

**The Public-Private Joint Venture in Developing the  
Lad Krabang Subcenter**

by

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## **Abstract**

Bangkok, the capital city of Thailand, faces numerous problems. The creation of Lad Krabang Subcenter will mitigate these problems as well as create a better living environment. This thesis studies the implementation of the development of the Lad Krabang Subcenter. Topics examined include: the structure of the development organization, the financial alternatives of the project, and the critical requirements for this development.

Based on this study, it is argued that the development organization should be a public-private joint venture company. The private partner will carry out the development with support from the public partner. New regulations for acquiring the land must be established. The rate of return of the development will be favorable for to the private partner if the government subsidizes the infrastructure costs, provides tax exemption, and provides loans at a low rate. The most important related projects for the development of the Lad Krabang Subcenter are SBIA and mass transit projects.

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Thank you

# Introduction

The Thai economy and her business practices provide various real estate development opportunities in Bangkok, the capital city of Thailand. However, numerous problems exist in Bangkok as well, which include traffic, congestion, pollution, and environmental problems. These problems present one of the most major constraints on the economic development as well as foreign investments in Bangkok and Thailand.

As a result, in 1993, Bangkok administrators and Governor Krisda Arunwong decided to hire the MIT Consultant Team to explore solutions to the problems. After extensive research, the MIT Consultant Team made numerous recommendations for the their resolution. One of the long term resolutions, which we will focus on this thesis, is the creation of subcenters around Bangkok.

The MIT Consultant Team's recommendations, although well conceived, did not make clear how the subcenters can be implemented. This thesis will discuss the implementation of one of the proposed subcenters, the Lad Krabang Subcenter. The central focus of the thesis will be how the organization that will carry out the development of this project will be established. The thesis will also examine the feasibility studies, financial alternatives, and the special regulations that will be needed to establish in order to develop the Lad Krabang Subcenter. The major questions of this research are as follows:

- What is the most viable way to develop the Lad Krabang Subcenter?
- Who should be the partners in this development? How should the shares of development firms among the partnership be allocated?
- What are the new laws and regulations that will be needed for the development of the subcenter?

This thesis is divided into five chapters as follows: Chapter 1, *Overview of Bangkok and Related projects*, will describe the economic characteristics as well as the current problems of Bangkok. This chapter will also examine the related development projects that will have a substantial impact on the urban development of Bangkok and the Lad Krabang Subcenter. Chapter 2, *Metropolitan Subcenters and The Lad Krabang Subcenter*, will explore the concept of a Metropolitan Subcenters. The location and access of the Lad Krabang Subcenter will also be presented in detail. Chapter 3, *The Public-private Joint Venture*, will explain the necessity for the establishment of a joint venture between the public and private sectors. The roles of the participants will also be described. Chapter 4, *The Development Feasibility Studies and Development Timetable*, will highlight the feasibility studies and financial alternatives of the project. In addition, the development timetable of this project will be discussed. Chapter 5, *Conclusion and Recommendations*, will provide final recommendations for both the public and private sectors.

# Chapter I

## Overview of Bangkok and Related development projects

Thailand, with her 58 million people<sup>1</sup>, located in the center of Southeast Asia, represents a massive market of human and natural resources. Nationally, economic expansion has exceeded 5% every year for over two decades, except briefly during the 1985-1987 recession.<sup>2</sup> During the last three years, the Thai economy has grown about 8 % per year.<sup>3</sup> In consideration of its location, culture, business practices, and financial system, Thailand provides the ideal gateway to Southeast Asia. However, the congestion problem in her capital city, Bangkok, presents one of the most serious drawbacks to economic development and the foreign investment in Thailand.

### **Bangkok**

Bangkok, one of the world's largest cities, has been growing rapidly during the last several decades. The Bangkok Metropolitan Administration (BMA) is the center of the metropolitan region. The Bangkok Metropolitan Region (BMR), which includes five neighborhood provinces--Samut Prakarn, Samut Sakhorn, Nakhon Pathum, Nonthaburi, and Pathum Thani--has a total area of approximately 7,758 sq. km. (see **Figure 1**). The BMA itself has an area of approximately 1,565 sq. km.<sup>4</sup> The current population figures of the BMA and BMR are approximately 7.9 million and 11 million respectively.<sup>5</sup> The population of the BMA and BMR has increased slightly since 1980, as shown in **Figure 2**:

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1 Data from Office of the Board of Investment.

2 Richard Ellis, "Strong Economy Support Housing Market," Bangkok Post, 23 May 1994.

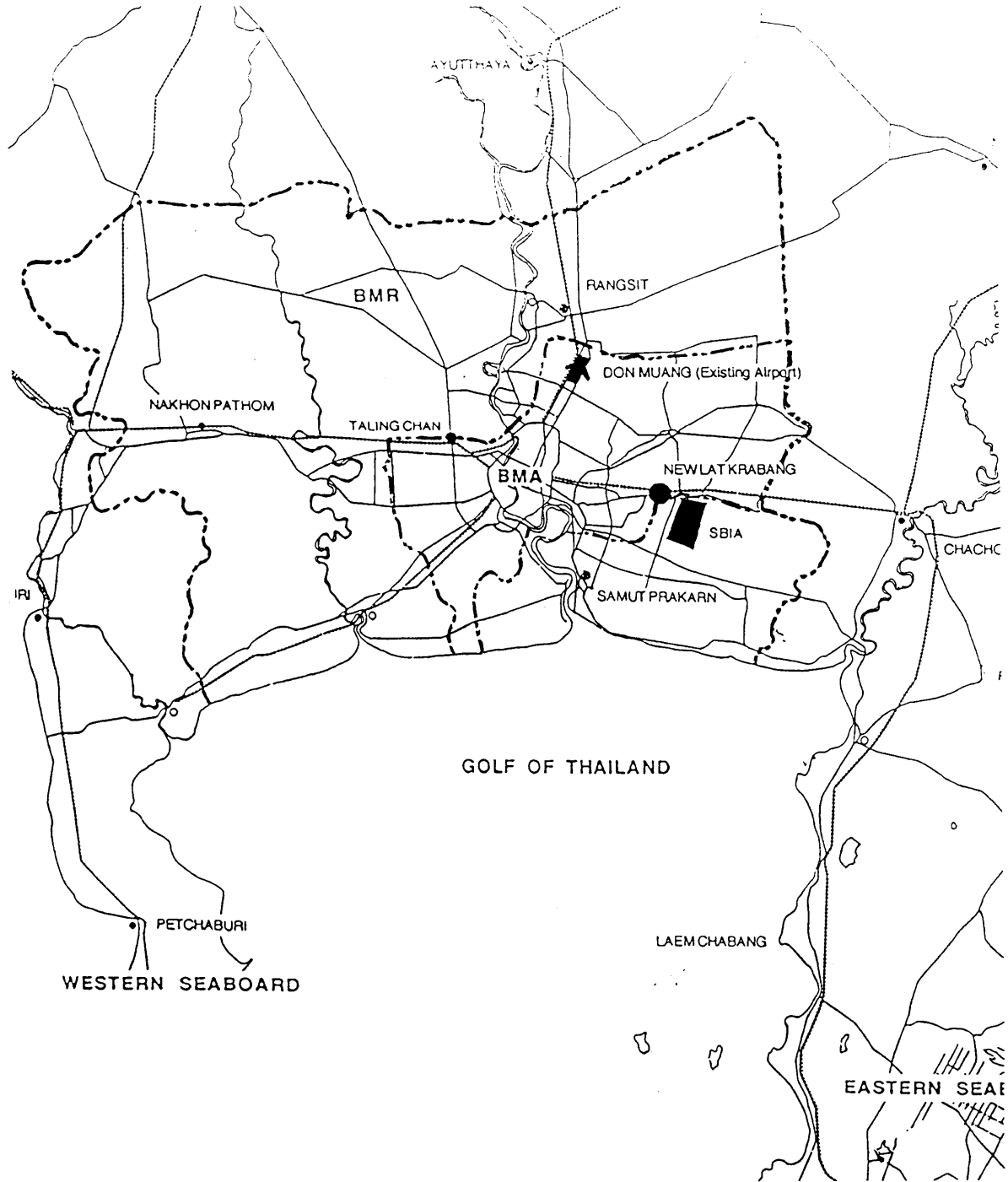
3 Data from National Economic and Social Development Board, 1994.

4 Bangkok Metropolitan Administration, "The Bangkok Plan", July 1995, p. 1.

5 MVA Asia Ltd., et al. Bangkok's Mid 1995 Population (Working Paper D6), Bangkok: OCMRT, July 1995.

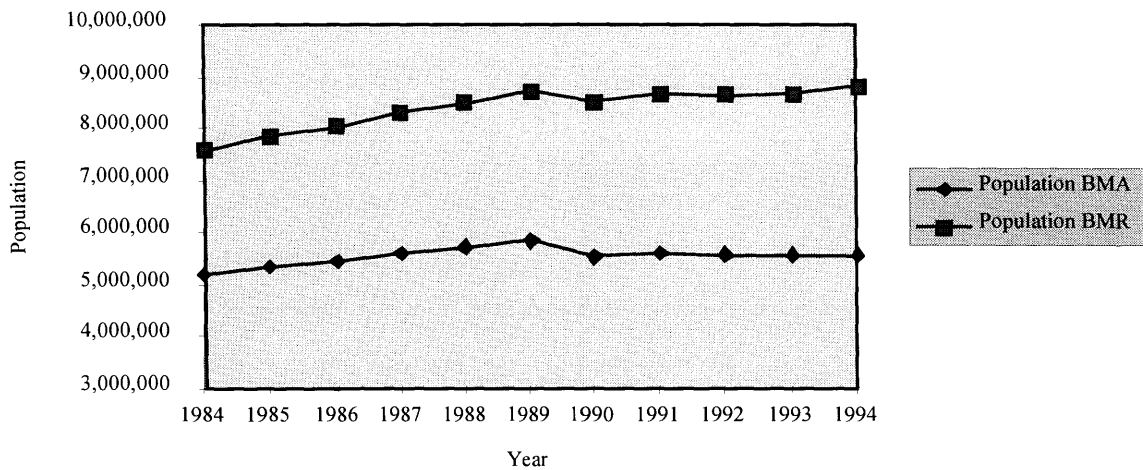


**Figure 1: BMA and BMR**



Source: City of Bangkok

**Figure 2: Population of the BMA and BMR<sup>6</sup>**



The annual rate of increase in the BMA population is just under 3%.<sup>7</sup> The Bangkok Metropolitan Region's economy has consistently grown at a rate of about 3% higher than the national economy -- it is currently growing at over 11% (using the Province Domestic Product as a measure).<sup>8</sup> This enormous growth brings many problems because Bangkok does not have long-term city planning. The city expanded from its core, on the eastern bank of the Chao Phya River, outward without pattern and direction. Settlement now extends over 40 km from central Bangkok.<sup>9</sup> This has caused inefficiency in commuting, increased flood hazards, and environmental problems.

Traffic congestion in Bangkok is infamous as being of the worst in the world. One reason for this is the fact that roads in Bangkok account for only 11% of the total area of the city, compared to 25% in many of the world's leading cities.<sup>10</sup> In addition, Bangkok does not

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6 Data from the City of Bangkok.

7 Bangkok Metropolitan Administration, "The Bangkok Plan", July 1995, p. 1.

8 Bangkok Metropolitan Administration, "The Bangkok Plan", July 1995, p. 1.

9 Hack, Gakenheimer, Levy, Martland, and Sussman, "Strategic Planning for Metropolitan Bangkok phase III", 1994.

10 Hack, Gakenheimer, Levy, Martland, and Sussman, "Strategic Planning for Metropolitan Bangkok phase IV: Open Space in Bangkok", 1994.

have an efficient mass transit system. As a result, most Bangkok commuters must travel by car. Most people in Bangkok spend approximately four hours per day commuting. The traffic problem is not only a cause of inefficiency in commuting but also a major source of the air pollution problem in Bangkok. Another source of traffic congestion is the overburden infrastructure. The infrastructure has not been adequate for the increase in building in Bangkok. Consequently, the installation of additional infrastructure for the new buildings frequently closes parts of the roads.

The general congestion problem in Bangkok arises from the same reason, lack of long-term city planning. The private sector's developments have followed the government's infrastructure decisions, which are made without long-term plans. This has caused zoning confusion--Bangkok has all kind of buildings in every zone. Office, residential, and industrial buildings are mixed together. Furthermore, Bangkok does not have adequate public parks; its parks account for only 0.21% of total area, as compared to 7.8% of total area in Manhattan.<sup>11</sup> These factors result in a poor living environment in Bangkok.

The congestion in Bangkok is frequently pointed to as a major constraint on the continued economic growth of Thailand. To many foreign investors and tourists, this problem creates a poor business environment in the city. Nowadays, this congestion problem is a major concern for the government as well as the private sector. In order to solve the problem, as well as to prepare for the growth of the city's population, the government has established many projects.

Two of these projects related to the central focus of this thesis are the Second Bangkok International Airport (SBIA) and the Hopewell mass transit project. Each of the projects,

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<sup>11</sup> Hack, Gakenheimer, Levy, Martland, and Sussman, "Strategic Planning for Metropolitan Bangkok phase IV", 1994.

when completed, will have a substantial impact on the urban form of Bangkok as well as the development of the Lad Krabang Subcenter, which will be described in detail in Chapter II.

### **Second Bangkok International Airport (SBIA)**

*“By the year 2000, the new modern Second Bangkok International Airport (SBIA), with highly effective service will be erected to be the leading airport of the Region and will impress all visitors.”<sup>12</sup>*

At the present time, Bangkok International Airport (BIA) is the only operating international airport in Bangkok. The use of air traffic in BIA has grown at a substantial rate during the last five years. The Airports Authority of Thailand (AAT) consultants forecast that the number of passengers will be 35 million in the year 2000 and increase to 55 million in 2010, whereas the cargo volume will be 1.3 and 2.46 million tons respectively<sup>13</sup>. The BIA has already been developed to reach its full capacity. Unfortunately, the full capacity of the BIA will not be sufficient to keep up with demand beyond the year 2000. Thus, it is imperative that a new airport be constructed. Consequently, in May 1991, the government approved the Second Bangkok International Airport (SBIA) project and authorized AAT to supervise the project.

The future site of SBIA covers an area of about 3,100 ha, located in the area of Bang Chalong, Raja Teva and Nong Prue, approximately 30 km east of Bangkok and 40 km southeast from the BIA (see **Figure 3**).<sup>14</sup> This site can be accessed by car from both north and south. The Second Expressway Network and the Hopewell Elevated Train are also designed to connect with SBIA.

