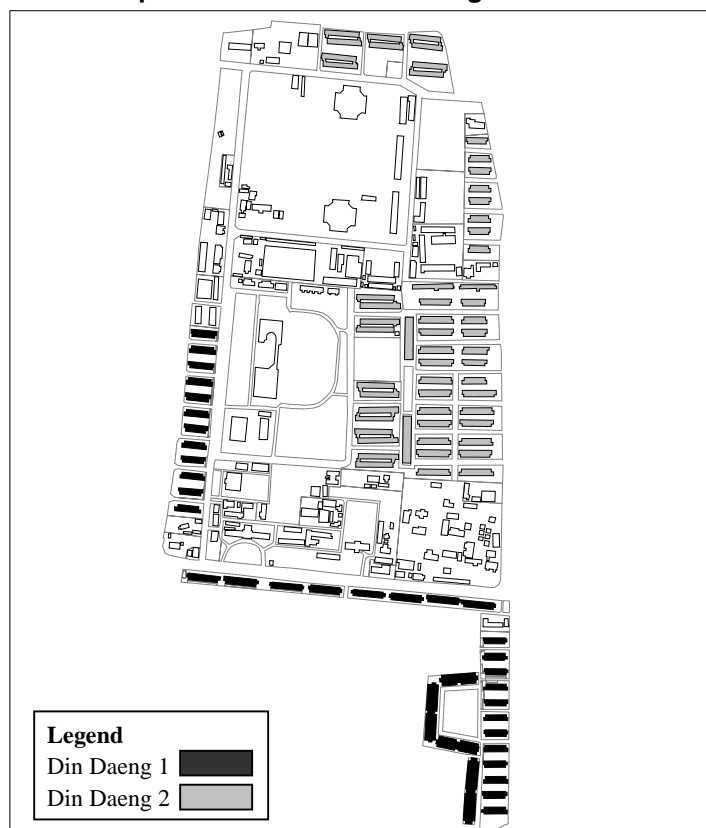


6.4 OPERATIONAL ISSUES IN NHA HOUSING SECTION

6.4.1 Operation and Management System

There are two administration offices in the Din Daeng complex, namely Din Daeng 1 and Din Daeng 2. Some of the NHA staff are permanently stationed in these offices. The following figure shows demarcation of responsible facilities among the two offices.

Figure 6.8: Respective Areas of Din Daeng Administration Offices



At present, NHA bears all the maintenance cost, because it has no agreement with residents for payment of a maintenance fee. Therefore NHA diverts the collected fee from stalls and vendors for this purpose. Depending on contribution from political parties, the offices contract and supervise repair works based on the request gathered from the residents.

The current problems raised by the administration office are as follows.

- Aged facilities including leakage of drainage and water supply, ground subsidence, crack on structures, and insufficient ventilation;

- Lack of revenue for maintenance;
- Illegal occupation on pilotis; and
- Unclear definition of the extent and period for the hire-purchase units.

6.4.2 House Rent and Occupancy Ratio

(1) House Rent of NHA Complex

House rents in NHA's Din Daeng Housing Complex range from 300 to 3,000 baht/unit/month resulting in an average of around 600 baht/unit/month. This figure roughly coincides with the result of the social survey in the first phase and are designated in the existing master plan.

The annual amount of rent totals 62 million baht, comprising 55.6 million baht of the housing section and 6.1 million baht of the shophouses. The total amount represents 14% of the entire revenue of NHA, which earns 435.7 million baht from housing and shophouses in the whole country, or approx. 19% of 330.8 million baht from housing and shophouses in BMA.

As sharing a large portion in NHA's revenue, it is very important to minimize the vacancy periods due to moving out and/or temporary relocation of residents associated with renewal of the buildings.

Table 6.14: Rents of NHA Din Daeng Housing Complex in 2001

Project	Nos. of Unit	Range of Rent (B/unit/month)		Annual Amount of Rent	Monthly Average Rent	Completion Year
				(B/Year)	(B/Unit/month)	
Apartment and Condominium						
Din Daeng 1	1,985	300	to 1,800	9,456,000	397	
Din Daeng 12	664	300	to 1,500	2,768,000	347	
Din Daeng 2	2,160	300	to 1,800	8,087,000	312	
Din Daeng 2-3	676	300	to 1,200	3,523,000	434	1980
Din Daeng 4-2	674	300	to 1,350	2,906,000	359	1981
Din Daeng 4-1	972	300	to 1,500	4,246,000	364	1982
Din Daeng 4	352	2,700	to 3,000	6,621,000	1,567	1992
Din Daeng 5 (leasing)	270	5,000	to 12,000	18,000,000	5,556	2001
Total	7,753	300	to 1,800	55,607,000	598	
Shop-House						
Din Daeng 3 Flat	67	5,000	to 7,650	3,230,000	4,017	1973
Din Daeng 12 (1-10)	162	1,750		2,909,000	1,496	1977
Total	229	1,750	to 7,650	6,139,000	2,234	
Grand Total	7,982	-	-	61,746,000	-	-

Source: NHA

On the other hand, the Study examined NHA and private housing in BMA to understand the market price of housing rent as summarized in the table below.

The average rent around the DC area is 3,335 baht/month for a room size of 23m². Compared with private sector housing rents in the same locality, the average rent of 598 baht/month in NHA's Din Daeng Housing Complex is less than one ninth of the market price. Therefore it might be important for NHA to substantially update the rents in BMA.

Table 6.15: Comparison of Housing Rents in BMA

	Rent per Unit (baht/month)	Area (m ²)	Unit Rate (baht/m ² /month)
Private Housing around DC Area	3,335	23	145
NHA Housing in BMA			
Before 1973	504		
After 1973	1,040		
NHA Housing in Other Provinces			
Before 1973	871		
After 1973	1,212		

(2) Rent Collection

A significant number of households are in arrears of rent for one to two months. According to NHA, this has been a traditional arrears problem and has no financial implication for changes in cash flow. However a particular group of 289 households in Din Daeng 2 are in arrears of more than months, and this has been a major collection problem.

In general, the arrears of over two months is not a large portion, as it represents less than 20% of the total arrears.

Table 6.16: Number of Residents in Arrears of Rent

Flats	1-2 months		3-6 months		>7 months		Total	
	No	%	No	%	No	%	No	%
Din Daeng 1	438	27.9%	4	0.3%	20	1.3%	462	29.4%
Din Daeng 2	819	52.2%	-	0.0%	289	18.4%	1108	70.6%
Total	1,257	80.1%	4	0.3%	309	19.7%	1570	100.0%

Source: NHA

Note: Din Daeng 1 (Flat 1-32), and Din Daeng 2 (Flat 33-64, Chor 1-11 and the others)
November 2000

(3) Occupancy Rate

According to the social survey in the first phase area conducted by the Study, the vacancy rate in the area is 7.5%, which is slightly lower than that of the entire Din Daeng Housing Complex (8.0%). Compared to other NHA housing, the rate in Din Daeng Housing Complex is higher than that of BMR (4.4%).

