4th Workshop (September 16, 13:00-14:30)

The 4th Workshop was held on September 16, 2013. Discussion in this workshop included brainstorming among the participants on the environmental and social issues in Yangon.

1) Presentation (Brainstorming on the Environmental and Social Issues in Yangon)

**Table 2.5.4: Agenda of the 4<sup>th</sup> Workshop**

Items	Presenter/Facilitator
Discussion on the Expected Environmental and Social Issues for the Development Project	Mr.Sai/Attendees
Proposal for Mechanism on Land Acquisition and Compensation in Development Projects	Mr Toe Aung
Topics from Resource and Environment Myanmar	Mr Sai/REM
Discussion	Attendees
Questions/Answers	Mr Sai (JICA Study Team)
Comments from Attendees	Attendees
Closing Remark	Mr Sai

Source: JICA Study Team



Source: JICA Study Team

**Figure 2.5.5: Pictures of the 4<sup>th</sup> Workshop**

2) Summary of Comments/Questions

- ✓ What are the responsibility, duty, and role of the Planning Department in terms of environmental and social reconciliation? (JICA Study Team)
- ✓ At the moment, we just have the Land Acquisition Act and land-related laws. Our responsibility and role for land acquisition under development projects are still not



clear. I think it is important to prepare the appropriate guidelines for land acquisition as early as possible. (Director of Planning Department)

- ✓ I have limited experience on environmental and social considerations including our staff. I want to make an awareness program on the importance of EIA for development project. (Participant)
- ✓ I think traffic congestion due to limited width of roads is a serious issue in Yangon. In order to secure the land for road development, I would like to propose a discussion with related agencies. The discussion will include how to conduct land acquisition for road widening and how to address squatters living in the area. (Participant)
- ✓ I think that there is a lack of consideration given to air pollution by vehicle emissions in Myanmar. The guidelines for protection of air quality should be established as early as possible. (Participant)

#### **5.4 Conclusion**

The workshop was conducted successfully with high interest of the participants on the presentations given by the JICA Study Team experts and other presenters. Although the participants do not have much experience and their academic backgrounds are insufficient, they showed keen interest on the presentation topics. The EIA regulations, which are under the approval process at the parliament, might be one of the reasons for their keen interest.

The presentation made by the local consultants, who have been conducting EIA study in Myanmar, contributed significantly to facilitate the understanding of the attendees.

At the moment, the role of the Urban Planning Unit of YCDC in the development project is not clear. However, it is expected that the level of understanding for environmental and social considerations among the staff of the Urban Planning Unit will be increased as a result of the workshop.

# ***CHAPTER 3***

***Conclusion and Recommendation***

## **CHAPTER 3: CONCLUSIONS, RECOMMENDATIONS**

### **3.1 Conclusions**

This project has been carried out in two phases. Phase 1 was the main part of this project, in which the analysis of present conditions was made, and consequently the vision for the future of the Greater Yangon area, as well as the strategies for land use and urban infrastructure, among others, was presented. The conclusion and recommendation for Phase 1 were already presented in Phase 1 Final Report for the reference of this report.

Phase II of the project focused on the capacity development to assist the implementation of the plans and strategies recommended in Phase I report. The capacity development focused on 5 fields of urban planning and other related field.

The first theme was the CBD (Central Business District) development. This focus on actual formulation of detail land use plan in consultation with related organizations such as Department of Human Settlement and Housing Development (DHSHD) of MOC, Yangon Heritage Trust which carries out activities in relation to preserving heritage within the city, and the JICA Study Team. In order to take countermeasures against existing problems such as traffic jam, environmental pollution, rising land values, deterioration or damage to cultural heritage, and others, detailed CBD development plans were carried out.

The second theme was North-East Region development. This region is a fast growing suburb of Yangon. The planning was carried out in collaboration with Urban Planning Division of YCDC, JICA Study Team and relevant Township Offices.