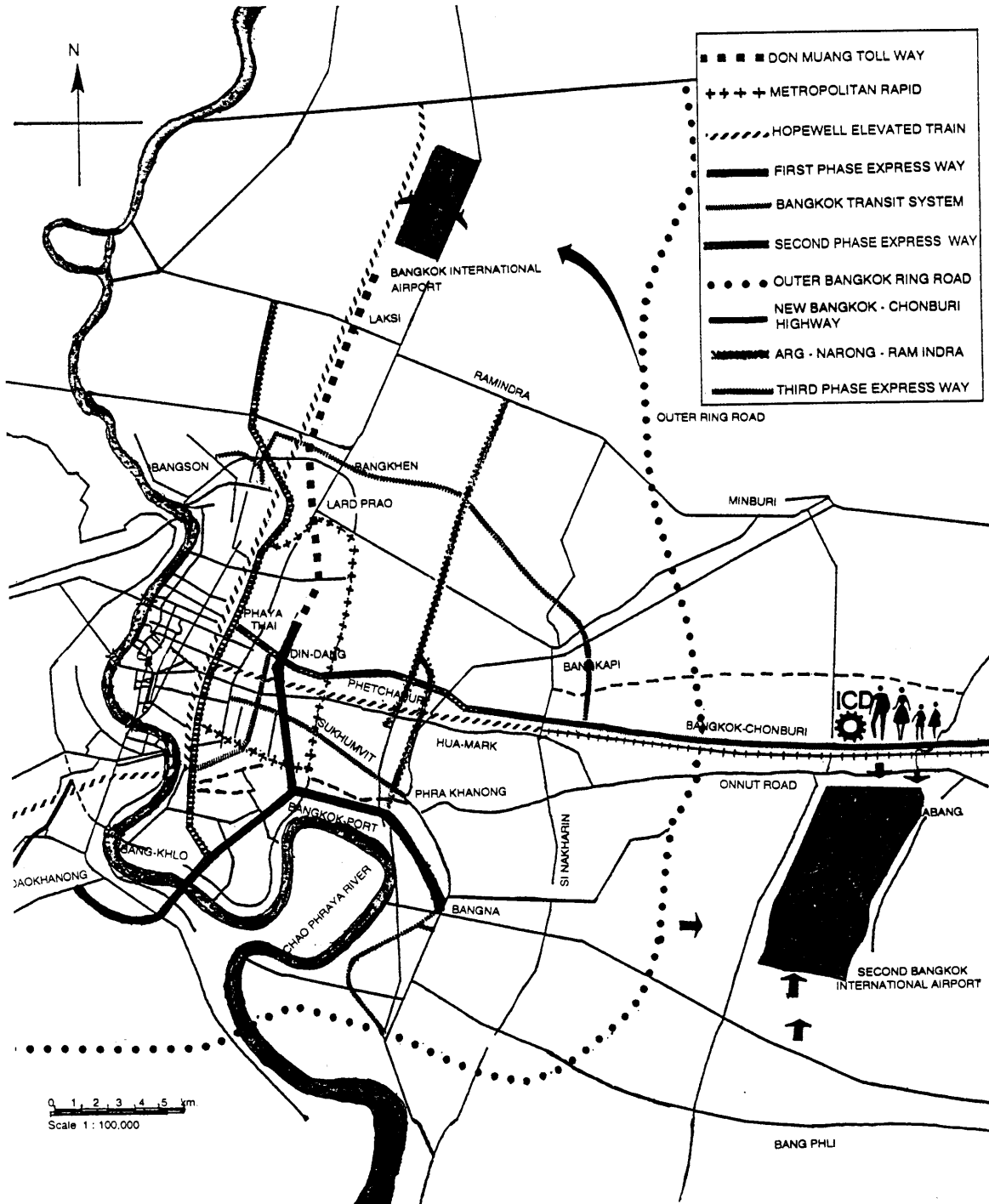
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12 Public Affair Division : Airport Authority of Thailand, “Second Bangkok International Airport.”

13 Public Affair Division : Airport Authority of Thailand, “Second Bangkok International Airport.”

14. 3,100 ha = 19.375 rai

Figure 3: Location of SBIA and routes of Hopewell project



Source: Public Affair Division : Airport Authority of Thailand, "Second Bangkok International Airport."

The concept design for the SBIA terminal complex consists of north and south terminals with two mid-field satellites with a total of four runways. The maximum capacity of SBIA will be approximately 100 million passengers per year and 64 million tons of cargo.<sup>15</sup>

SBIA is planned not only to meet the demand of air traffic but also to promote Thailand as an aviation hub of the region. BIA and SBIA will complement each other to provide for future air traffic. Because of the limitations on the further development of BIA, SBIA will become the primary airport for the region and BIA the auxiliary, similar to airport usage in other major cities of the world. Thus, SBIA will serve the international aviation market while BIA will serve the strong local market. However, all airlines operating at BIA will provide service at SBIA as well.

The development of SBIA is now in the architectural design process under the guidance of a group of architects lead by Murphy and Jahn. Land for the SBIA is in the process of acquisition and grading. If development continues to proceed according to plan, SBIA is expected to begin operations in the year 2000. The construction of SBIA in its proposed location is a critical factor for the viability of the Lad Krabang Subcenter because the airport will be a large economic magnet that will create real estate demand for the subcenter.

*“Throughout the world, new airports have provided stimulus for a host of related developments: high technology research and manufacturing parks, airport-related industries, convention and exposition facilities, and offices of international firms which rely heavily on air travel.”<sup>16</sup>*

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15 Public Affair Division : Airport Authority of Thailand, “Second Bangkok International Airport.”

16 Hack, Gakenheimer, Levy, Martland, and Sussman, “Strategic Planning for Metropolitan Bangkok phase IV”, 1994.

BIA has had a substantial impact on the Bangkok real estate market. From 1990 to 1995, many new office locations were established, the largest proportion of which new was the airport corridor, the area along the major routes between the central city to Bangkok International Airport. In fact, this airport corridor now accounts for almost 25% of the total stock of office space in Bangkok.<sup>17</sup> Meanwhile, the Central Business District proportion of all high quality office stock in Bangkok experienced a decline from 70% in 1980 to 35% by the end of 1994.<sup>18</sup>

Based on these data, it is predicted that the completion of the SBIA will also substantially impact the urban development of Bangkok. The creation of the new airport corridor, from the center of Bangkok to the SBIA, will attract new development of office buildings, residential buildings, and exhibition centers.

Another benefit that construction of SBIA will bring to the Lad Krabang Subcenter is the mass transit systems that will be provided between the CBD of Bangkok and the new airport. These new transportation routes will be crucial to the success of the Lad Krabang Subcenter; if SBIA is not constructed at the present location, the development of the subcenter will be impossible. The most ambitious of the proposed transit systems linking the CBD and SBIA is the Hopewell project.

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17 Jones Lang Wootton, Sindhu Pike Bodell, "Bangkok Property Market: Mass Rapid Transit Projects", Property Research Paper, May 1995, p. 10.

18 Jones Lang Wootton, Sindhu Pike Bodell, "Bangkok Property Market: Mass Rapid Transit Projects", Property Research Paper, May 1995, p. 10.

## **Hopewell project**

The Hopewell project will be a major transportation corridor for commuters between Bangkok's CBD, the Lad Krabang Subcenter, and SBIA. It will consist of an elevated train, an elevated road and commercial developments. Hopewell and the Lad Krabang Subcenter will benefit from each other. This is because Hopewell, like other mass transit systems, needs a concentrated destination, and the Lad Krabang Subcenter needs a mass transit system.

This project was initiated by the State Railway of Thailand (SRT) in 1990. The first stage of its route, 60 km, will consist of two main lines (**see Figure 3**) from Hua Mark to Tailing Chan, and from Rangsit to Phonimitr. The project is planned to extend another 78.6 km from the Lad Krabang Subcenter to SBIA, from Yommarat to the Taling Chan Subcenter, and from Hua Lamphong to the Bang Khun Thian Subcenter. The project will have three levels: shophouses on the ground level, SRT and mass transit on the second level, and a tolled expressway on the third level. In sum, the project will look like a big clumsy wall encompassing the city. Together, the three levels will have the capacity to move 60,000 passengers per hour.

Unfortunately, the Hopewell project is more than four years behind its schedule because it faces numerous problems including environmental problems, land expropriation problems, and financial problems. To date, only some piling work has been completed. Many people predict that this project will be abandoned soon. Unfortunately, mass transit to the Lad Krabang Subcenter relies on the Hopewell project. It is important to note that if the Hopewell project is abandoned, a substitute mass transit project will be needed for the Lad Krabang Subcenter in order to ensure its success.

In 1994, the national cabinet introduced a high-speed train master plan. This mass transit project will support the development of the Lad Krabang Subcenter because it will



connect Bangkok, SBIA, and the Eastern Seaboard with high-speed trains. This will promote an eastward development corridor along the same corridor as the site of the Lad Krabang Subcenter. At the present time, the detailed plan of this high-speed train is being studied.

### **Current Real Estate Market in Bangkok**

Real estate is a cyclical market; this is extremely true in Bangkok. The biggest problem being faced now by developers is the oversupply of space in Bangkok. Nevertheless, the developers continue to compete with each other to add space to the market. In order for the Lad Krabang Subcenter to be successful, its the new space supplied to the market by its development must be able to be absorbed. According to research done by the collaborative team of the Department of City Planning, the MIT Consultant Team, and the EC/BMA Project Team, the current vacancy rate and future trends for each type of development are as follows:

Office space: During 1991-1993, building permits for office space in the BMA averaged over 3 million sq. m per year, for a total of approximately 10 million sq. m of additional office space.<sup>19</sup> This substantial amount of added space has resulted in the current oversupply of office space in the city. At this time, a high portion of office space remains unoccupied. However, the vacancy rate in the financial district (including Silom, Sathorn, Wireless, and Lumpini) decreased from 21% in 1994 to 16% in 1995.<sup>20</sup> This means the vacancy rate is unequally distributed across the area. The developers are continuing to seek locations that are expected to have a low vacancy rate and make their project profitable. For this reason, new office space is expected to increase by almost 1 million sq. m in 1995-1997.<sup>21</sup> As the vacancy rates rise, it is expected that office space permitting

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19 Bangkok Metropolitan Administration, "The Bangkok Plan", July 1995, p. 27.

20 Bangkok Metropolitan Administration, "The Bangkok Plan", July 1995, p. 27.

21 Bangkok Metropolitan Administration, "The Bangkok Plan", July 1995, p. 27.

is likely to decline over the next five years, then bounce back in 2000-2005.<sup>22</sup> The research teams predict that projects representing 2.5 million sq. m per year in 1996-2000 and 3.5 million per year from 2001-2005 will seek permits.<sup>23</sup> It is calculated that the Lad Krabang Subcenter will supply 259,000 sq. m per year of new office space to the office market every year between 1999 and 2007.<sup>24</sup> Thus, if the Lad Krabang Subcenter presents an exceptional environment for office building, the supply space of the subcenter can be absorbed.

Commercial: Permits for new commercial space averaged 6.3 million sq. m from 1991-1993.<sup>25</sup> The research teams expect that commercial projects representing approximately 6 million sq. m will seek permits each year through 2005.<sup>26</sup> Commercial developers will seek to locate their buildings in the areas that present a substantial number of consumers. The Lad Krabang Subcenter is a promising location for commercial buildings due to its population. It is calculated that the Lad Krabang Subcenter will present 111,000 sq. m of commercial space each year.<sup>27</sup>

Residential: The population of Bangkok has risen, yet the average household size in the BMA declined from 6.32 in 1960 to 4.45 in 1990.<sup>28</sup> This suggests an increase in the regional demand for housing units including small apartments and condominiums. Nevertheless, the amounts of housing added to the market have been consistently

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22 Bangkok Metropolitan Administration, "The Bangkok Plan", July 1995, p. 27.

23 Bangkok Metropolitan Administration, "The Bangkok Plan", July 1995, p. 28.

24 70 % of the Office and Commercial space provide by Lad Krabang Subcenter divided by 10 years:  
 $70\% * (98,000 * 10 + 340,000 * 8) / 10$ .

25 Bangkok Metropolitan Administration, "The Bangkok Plan", July 1995, p. 28.

26 Bangkok Metropolitan Administration, "The Bangkok Plan", July 1995, p. 28.

27 30 % of Office and Commercial space provided by the Lad Krabang Subcenter:  
 $30\% * (98,000 * 10 + 340,000 * 8) / 10$ .

28 National Statistical Office, reference

substantially higher than can be absorbed by the population. In fact, housing is being built at twice the rate new households are being added to the area, with almost 100,000 units completed in the BMA during 1994; this is not sustainable.<sup>29</sup> As a result of the oversupply in housing the developers are being forced to compete fiercely with each other in order to obtain a share of the housing market.

The research teams assume that 85,000 housing units will be built each year, at average densities of 50 units/ha in the inner Bangkok areas and 30 units/ha in suburban areas. This would create a demand for approximately 6,800 ha of site in the central area for new housing, and 25,500 ha of land for developments in suburban areas through the year 2005 or 2,550 ha of land per year.<sup>30</sup> The Lad Krabang Subcenter will supply land 5.1 ha per year for medium-density residential development and 1.57 ha per year for low-density residential development. Given the intense competition for real estate buyers, the demand for residential land in the Lad Krabang Subcenter, and the success of the subcenter as a whole, will depend on the attractiveness of its living environment.

Hotels: Hotels in Bangkok are facing a difficult time. Most hotels are experiencing occupancy rates of 50-60%, below that required for economic operation.<sup>31</sup> This is due to the oversupply of hotels in Bangkok, whose developers have been over-optimistic about the hotel market in Bangkok. Consequently, only a small number of new hotels are being built in Bangkok at this time. Accordingly, the Lad Krabang Subcenter will devote only a small portion of land to hotels, 450,000 sq. m total in 10 years. This amount of hotel space is expected to be absorbed due to the proximity of the Lad Krabang Subcenter to SBIA.

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29 Bangkok Metropolitan Administration, "The Bangkok Plan", July 1995, p. 28.