Table 6.17: Occupancy Rate of NHA Housings in the Country

Category	No. of Housing Units			No. of Occupied Units			Occupancy Rate (%)		
	BMR	Other Regions	Total	BMR	Other Regions	Total	BMR	Other Region	Total
Hire Purchase									
Housing	67,978	26,270	94,248	66,452	22,957	89,409	97.8	87.4	94.9
New Town	6,982	803	7,785	5,173	803	5,976	74.1	100.0	76.8
Total	74,960	27,073	102,033	71,625	23,760	95,385	95.6	87.8	93.5
Rental Project									
Housing	30,794	8,010	38,804	29,424	6,612	36,036	95.6	82.6	92.9
New Town	7,608	0	7,608	5,067	0	5,067	66.6	-	66.6
Total	38,402	8,010	46,412	34,491	6,612	41,103	89.8	82.6	88.6
Grand Total	113,362	35,083	148,445	106,116	30,372	136,488	93.6	86.6	92.0

Source: Statistics by NHA in July 2001.

6.4.2 Living Standard and Life Style

In order to understand the life style and living standard of the resident families in the DC Area, the Study carried out a social survey on 600 households in the first phase area designated in the existing master plan. Four hundred and seventy-nine of them responded to the interview or an 80% effective response.

The social survey confirmed that the actual population is 1,727 with the average family size of 3.6 persons in the first phase area. Among the 121 households that did not respond, 45 units were vacant despite an existing rent contract with NHA. This implies a vacancy rate of 7.5 % over the entire NHA' Din Daeng Community.

Table 6.18: Response of Interview

Building No.	No. of Units	No. of Units with Response		No. of Units without Response					
				Permanently Locked		Owner was not present		Refusal of Interview	
Flat 16	56	43	77%	9	16%	4	7%	0	0%
Flat 17	56	45	80%	4	7%	7	13%	0	0%
Flat 18	56	45	80%	3	5%	4	7%	4	7%
Flat 19	56	43	77%	6	11%	5	9%	2	4%
Flat 20	56	46	82%	3	5%	5	9%	2	4%
Flat 33	80	60	75%	8	10%	8	10%	4	5%
Flat 57	48	44	92%	0	0%	4	8%	0	0%
Flat 58	48	44	92%	1	2%	2	4%	1	2%
Flat 59	48	40	83%	0	0%	4	8%	4	8%
Flat 60	48	33	69%	5	10%	6	13%	4	8%
Flat 61	48	36	75%	6	13%	5	10%	1	2%
Total	600	479	80%	45	8%	54	9%	22	4%

Source: Social survey by JICA Study Team

(1) Living Standards

Major findings on occupation and financial conditions of interviewees are summarized to understand social characteristics in the following sections and in Table 6.19.

1) Employment

Residents employed make up 61.8% and those not employed are 31.5%. The remaining 6.7% consists of “retired government official” and “unemployment”. Residents having small shops in the community amount to 7.7%.

Regarding the place of work, 42.1% of the respondents with business has work places in Din Daeng district and the rest in other areas including 31 districts of BMA and three neighboring provinces.

2) Income Level

Personal income: 66.0% of the respondents presented that their monthly average income is 9,937 baht.

Family income: Family income: The average income of the respondents is 17,121 baht/month. Their income of residents is 8,040,060 baht/month.

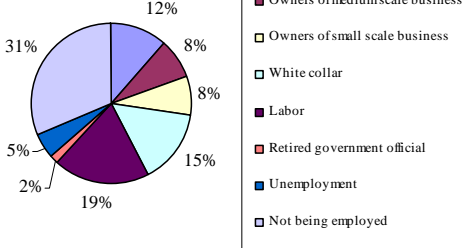
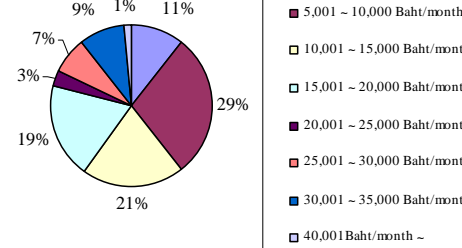
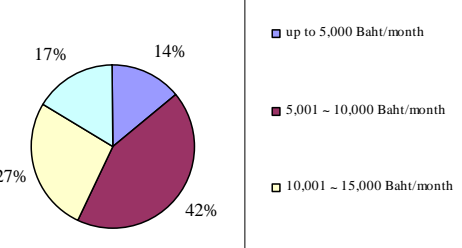
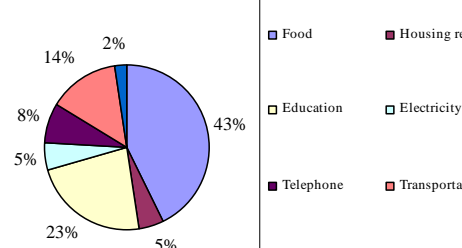
3) *Expenditure*

The average expenditure of the respondents is 10,769.14 baht per month.

4) *Properties and Assets*

Currently 28 % of all households in the pilot project area own cars. Such households generally have a monthly income greater than 18,000 baht.

Table 6.19: Living Standards

Residents by Employment		Residents by Income		
				
Items	Share	Items	Individual Income	Family Income
Employees of government or state enterprise	11,7 %	up to 5,000 Baht/month	31,0 %	10,6 %
Owners of medium scale business	8,1 %	5,001 ~ 10,000 Baht/month	43,4 %	28,8 %
Owners of small scale business	7,7 %	10,001 ~ 15,000 Baht/month	11,7 %	20,7 %
White collar	14,8 %	15,001 ~ 20,000 Baht/month	7,9 %	18,8 %
Labor	19,4 %	20,001 ~ 25,000 Baht/month	1,9 %	3,3 %
Retired government official	1,5 %	25,001 ~ 30,000 Baht/month	2,5 %	7,3 %
Unemployment	5,2 %	30,001 ~ 35,000 Baht/month	0,6 %	9,2 %
Not being employed	31,5 %	40,001 ~ 45,000 Baht/month	0,3 %	1,3 %
Total	100,0 %	45,000 Baht/month ~	0,6 %	
		Total	100,0 %	100 %
Residents by Expenditure		Composition of Expenditure		
				
Items	Share	Items	Expenditure	Share
up to 5,000 Baht/month	14,2 %	Food	4950,0 Baht/month	42,7 %
5,001 ~ 10,000 Baht/month	42,8 %	Housing rent	592,0 Baht/month	5,1 %
10,001 ~ 15,000 Baht/month	26,5 %	Education	2633,0 Baht/month	22,7 %
15,001 Baht/month ~	16,5 %	Electricity	600,0 Baht/month	5,2 %
Total	100,0 %	Telephone	905,0 Baht/month	7,8 %
		Transportation	1628,0 Baht/month	14 %
		Water supply	283,0 Baht/month	2,44 %
		Total	11591,0 Baht/month	100 %
Properties and Assets		Source and Notes		
Items	Share	1) Source: The Social Survey by the Study		
Television	98,5 %	2) Note: Regarding the distribution of residents by income, detailed information of incomes are upon on the following conditions. : 66.0%		
Refrigerator	96,2 %	- Having income with detailed explanation : 2.1%		
Home telephone	88,7 %	- Having income without detailed explanatio : 31.9%		
Washing machine	around one-third	- No income		
Mobile phone	around two-fifth			
Air conditioner	around one-fourth			
Motorcycle	around one-fifth			
Computer	around one-sixth			

Source: Social survey by JICA Study Team

(2) Life Style

The social survey by the Study has confirmed the conditions of building use by residents and demanding for the new housing units. The major findings are itemized below.