The third theme was an exercise towards what is called Transit-Oriented Development, which essentially tries to harmonize urban development and public transport system. In this Project, commuter service on the existing railway line, such as the Circular Line, was proposed as one of the priority project for implementation. Case studies were carried out in some of the main stations along the Circular Railway Line in such a way as to provide smooth exchange from the railway to other transport modes such as busses and/or private cars.

The fourth theme was the capacity development plan. The Strategic Urban Development Plan is for future development in the Greater Yangon area. In order to realize the plan, it is necessary to establish an urban planning system for larger regions and a detailed plan for smaller area.

The fifth them was the Strategic Environmental Assessment. In the Phase II, the workshop on environmental and social considerations which is necessary for future development programs in Yangon was conducted by the JICA Study Team in the course of technical transfer for the implementation of case studies.

By December 2013, all the activities in Myanmar have been completed on all the five themes mentioned above. This report, Final Report for Phase II of the Project describes the outcome of the activities mentioned above.

## **3.2 Recommendations**

Through the course of the activities of Phase II, the Study Team worked with UPD of YCDC and other related organizations to complete the case studies on the five themes. The followings are the recommendations based on Phase II activities.

- In CBD development, a draft zoning scheme was formulated in consultation with YCDC, JICA Study Team, MOC and YHT. In order for this draft plan to be effective, YCDC needs to carry out a series of public consultation to obtain feedbacks from the citizens of Yangon. Also a legal framework for the implementation of the zoning scheme will also have to be thought through, and consequently the notification to the public has to be made. These are the procedure necessary to make this draft zoning plan to be applied in effect to the control and management of development in the CBD zone of Yangon.
- Besides the above, in order for the protection of historical heritages, the proposed two zones, i.e. Central Area Heritage Zone and Secretariat Area Heritage Zone, have to be designated by By-Law of Yangon for conservation, together with stipulation of the prohibition and alteration of buildings and regulation of redevelopment.
- In order to advise on the preservation of historical landscape in CBD, an organization named a landscape council is recommended to be formed made up of YCDC, YHT, Association of Myanmar Architects (AMA) and other professionals with extensive knowledge and experience.
- For the planning of new development in the suburbs of Yangon, the duties and responsibility of YCDC needs to be clearly defined. Formerly, MOC has been initiating new development in the suburban area, but in the course of devolution, this function may as well be transferred to local entities. This matter has to be discussed thoroughly within the central government and if the function is transferred to local entities, the capacity development has to be done for the Region/State Government as well as three City Development Committees including YCDC. Budgetary allocation has to be also thought of in line with the transfer of function and responsibility.
- Transit-Oriented Development is an important concept for Yangon, as it will have to depend more on the public transport in future. For an effective implementation of TOD, cooperation with Myanmar Railway will be essential. To facilitate TOD, one successful example will be helpful for other cases to follow. YCDC needs to act as a focal point to coordinate relevant organizations to follow through a TOD model. A TOD model of Yangon Central Station and Insein Stations will be crucial.
- YCDC needs to continue to carry out the capacity development for the sustainable control of urban development in Yangon. Currently, a few donor organizations are extending capacity development programs. YCDC shall need to coordinate the programs of various donors.
- Strategic Environmental Assessment, or SEA, is an effective tool for urban growth management and planning, and YCDC should continue to train its staff as facilitators of SEA in various fields of planning and management. It should be noted that SEA is not only a method for environmental management, but also a tool for participatory planning involving the citizens for feedback.



# *Appendix*

## **Appendix 1: Supplementary Note on the Development of Dala Area**

### **1.1 Introduction**

In the steering committee discussion on Phase II held in November 2013, there was a comment on the possibility of developing the Dala area. This matter has been dealt with in Phase I, and the final report for Phase I has already been submitted and approved. Thus, this supplementary note is prepared to provide some additional remarks to the possible development of the Dala area, which is located south of the Yangon CBD across the Yangon River. Due to the proximity of the Dala area to the CBD, there have been quite few proposals for developing the area as an extension of the CBD.

### **1.2 Present Condition of the Dala Area**

The Dala area, which is just across the Yangon River from the Yangon CBD, has been urbanized during the 1900s. Since the Dala area is generally low lying with elevation between EL.3 to 6 m above mean sea level (MSL), flooding is seen during high tide. One such incident was during the time of Cyclone Nargis, which brought about extensive flooding.