30 Bangkok Metropolitan Administration, "The Bangkok Plan", July 1995, p. 28.

31 Bangkok Metropolitan Administration, "The Bangkok Plan", July 1995, p. 28.

## Chapter II

### The Metropolitan Subcenters and The Lad Krabang Subcenter

#### The Metropolitan Subcenters

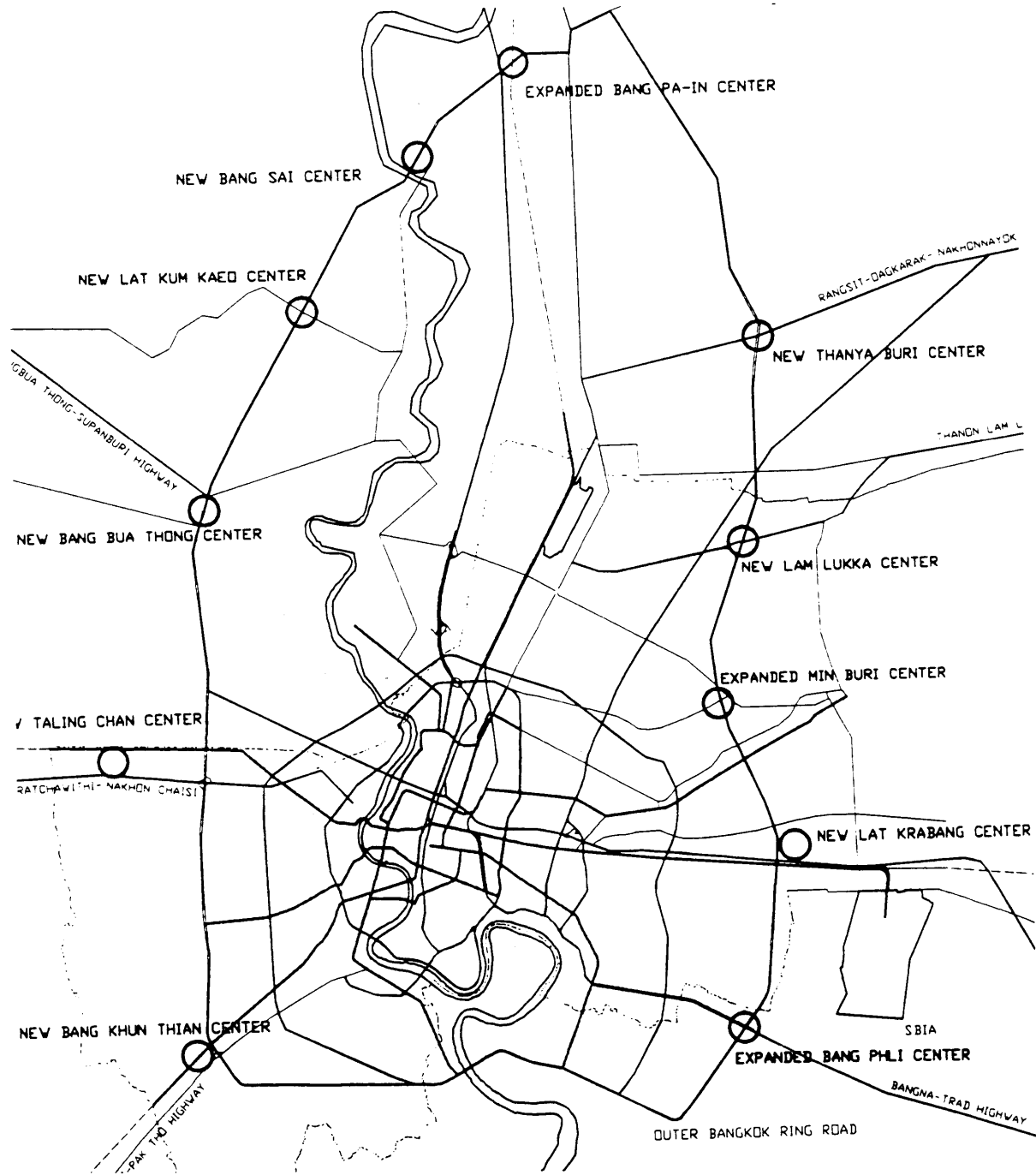
The Metropolitan Subcenters, which are known as "Satellite Cities," will be modern cities with excellent planning and living environments. The subcenters will be a mixed use development including government buildings, office buildings, commercial buildings, residential buildings, hotels, parks, public space, etc. The subcenters will be work as small self-sufficient cities. The estimated size is 215 ha for the core of each subcenter.<sup>32</sup> These Metropolitan Subcenters will be located along the Outer Ring Road so that they will be connected with each other and Bangkok.

After examining many possible sites for locating subcenters, the consultant team proposed 11 subcenters along the Outer Ring Road: New Lad Krabang Center, Expanded Min Buri Center, New Lam Lukka Center, New Thanya Buri Center, Expanded Bang Pa-In Center, New Bang Sai Center, New Lad Kum Kaeo Center, New Bang Bua Thong Center, New Taling Chan Center, New Bang Khun Thian Center, and Expanded Bang Phli Center (see **Figure 4**).

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32 215 ha = 1,350 rai

**Figure 4: The Metropolitan Subcenters**



Source: Hack, Gakenheimer, Levy, Martland, and Sussman, "Strategic Planning for Metropolitan Bangkok phase IV", 1994.

The Metropolitan Subcenters will mitigate many problems in Bangkok and create benefits for their communities as well. The benefits of establishing the Metropolitan Subcenters are as follows:

Encouragement of the use of mass transit: It is important to the mass transit system to have concentrated destinations because only then can they efficiently move many people from one location to another. The Metropolitan Subcenters will provide the necessary concentrated destinations, promoting the use of mass transit, consequently mitigating the traffic problem in Bangkok.

Reduction of migration to Bangkok: Migration of people from the suburbs is one of the sources of congestion in central Bangkok. Bangkok encourages the flow of people into the city because it provides higher income and employment opportunities that does not exist in the suburbs. The Metropolitan Subcenters will create various jobs in the suburbs. Thus, they will help reduce immigration to central Bangkok and mitigate congestion in the city.

Minimization of the distance and time to travel for people: As self-sufficient cities, the Metropolitan Subcenters will be mixed-use developments. In the core of every subcenter will be government offices, office and residential buildings, parks, public spaces, amenities, exhibition centers, hospitals, schools, etc. The people who will live in the subcenters will be able to sustain every aspect of their lives without going to the center of Bangkok. This will minimize time needed for people to travel from place to place. Therefore, the Metropolitan Subcenters will provide a convenient lifestyle for people who will live in the subcenters as well as mitigate the congestion in Bangkok.

Creation of a Job-housing balance: Currently, Bangkok faces a problem of job-housing imbalance. There are many more employment opportunities in the center of Bangkok

than residential units for the workers who work there<sup>33</sup>. This means commuters have to travel in to the center of the city in the morning every work day and out of the center of the city in the evening as well. Consequently, there is a heavy traffic flow to the center of Bangkok in the morning and a heavy flow outwards in the evening. This is not an efficient way to use the road and transportation system. The Metropolitan Subcenter will create many workplaces and employment opportunities in the suburbs of Bangkok. Thus, the Metropolitan Subcenters will mitigate the job-housing imbalance.

Creation of a better living environment: The Metropolitan Subcenters are intended to be new modern 21<sup>st</sup> century cities. The urban planning of the subcenters will be different from that of BMA, which is unorganized and congested. It will be done in advance and infrastructure will be installed before the development of the buildings. This will ensure that the infrastructure will be efficient and adequate. The subcenters will also have a high proportion of public space to total area, providing many parks, public spaces and amenities. This will create a good living environment, which cannot be found in BMA.

Encouragement of the economic growth of Bangkok: There are many factors that support the economic growth of Bangkok. The economy of the Bangkok Metropolitan Region is currently growing at over 11% (using the Province Domestic Product as a measure)<sup>34</sup>. However, future economic growth will depend largely on the living environment offered in Bangkok. Foreign investors will not be attracted if the present conditions are not improved. Thus, in order to sustain economic growth, the living environment of the Bangkok Metropolitan Region must be developed. The Metropolitan Subcenters, with their carefully planned living environments will provide such development.

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33 Source: Hack, Gakenheimer, Levy, Martland, and Sussman, "Strategic Planning for Metropolitan Bangkok phase IV", 1994.

34 Bangkok Metropolitan Administration, "The Bangkok Plan", July 1995, p. 1.

Decentralization of economic growth: The present centralization of economic activity in Bangkok has given rise to numerous problems, such as congestion, traffic jams, and uncontrolled immigration into city. The natural solution to these problems is to decentralize the economy by creating a center for economic activity outside CBD. In order to decentralize the economy, the public sector must lead and then the private sector will follow. The concept of decentralized economic growth has been proposed by the government for a long time. The Metropolitan Subcenters are designed to provide government buildings, thus, allow the government to decentralize. In this way, the Metropolitan Subcenters will support the decentralization of the economy.

Due to the real estate market in Bangkok, the development of all 11 subcenters cannot be carried out at the same time because the demand for space is not sufficient to absorb all of the space planned in all 11 subcenters. Therefore, it is reasonable to first develop the subcenter that has the greatest potential. After considering all of the factors, the MIT Consultant Team concluded that the most viable subcenter to develop first is the Lad Krabang Subcenter.

### **The Lad Krabang Subcenter**

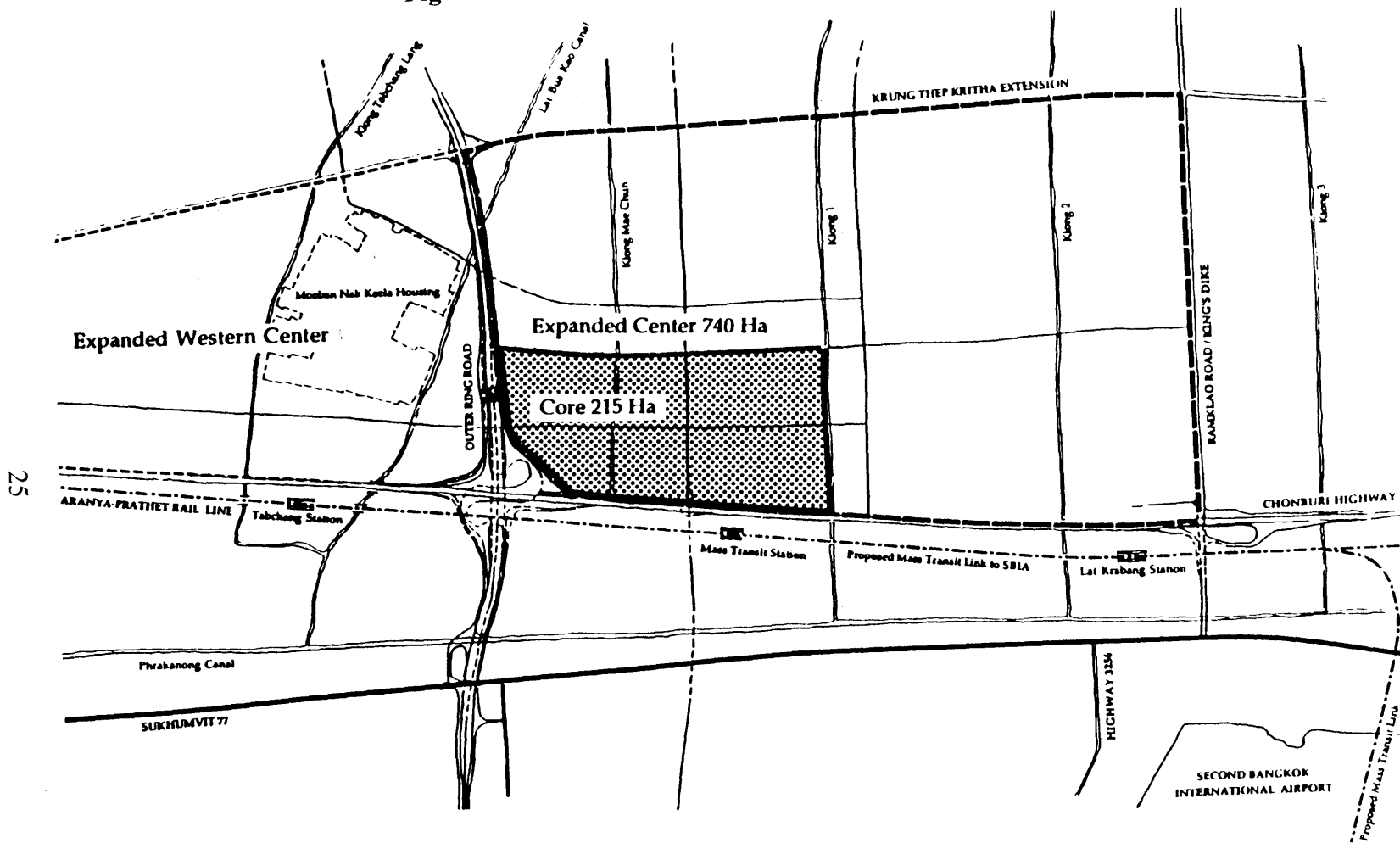
The Lad Krabang Subcenter will be located in an area of approximately 215 ha to the east of Bangkok Metropolitan Administration.<sup>35</sup> It will be located at the intersection of the Outer Ring Road and the Chonburi Highway (see **Figure 5**). The aerial view of the Lad Krabang Subcenter is shown in **Figure 6**.

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35 215 ha = 2,150,000 sq. m. = 1,350 rai

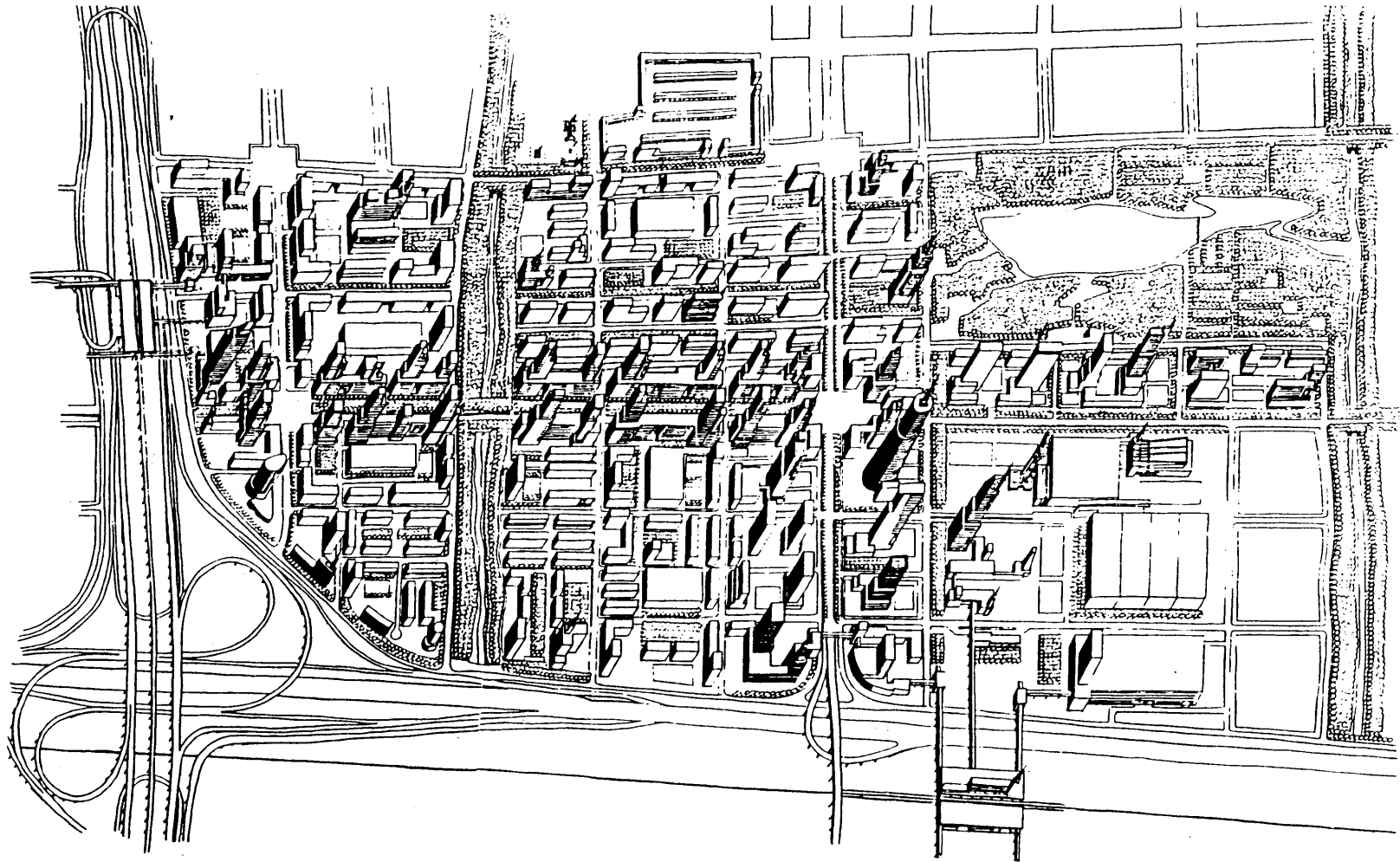


Figure 5: Location of the Lad Krabang Subcenter



Source: Hack, Gakenheimer, Levy, Martland, and Sussman, "Strategic Planning for Metropolitan Bangkok phase IV", 1994.