- Residents satisfied with the existing facilities are around 40%. They want to improve the housing facilities and the living environment.
- Residents using housing units only for living amount to 72%, while 28% use for work space only and supplement work space.
- Housing units of 31-40 m² are preferred by 28% of the residents, while 21.6% prefer units of 41-50m².
- More than 85% of residents hope the number of floors to be less than 15.
- In 84% of the existing units bedroom(s) are separated from the living room.
- More than 80% of units have unit bath type without tub.
- More than a half of existing units combine a kitchen with a living room.
- Expected units have two or three bedrooms and one or two bathrooms.
- Fifty-seven percent of residents prefer unit bath type and around 80% prefer with tub.
- A kitchen separated from the living room is preferred by 88% of the residents.

Table 6.20: Life Style of the Existing Residents

Satisfaction to Existing Living Environment (%)		Expected Number of Floors (%)																																																					
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Source: Social survey by JICA Study Team

Through the on-site investigation of housing complexes, the Study confirmed the life style of the residents. The major findings are presented in the following table.

Table 6.21: Major Findings of Life Style

	<p>1) Place: Corridor</p> <p>2) Findings: Belongings of the residents are kept in the corridor.</p> <p>3) Consideration: These items obstruct passage for daily use and in emergency for evacuation and rescue. On the other hand, residents can form community awareness which contributes to security.</p>
	<p>1) Place: Housing unit near a corridor</p> <p>2) Findings: Multi-space is used for living room having various items, such as photographs, television, and image of Buddha.</p> <p>3) Consideration: There are many cases where residents live in one multi-room without any partition wall. Long and narrow room prevents sunlight coming to the bottom of the room.</p>
	<p>1) Place: Housing unit near a balcony</p> <p>2) Findings: Upper space at the bottom of the room is utilized for a bedroom. Residents have refrigerator and cupboards.</p> <p>3) Consideration: Ceiling height is more than 3m. It allows residents to set bed spaces near the ceiling. Sunlight from balcony is insufficient. However balcony functions for ventilation.</p>

Table 6.21: Major Findings of Life Style (Continued)

	<p>1) Place: Housing unit</p> <p>2) Findings: A housing unit is refurbished for the shophouse.</p> <p>3) Consideration: Housing facilities should include shops for daily consumer goods.</p> <p>4) Notes According to the social survey, work space by the residents includes;</p> <p>i) Trading 57.8%, ii) Dress making 23.1%, iii) Barber shop 9.9%, iv) Motorcycle repair shop 4.1%, v) Computer shop 2.3%, vi) Laundry 1.2%, vii) Photo shop 1.2%, viii) 0.6%</p>
	<p>1) Place: Exterior wall of a housing facility</p> <p>2) Findings: The corridors and walls are used by residents for plants and drying clothes.</p> <p>3) Consideration: Exterior wall along the corridor allows residents to have a fine view. The residents are accustomed to usage of common space.</p>
	<p>1) Place: Balcony</p> <p>2) Findings: Balcony equipped with dust chute is used for kitchen.</p> <p>3) Consideration: Dust chute has some negative matters for separation of trash and maintenance, though dust chute is a convenient facility for residents.</p> <p>4) Notes: Low rise building less than 5 stories are designed to have water place at the balcony side.</p>

6.5 POSSIBILITY OF RELOCATION

6.5.1 Consensus for the Project among Residents

According to the social survey results, there are about 51% of households not in favour of the project, while 38% are in favor and 11% remain uncertain.

It is assumed that there will be about 49% of residents who have difficulty in finding new shelter. On the other hand, residents other than those on subsistence level income seem to be capable of paying higher rents. From the viewpoint of social justice in the public housing policy, efforts should be taken by NHA to provide for this better-off population group within a reasonable range to maintain a decent citizen life style.

Most of the returning families have two to four members per family. Those represent 66% as tabulated in Table 6.23.

Table 6.22: Community Opinions on Redevelopment

Residents	Case Study Area				Assumption in Din Daeng Community			
	Disagree %	Agree %	Not sure %	Total %	Disagree	Agree	Not sure	Total
Attitude on "non-returning"	170 28%	86 14%	21 4%	282 47%	1,950	990	250	3,190
Relocate	20 3%	22 4%	1 0%	43 7%	230	250	10	490
Moving to other NHA	134 22%	18 3%	2 0%	154 26%	1,540	210	20	1,770
Absentee	0 0%	45 8%	0 0%	45 8%	0	520	0	520
Total	154 26%	85 14%	3 1%	242 40%	1,770	980	30	2,780
Estimated share of "not sure"	(16) 3%	(1) 0%	(18) 3%	(40) 7%	180	10	210	400
Attitude on "returning"	136 23%	144 24%	43 7%	318 53%	1,570	1,650	490	3,710
Returning	124 21%	142 24%	6 1%	272 45%	1,420	1,630	70	3,120
Estimated share of "not sure"	(12) 2%	(2) 0%	(37) 6%	(46) 8%	140	20	420	580
Uncertain Group								
Not Sure	6 1%	3 1%	1 0%	10 2%	70	30	10	110
Not Contacted	0 0%	0 0%	54 9%	54 9%	0	0	620	620
Refuse Interview	22 4%	0 0%	0 0%	22 4%	250	0	0	250
"Not Sure" for participation	28 5%	3 1%	55 9%	86 14%	320	30	630	980
Total	306 51%	230 38%	64 11%	600 100%	3,520	2,640	740	6,895

Source: Social survey by JICA Study Team in July 2001.