As there is no bridge across the Yangon River, the Dala area has always been served by ferry boats, which are operated by IWT. The Japanese government is preparing to support the improvement of the ferry boats servicing the Dala area and Yangon CBD and some related facilities for better quality of services and comfort of passengers. Currently, the Dala District has urban areas mostly near the ferry terminal on the Yangon River, with a population of about 200,000 in 2011.

#### **(1) Yangon River Crossing**

There has not been any bridge between the Dala area and Yangon CBD. As the southern and southwestern sides of the CBD along the Yangon River are extensively used as the Yangon Main Port, which is currently the main port of Yangon, as well as of the entire Myanmar, navigations of ships are plenty and frequent in the Yangon River, particularly between the Dala area and the CBD. One of the difficulties in building a bridge between the Dala area and Yangon CBD is the requirement of high clearance across the water. The specific clearance of a new bridge will have to be discussed with MPT at the time of F/S or earlier. The clearance tends to be high. If the clearance is high, access roads on both sides should be elevated for quite a long distance. In the Dala area, such elevated access road may not be that complicated; however, in the CBD side, due to its limited area available for the access road, building an elongated and elevated access road may not be easy.

An alternative is a tunnel. A tunnel will address any clearance problem, but access roads on both ends need to be lowered in an underpass from the surface level to enter the tunnel crossing the Yangon River. This may not be easy due to the built-up condition of the CBD.

When the Phase I report was prepared in March 2013, there was no specific plan for a bridge or a tunnel. Realizing either a bridge or a tunnel shall take some time for studying, planning, designing, and construction.

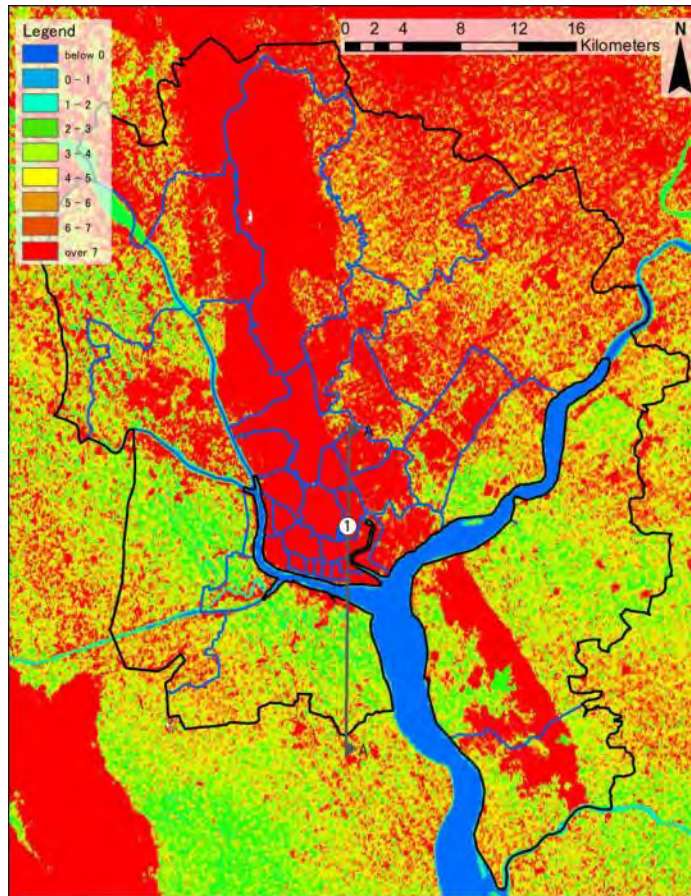
Crossing the Yangon River between Dala and Yangon CBD either by bridge or tunnel is technically possible and indeed desirable for the future of the Dala area. If a specific plan for the crossing is launched through bilateral or multilateral cooperation, this will change the potential of the Dala area positively.