Figure 6: Aerial view of the Lad Krabang Subcenter



Source: Hack, Gakenheimer, Levy, Martland, and Sussman, "Strategic Planning for Metropolitan Bangkok phase IV", 1994.

There are many factors that make the Lad Krabang Subcenter the most viable subcenter at the present time. The important factors are as follows:

Second Bangkok International Airport (SBIA): the development of SBIA will create an economic boom in the area. Past experience in many countries has shown that airports encourage related developments such as industrial parks, convention centers, and offices of international organizations; this has been experienced in Bangkok as well. At the current time, the airport corridor accounts for almost 25% of the total stock of office space in Bangkok.<sup>36</sup> The SBIA will create a significant demand for the Lad Krabang Subcenter. Thus, the emergence of SBIA is the most crucial factor for the development of Lad Krabang Subcenter. Without the SBIA, it will be impossible for the Lad Krabang Subcenter to attain success.

Eastern Seaboard: The Eastern Seaboard is an industrial seaport located in Rayong, east of Bangkok. This seaport is appropriate for industrial companies that seek easy access to deep port facilities. The government also provides a special tax incentive for industries that locate in this zone. Although the project has not been very successful to date, it is one of the foundations of economic development to the east of Bangkok. It is predicted to provide demand for related businesses in the Lad Krabang Subcenter to take advantage of easy access to both itself and the center of Bangkok.

The Hopewell Project: The Hopewell Project is one of the most important components of the development of the Lad Krabang Subcenter because the Lad Krabang Subcenter will need the mass transit systems provided by the project to and from central Bangkok. Mass transit systems will make it possible for the people who will live in the Lad Krabang Subcenter to easily commute between the center of Bangkok and Lad Krabang Subcenter.

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<sup>36</sup> Jones Lang Wootton, Sindhu Pike Bodell, "Bangkok Property Market: Mass Rapid Transit Projects", Property Research Paper, May 1995, p. 10.

The New Chonburi Highway and the Outer Ring Road: Chonburi Highway will be the major road to the Lad Krabang Subcenter. This road will connect Bangkok eastward through the subcenter. People will be able to travel by car between the Lad Krabang Subcenter and central Bangkok using this road. The Outer Ring Road will provide a convenient link between the suburbs around Bangkok. It will allow automobiles to avoid the traffic jams in central Bangkok. This road will allow the Lad Krabang Subcenter to be accessed from the suburbs and other subcenters.

Along with the support of the government, the above contributing factors will ensure that the Lad Krabang Subcenter will provide an enormous opportunity for developers, who seek the best locations to construct buildings in order to capture future demand. The preliminary plan of Lad Krabang Subcenter has been proposed by the MIT Consultant Team. The land use can be divided into 10 categories with its FAR ( **see Table 1**):

**Table 1: Land use in the Lad Krabang Subcenter**

<b>Zoning</b>	<b>FAR</b>	<b>Sq.m.</b>	<b>% of Total area</b>
Office & Commercial-High density	10	98,000	5%
Hotels	10	45,000	2%
Office & Commercial-Medium density	8	340,000	16%
Residential-Medium density	6	510,000	24%
Government	4	160,000	7%
Residential-Low density	2	157,000	7%
Exhibition Halls	2	147,000	7%
Roads	0	289,000	13%
Recreation areas	0	250,000	12%
Parks	0	154,000	7%
<b>Total</b>		<b>2,150,000</b>	<b>100%</b>

From Table 1, we see that the Lad Krabang Subcenter will devote a substantial proportion of its land to recreational areas and parks--19% of its total area, compared to 7.8% of total

area devoted to recreation areas and parks in Manhattan.<sup>37</sup> The proportion of recreation areas and parks is the foundation of the good living environment to be provided in the Lad Krabang Subcenter. The 13% of total area devoted to roads in the Lad Krabang Subcenter might at first seem to be insufficient, compared to the 25% in many of the world's leading cities.<sup>38</sup> However, it is predicted that this amount will more than suffice because the Lad Krabang Subcenter is planned to be a mixed-used development where it will be not necessary for people to travel by car inside the subcenter.

The Lad Krabang Subcenter will present many benefits for Bangkok and its habitants. However, how to develop the Lad Krabang Subcenter and who should develop it are still in question. Due to the scale of the Lad Krabang Subcenter, the development of this project will require many participants. The public sector or private sector alone may be unable to develop this project, because the central government does not have the development expertise to carry out such a large-scale project, while the private sector would not be able to carry out the project without the legislative force and economic resources of the central government. Therefore, the development of the Lad Krabang Subcenter will require the establishment of a public-private joint venture. The reasons why the public sector or private sector alone cannot develop this project and why a public-private joint venture organization must be established will be described in greater detail in the following chapter.

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37 Hack, Gakenheimer, Levy, Martland, and Sussman, "Strategic Planning for Metropolitan Bangkok phase IV", 1994.

38 Hack, Gakenheimer, Levy, Martland, and Sussman, "Strategic Planning for Metropolitan Bangkok phase IV", 1994.

## Chapter III

### The Public-Private Joint Venture

The development of the Lad Krabang Subcenter is intended to be a land development project whose parcels of land will be acquired from the original owners and developed, and then the developed land will be sold to other developers who will ultimately develop the buildings for sale or rent. Most of the land development projects in Thailand are carried out by the private sector with minimal government involvement. The process to develop the Lad Krabang Subcenter will be similar to the private sector's land development process in Thailand. However, due to the massive size of this project and its many consequent complications, it would be almost impossible to carry out through the private sector alone. The following sections will describe the private sector's land development process in Thailand and why the development of Lad Krabang Subcenter will need support from the government.

The private sector's processes of land development in Thailand, as in other countries, involve many phases. The processes can be briefly divided into the following steps:

Formulate the design concept and conduct a feasibility study: First, before the developers buy the land, they study the design concept, including the location, planning, land use, and amenities of the project with the architect. This concept design depends on market research, experience in the market and the target buyer of the project. At the same time, a financial feasibility study must be conducted to explore cost, expenses, sale price, and prospective lenders.

Arrange for source of capital: Second, the developer arranges for sources of capital, both equity and debt. They decide how much equity will be needed for the development. Typically, the developer's equity fund is approximately 20% of the total costs of project,

which includes land costs, construction costs, selling and administrative expenses, government fees, etc. The equity needed also depends on the financial institutions' policies. After arranging for capital, they negotiate with the financial institutions to provide loans for the project and for their prospective customers. There are many ways to arrange for sources of capital; in particular, the development companies that are the public company may issue bonds or issue new stocks.

Acquire the land: After the money has been arranged, the developers buy the land and prepare it for development by clearing, grading, etc. Typically, the developers pay the total cost of the land and the ownership of the land is transferred to the developers. Buying the land is not a difficult task if the original owner is willing to sell it. However, it can be extremely difficult if the developer has to put together many parcels of land that some original owners are willing to sell but others are not. Such a process is doable for an experienced developer, but it requires a lot of money and time. Some developers of large projects in the past have spent more than 10 years assembling the land.

Design the project: Concurrently, the architect and engineer work with the developer to plan and draw the project. Upon completion, the plan must be submitted to the government agencies for permits.

Promote and sell the project: The developers and marketing agents can promote, pre-sell and sell the project. When to begin to sell the project depends on the confidence level of the developer about the plan and sale price.

Construct the infrastructure: Construction can begin as soon as the permits are ready. The land is subdivided and infrastructure is installed. The infrastructure includes roads, paving, parks, recreation areas, sanitary sewers, water supply, electricity, telephone lines, etc. The construction progresses depending on the level of the project sold and the cash flow of the project.

Transfer the project to the owner: When construction of the project is complete, the parcels of land are transferred to the buyers. Normally, the public areas such as roads, parks, recreation areas are not transferred to the government; each land buyer of the project will proportionally own this public area. The developer gets its remaining money from the financial institution that provided loans for the buyer.

Establish after-sale organization: The developer must establish the organization that will be responsible for maintaining the public spaces in the project. This organization must be established not only to ensure that the project will remain in good condition after completion but also to collect public area expenses to maintain that condition. The members of the organization may come from the buyers of the project.

The private sector's development processes work well in Thailand as well as in Bangkok, especially for small to mid-scale projects. However, using only the private sector's development process will be almost impossible for the Lad Krabang Subcenter due to various problems. These problems are as follows:

Land acquisition: The Lad Krabang Subcenter covers almost 215 ha; it is a very large project. To develop the project in a timely manner, government power is needed to help acquire the land. In the past, several projects whose scale was similar to the Lad Krabang Subcenter were carried out by the private sector alone. However, this was only possible because the developer acquired the land a long time ago.

The integration of the public infrastructure and the other projects of the government: The development of the Lad Krabang Subcenter requires tight integration with the public infrastructure facilities such as roads, sewers, and electricity. The Lad Krabang Subcenter must also be developed simultaneously with the mass transit projects and SBIA. Many similar large projects were not successful in the past because they did not have sufficient support from government for such necessities as connection to the mass transit system.



Length of the project: The Lad Krabang Subcenter will not only be large but also long-term. The Lad Krabang Subcenter is expected to be completed in 15 years. Consequently, the project will require long-term financing and long-term integration with the public infrastructure.

Return on investment of the Lad Krabang Subcenter: If the Lad Krabang Subcenter is developed without government support, the rate of return on investment will be very low, thus, unacceptable for private sector (this rate of return will be described in detail in the chapter IV). As a result, financial support from the government will be needed to provide an attractive rate of return.

Thus, a private sector developer would not be able to complete the Lad Krabang Subcenter without government support. Since the government obviously does not have enough real estate expertise to carry out a project like this on its own, a joint venture between the public and private sectors is needed.

Therefore, we conclude that the development of the Lad Krabang Subcenter will need both the private and public sectors. We suggest that the organization responsible for developing the Lad Krabang Subcenter be a joint-venture company consisting of both public and private shareholders. In order to ensure the success of the project, the government must carefully select the private shareholders in the company based on the expertise and experience of the potential private sector partner. After the establishment of the public-private joint venture company, the private partner will be the key force driving the project and the public partner, the government, will act as the supporter. The role of the private partner will be to use its expertise to develop the project and to arrange for capital. The role of the public partner will be to use its regulatory power to support the project.

The public-private joint venture company will have three major partners, including the private partner, which will carry out the project, the City of Bangkok, which will initiate and support the project, and the national government, which will also support the project. Due to its development expertise, the private partner will be assume the chief responsibility to carry out the project; thus, it should hold the majority of shares in this public-private joint venture company. As public partners, the city of Bangkok and the central government should hold equal shares in the company. Accordingly, the suggested share proportions are as follows: the private partner should hold 60 % of the company, the City of Bangkok hold 20% of the company, and the central government hold 20%.

The major roles of the government partner will be to establish regulations to allow the land to be acquired, create investment incentives for the project, and ensure that the development of SBIA, the Hopewell project, and other related projects will be realized according to the pre-arranged time frame.

The first role of government must be to support private developers in acquiring the land. Acquiring 215 ha of land will be a difficult task, especially since the parcels of land have many owners.<sup>39</sup> If all the parcels of land had to be bought by the private sector, the total land cost would be expected to soar. This is because after the private developers buy some parcels of land, the remaining land owners will attempt to inflate the prices above a reasonable amount. If that were allowed to happen, it would not be financially feasible for the Lad Krabang Subcenter to sell the developed lands at a reasonable price and price is, of course, an important factor to encourage the ultimate developers to buy developed land. Thus, without government support, it will take an extremely long time to assemble the lands and the Lad Krabang Subcenter will not be able to mitigate problems in Bangkok in a timely manner. On the other hand, if appropriate intervention by the government ensures that the joint venture company will be able to buy the parcels of land

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39 215 ha = 2,150,000 sq. m. = 1,350 rai

at a reasonable price. If the private sector partner already owns some parcel of the land, it will be able to use that land instead of its equity to contribute to the public-private joint venture company.

Thus, government power will be needed to assemble the land. The 1987 Eminent Domain Act can be used to acquire land for public purposes. In the past, this act was used to acquire land for public works projects such as roads and expressways. Recently, eminent domain has also been used to acquire land for SBIA. It would seem natural, therefore, to suggest that it also be used for the development of the Lad Krabang Subcenter. However, unlike the previous projects, the development of the subcenter is intended not only for public purposes--mitigating congestion problems in Bangkok, but also for business purposes--creating a good living environment for its buyers.

Another complication that arises with eminent domain is that whenever the act is used, the government always has conflicts with the original land owners, who always argue that government compensation for their land is too low. In fact, it is generally agreed that the compensation from the government is below the market price of the land and resettlement costs for the owners.

Since eminent domain will not suffice in the case of the Lad Krabang Subcenter, the government must establish new regulations to assemble the land in a timely manner and at a reasonable price. It is suggested that the new method be a middle way between eminent domain and direct purchase. It should be noted that many new towns in the world have used a combination of compulsory and noncompulsory techniques with incentives to encourage voluntary sales to make possible development projects.<sup>40</sup>

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40 Hack, Gakenheimer, Levy, Martland, and Sussman, "Strategic Planning for Metropolitan Bangkok phase III", 1994.