Table 6.23: Family Size of Returning Residents

Family Members	Case Study Area				Whole DC Area (estimated)	
	All households		Returnees		"All households"	"Returnee"
One	36	8%	17	6%	520	120
Two	105	22%	56	21%	1,510	760
Three	111	23%	67	25%	1,600	920
Four	102	21%	54	20%	1,470	720
Five	63	13%	38	14%	910	530
Six	33	7%	21	8%	480	290
Seven	14	3%	7	3%	200	80
Eight	9	2%	4	2%	130	50
Nine	5	1%	3	1%	70	30
Ten	1	0%	1	0%	10	10
Total	479	100%	268	100%	6,900	3,510

Source: Social survey by JICA Study Team in June 2001

Basically some of the outgoing residents already possess lands or houses in other places. There are about 20% of the households that belong to this category. Among them, 35% wish to move out to other places.

Table 6.24: Possession of Land/House in Other Areas by Resettlement Plans

Categories of "non-returning" Residents	In-favor group					Disfavor group					Total
	Relocation	Other NHA	Returnee	Not sure	Total	Relocation	Other NHA	Returnee	Not sure	Total	
Land in Bangkok	2	1	0	0	3	2	3	4	0	9	12
Land in other provinces	4	40	7	1	52	8	27	30	1	66	118
House and/or condominium in Bangkok	4	10	1	0	15	1	7	11	0	19	34
House and/or condominium in other provinces	5	33	8	1	47	5	20	21	0	46	93
Total	15	84	16	2	117	16	57	66	1	140	257

Source: Social survey by JICA Study Team in June 2001

Regarding the possession of cars, 28% of the respondents own cars, 7% of the returnees, and 21% of the relocation group.

Table 6.25: Possession of Cars

Category	No. of Residences with Cars by Income							Total	Share	Avg. income
	Up to 5,000	5001-10,000	10,001-15,000	15,001-20,000	20,001-25,000	25,001-30,000	More than 30,000			
Relocation		2		4	2	2	2	12	3%	20,417
Relocation to other NHA	1	9	16	24	4	11	19	84	18%	19,167
"Returnee"	2	5	8	10	1	4	4	34	7%	17,574
Not sure						3	1	4	1%	39,375
Total	3	16	24	38	7	20	26	134	28%	18,470
Total number	51	138	99	90	16	35	42	471	100%	-
Percentage	6%	12%	24%	42%	44%	57%	62%	28%	100%	-

Source: Social survey by JICA Study Team in June 2001

CHAPTER SEVEN:

BASIC POLICIES

ON REDEVELOPMENT MASTER PLANNING

7.1 CONDITIONS AND VIEWPOINTS FOR PLANNING

7.1.1 Requirements by the Cabinet

According to the contents of the approved cabinet paper, NHA needs to carry out further study in order to obtain approval for implementation of the project. Given this, all items pointed out at the cabinet meeting have to be taken into consideration.

7.1.2 Conditions Taken Over from the Existing Master Plan

As the existing master plan has been approved by the cabinet, it is necessary to follow fundamental conditions being employed or proposed in the existing master plan. These are as listed below:

- Objectives of the project set by NHA;
- The project area of 100 ha named Din Daeng Community Area;
- Implementation period of 10 years with a phased construction;
- Exclusion of some NHA housing blocks from the renewal scheme, where shophouses with complicated ownership are located. (Block 1.10, 1.12, 1.13, and 1.14);
- Exclusion of central government buildings from the renewal scheme as the facilities are rather new;
- The land blocks of the first phase will be the same as workshops with residents have been started; and
- The land tenure of Block 2.16 will be exchanged between NHA and BMA by transferring Block 1.7 and 1.8 of NHA to BMA. (This is because scale of buildings for public in Block 2.16 is restricted up to 10,000 m² according to the Ministerial Regulation.)

The following table shows target buildings for redevelopment. Further the buildings in Block 1.9 would be more than 20 years old before the completion of redevelopment. Consequently the number of buildings and housing units for redevelopment are 80 buildings with 6,818 units.

Table 7.1: Target Housing Facilities of NHA

Built Year	Block	Site Area (m ²)	Building Area (m ²)	Floor Area (m ²)	Use of Building	No of Buildings	No. of Units
1963	1.1	3,996	876	1,666	O & PS	3	-
1963	1.5	20,522	9,022	45,000	R	8	640
1964	1.4	29,381	9,184	43,776	R	12	672
1967	1.3	32,597	9,963	43,776	R	12	672
1968	1.2	86,004	35,291	111,354	R	24	1,776
1974	1.6	23,365	5,763	23,336	R	8	384
1975	1.10	17,395	6,273	18,790	R & S	10	664
1975	1.12	7,955	1,902	27,487	R	2	308
1977	1.13	28,396	11,078	89,244	R & S	4	952
1978	1.7	23,579	9,286	45,280	R	4	900
1980	1.8	11,207	4,478	22,640	R	2	450
1980	1.11	31,446	9,733	38,800	R	5	972
1984	1.9	9,427	2,067	15,000	R	2	352
1999	1.14	2,224	2,224	31,130	R & S	1	270
Total of Target Buildings		271,524	95,663	390,628	-	80	6,818
Total of Existing Buildings		327,494	117,140	557,279	-	97	9,012

Note: R = Resident, S = Shops, O= Office, PS= Pawn Shop

7.1.3 Major Items to be Revised from the Existing Master Plan

(1) Identification and Clarification of Functional and Facility Components

1) Identification of Target Population

The existing master plan was formulated to develop housing areas together with commercial and office areas, complying with the creation of polycentric urban structure by maintaining reasonable population density and living environment in Bangkok. However, the existing master plan did not present the target population. The Study therefore will estimate the target population to be reflected to the design of buildings and utilities.

2) Identification of Realistic Development Size

In the existing master plan, approx. 260,000m² commercial floor area is envisioned.

This is equivalent to about 2.5% of the current stock of office space (6,900,000m²) and commercial space (3,400,000m²) in the entire area of BMA, despite currently experiencing non-occupancy rates of 30% and 19% respectively. The Study will examine the appropriate floor areas for commercial and office uses through demand analyses and projection works.

3) Identification of Potential Sector for Participation to the Project

Although it is proposed that the low revenue portion to be cross-subsidized by participation of the private sector, the real estate market is in slump in Bangkok since the currency crisis. The Study therefore will identify potential sector through market survey along with its conditions for participation.

4) Identification of Specific Land Use Components

The existing master plan did not also specify specific components of the future land use, though much attention was paid to environmental improvement by securing large open space through construction of high-rise buildings. The Study will identify specific land use components, through potential analysis on various functions.

5) Clarification of Land Distribution

In the existing master plan, the land use after the project is not clearly presented regarding how the plan would affect the net land areas used by each party. The Study therefore will carefully examine the current land use and formulate a land use plan that will be equitable among the concerned parties.

(2) Optimization of Physical Planning and Design

1) Identification of Viable Grade of Buildings

Housing buildings have mostly been made high rise with smaller building coverage ratio in order to secure large open space for better environment. This however will no doubt entail a higher construction cost. Therefore the Study will examine optimal proportion among low-income housing (for returning residents), and middle to high-income group housing.