(2) Topography

The Dala area, which extends on the southern bank of the Yangon River, is generally lower in elevation than the northern bank, where the main part of Yangon City is located. Figure A.1 shows the general topography of the area in terms of elevation. In this figure, the boundary area marked in brown and red indicates that the area is above EL.5 m, while the area shown in yellow, green, and blue is less than EL.5 m. Most of the Dala area has an elevation between EL. 2 m and 6 m, while most of the urban area which is north of the river has an elevation of more than EL. 5 m.

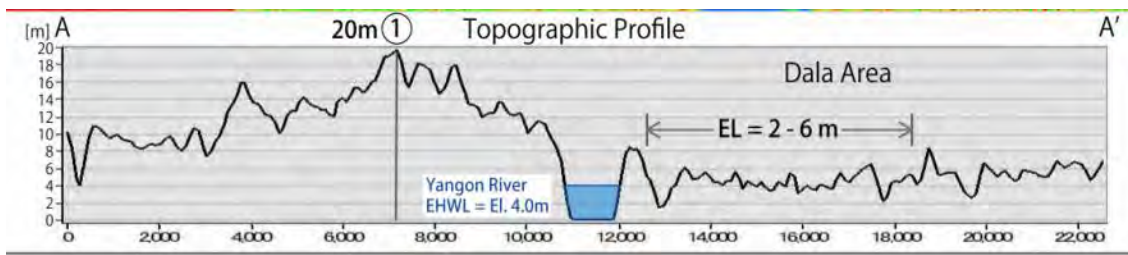
It is noteworthy that the EHWL (at the time of Cyclone Nargis) was at EL. 4 m, and there was extensive flooding in the Dala area. Also, the normal high water level of the Yangon River is said to be at around EL. 3 m.

The topographic cross section as shown in Figure A.2 depicts the above description. While the elevation on the northern bank of the Yangon River is generally above EL.4 m, the Dala area is situated between EL. 2 m and 6 m. This indicates that some of the Dala low lying areas may be prone to flooding.



Source: JICA Study Team

**Figure A-1.1: Topography of Yangon**



Source: JICA Study Team

**Figure A-1.2: Topographic Cross Section of Yangon City**

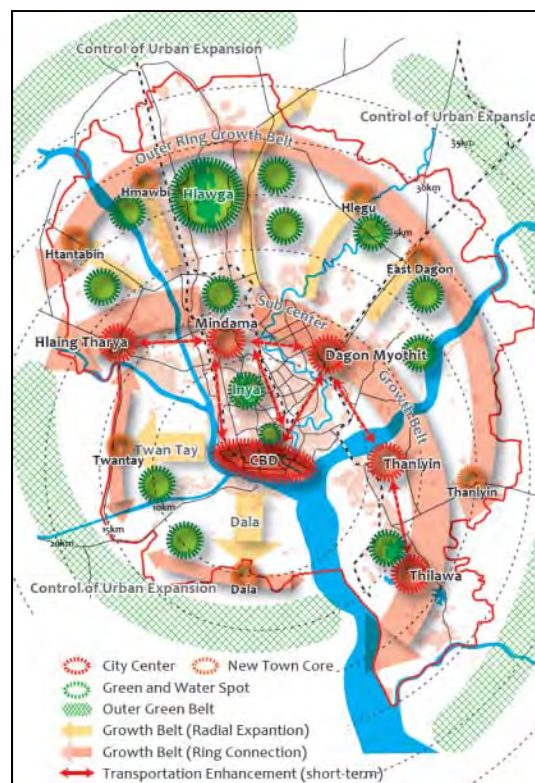
### 1.3 Present Assessment of the Dala Area in Phase I Final Report

#### (1) Structure Plan

In the Phase I Final Report, the selected structure plan of Greater Yangon covers the CBD with its existing location north of the Yangon River, supplemented by secondary CBD (Mindama) and four other subcenters in the immediate fringe of the inner urban area, as well as seven new town centers in suburban locations. The Dala area constitutes one of the seven proposed new town centers. The new town center is proposed in the southern part of the Dala area, where the outer ring road is planned to be constructed in the future. The elevation of the ground in the southern part of the Dala area is relatively high, which makes the development easier and less expensive.