There are two following techniques that can be pursued:

Voluntary sale of land for cash or partnership shares: The government should propose two alternatives for the original land owners. The owners can either sell their lands at market price or become a partner in the project. The market price of land should be determined by taking the average of prices from many professional appraisals. The developer of the Lad Krabang Subcenter will first offer to buy the lands at the professionally determined market price. In order to encourage the willingness of the sellers, the government can provide incentives, such as tax relief mechanisms or tax rebates.<sup>41</sup> We expect that through this technique, the majority of the land will be sold to the developers. The remaining land owners will be forced to become shareholders in the project. The proportion of shares they will receive will be based on the market price of their land.

Land readjustment: The second technique is Land Readjustment. The basic idea of Land Readjustment is that the landowners pool their lands together. Then their lands will be developed and re-divided. Finally, the original landowners will be given back a portion part of the re-divided lands. The size of land given back to them will equal the size of their original land minus *public land* minus *cost equivalent land*. The *public land* is the land that is needed for roads, parks, and other public facilities. The *cost equivalent land* is the land that is needed to be sold in order to finance the cost of developments, such as the cost of constructing the roads, parks, and infrastructure. For example, suppose the owner contributes 10 ha of land. Subsequently, one ha is needed for roads (*public land*) and money equivalent to the sale of another three ha (*cost equivalent land*) is needed to construct those roads. At the end of the project, the original owner is given back six ha

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41 Hack, Gakenheimer, Levy, Martland, and Sussman, "Strategic Planning for Metropolitan Bangkok phase III", 1994.

(10 minus one minus three) of equal or higher value than the original 10 ha of land. This is because the price of land will be increase after the infrastructure was installed.

The major advantage of the Land Readjustment method is that it does not require large capital to finance the cost of land. However, the Land Readjustment method will not be financially viable if the increase in land value is small. This is because it will not be able to compensate for the cost of infrastructure. Fortunately, as found in a study done by Dowell, residential land value in Thailand increases about 165%-221% due to construction of infrastructure. This makes Land Readjustment a viable method for acquiring large parcels of land in Thailand.

The second role of the government will be to create investment incentives for the project. Normally, a private sector developer seeks projects that can generate the highest possible profit with the lowest possible risk. As described in chapter I, the current oversupply in the market forces private developers in Bangkok to compete with each other intensely, which results, naturally, in only moderate or low profit margins. The Lad Krabang Subcenter project will be appealing to private sector developers if it can generate profits comparable to market level or higher. In order to ensure that the developers will be attracted to the project, the government can use several techniques to increase the profit margins for the developers. These techniques include:

Tax incentives: The government can provide tax exemptions for the developers of the Lad Krabang Subcenter. The government organization that is responsible for providing investment incentives is the Board of Investment (BOI). The BOI promotes projects that meet national economic goals by exempting their developers from corporate income taxes for three to eight years.<sup>42</sup> Since the corporate income tax in Thailand takes 30% of the profit, a tax exemption for the developers of the Lad Krabang Subcenter would

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42 Office of the Board of Investment, "A Guide to Board of Investment", Jan 1995.

substantially increase the return on investment.

Unfortunately, the BOI does not normally grant such tax exemptions for real estate projects located in the Bangkok area, which includes the location of the Lad Krabang Subcenter. However, if the board considers the special factors that apply, perhaps an exception can be made.<sup>43</sup> Namely, the development of Lad Krabang Subcenter meets the major criteria for the granting of a tax exemption as follows:

- The subcenter is a project that develops public utilities and basic infrastructure.
- The development of the subcenter will reduce environmental problems.
- The development of the subcenter will create employment opportunities.
- The development of the subcenter will contribute to the economic growth of the region outside Bangkok. Even though the Lad Krabang Subcenter will be located in the Bangkok area, it will contribute to the eastward economic growth.

Thus, in order to create a reasonable profit for the developers of this project, the government and BOI should consider granting a special corporate tax exemption for the developers of the Lad Krabang Subcenter.

Government loan: After considering all factors, it is expected that the development of the Lad Krabang Subcenter will be completed in approximately 15 years. In fact, experience throughout the world shows that similar new towns take approximately 15 to 25 years to be completed.<sup>44</sup> A substantial amount of capital will be needed during the beginning stage of the development. After that, the money will be recouped through sales of the project. Since the project will take a long time to be completed, the cost of capital is a crucial

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43 Office of the Board of Investment, "A Guide to Board of Investment", Jan 1995.

44 Hack, Gakenheimer, Levy, Martland, and Sussman, "Strategic Planning for Metropolitan Bangkok phase III", 1994.

factor to determine the profitability of this project. The cost of capital should be as low as possible. If the private sector partner is a public company, it will be able to get the capital at a low cost through a public offering. Nevertheless, due to the size of the project, the amount of capital needed for its will be tremendous. This means that if the developers have to borrow capital from a financial institution at the regular interest rate (MLR), their profit may decline substantially or even vanish completely. Therefore, the government should also provide a low interest loan for the development. (The financial aspects of the project will be discussed in detail in chapter IV.)

The third role of the government in this joint venture is to control the progress of related projects. As discussed above in chapter II, the success of the Lad Krabang Subcenter will be dependent on the timely completion of SBIA and related mass transit projects. Ideally, the Hopewell project should begin its operation when the first inhabitants move into the Lad Krabang Subcenter. (It is expected that the first habitants will move to the Lad Krabang Subcenter in five years from the beginning for the project.) The SBIA should also be in operation as soon as possible in order to act as a magnet for economic growth and create demand for the Lad Krabang Subcenter. Thus, the development of SBIA and Hopewell are critical components for the development of the Lad Krabang Subcenter. However, the development of these projects will be beyond the power of the private developers to control. Thus, to ensure the success of the Lad Krabang Subcenter, the government must carefully control the progress of SBIA and the Hopewell project and coordinate the authorities involved in the projects.

In sum, just as in a more usual land development process, the role of the private sector partners of the Lad Krabang Subcenter will be to carry out the project itself. The size of the project will make it necessary for the public sector to become involved as well, providing legislative and financial support where needed. Both the private sector partners and the public sector partners will profit from the development. The following chapter will explore in detail the profit and the rate of return of the project.

# Chapter IV

## The Development Timetable and The Feasibility Studies

### The Development Timetable

The development timetable of the Lad Krabang Subcenter depends largely on the absorption rate of the project. However, the absorption rate and sale duration of the Lad Krabang Subcenter are difficult to predict since it is based on the quality of the developed land provided by the project. As aforementioned in Chapter I, the collaborative team of the Department of City Planning, the MIT Consultant Team, and the EC/BMA Project Team, forecast the additional building space that will be provided by developers in Bangkok during 1996-2005. This additional building space can be translated into the developers' demand for land based on the FAR of each type of building. The developers' demand for land in Bangkok and the supply of land provided by the Lad Krabang Subcenter are summarized in **Table 2**:

**Table 2: The developers' demand for land in Bangkok vs. The supply of land provided by the Lad Krabang Subcenter during 1996-2005**

	The Developers' Demand for Land (sq.m)	The Lad Krabang Subcenter's Supply of Land (sq. m)	Percentage of Demand for Land that is captured by the Lad Krabang Subcenter	Sale Duration of Land in the Lad Krabang Subcenter (year)
Land for office buildings	3,750,000	306,600	10%	8
Land for commercial buildings	7,500,000	131,400	5%	4
Land for residential buildings	255,000,000	3,374,000	2%	7

We expect that the developed land of the Lad Krabang Subcenter will favor most the office and commercial developers due to its exceptional characteristics. We assume that the developed land in the Lad Krabang Subcenter can capture approximately 10% of the developers' demand for land for office buildings, 5% of the developers' demand for land for commercial buildings, and 2% of the developers' demand for land for residential



buildings. Based on these assumptions, we conclude that the land for office buildings can be sold out in approximately eight years, the land for commercial buildings can be sold out in approximately four years, and the land for residential buildings can be sold out in approximately seven years. Unfortunately, the developers’ demand for land for hotels, land for government buildings, and land for exhibition halls has not been predicted by the research team. However, the location of the Lad Krabang Subcenter is excellent for hotels and exhibition centers because it close to SBIA. We will make the conservative assumption that the land for hotels and the land for exhibition halls will be sold out in three years. The land for government buildings will be sold to the government; we predict that this land will also be sold out in three years. The sale forecast of the Lad Krabang Subcenter is shown in **Table 3**. This sale forecast will be used to calculate the cash flow, which will be shown in the development feasibility section.

**Table 3: The sale forecast for the Lad Krabang Subcenter**

	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Total
Land for office buildings	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	0.7%	34%
Land for commercial buildings	4.2%	4.2%	4.2%	2.1%						15%
Land for hotesl	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%				6%
Land for residential buildings	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	2.2%			23%
Land for government buildings	1.3%	1.3%	1.3%							4%
Land for exhibition halls	6.1%	6.1%	6.1%							18%
Total	20.2%	20.2%	20.2%	10.8%	8.7%	8.7%	6.3%	4.2%	0.7%	100%

\*\*\*The number shown in each block represents the percentage of the total sale of the Lad Krabang Subcenter

After we forecast the sale duration of the Lad Krabang Subcenter, we can begin to predict the development timetable of the project. The development timetable for the Lad Krabang Subcenter can be divided into five major categories: Project Planning, Land Acquisition, Architectural Design, Construction, and Marketing. The details in each category are as follows:

Project Planning—This category includes *Project Concept* and *Project Feasibility Study*. The main concept of the project was established by the MIT consultant team. However, if

this project is realized, the concept design must be revised and explored in detail to take into account the circumstances at that time. We predict that this *Project Concept* will be completed in one year. The *Project Feasibility Study* can be started at the same time but it will be completed after the *Project Concept*. This is because the major component of the *Project Feasibility Study*, the land development cost, will be reliable only when it is calculated based on the final *Project Concept* of the Lad Krabang Subcenter. We predict that the *Project Feasibility Study* can be completed one year after the completion of the *Project Concept*.

Land Acquisition—Acquisition of the land without government intervention might take more than 10 years. However, we predict that land acquisition with the new government regulations described in Chapter II will take approximately five years. We expect that the majority of the land, approximately 40% of the total land, will be acquired during the first year. The other 60% of the total land is expected to be acquired during the second year to fifth year, that is, 15% each year.

Design—This process involves the design of land use and infrastructure of the land development of the Lad Krabang Subcenter. The *Design* is the work that will be performed by the design team. This category includes *Conceptual Design*, *Design*, *Design Development*, and *Working Drawing*. The *Conceptual Design* will be performed simultaneously with the *Project Concept* since the *Conceptual Design* is the important part of the *Project Concept*. After completion of the *Conceptual Design* and the *Project Concept*, which will take approximately one year, the *Design* process will be begun. The *Design* process will involve many designers including urban planners, architects, landscape architects, engineers, etc.. The design of the land development in the Lad Krabang Subcenter will be developed and explored in more detail during the *Design Development* process. The *Design* and *Design Development* process will run one year ahead of the sale of the project and will be completed in nine years. The *Working Drawing*, which involves the production of the drawings or the blueprints, can be

completed together with the *Design Development* process.

Construction—This process begins with the *Construction Management Evaluation*, which involves cost control and construction procedures. The *Construction Management Evaluation* must be performed simultaneously with the *Architectural Design* process. The *Clearing and Grading* can be begun after some part of the land is acquired. We expect that it will be begun one year after the inception of the *Land Acquisition* process and it will be completed one year after the completion of that process. The *Tenders*, which involves the process of selecting the construction company, should be started one year before the sale of the project. The *Construction* process will take approximately 11 years. The length of the *Construction* process is predicted based on the sale forecast of the project. It can be shorter or longer, depending on the actual sale of the Lad Krabang Subcenter.

Marketing—This process involves promotion and sale of the project. The *Actual Sale* can be begun immediately two years after *Design* process. We expect that the sale can be completed in nine years. The *Pre-Sale* can be begun one year before the *Actual Sale*.

The development timetable is shown in **Table 4**:

**Table 4: The Development Timetable**

**LAD KRABANG SUBCENTER**

DESCRIPTION	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
<b>PROJECT PLANNING</b>															
<i>Project Concept</i>	█														
<i>Project Feasibility Study</i>	█	█													
<b>LAND ACQUISITION</b>															
<i>Land Acquisition</i>	█	█	█	█	█	█									
<b>DESIGN</b>															
<i>Conceptual Design</i>	█	█	█	█	█	█	█	█	█	█	█				
<i>Design</i>		█	█	█	█	█	█	█	█	█	█	█	█		
<i>Design Development</i>			█	█	█	█	█	█	█	█	█	█	█		
<i>Working Drawing</i>			█	█	█	█	█	█	█	█	█	█	█		
<b>CONSTRUCTION</b>															
<i>Construction Management Evaluation</i>	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
<i>Clearing and Grading</i>		█	█	█	█	█	█	█	█	█	█	█	█	█	█
<i>Tenders</i>			█	█	█	█	█	█	█	█	█	█	█	█	█
<i>Construction</i>			█	█	█	█	█	█	█	█	█	█	█	█	█
<b>MARKETING</b>															
<i>Pre-Sale</i>			█	█	█	█	█	█	█	█	█	█	█	█	█
<i>Actual Sale</i>				█	█	█	█	█	█	█	█	█	█	█	█

## **The Development Feasibility Studies**

As mentioned before, the Lad Krabang Subcenter will be developed in a manner similar to other land development projects in Bangkok. After the public-private joint venture company is established, all the parcels of land will be acquired from their original owners. The initial developer will install the infrastructure and re-divide the land, build the parks and the public areas. Then the parcels of re-divided lands will be sold to the ultimate developers, who must develop the buildings in the required period in order to encourage people to move in to the subcenter.

The sale price of the re-divided land sold to the ultimate developers is one of the most important components of the feasibility study because the profit or loss of the land development project as a whole largely depends on this sale price. Thus, in order to predict how profitable the project will be, we need to determine the *land sale price* of the re-divided land.

Normally, the best way to determine the *land sale price* is to find the market price of comparable land. Unfortunately, this is not possible in the Bangkok region because the market price of land in the region is irrational. This is because most landowners tend to think that it will be impossible for their land to decrease in value, despite the addition of recent restrictions concerning land use. For instance, since 1990, the City of Bangkok has proclaimed many new regulations to control land use in Bangkok but the price of land remains unaffected. In particular, one of the new regulations states that it is not permitted to build a high-rise building on a parcel of land along a small road; nonetheless, the price of such land still remains the same. The reason for this may be that the landowner thinks that the regulation will not be enforced. However, if a building is developed based on that unrealistically high land price, the project is not likely to turn out financially viable in the end.

In contrast, the *market sale price* of a building is quite rational in Bangkok; it is

determined by the location of the building, the quality of the building, and the supply-demand conditions in the market. Thus, the *land sale price* of the Lad Krabang Subcenter should be calculated based on the *market sale price* of the buildings. The following section will describe how the *market sale price* of the buildings can be used to calculate appropriate *land sale prices* for parcels of land in each building zone.