2) Identification of Number of Returning Residents

Further study is necessary regarding the returning residents to renewed NHA housing, because there seems to be a number of latent problems associated with this group toward implementation of the renewal of their houses. The Study will find a certain percentage of non-returning residents including those who wish to move to other NHA housing complexes.

3) Housing Design to Match Needs of the Existing Residents

Proposed layout of apartments around aqua-parks and a random arrangement of building would create an interesting cityscape. However as provision of housing has generally targeted low to middle income population, it is necessary to adopt a design concept compatible with their lifestyle, affordable rents, amongst other amenities.

4) Modification of Future Road Network

As a new road has been developed connecting Asok-Din Daeng Road with Si Ayutthaya Road, and an underground road crossing Vibhavadi Rangsit Road has been planned after completion of the existing master plan, the future road network should be reconsidered. The Study therefore will modify the road network along with the traffic load assessment after the project.

5) Appropriate Planning of Infrastructure

As the target population has not been presented, the existing master plan is not securely coordinated with infrastructure and public facilities. The Study will examine the coordination between the target population and these facilities.

(3) Generation of Practical Implementation Plan

1) Formulation of Implementation Plan Minimizing Impacts to Existing Residents

As pointed out by the community leaders in the workshop, it is important to provide job opportunity by involving them in the project. The Study therefore will propose a workable redevelopment plan that is well based on the economical condition of the residents, particularly the low-income group.

2) Generation of Realistic Relocation Plan

In the existing master plan, NHA's housing for returning residents have been laid down in the same places as the original ones. The Study will examine alternative relocation planning for more flexible implementation along with practical temporary relocation planning following proportion of returning and non-returning residents.

3) Contribution to Improvement of Livelihood

A policy must be implemented as a part of the redevelopment to increase household income of the lower-income residents by generating employment opportunity and affording chances of better education. Forty-nine percent of existing residents are currently classified into low-income group and will face difficulty to apply for increased rents after the redevelopment.

7.2 BASIC DIRECTIONS ON DIN DAENG COMMUNITY AREA REDEVELOPMENT

7.2.1 Functional Components

(1) New BMA City Hall and associated Symbolic Space

The new BMA City Hall will become a civic center which will provide administrative service and information for the citizens all over Bangkok. In addition, as the City Hall will undoubtedly be a new cultural center of Bangkok, some high grade public space will be secured with symbolic city scape.

(2) Commercial Facilities

Private sector participation is an indispensable condition to implement the project in NHA's low cost housings. According to the real estate market trend, applicable sector for investment is limited to the large retail industry as discussed in Appendices 3 and 4.

(3) Housing Facilities

Provision of housing units will include the units for low-income households by utilizing existing housing units. New housing units will be provided for those who can afford an increased rent. New housing units will be supplied for middle income households (15,000 baht/month) with four family members.

7.2.2 Development Framework

(1) Demand Forecast

The development potential of the Study Area has been examined to find target population, commercial and office demands in 2010, as discussed in Appendix 2.

1) Population

The population of the Study Area in 2011 is estimated to be 243,500 with a growth rate of 6.3% from 228,900 in 2000. Those numbers are assumed from 1.27 times of the registered population. Applying the same growth rate, residential population in the DC Area is assumed to increase from 30,011 in 2000 to 31,925 in 2011.

2) *Housing Units*

In the existing master plan, the number of housing units is proposed to be 13,542 including 7,212 units as compensation for existing residents and 6,330 units for new residents. The increased number of the units is 4,530 units.

Taking into account the existing vacancy rate of 7.5% in the DC Area and 6.3% of 21 housing projects around the DC Area, the proposed supply of housing units would exceed the demand.

Therefore the Study basically adopts that the number of housing units will be similar to the existing number of units (9,012) including 3,806 units as compensation for the existing residents and about 5,206 units for new residents and existing residents with appropriate income for the increased rent.

3) *Commercial Floor*

Commercial floor demand surplus to the existing stock is estimated 183,000 m² including 156,000 m² for modern commercial facility and 27,000 m² for medium and small scale commercial facility.

The redevelopment plan will target most of the commercial floor demand, as it is difficult to develop large scale commercial facility in other areas in the surrounding area.

4) *Office Floor*

The demand for office space in the Study Area in 2010 is estimated at 405,000m², excluding the existing stock. The project will supply a very large floor area by the construction of the new BMA's City Hall. (193,000 m²)

(2) *Development Framework*

Population of the DC Area in 2011 is estimated at 29,800 persons for residential and 56,200 persons during daytime as presented in table 7.2 below. Apart from those, visitors for Thai-Japan Youth Center is assumed 4,631 persons which is same with the current daily average. Visitors for commercial facilities are estimated at 59,900 persons.

The daytime population will increase by 160% by the year 2011. Assumptions for population estimates are listed below.

- The number of people is based on the quantity of proposed housing units (8,761 units) and an average family member of 3.4 persons/household.
- Increase of employees is due to additional office supply by the new BMA City Hall.
- Increase of students is due to the change of age structure.
- The number of visitors and employees follows the existing figure, where redevelopment will not be implemented.

Table 7.2: Target Population in DC Area in 2011

Categories	Population	
	Existing (2001)	Future (2011)
1. Residents (NHA Housing)	30,011 persons	29,800 persons (29,789)
2. Daytime Population	32,279 persons	56,200 persons (56,187)
2.1 Employees	25,325 employees	50,900 employees (50,857)
NHA	748 employees	14,366 employees
BMA	20,656 employees	35,484 employees
MOL	3,013 employees	99 employees
MOE	163 employees	163 employees
MOPH	511 employees	511 employees
OPM	224 employees	224 employees
Other	10 employees	10 employees
2.2 Students	6,954 students	5,900 students (5,896)
BMA	4,508 students	5,396 students
MOE	2,446 students	500 students
3. Visitors	4,631 persons (daily average)	59,900 persons (59,831)
Thai Youth Center	4,631 persons (daily average)	4,631 persons (daily average)
Customers to commercial	-	55,200 persons (daily average)

Note: The number of NHA employees means the assumed number of staffs for commercial area.

Regarding the age structure, there is no significant change as shown in Table 7.3

Table 7.3: Age Structure in DC Area in 2011

Age	2001				2011			
	Male	Female	Total		Male	Female	Total	
Up to 14	2,000	2,300	4,300	14.6 %	2,300	2,400	4,700	15.7 %
15 - 59	9,600	11,700	21,300	72.4 %	9,800	11,600	21,400	71.6 %
Over 60	1,600	2,200	3,800	12.9 %	1,400	2,400	3,800	12.7 %
Total	13,200	16,200	29,400	100.0 %	13,500	16,400	29,900	100.0 %

7.2.3 Physical Development Policies

For physical development planning the following policies are employed.

