However, it seems to work as a tentative measure in the development of a replotting method in Thailand. In this regard, the replotting design was examined and the evaluation replotting calculation method was accomplished for this study.

2.2.2 Land Area of Replot (Evaluation replotting calculation method)

The basic concept of this method is that total development profits for the project are to be distributed equally to all individual lots in the project area. For this to occur, the property values of individual lots are designed to increase in proportion to the increase of total land value for the project area.

As shown in the **Figure 4.3**, due to the land contribution (d - contribution ratio), the land area is to be reduced at (1-d) while unit land value is to increase at y (= e_o/a_o). Consequently, the total land value of the project area is to increase at y = (1-d)xy. Here "y" is the land utility increase ratio and "α" is the proportional coefficient. α is used because the value of the individual lots are supposed to proportionally increase at the rate of α.

The total land value of lot (Aiai) before the replotting is to be multiplied by α to estimate the total land value of lot (Eiei) after the replotting (Eiei = Aiai x α)

Consequently, the land area of replot (Ei) is calculated as follows:

$$Ei = \frac{Aiai \times (1-d)y}{ei}$$

In order to design the replot utilizing this formula, the land evaluation system (Estimation of the value indices of ai ei for instance) and the replotting design system (Layout of replot in use of the calculated indices), must be established as follows.

2.3 Land Evaluation System

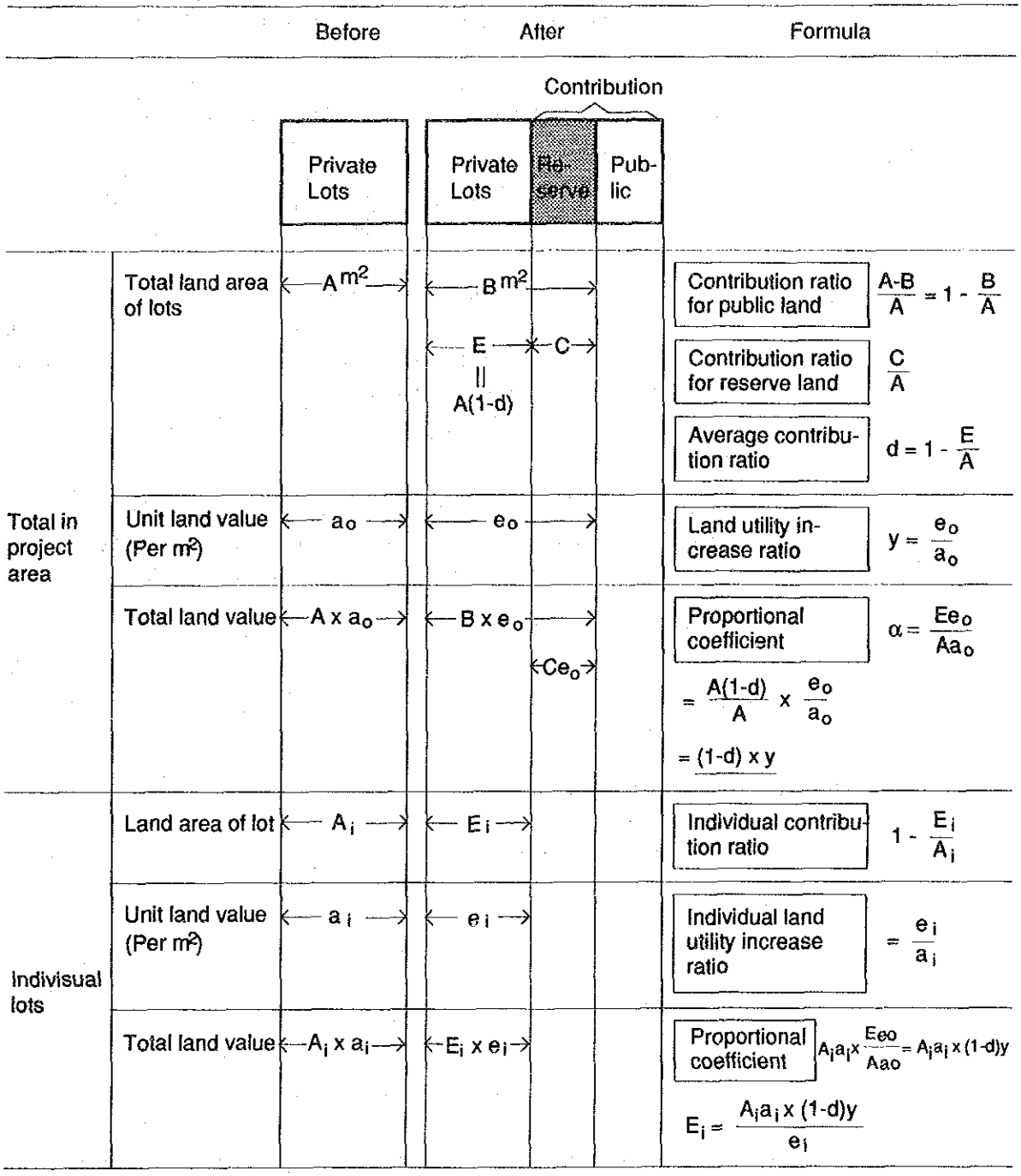
2.3.1 Current Land Evaluation in Thailand

There are two (2) land evaluation methods institutionalized in Thailand.