There are many building zones in the Lad Krabang Subcenter, including: office and commercial-high density zone (10 FAR), hotel zone (10 FAR), office and commercial-medium density zone (8 FAR), residential-medium density zone (6 FAR), government zone (4 FAR), residential-low density zone (2 FAR), exhibition hall zone (2 FAR), and public space. The sale price of land in each zone will depend on its FAR. The higher the FAR is, the higher the sale price will be. Thus, in order to calculate the *land sale price*, we must first study data covering the *market sale price* of each type of building in Bangkok. The summary of the *market sale price* of buildings in Bangkok is shown in **Table 5:**

**Table 5: The market sale price of each type of building in Bangkok**

<b>Building Type</b>	<b>Market Sale Price of Building / sq. m</b>
Office and Commercial-High density	50,000
Hotels	50,000
Office and Commercial-Medium density	50,000
Residential-Medium density	45,000
Government buildings	40,000
Residential-Low density	40,000
Exhibition Halls	100,000

In order to sell the land in the subcenter, the ultimate developers must be able to make a reasonable profit when they develop the buildings. Normally, the *return on sale* in the Bangkok real estate market is approximately 25%. Thus, the price of the initially developed land should allow the ultimate developer to make a profit of 25%, based on the *market sale price* of buildings from **Table 5**.

For the ultimate developer, the *land cost* is the *land sale price* of the initially developed land. An appropriate *land cost* for the ultimate developer that will ensure a profit of 25% can be calculated as follows: It is assumed that the ultimate developers will develop the buildings at an average of 80% of the allowed FAR. This means that, for our calculations, the *total area of the building* will equal the FAR multiplied by 80%, multiplied by the *land area*. Generally, the *salable area of the building* equals approximately 55% of the *total area of the building*. Thus, the *income from sale* can be calculated by multiplying the *market sale price of the building* (**Table 5**) by the *salable area of the building*. The *net profit* can then be calculated by deducting *total expenses* and *taxes* from the *income from sale*. The *expenses* are calculated as percentages of the *income from sale*; *taxes* are calculated at 30% of *earnings* (*income from sale* minus *total expenses*). Finally, the *return on sale* is calculated by dividing the *net profit* by the *income from sale*. With the *return on sale* fixed at 25%, sample calculations for 4,800 sq. m. parcels of land in six of the building zones are shown in **Table 6-11**:

**Table 6**

**OFFICE and COMMERCIAL BUILDINGS-HIGH DENSITY**

FAR	<b>10</b>	
Land area	4,800	
Land cost / Sq.m.	<b>23,879</b>	Land Sale Price of Subcenter
Total Building area	38,400	@ 80% of FAR
Building Salable area	21,120	@ 55% of Total Building area
Building Sale price / Sq.m.	<b>50,000</b>	

**INCOME**

Income from sale	1,056,000,000
<b>TOTAL INCOME</b>	<b>1,056,000,000</b>

**EXPENSES**

Land cost	114,617,143	
Land development cost	4,224,000	@ 0.4% of Sale
Construction cost	384,000,000	@ 10,000 Baht / Sq.m.
Selling and Administration		
Design and Consultant fees	19,200,000	@ 5% of Construction costs
Commission fee	21,120,000	@ 2% of Sale
Advertising fee	21,120,000	@ 2% of Sale
Administration expenses	12,672,000	@ 1.2% of Sale
Transfer fee	13,200,000	@ 1.25% of Sale
Special tax	34,848,000	@ 3.3% of Sale
Public Approvals, fees	1,056,000	@ 0.1% of Sale
Total Selling and Administration	123,216,000	
Interest expense	52,800,000	@ 5% of Sale
<b>TOTAL EXPENSES</b>	<b>678,857,143</b>	

**EARNINGS BEFORE TAXES**

	377,142,857
Tax @ 30%	113,142,857

**NET PROFIT**

	<b>264,000,000</b>
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<b>RETURN ON SALE</b>	<b>25%</b>
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**Table 7**

**OFFICE and COMMERCIAL BUILDINGS-MEDIUM DENSITY**

FAR		<b>8</b>	
Land area		4,800	
Land cost / Sq.m.		<b>19,103</b>	Land Sale Price of Subcenter
Total Building area		30,720	@ 80% of FAR
Building Salable area		16,896	@ 55% of Total Building area
Building Sale price / Sq.m.		<b>50,000</b>	
 <b>INCOME</b>			
Income from sale		844,800,000	
<b>TOTAL INCOME</b>		<b>844,800,000</b>	
 <b>EXPENSES</b>			
Land cost		91,693,714	
Land development cost		3,379,200	@ 0.4% of Sale
Construction cost		307,200,000	@ 10,000 Baht / Sq.m.
Selling and Administration			
Design and Consultant fees	15,360,000		@ 5% of Construction costs
Commission fee	16,896,000		@ 2% of Sale
Advertising fee	16,896,000		@ 2% of Sale
Administration expenses	10,137,600		@ 1.2% of Sale
Transfer fee	10,560,000		@ 1.25% of Sale
Special tax	27,878,400		@ 3.3% of Sale
Public Approvals, fees	844,800		@ 0.1% of Sale
Total Selling and Administration		98,572,800	
Interest expense		42,240,000	@ 5% of Sale
<b>TOTAL EXPENSES</b>		<b>543,085,714</b>	
 <b>EARNINGS BEFORE TAXES</b>			
		301,714,286	
Tax @ 30%		90,514,286	
 <b>NET PROFIT</b>			
		<b>211,200,000</b>	
<b>RETURN ON SALE</b>		<b>25%</b>	

**Table 8**

**RESIDENTIAL BUILDINGS-MEDIUM DENSITY**

FAR		<b>6</b>	
Land area		4,800	
Land cost / Sq.m.		<b>7,599</b>	Land Sale Price of Subcenter
Total Building area		23,040	@ 80% of FAR
Building Salable area		12,672	@ 55% of Total Building area
Building Sale price / Sq.m.		<b>45,000</b>	
<b>INCOME</b>			
Income from sale		570,240,000	
<b>TOTAL INCOME</b>		<b>570,240,000</b>	
<b>EXPENSES</b>			
Land cost		36,473,143	
Land development cost		2,280,960	@ 0.4% of Sale
Construction cost		230,400,000	@ 10,000 Baht / Sq.m.
Selling and Administration			
Design and Consultant fees	11,520,000		@ 5% of Construction costs
Commission fee	11,404,800		@ 2% of Sale
Advertising fee	11,404,800		@ 2% of Sale
Administration expenses	6,842,880		@ 1.2% of Sale
Transfer fee	7,128,000		@ 1.25% of Sale
Special tax	18,817,920		@ 3.3% of Sale
Public Approvals, fees	570,240		@ 0.1% of Sale
Total Selling and Administration		67,688,640	
Interest expense		28,512,000	@ 5% of Sale
<b>TOTAL EXPENSES</b>		<b>365,354,743</b>	
<b>EARNINGS BEFORE TAXES</b>			
		204,885,257	
Tax @ 30%		61,465,577	
<b>NET PROFIT</b>			
		<b>143,419,680</b>	
<b>RETURN ON SALE</b>		<b>25%</b>	

**Table 9**

**GOVERNMENT BUILDINGS**

FAR	<b>4</b>	
Land area	4,800	
Land cost / Sq.m.	<b>4,521</b>	Land Sale Price of Subcenter
Total Building area	15,360	@ 80% of FAR
Building Salable area	8,448	@ 55% of Total Building area
Building Sale price / Sq.m.	<b>40,000</b>	

**INCOME**

Income from sale	337,920,000
<b>TOTAL INCOME</b>	<b>337,920,000</b>

**EXPENSES**

Land cost	21,701,995	
Land development cost	1,351,680	@ 0.4% of Sale
Construction cost	138,240,000	@ 9,000 Baht / Sq.m.
Selling and Administration		
Design and Consultant fees	6,912,000	@ 5% of Construction costs
Commission fee	6,758,400	@ 2% of Sale
Advertising fee	6,758,400	@ 2% of Sale
Administration expenses	4,055,040	@ 1.2% of Sale
Transfer fee	4,224,000	@ 1.25% of Sale
Special tax	11,151,360	@ 3.3% of Sale
Public Approvals, fees	337,920	@ 0.1% of Sale
Total Selling and Administration	40,197,120	
Interest expense	16,896,000	@ 5% of Sale
<b>TOTAL EXPENSES</b>	<b>218,386,795</b>	

**EARNINGS BEFORE TAXES**

	119,533,205
Tax @ 30%	35,859,961

**NET PROFIT**

	<b>83,673,243</b>
<b>RETURN ON SALE</b>	<b>25%</b>

**Table 10**

**RESIDENTIAL BUILDINGS-LOW DENSITY**

FAR	<b>2</b>	
Land area	4,800	
Land cost / Sq.m.	<b>2,266</b>	Land Sale Price of Subcenter
Total Building area	7,680	@ 80% of FAR
Building Salable area	4,224	@ 55% of Total Building area
Building Sale price / Sq.m.	<b>40,000</b>	

**INCOME**

Income from sale	168,960,000
<b>TOTAL INCOME</b>	<b>168,960,000</b>

**EXPENSES**

Land cost	10,877,388	
Land development cost	675,840	@ 0.4% of Sale
Construction cost	69,120,000	@ 9,000 Baht / Sq.m.
Selling and Administration		
Design and Consultant fees	3,456,000	@ 5% of Construction costs
Commission fee	3,379,200	@ 2% of Sale
Advertising fee	3,379,200	@ 2% of Sale
Administration expenses	2,027,520	@ 1.2% of Sale
Transfer fee	2,112,000	@ 1.25% of Sale
Special tax	5,575,680	@ 3.3% of Sale
Public Approvals, fees	168,960	@ 0.1% of Sale
Total Selling and Administration	20,098,560	
Interest expense	8,448,000	@ 5% of Sale
<b>TOTAL EXPENSES</b>	<b>109,219,788</b>	

**EARNINGS BEFORE TAXES**

	59,740,212
Tax @ 30%	17,922,064

**NET PROFIT**

	<b>41,818,149</b>
<b>RETURN ON SALE</b>	<b>25%</b>

**Table 11**

**EXHIBITION HALLS**

FAR	2	
Land area	4,800	
Land cost / Sq.m.	<b>22,429</b>	Land Sale Price of Subcenter
Total Building area	7,680	@ 80% of FAR
Building Salable area	4,224	@ 55% of Total Building area
Building Sale price / Sq.m.	<b>100,000</b>	

**INCOME**

Income from sale	422,400,000
<b>TOTAL INCOME</b>	<b>422,400,000</b>

**EXPENSES**

Land cost	107,657,143	
Land development cost	1,689,600	@ 0.4% of Sale
Construction cost	92,160,000	@ 12,000 Baht / Sq.m.
Selling and Administration		
Design and Consultant fees	4,608,000	@ 5% of Construction costs
Commission fee	8,448,000	@ 2% of Sale
Advertising fee	8,448,000	@ 2% of Sale
Administration expenses	5,068,800	@ 1.2% of Sale
Transfer fee	5,280,000	@ 1.25% of Sale
Special tax	13,939,200	@ 3.3% of Sale
Public Approvals, fees	422,400	@ 0.1% of Sale
Total Selling and Administration	46,214,400	
Interest expense	21,120,000	@ 5% of Sale
<b>TOTAL EXPENSES</b>	<b>268,841,143</b>	

**EARNINGS BEFORE TAXES**

	153,558,857
Tax @ 30%	46,067,657

**NET PROFIT**

**RETURN ON SALE**

<b>107,491,200</b>
<b>25%</b>

Reiterating, the *land cost* for the ultimate developers equals the *land sale price* for the initial developers; the *land sale prices* for each type of development zone are summarized in **Table 12**:

**Table 12: The land sale prices of the Lad Krabang Subcenter**

Zoning	FAR	Land Sale Price / sq. m
Office and Commercial-High density	10	23,879
Hotels	10	23,879
Office and Commercial-Medium density	8	19,103
Residential-Medium density	6	7,599
Government buildings	4	4,521
Residential-Low density	2	2,266
Exhibition Halls	2	22,429

**Development Scenarios**

The results of the land sale price calculations can be used to forecast the overall financial success of the project, based on three possible scenarios. The first scenario is the base case, the typical land development process in Bangkok; in the second scenario, government subsidies for the development of the infrastructure are added, while in the third, the land development process is carried out through a process termed *Land Readjustment*.

In the first, base, scenario the income for the project will come from the sale of the land in the Lad Krabang Subcenter. The *total income* will be the sum of the income from the sale of the land in each zone, based on the calculations above. The *total income* is shown in **Table 13**:

**Table 13: The total income from sale of the Lad Krabang Subcenter**

<b>Zoning</b>	<b>FAR</b>	<b>Sq.m.</b>	<b>Land Sale Price / Sq.m.</b>	<b>Land sale price</b>
Office and Commercial-High density	10	98,000	23,879	2,340,100,000
Hotels	10	45,000	23,879	1,074,535,714
Office and Commercial-Medium density	8	340,000	19,103	6,494,971,429
Residential-Medium density	6	510,000	7,599	3,875,271,429
Government buildings	4	160,000	4,521	723,399,837
Residential-Low density	2	157,000	2,266	355,781,224
Exhibition Halls	2	147,000	22,429	3,297,000,000
<b>Total Income from Sale</b>				<b>18,161,059,633</b>

The expenses for the project can be divided into four main categories: land cost, land development cost, selling and administration, and interest expenses. The land cost of this project is the cost of acquiring the land. The original owners of the land have two choices. They can sell their land to the project or participate in the project. The choice of the original landowners will make no difference in the *return on investment* of the Lad Krabang Subcenter since both alternatives--the land contributed to the project and the land that is purchased for the project--will be given the same land value.

According to our research, the cost of land at the location of the Lad Krabang Subcenter is 5,000,000 *baht / rai* plus a resettlement cost of about 500,000 *baht / rai*. This equals a total cost of 3,437.5 *baht / sq. m*. Thus, the cost of acquiring the land is approximately 7,391 million *baht*.