(1) Offering Super Block for Private Sector Participation

The most probable investor is believed to be the retail sector such as shopping centers, hotels and serviced apartments.

As per conditions for their participation, it is necessary to provide a super block as large as 40 rai (6.4 ha) as disclosed through the interviews to real estate developers and large scale retailers. (See Appendix-4)

(2) Provision of Livable Housing for Low Income Group

It is proposed to prepare (not construct but refurbish existing building) housing to accommodate low income returnees, where they can stay for the same house rent for a period of 10 to 15 years as a transitional measure. These houses will be renewed after the commercial development has been completed.

(3) Separation of Land Use between Commercial and Residential Purposes

A land use plan will be worked out based on existing land blocks and land users. However, it is recommended to separate residential zones from commercial/business zones. Within the residential zone, it is also recommended to separate houses for low income households from those for new residents, because of difference in income and life style.

(4) Improving Efficiency of Land Use

It is proposed to carry out a certain land reallocation in order to raise land use efficiency. At the same time necessary space for important public facilities such as a bus terminal and a square for local community rejuvenation center are created by equitable sacrifice of existing users.

(5) Improvement of Transport Function

Access from outside, particularly from Vibhavadi Rangsit and SRT's Makkasan yard will be improved, and provision of a bus terminal, pedestrian walkways, public car parks, and feeder access to various facilities will be strengthened.

(6) Provision of Car Park for Housing

Though concerned regulations on the requirements of car parking will determine the required number of car parks, car ownership rate of the returning households is

merely 7%. It is about 15% among the households earning less than 15,000 baht/month. As a result, the excess of car parks will be utilized for public purposes, such as visitors for commercial facility.

(7) Creating Opportunities for Livelihood Improvement of Low Income Group

Provision of a local community rejuvenation center is proposed to this effect. In this place, people will participate in suitable vocational training, and production, and run street stalls for local communities.

7.3 ALTERNATIVE REDEVELOPMENT PLANS

7.3.1 General

Following the basic directions discussed in the previous section, the Study has worked out three alternative ideas for future land use associated with building layout planning. Alternatives A, B, and C are presented in the proceeding pages. Basic characteristics of these alternatives are as follows:

Alternative A has made the apartment houses which are mostly for returning households with medium height (10, 14-15 storeys) buildings to minimize the maintenance cost after completion and to comply with generally accepted building height among majority of these returnees.

Alternative B attempted to raise the height of apartment buildings (over 20 storeys) aiming at raising the land use intensity (FAR) to accommodate not only new residents but also the returnees.

Alternative C attempted to re-consolidate the plots of land, a residential zone can be put along Pracha Songkhro Road which is separated from business/commercial zone along Vibhavadi Rangsit road with relocated Thai-Japan Youth Center in between.

There is basically no difference between Alternative A and B as far as land use and building layout are concerned except that height of buildings are different in NHA's portion.

Outlines of the alternatives are presented in the following tables.

Table 7.4: Outline of the Alternative A

Items	Outlines
General Structure	1) Main roads have been enlarged to accommodate passing-by traffic through the Area. 2) In laying down land use, large-scale commercial zone was put on the West Side of Pracha Songkhro road aiming at forming a commercial core in the surrounding blocks. 3) In an effort not to invite external traffic passing through the Area, a bus terminal will be planned and when realized a station on Orange Line of MRTA is expected to play a very important role. 4) This plan is also expected to reduce traffic volume of vehicles from here to the central part of the city.
Zone Description	<p>Zone A: This zone is provided mostly for houses to accommodate returning residents. Part of the lower floors of the building will have a commercial facility. Southern half of this zone will be developed in the Case Study Plan.</p> <p>Zone B: This zone is designated as a large-scale commercial zone aiming at developing new type of shopping place.</p> <p>Zone B': This is to be redeveloped immediately in the Case Study Plan. Apartment houses here are constructed mostly to accommodate returning residents. The households here will generally be of middle income returnees.</p> <p>Zone C: This zone is provided mostly for houses to accommodate returning residents. Part of the lower floors of the building will have a commercial facility. Southern half of this zone will be developed in the Case Study Plan.</p> <p>Zone D: This zone accommodates mostly new residents. Southern end of the zone facing the road intersection will be public greenery space.</p> <p>Zone E & F: In these zones, existing housing will be maintained for some time to come until the last stage of redevelopment. The houses will be utilized to accommodate low-income households that can not afford new house rent. Redevelopment will have to be timed with improvement of livelihood of these households.</p> <p>Zone G: An existing school and indoor gymnasium in Zone G will be relocated (rebuilt) in this zone, refer to be necessary due to a proposed new bus terminal. This zone can be characterized as buffer as well as fusion zone with such large scale facilities as the new city hall of BMA and the shopping center in Zone B along with Thai-Japan Youth Center and the bus terminal.</p>