#### (2) Timeline for Development

In the Phase I Final Report, the timeline for the development of secondary CBD/subcenters and new town centers is proposed as shown in Figure A.4 below. The immediate target of development will be placed on the present CBD and secondary CBD, which in combination shall carry out the business and administrative functions of Greater Yangon, followed by subcenters to supplement the functions of CBD/secondary CBD in the short and medium terms. Development of new town center areas will follow, presumably in the medium to long term.



Source: JICA Study Team

**Figure A-1.3: Proposed Structure Plan of Greater Yangon**

Type	Distance	No.	Height	Schedule
CBD	Center	1	Mid and High-rise	Short-term
Secondary CBD	10-15 km	1	High-rise	Short-term
Sub-centers	10-15 km	4	High-rise	Short and Mid-term
New Town Core Areas	10-30 km	7	Mid-rise	Mid and Long-term

Source: JICA Study Team

**Figure A-1.4: Timeline for Development**



## 1.4 Discussion of Accelerating the Dala Area Development

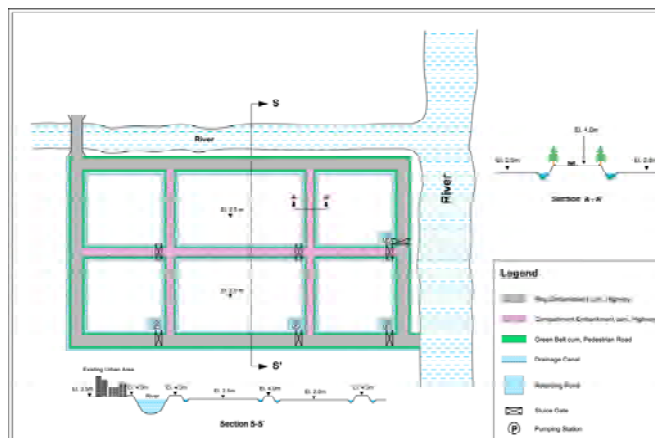
### (1) Overview

The strength of Dala is its proximity to the Yangon CBD. If there is a direct link, e.g., bridge or tunnel, Dala will be easily accessible from the Yangon CBD. The weakness of Dala is the low ground elevation in most of its areas, which makes it generally susceptible to flooding, particularly during high tide. In order to accelerate the development of the Dala area, it is recommended to plan flood mitigation on one hand, and to realize a direct connection with Yangon CBD by bridge or tunnel on the other.

### (2) Measures against Flooding

In order to avoid flooding, there are few practical measures such as land filling, building dikes around the living quarters, installation of pump, and installation of retention pond. If the development of the Dala area will be considered, an engineering study to compare and optimize the possible countermeasures needs to be carried out.

A preliminary study conducted by the JICA Study Team is shown in Figure A.4. This figure shows a compartment type of flood protection measures, where the low-lying area is surrounded by dikes to make a compartment. The dikes also serve as roads. In each compartment, a drainage canal is set along the dikes, allowing the surface water to be drained to a pond at the corner of the compartment. At the pond, a pump is set to drain the water coming into the pond, even if the water level outside of the river is high.



Source: JICA Study Team

**Figure A-1.5: Schematic Image of Compartment Type of Flood Protection in Low-lying Areas**

### (2) Study on the Outer Ring Road Extension and Construction of Bridge/Tunnel

Extending the Outer Ring Road of Yangon towards the Dala area from the western part of Yangon is considered to be a good option in providing surface access to the Dala area from the central part of Yangon. This road extension shall bring about economic development along the road, such as industrial parks and logistics zones, as well as residential areas alongside the Outer Ring Road.

If the traffic demand from Dala to the central part of Yangon increases, the construction of a new bridge/tunnel may be considered. For the crossing, technical and economic analyses have to be carried out as to the best suited type of crossing facility considering various conditions of the site, including necessary clearance for the bridge, as well as necessary access road arrangement (particularly in the CBD area where the land is scarce).