The land development expenses will be calculated based on the current construction costs in Bangkok. The selling and administrative expenses will be calculated as a percentage of the total income of the project. The interest expenses will be obtained from the forecast cash flow. In our cash flow, we predict that the Lad Krabang Subcenter project will be completed in approximately 15 years due to the demand for space in the Bangkok real

estate market. Since the Lad Krabang Subcenter is a lengthy project, inflation will have a substantial impact on the rate of return of the project. If we overestimate the inflation rate, the rate of return of the project will be too high. On the other hand, if we underestimate the inflation rate, the rate of return of the project will be too low. Thus, the most reasonable way to perform the calculations is to assume that we can raise the sale price to compensate for the increase in expenses due to inflation. The income statement and the cash flow of the first scenario are shown in **Tables 14** and **15** respectively:



**Table 14: The income statement of the first development scenario**

<b>CAPITAL STRUCTURE</b>		
Paid up Capital	2,434,964,064	@ 20% of Total expense
Loan	5,908,951,892	
Down payment	5,448,317,890	
	<b>13,792,233,846</b>	
<b>INCOME</b>		
Sale of Commercial-High density area	2,340,100,000	
Sale of Hotel area	1,074,535,714	
Sale of Commercial-Medium density area	6,494,971,429	
Sale of Residential-Medium density area	3,875,271,429	
Sale of Government area	723,399,837	
Sale of Residential-Low density area	355,781,224	
Sale of Exhibition Hall area	3,297,000,000	
<b>TOTAL INCOME</b>	<b>18,161,059,633</b>	
<b>EXPENSES</b>		
Land cost	7,390,625,000	
Land development cost		
<i>Grading and Clearing</i>	135,450,000	@ 63 Bath / Sq.m.
<i>Road and Paving</i>	679,400,000	@ 316 Bath / Sq.m.
<i>Recreation area</i>	375,000,000	@ 1500 Bath / Sq.m.
<i>Park</i>	231,000,000	@ 1500 Bath / Sq.m.
<i>Sanitary sewers</i>	99,086,400	@ 4800 Bath / m.
<i>Water</i>	206,430,000	@ 10,000 Bath / m.
<i>Electricity</i>	289,002,000	@ 14,000 Bath / m.
<i>Telephone</i>	412,860,000	@ 20,000 Bath / m.
<i>Other (signage, etc.)</i>	100,000,000	
Total Land development cost	2,528,228,400	
Selling and Administration		
<i>Design and Consultant fees</i>	126,411,420	@ 5% of Construction cost
<i>Commission fee</i>	363,221,193	@ 2% of Sale
<i>Advertising fee</i>	363,221,193	@ 2% of Sale
<i>Administration expenses</i>	150,000,000	
<i>Transfer fee</i>	635,637,087	@ 3.5% of Sale
<i>Special tax</i>	599,314,968	@ 3.3% of Sale
<i>Public Approvals, fees</i>	18,161,060	@ 0.1% of Sale
Total Selling and Administration	2,255,966,920	
Interest expense	1,720,897,758	
<b>TOTAL EXPENSES</b>	<b>13,895,718,078</b>	
<b>EARNING BEFORE TAX</b>	<b>4,265,341,555</b>	
Tax @ 30%	1,279,602,467	
<b>NET PROFIT</b>	<b>2,985,739,089</b>	

Table 15: Forecast Cash Flow for the First Development Scenario

PERIOD-YEAR	1	2	3	4	5	6	7	8
% of Sale				20%	20%	20%	11%	9%
% of Construction				7%	13%	20%	17%	13%
<b>CASH IN</b>								
Paid up Capital	2,434,964,064							
Sale of land				367,162,582	734,325,165	1,101,487,747	3,500,093,700	3,290,437,638
<b>TOTAL CASH IN</b>	<b>2,434,964,064</b>	<b>-</b>	<b>-</b>	<b>367,162,582</b>	<b>734,325,165</b>	<b>1,101,487,747</b>	<b>3,500,093,700</b>	<b>3,290,437,638</b>
<b>CASH OUT</b>								
Land cost	2,956,250,000	1,108,593,750	1,108,593,750	1,108,593,750	1,108,593,750			
Land development cost								
<i>Grading and Clearing</i>		45,150,000	45,150,000	45,150,000				
<i>Paving</i>				45,784,821	91,569,642	137,354,463	115,964,572	89,820,662
<i>Storm sewers</i>				25,271,280	50,542,561	75,813,841	64,007,528	49,577,198
<i>Sanitary sewers</i>				15,567,109	31,134,217	46,701,326	39,428,637	30,539,554
<i>Water</i>				6,677,440	13,354,881	20,032,321	16,912,735	13,099,803
<i>Electricity</i>				13,911,334	27,822,669	41,734,003	35,234,864	27,291,256
<i>Landscaping</i>				19,475,868	38,951,736	58,427,604	49,328,809	38,207,758
<i>Park</i>				27,822,669	55,645,337	83,468,006	70,469,728	54,582,512
<i>Other (signage, etc.)</i>				6,739,008	13,478,016	20,217,024	17,068,674	13,220,586
Selling and Administration								
<i>Design and Consultant fees</i>	42,137,140	42,137,140	42,137,140					
<i>Commission fee</i>				7,343,252	14,686,503	22,029,755	70,001,874	65,808,753
<i>Advertising fee</i>	24,214,746	24,214,746	24,214,746	24,214,746	24,214,746	24,214,746	24,214,746	24,214,746
<i>Administration expenses</i>	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
<i>Transfer fee</i>							128,506,904	128,506,904
<i>Special tax</i>							121,163,652	121,163,652
<i>Public Approvals, fees</i>				18,161,060				
<b>TOTAL CASH OUT</b>	<b>3,032,601,886</b>	<b>1,230,095,636</b>	<b>1,230,095,636</b>	<b>1,374,712,337</b>	<b>1,479,994,059</b>	<b>539,993,090</b>	<b>762,302,723</b>	<b>666,033,385</b>
Balance	(597,637,822)	(1,230,095,636)	(1,230,095,636)	(1,007,549,755)	(745,668,894)	561,494,658	2,737,790,978	2,624,404,253
Interest Payment	7%	(41,834,648)	(130,869,767)	(226,137,346)	(312,495,443)	(386,566,946)	(374,322,006)	(208,879,178)
<b>MONTHLY TOTAL</b>	<b>(639,472,470)</b>	<b>(1,360,965,404)</b>	<b>(1,456,232,982)</b>	<b>(1,320,045,197)</b>	<b>(1,132,235,840)</b>	<b>187,172,651</b>	<b>2,528,911,799</b>	<b>2,584,611,830</b>
Outstanding Balance	(639,472,470)	(2,000,437,873)	(3,456,670,855)	(4,776,716,052)	(5,908,951,892)	(5,721,779,241)	(3,192,867,442)	(608,255,612)
Corporate Tax @ 30%	-	-	-	-	-	-	-	-
<b>NET CASH FLOW FROM OPERATION</b>	<b>(2,434,964,064)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>IRR-(All Equity)</b>	<b>8.0%</b>							
<b>IRR-Equity and Debt</b>	<b>8.8%</b>							
<b>IRR-Equity and Debt without Corporate Taxes</b>	<b>11.0%</b>							
Maximum Debt	(5,908,951,892)							

**Table 15: Forecast Cash Flow for the First Development Scenario**

9	10	11	12	13	14	15	TOTAL	PERIOD-YEAR
9%	6%	4%	1%				100%	% of Sale
9%	8%	6%	4%	2%	0.2%		100%	% of Construction
								<b>CASH IN</b>
							2,434,964,064	Paid up Capital
3,080,781,575	1,799,445,108	1,450,713,755	1,306,520,356	894,087,891	542,812,265	93,191,849	18,161,059,633	Sale of land
<b>3,080,781,575</b>	<b>1,799,445,108</b>	<b>1,450,713,755</b>	<b>1,306,520,356</b>	<b>894,087,891</b>	<b>542,812,265</b>	<b>93,191,849</b>	<b>20,596,023,697</b>	<b>TOTAL CASH IN</b>
								<b>CASH OUT</b>
							7,390,625,000	Land cost
								Land development cost
							135,450,000	Grading and Clearing
63,676,753	53,624,564	43,416,229	25,435,451	11,092,710	1,660,133		679,400,000	Paving
35,146,868	29,598,486	23,963,918	14,039,291	6,122,706	916,323		375,000,000	Storm sewers
21,650,471	18,232,668	14,761,774	8,648,203	3,771,587	564,455		231,000,000	Sanitary sewers
9,286,871	7,820,820	6,331,996	3,709,607	1,617,805	242,120		99,086,400	Water
19,347,648	16,293,375	13,191,658	7,728,349	3,370,427	504,418		206,430,000	Electricity
27,086,707	22,810,725	18,468,321	10,819,688	4,718,598	706,185		289,002,000	Landscaping
38,695,296	32,586,750	26,383,315	15,456,698	6,740,854	1,008,835		412,860,000	Park
9,372,498	7,892,930	6,390,378	3,743,811	1,632,721	244,353		100,000,000	Other (signage, etc.)
								Selling and Administration
							126,411,420	Design and Consultant fees
61,615,631	35,988,902	29,014,275	26,130,407	17,881,758	10,856,245	1,863,837	363,221,193	Commission fee
24,214,746	24,214,746	24,214,746	24,214,746	24,214,746	24,214,746	24,214,746	363,221,193	Advertising fee
10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	150,000,000	Administration expenses
128,506,904	68,470,660	55,127,282	55,127,282	40,256,602	26,474,957	4,659,592	635,637,087	Transfer fee
121,163,652	64,558,051	51,977,152	51,977,152	37,956,224	24,962,102	4,393,330	599,314,968	Special tax
							18,161,060	Public Approvals, fees
<b>569,764,047</b>	<b>392,092,677</b>	<b>323,241,043</b>	<b>257,030,685</b>	<b>169,376,737</b>	<b>102,354,874</b>	<b>45,131,506</b>	<b>12,174,820,320</b>	<b>TOTAL CASH OUT</b>
2,511,017,528	1,407,352,431	1,127,472,712	1,049,489,672	724,711,154	440,457,391	48,060,344	8,421,203,377	Balance
							(1,720,897,758)	Interest Payment
<b>2,511,017,528</b>	<b>1,407,352,431</b>	<b>1,127,472,712</b>	<b>1,049,489,672</b>	<b>724,711,154</b>	<b>440,457,391</b>	<b>48,060,344</b>	<b>6,700,305,619</b>	<b>MONTHLY TOTAL</b>
1,902,761,916	3,310,114,347	4,437,587,059	5,487,076,730	6,211,787,884	6,652,245,275	6,700,305,619		Outstanding Balance
	262,545,085	338,241,813.6	314,846,901	217,413,346	132,137,217	14,418,103	1,279,602,467	Corporate Taxes @ 30%
<b>1,902,761,916</b>	<b>1,144,807,346</b>	<b>789,230,898</b>	<b>734,642,770</b>	<b>507,297,808</b>	<b>308,320,174</b>	<b>33,642,241</b>	<b>2,985,739,089</b>	<b>NET PROFIT</b>

If we finance the project entirely with equity funds, the *Internal Rate of Return* will be 8.0%. Even if the project acquires a 7% loan (a typical loan rate from financial institution is approximately 13.5%) and a tax exemption from government, the *Internal Rate of Return* will still be only 11%.

In the second scenario, the government makes the project more attractive by subsidizing the infrastructure cost. The infrastructure cost will subsequently be recovered in two ways. First, it will be recovered by the government's share of the profits in the project, which is 40% of the total profit. The remaining infrastructure cost will be recovered through betterment fees, a tax collected from the ultimate users of the buildings. The concept behind the betterment fee method is that since the ultimate users get the benefit of a better living environment, they should pay some premium. The income statement and the forecast cash flow of the second scenario are shown in **Tables 16** and **17** respectively:

**Table 16: The income statement of the second development scenario**

<b>INCOME</b>		
Sale of Commercial-High density area	2,340,100,000	
Sale of Hotel area	1,074,535,714	
Sale of Commercial-Medium density area	6,494,971,429	
Sale of Residential-Medium density area	3,875,271,429	
Sale of Government area	723,399,837	
Sale of Residential-Low density area	355,781,224	
Sale of Exhibition Hall area	3,297,000,000	
Subsidy from Government	2,528,228,400	equal to the Land development cost
<b>TOTAL INCOME</b>	<b>20,689,288,033</b>	
<b>EXPENSES</b>		
Land cost	7,390,625,000	
Land development cost		
<i>Grading and Clearing</i>	135,450,000	@ 63 Bath / Sq.m.
<i>Road and Paving</i>	679,400,000	@ 316 Bath / Sq.m.
<i>Recreation area</i>	375,000,000	@ 1500 Bath / Sq.m.
<i>Park</i>	231,000,000	@ 1500 Bath / Sq.m.
<i>Sanitary sewers</i>	99,086,400	@ 4800 Bath / m.
<i>Water</i>	206,430,000	@ 10,000 Bath / m.
<i>Electricity</i>	289,002,000	@ 14,000 Bath / m.
<i>Telephone</i>	412,860,000	@ 20,000 Bath / m.
<i>Other (signage, etc.)</i>	100,000,000	
Total Land development cost	2,528,228,400	
Selling and Administration		
<i>Design and Consultant fees</i>	126,411,420	@ 5% of Construction cost
<i>Commission fee</i>	363,221,193	@ 2% of Sale
<i>Advertising fee</i>	363,221,193	@ 2% of Sale
<i>Administration expenses</i>	150,000,000	
<i>Transfer fee</i>	635,637,087	@ 3.5% of Sale
<i>Special tax</i>	599,314,968	@ 3.3% of Sale
<i>Public Approvals, fees</i>	18,161,060	@ 0.1% of Sale
Total Selling and Administration	2,255,966,920	
Interest expense	1,404,913,584	
<b>TOTAL EXPENSES</b>	<b>13,579,733,904</b>	
<b>EARNINGS BEFORE TAXES</b>	<b>7,109,554,129</b>	
Tax @ 30%	1,279,602,467	
<b>NET PROFIT</b>	<b>5,829,951,663</b>	