Land Use Plan

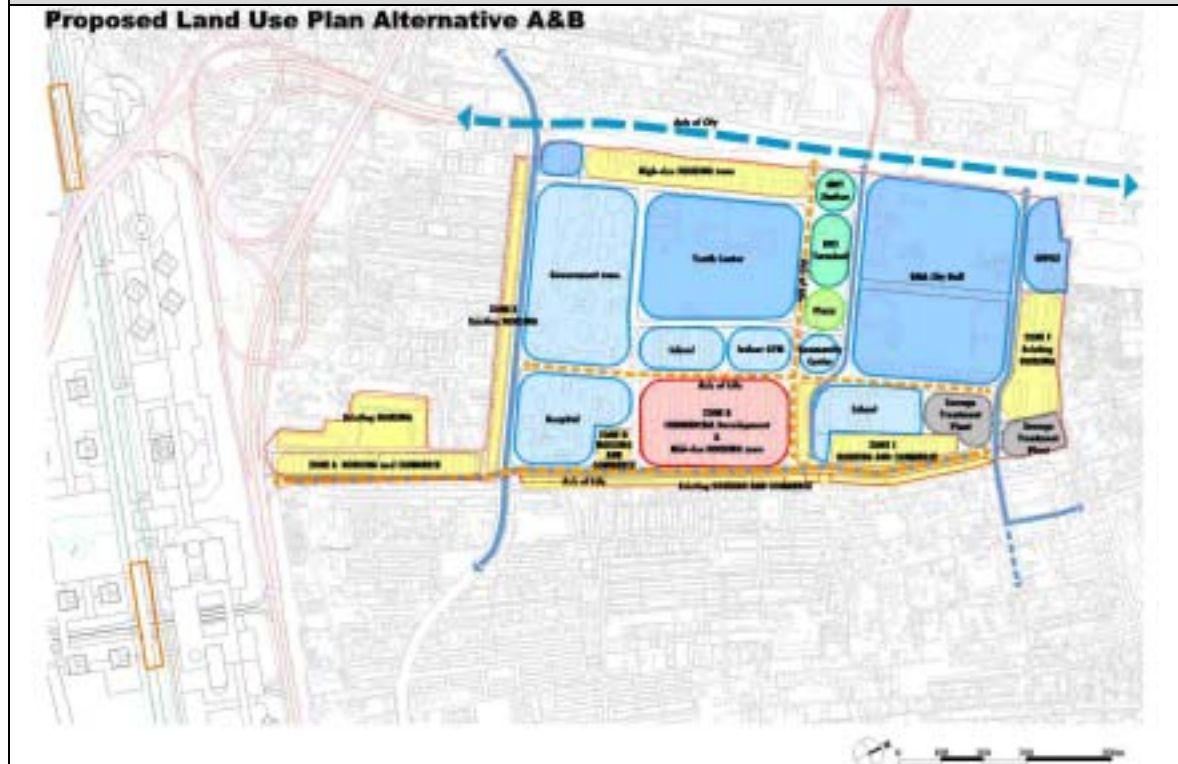


Table 7.5: Outline of the Alternative B

Items	Outlines
General Structure	1) Blocks of lands have followed the existing configuration and land use layout is the same as Alternative A. 2) Housing for returning residents has been made high rise building increasing the number of housing units of NHA.
Zone Description	<p>Zone A: Apartments here are mostly for returning residents, however, the building feature has been made tower-like building as opposed to plate-like building in Alternative A in order to produce more housing units and at the same time to avoid barrier wall like impression. This part is to be redeveloped in the Case Study Plan.</p> <p>Zone B: The same as Alternative A</p> <p>Zone B': The same as Alternative A</p> <p>Zone C: Number of housing units for returning residents will be increased owing to larger heights of buildings. This part is to be redeveloped in the Case Study Plan the same as Alternative A.</p> <p>Zone D: The same as Alternative A</p> <p>Zone E: The same as Alternative A</p> <p>Zone F: The same as Alternative A</p> <p>Zone G: The same as Alternative A</p>

Proposed Land Use Plan Alternative B

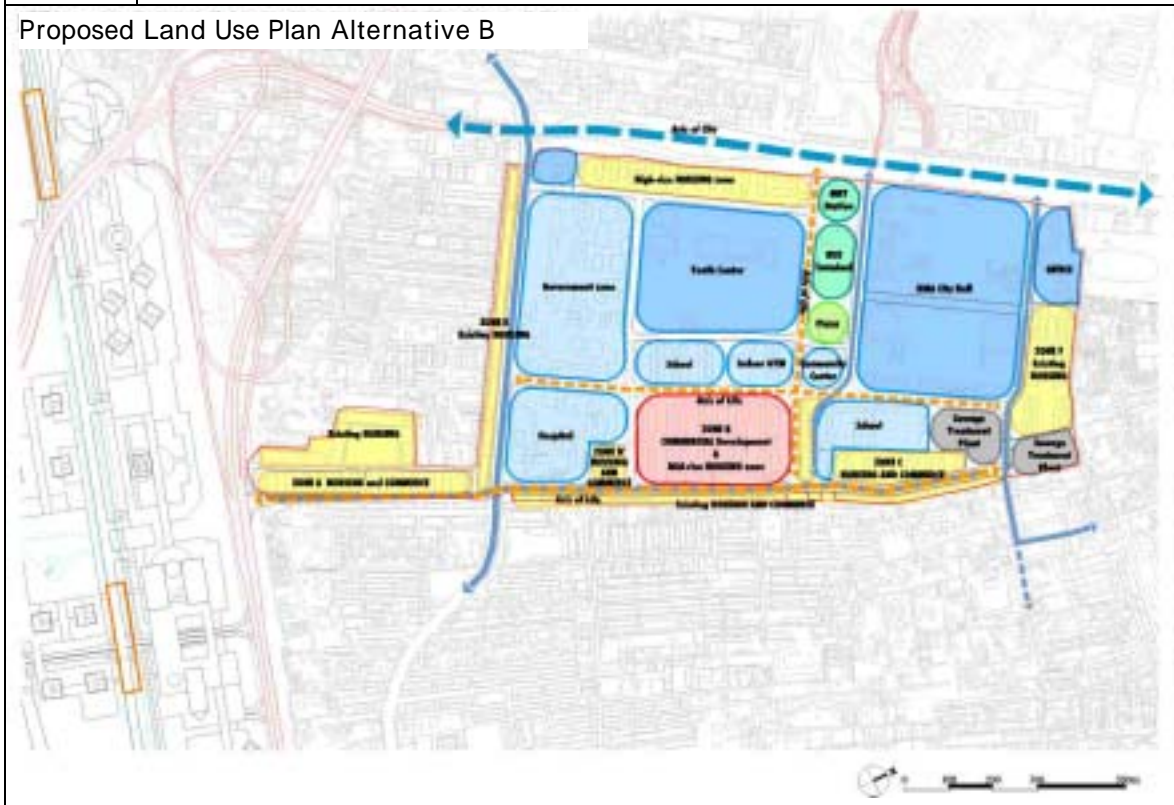
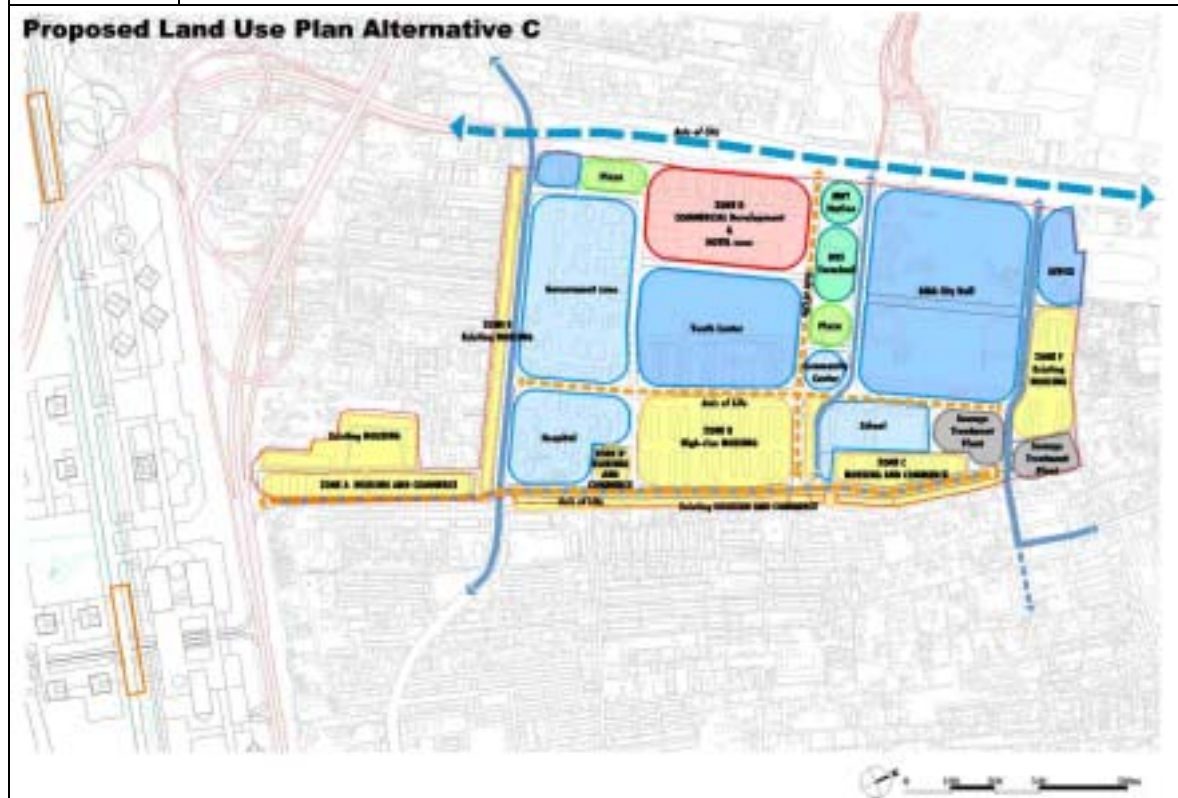


Table 7.6: Outline of the Alternative C

Items	Outlines
General Structure	<p>1) This alternative proposes to develop more systematic and efficient land use. Since it contains a super block for commercial facility on the west, it becomes necessary to shift the existing location of Thai-Japan Youth Center eastward.</p> <p>2) Development of housing zones has been set at a moderate level, the same as Alternative A.</p> <p>3) Efforts have been made to prevent ingress of passing-by traffic from outside by introducing a MRTA station and a bus terminal. It is also intended to reduce the traffic volume of ordinary cars going into the city center from here by intra-modal exchange convenience of MRTA.</p>
Zone Description	<p>Zone A: The same as Alternative A</p> <p>Zone B: This zone is allocated mostly for housing for new residents. Along Pracha Songkhro road housing will be made tower-like.</p> <p>Zone B': The same as Alternative A.</p> <p>Zone C: The same as Alternative A.</p> <p>Zone D: This will be a commercial oriented zone where a large scale shopping center complex, like a town center, will be introduced.</p> <p>A hotel or serviced apartment will also be considered. Influence to the residential zones from here will be shut out by Thai-Japan Youth Center.</p> <p>Zone E & F: The same as Alternative A.</p> <p>Thai-Japan Youth Center:</p> <p>By providing the large scale of super-blocks along Vibhavadi Rangsit road, it will become necessary to shift the location of Thai-Japan Youth Center. The Center is expected to function as a buffer space between the proposed high-rise buildings on both sides (Vibhavadi and Pracha Songkhro).</p>



7.3.2 Evaluation of Alternatives

An evaluation was made on the alternatives and Alternative A was selected as the most suitable plan. The process of evaluation is summarized in the following table.

Table 7.7: Comparison of the Alternatives

	Alternative-A	Alternative-B	Alternative-C	
Supply of residences	++	+++	++	<ul style="list-style-type: none"> Number of supplied residential units are much the same as the existing ones in Alternatives A and C. Alternative B enhances number of residential units and floor area. From supply point of view, Alternative B excels.
Number of residential units (Plan/current)	97%	120%	103%	
Floor area of residence (Plan/current)	108%	148%	118%	
Grade of residence	+++	+++	++	<ul style="list-style-type: none"> Current composite floor area is about 60m². All Alternatives afford larger floor space.
Residential floor incl. common space	67m ²	73 m ²	68 m ²	
Level of public/welfare facility	+++	+++	+	<ul style="list-style-type: none"> Land area for public/welfare facility is smaller in Alternative C due to larger allocation of land to commercial establishment. Another issue is that land for school relocation becomes unavailable due to relocation of Thai-Japan Youth Center. Alternatives A and B succeeded in enlarging land for public/welfare facility.
Floor of public/welfare facility	242,800	242,800	213,900	
Land for public service facility (day care center, community rejuvenation center)	9,800 m ²	9,800 m ²	9,800 m ²	
School	111,400 m ²	111,400 m ²	91,400 m ²	
Hospital	51,200	51,200	49,100	
Park (park, community rejuvenation center square)	45,300 m ²	45,300 m ²	37,900 m ²	
Bus terminal	25,000 m ²	25,000 m ²	25,000 m ²	
Operation/maintenance of residence	++	+	++	
Land use intensity	++	+++	++	
F A R	220%	247%	225%	
Adequacy of land use arrangement	++	++	+++	<ul style="list-style-type: none"> Alternative C is excellent from the view point of land use arrangement plan, where commercial and residential zones are clearly separated, the former on Vibhavadi Rangsit road side and the latter on Pracha Songkhro road side. Moreover, conflict with small/medium commercial business along Pracha Songkhro road can be avoided.
Compatibility with the city plan	++	+	+	<ul style="list-style-type: none"> Alternative B may cause larger traffic volume increase (trip generation) due to higher population density. Alternative C may cause concentration of traffic on Vibhavadi Rangsit road.

	Alternative-A	Alternative-B	Alternative-C	
Possibility of private sector participation	++	++	+++	<ul style="list-style-type: none"> • All Alternatives secured land for commercial development in adequate scale for participation of private sector. They also succeeded in separating NHA residential complexes from the commercial area. • Alternative C complies best with private sector's desire for locating commercial establishment, as it prefers Vibhavadi Rangsit to Pracha Songkhro. • Alternative C stands better chance for private sector participation.
Consensus forming for development undertaking	+++	++	+	<ul style="list-style-type: none"> • Consensus forming in Alternative C will be difficult on account of relocation of Thai-Japan Youth Center. • Alternative B may encounter certain resistance from the current residents who are not accustomed to high-rise residences (over 20 storeys). • Consensus forming in Alternatives B and C will also be difficult from view point of city plan on account of increase of population density or traffic (trip generation) on Vibhavadi Rangsit road by commercial establishment.
Overall evaluation	+++	++	+	<ul style="list-style-type: none"> • Alternative A is judged to be the best from various angles. • Difference between Alternative A and B lies merely in the number of supplied residential units. • Alternative C is the best for private sector participation and from view point of efficient land use plan, however, it has a crucial problem of relocating Thai-Japan Youth Center. • Consequently, it is recommended to select Alternative A as the principal idea and make adequate adjustment in number of supplied residences according to the actual number of returning residents and demand for new comers, between Alternative A and B. • It should be born in mind that it is an essential condition to secure a good access to commercial establishment on Pracha Songkhro side from Vibhavadi Rangsit road for participation of private sector.

Remarks: +++: Excellent
++: Good
+: Fair