**Table 17: The Forecast Cash Flow of the Second Development Scenario**

PERIOD-YEAR	1	2	3	4	5	6	7	8
% of Sale				0%	0%	0%	0%	0%
% of Construction				7%	13%	20%	17%	13%
<b>CASH IN</b>								
Paid up Capital	2,434,964,064							
Sale of land				367,162,582	734,325,165	1,101,487,747	3,500,093,700	3,290,437,638
Subsidy from Government	-	45,150,000	45,150,000	206,399,530	322,499,059	483,748,589	408,415,546	316,339,330
<b>TOTAL CASH IN</b>	<b>2,434,964,064</b>	<b>45,150,000</b>	<b>45,150,000</b>	<b>573,562,112</b>	<b>1,056,824,224</b>	<b>1,585,236,336</b>	<b>3,908,509,247</b>	<b>3,606,776,967</b>
<b>CASH OUT</b>								
Land cost	2,956,250,000	1,108,593,750	1,108,593,750	1,108,593,750	1,108,593,750			
Land development cost								
<i>Grading / Clearing</i>		45,150,000	45,150,000	45,150,000				
<i>Paving</i>				45,784,821	91,569,642	137,354,463	115,964,572	89,820,662
<i>Storm sewers</i>				25,271,280	50,542,561	75,813,841	64,007,528	49,577,198
<i>Sanitary sewers</i>				15,567,109	31,134,217	46,701,326	39,428,637	30,539,554
<i>Water</i>				6,677,440	13,354,881	20,032,321	16,912,735	13,099,803
<i>Electricity</i>				13,911,334	27,822,669	41,734,003	35,234,864	27,291,256
<i>Landscaping</i>				19,475,868	38,951,736	58,427,604	49,328,809	38,207,758
<i>Park</i>				27,822,669	55,645,337	83,468,006	70,469,728	54,582,512
<i>Other (signage, etc.)</i>				6,739,008	13,478,016	20,217,024	17,068,674	13,220,586
Selling and Administration								
<i>Design and Consultant fees</i>	42,137,140	42,137,140	42,137,140					
<i>Commission fee</i>				7,343,252	14,686,503	22,029,755	70,001,874	65,808,753
<i>Advertising fee</i>	24,214,746	24,214,746	24,214,746	24,214,746	24,214,746	24,214,746	24,214,746	24,214,746
<i>Administration expenses</i>	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
<i>Transfer fee</i>							128,506,904	128,506,904
<i>Special tax</i>							121,163,652	121,163,652
<i>Public Approvals, fees</i>				18,161,060				
<b>TOTAL CASH OUT</b>	<b>3,032,601,886</b>	<b>1,230,095,636</b>	<b>1,230,095,636</b>	<b>1,374,712,337</b>	<b>1,479,994,059</b>	<b>539,993,090</b>	<b>762,302,723</b>	<b>666,033,385</b>
Balance	(597,637,822)	(1,184,945,636)	(1,184,945,636)	(801,150,225)	(423,169,835)	1,045,243,246	3,146,206,524	2,940,743,583
Interest Payment	7%	(41,834,648)	(127,709,267)	(219,595,111)	(291,047,284)	(341,042,482)	(291,748,429)	(91,936,362)
<b>MONTHLY TOTAL</b>	<b>(639,472,470)</b>	<b>(1,312,654,904)</b>	<b>(1,404,540,747)</b>	<b>(1,092,197,509)</b>	<b>(764,212,317)</b>	<b>753,494,817</b>	<b>3,054,270,162</b>	<b>2,940,743,583</b>
Outstanding Balance	(639,472,470)	(1,952,127,373)	(3,356,668,120)	(4,448,865,629)	(5,213,077,946)	(4,459,583,129)	(1,405,312,967)	1,535,430,615
Corporate Tax @ 30%	-	-	-	-	-	-	-	-
<b>NET CASH FLOW FROM OPERATION</b>	<b>(2,434,964,064)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1,535,430,615</b>
<b>IRR-(All Equity)</b>	<b>12.0%</b>							
<b>IRR-Equity and Debt</b>	<b>14.9%</b>							
<b>IRR-Equity and Debt without Corporate Taxes</b>	<b>16.4%</b>							
Maximum Debt	(5,213,077,946)							

**Table 17: The Forecast Cash Flow of the Second Development Scenario**

9	10	11	12	13	14	15	TOTAL	PERIOD-YEAR
0%	0%	0%	0%					0% % of Sale
9%	8%	6%	4%	2%	0%			100% % of Construction
								<b>CASH IN</b>
							2,434,964,064	Paid up Capital
3,080,781,575	1,799,445,108	1,450,713,755	1,306,520,356	894,087,891	542,812,265	93,191,849	18,161,059,633	Sale of land
224,263,113	188,860,317	152,907,588	89,581,098	39,067,407	5,846,823	-	2,528,228,400	Subsidy from Government
<b>3,305,044,688</b>	<b>1,988,305,426</b>	<b>1,603,621,343</b>	<b>1,396,101,455</b>	<b>933,155,297</b>	<b>548,659,088</b>	<b>93,191,849</b>	<b>23,124,252,097</b>	<b>TOTAL CASH IN</b>
								<b>CASH OUT</b>
							7,390,625,000	Land cost
								Land development cost
							135,450,000	Grading and Clearing
63,676,753	53,624,564	43,416,229	25,435,451	11,092,710	1,660,133		679,400,000	Paving
35,146,868	29,598,486	23,963,918	14,039,291	6,122,706	916,323		375,000,000	Storm sewers
21,650,471	18,232,668	14,761,774	8,648,203	3,771,587	564,455		231,000,000	Sanitary sewers
9,286,871	7,820,820	6,331,996	3,709,607	1,617,805	242,120		99,086,400	Water
19,347,648	16,293,375	13,191,658	7,728,349	3,370,427	504,418		206,430,000	Electricity
27,086,707	22,810,725	18,468,321	10,819,688	4,718,598	706,185		289,002,000	Landscaping
38,695,296	32,586,750	26,383,315	15,456,698	6,740,854	1,008,835		412,860,000	Park
9,372,498	7,892,930	6,390,378	3,743,811	1,632,721	244,353		100,000,000	Other (signage, etc.)
								Selling and Administration
							126,411,420	Design and Consultant fees
61,615,631	35,988,902	29,014,275	26,130,407	17,881,758	10,856,245	1,863,837	363,221,193	Commission fee
24,214,746	24,214,746	24,214,746	24,214,746	24,214,746	24,214,746	24,214,746	363,221,193	Advertising fee
10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	150,000,000	Administration expenses
128,506,904	68,470,660	55,127,282	55,127,282	40,256,602	26,474,957	4,659,592	635,637,087	Transfer fee
121,163,652	64,558,051	51,977,152	51,977,152	37,956,224	24,962,102	4,393,330	599,314,968	Special tax
							18,161,060	Public Approvals, fees
<b>569,764,047</b>	<b>392,092,677</b>	<b>323,241,043</b>	<b>257,030,685</b>	<b>169,376,737</b>	<b>102,354,874</b>	<b>45,131,506</b>	<b>12,174,820,320</b>	<b>TOTAL CASH OUT</b>
2,735,280,641	1,596,212,748	1,280,380,300	1,139,070,770	763,778,560	446,304,214	48,060,344	10,949,431,777	Balance
-	-	-	-	-	-	-	(1,404,913,584)	Interest Payment
<b>2,735,280,641</b>	<b>1,596,212,748</b>	<b>1,280,380,300</b>	<b>1,139,070,770</b>	<b>763,778,560</b>	<b>446,304,214</b>	<b>48,060,344</b>	<b>9,544,518,193</b>	<b>MONTHLY TOTAL</b>
4,270,711,257	5,866,924,005	7,147,304,305	8,286,375,075	9,050,153,635	9,496,457,849	9,544,518,193		Outstanding Balance
-	262,545,085	338,241,814	314,846,901	217,413,346	132,137,217	14,418,103	1,279,602,467	Corporate Taxes @ 30%
<b>2,735,280,641</b>	<b>1,333,667,664</b>	<b>942,138,487</b>	<b>824,223,868</b>	<b>546,365,214</b>	<b>314,166,997</b>	<b>33,642,241</b>	<b>5,829,951,663</b>	<b>NET PROFIT</b>

The *Internal Rate of Return* of the second scenario--a maximum of approximately 16.4 % per year--is substantially higher than that of the first scenario. A summary of the *Internal Rates of Return* according to whether the government provides subsidized loans and tax exemptions is shown in **Table 18**:

**Table 18: The summary of the Internal Rates of Return**

	<b>Internal Rate of Return</b>	
	Scenario 1-Typical Land Development	Scenario 2-Government Subsidiary
<b>All Equity</b>	8.0%	12.0%
<b>Equity and Debt</b>		
Corporate Taxes and Loan @ 13.5%	3.9%	11.0%
Without Taxes and Loan @ 13.5%	5.1%	12.7%
Corporate Taxes and Loan @ 7%	8.8%	14.9%
Without Taxes and Loan @ 7%	11.0%	16.4%

In the third scenario, the land development process is carried out through Land Readjustment. The basic concept of Land Readjustment is that the landowners pool their lands together, then their lands are prepared for final development and re-divided. Upon completion of the preparation stage, the original landowners are given back some portion of the re-divided lands. The size of the land returned to them equals the size of their *original land* minus *public land* minus *cost equivalent land*. The *public land* is the land that is needed for roads, parks, and public facilities. The *cost equivalent land* is the land that must be sold in order to finance the cost of developments such as the cost of roads, parks, infrastructure. For example, suppose that each of the original owners of the Lad Krabang project contributes 215 ha of land. Of that land, 69.3 ha is needed for roads, recreation areas, and parks. In addition, another 41.8 ha, called “Cost Equivalent Land”, must be sold to finance the construction of those roads, recreation areas, and parks. This means that at the completion of the initial development, the original owner will be given back only 103.8 ha (215-69.3-41.8). However, the value of this land will be 75% higher than the value of the original land because the price of land will increase after the infrastructure is installed. If the land is developed in this way, the profits for the original owners can be calculated as shown in **Table 19**:



**Table 19: The Land Readjustment**

**LAND READJUSTMENT**

**Public Areas**

Roads	289,000	
Recreation Areas	250,000	
Parks	154,000	
<b>Total Public Area</b>	<b>693,000</b>	<b>32%</b> of Subcenter Area

**Development Expenses**

Land Development Costs	2,528,228,400	
Selling and Administration Expenses	2,255,966,920	
Interest Expenses	430,224,439	
<b>Total Expenses</b>	<b>5,214,419,759</b>	<b>29%</b> of Total Sale Price

Total Subcenter Area	2,150,000	
Public Area	693,000	
<b>Salable Area</b>	<b>1,457,000</b>	
Cost Equivalent Land	418,335	Total Expenses / Total Sale Price x Salable Area
<b>Returnable Land</b>	<b>1,038,665</b>	will be returned to original owner
		48% of Subcenter Area
		71% of Salable Area

Value of Returnable Land	12,946,639,873	
Total Cost of Original Land	7,390,625,000	
<b>Profit to Original Owner</b>	<b>5,556,014,873</b>	<b>75%</b> of Original Cost

The major advantage of the Land Readjustment method is that a large amount of capital is not required to finance the cost of the land. However, this method will not be financially viable if the increase in land value is small. This is because a small increase in land value would not be able to compensate for the costs of infrastructure. Fortunately, adding infrastructure will increase the land value in the Lad Krabang Subcenter by an average of 211%. Thus, Land Readjustment could be a viable method for developing the Lad Krabang Subcenter.

# **Chapter V**

## **Conclusion and Recommendations**

This chapter will investigate which of the three development scenarios of the Lad Krabang Subcenter are likely to have good outcomes and make corresponding recommendations. Other factors affecting the ultimate success of the subcenter will also be described and components vital to the project will be identified. Additional recommendations will be provided as well.

There are advantages and disadvantages to each of the three development scenarios described in Chapter IV. The first scenario provides the simplest way to develop the Lad Krabang Subcenter. In this scenario, the project is developed with minimal support from the government. However, the project will provide an unacceptable rate of return for the development corporation. Without tax exemptions and low rate loans, the rate of return is very low--just 3.9% per year. With tax exemptions and a 7% loan from the government, the rate of return will still be only 11% per year, which is just slightly higher than the 9.5% one year savings rate offered by a typical financial institution. Under this scenario, it would be impossible to find a private sector partner to join with the government to develop this project. Thus, the first scenario should be abandoned.

The third scenario looks attractive to the original landowners since it provides a high return for them. However, it is unfavorable to the land developer of the Lad Krabang Subcenter because Land Readjustment would shift the profits from the public-private joint venture development company to the original landowners, while the developer of the project would get only the administrative expenses, such as salaries. Thus, since profit is the major concern for the private sector, in this scenario, it would be difficult to find proficient private developers to join with the public sector.

Moreover, even if Land Readjustment provides the highest rate of return to the original landowners, the landowners will get only the re-divided land. Although the value of the re-divided land will be higher than that of the original land, the landowners may need immediate money at the start of the project to relocate their homes. For this reason, the original landowners may prefer to sell their land for money; they will feel more comfortable and familiar with the selling process, not Land Readjustment.

This leaves us with the second scenario, which is the best. It provides a simple way to develop the Lad Krabang Subcenter. However, this scenario needs maximum support from the government. In this scenario, the government needs to provide a subsidy for the cost of infrastructure. This cost will be partially recovered through the public sector's share of the profits. The remaining infrastructure costs will be recovered from the betterment fee. This sounds reasonable, since the subcenter will provide a better living environment and the residents should pay some premium to live there. With a subsidy from the government, a tax exemption and a 7% loan, this project can generate a favorable rate of return, 16.4% per year.

In order to provide an additional incentive, the private sector partner joined with the government to develop this project should have the first option to buy the re-divided lands, giving the private sector partner the chance to select and buy the best parcels of land in the Lad Krabang Subcenter. The partner can then become one of the ultimate developers who construct the buildings. This will allow the original private sector partner to make more profits from selling the buildings in the subcenter. Thus, such a priority would create a substantial incentive for the private sector partner to join with the government to develop this project.

The development of the Lad Krabang Subcenter cannot be realized without a mass transit project connecting the center of Bangkok to the subcenter and to SBIA. Nobody will

want to live in the subcenter if it does not have easy access to the center of Bangkok. At the time of writing this thesis, it is likely that the Hopewell mass transit project will be abandoned, due to many problems. If the Hopewell project is abandoned, it will be very important for the subcenter to have an alternative mass transit project.

The government introduced a high-speed train master plan in 1994 that would connect Bangkok, SBIA, and the Eastern Seaboard to the Lad Krabang Subcenter. However, the high-speed train may not be in operation in time for the development of the Lad Krabang Subcenter. If the development of the subcenter is delayed, it will not be able to mitigate the problems of Bangkok in a timely manner. Our recommendation is to find temporary mass transit alternatives, such as the development and temporary use of the existing railroad.

The development of SBIA is currently in the design process. Currently, SBIA is scheduled to be in operation by the year 2000; however, many people believe that SBIA will not be able to stay on schedule. In order to ensure the success of the Lad Krabang Subcenter project, the government must make sure SBIA will be in operation as soon as possible.

The rate of return of the project can be increased if the sale duration of the project can be shortened. Timely development of SBIA and the mass transit project are factors that could shorten the sale duration. This is because when SBIA and mass transit are put into operation, they will bring significant demand for the land in the Lad Krabang Subcenter, thus shortening the sale duration and increasing the rate of return. On the other hand, if these projects are delayed, the sale duration of the Lad Krabang Subcenter will increase and lower the project's rate of return.

The success of the project also depends on new government regulations for land acquisition. These new regulations will grant the power to assemble land. The developer

of the Lad Krabang Subcenter should first offer to buy the lands at market price; it is expected that the majority of the land will be sold to the developers in this way. The remaining landowners will be forced to become shareholders in the project and the proportion of their shares will be based on the market price of their land.

We conclude that there are six critical elements to the success of the development of the Lad Krabang Subcenter. New regulations will mitigate the land acquisition problem. SBIA and mass transit will generate demand for the project. Government subsidies for infrastructure costs, low rate loans, and tax exemptions will make the project financially viable. If all of the critical ingredients can be realized, we can look forward to the successful development of the Lad Krabang Subcenter, which will be followed by the development of other Metropolitan Subcenters around Bangkok.

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