(1) Asset valuation of the Ministry of Interior.

This asset valuation is utilized primarily for the purpose of calculating taxes and administrative fees. Techniqually it consists of the three (3) approaches, the income, cost, and market approaches. It is reported that of the three methods, the market approach is most appropriate in Thailand.

Figure 4.3-Evaluation Replotting Calculation Method



(2) Land Evaluation of Land Office

This is used for the purpose of calculating administrative fees in the Land Office, including fees for land registration, et cetera. Taking into consideration the data on land transactions for the past three years, and other information affecting land values, lands are to be evaluated in comparison to market prices.

2.3.2 Specific Characteristics of L\R Land Evaluation

The following two (2) specific characteristics must be emphasized in determining a land evaluation system for an L/R project.

(1) Estimation of land values at different points in time (before and after the project).

While the existing land valuation methods outlined above are limited to the valuation of land values in the present, land values at two (2) points in time (before and after the project) must be estimated in an L/R replotting system.

The existing valuation methods feature comparisons to market prices. If applied to the L/R, it is necessary to predict future market prices after the project completion. However, it is very difficult to predict future market prices because this involves many complex factors, some of which are unobserved and thus, unpredictable.

(2) Measuring the development effects.

It must be stressed that land valuation in an L/R is not for estimating the land prices or values, but for measuring the development effects across the individual lots, principally, utility increases in proportion to which the contributions of each lot are fairly determined.

Accordingly an L/R land evaluation trys to measure the land value increase attributable just to the L/R project implementation, and not to estimates of land prices or values affected by the social factors over time.

2.3.3 Street Value Evaluation Method

In consideration of the special characteristics of an L/R evaluation, the street value method was proposed (**Figure 4.4**)

The advantages of this method are summarized as follows:

1) Capable of evaluating a large number of lots and rights in a relatively short period, and with an equitable balance among the lots.

2) Possible bias from evaluators can be excluded from the evaluation.

3) Land evaluation at two (2) points in time with considerable time differences before and after the project, can be made at a single point in time.

4) Likely to convince landowners with less difficulty.

The land evaluation formula with the parameters of degrees for public facility and environment improvement in/around the lands established for the purpose of evaluation in an L/R, is to measure the increase of land utility exclusively attributed to land improvements.

(1) Index number

Land value (especially land utility value) is to be measured by an index rather than in monetary terms. The major reasons are:

1) In order to design the replot, more specifically calculate the land area of a replot, the indicators of relative value of lands between, before, and after the project and between lands (ex. land utility increase ratio and proportional coefficient as shown in the preceding section), must be calculated excluding the necessity of estimation of the absolute value of land in monetary terms.

   The value indicators are to be converted into monetary terms only when the equity payment is calculated after the completion of the construction works.

2) If indicated in monetary terms, land valuations vary depending upon the industrial/economic fluctuation of the society, it becomes difficult to objectively measure the development effects for the individual lots through the L/R project.

(2) External and Internal conditions

It is generally believed that land values (utility value) are affected by both external conditions (locational conditions) and internal conditions.

In other words, land values tend to increase in response to the improved conditions based on the L/R project.

The locational characteristics of lands are evaluated and the measured value is termed the "street value", which is aligned along the road network. The street value represents the locational value which the lands along the street commonly denote.

The internal conditions (for instance shape of land) are to be evaluated to adjust the street value "pursuant" to the individual conditions of the lots.

The street value is supposed to be the locational value of the standard lot which is hypothetically located facing a street.

Then individual lot values are measured through adjustment of street values taking into consideration the differences between the standard lot, and the actual lot based on the physical land conditions.

(3) Street value

The locational conditions under the following three (3) categories are to be evaluated.

Figure 4.4-Street Value Evaluation Method

Unit Land Value = (Street Value) X (Lot Evaluation Factors)
(Index per m^2)

↓

STREET VALUE=(Street coefficient)+(accessibility coefficient)+(land coefficient)

• Street coefficient $=t \cdot F(w)+\sum \times$				applied index
	t	:	Land value index attributable to the condition of front street	0.5~4.0
	F(w)	:	Adjusting *t* with street width	$F(w)=\frac{w}{w+c}$
	X	:	Value index of street improvement (Inclusive of canal 0.2~2.0)	-0.2~2.0
• Accessibility coefficient $=\Sigma m \cdot F(s)$				
	m	:	Value index of benefit/los of public facilities	0.3~1,5
	F(s)	:	Adjusting m with the distance from the public facilities	$(\frac{S-s}{S})^n$
• Land coefficient $=U \cdot F(P \cdot Q)+\Sigma Y$				
	U	:	Value index of regional conditions	1.0~3.0
	F(P·Q)	:	Adjusting U with level of public facility improvement	
			$=1+\sqrt{P/Po \times Q/Qo}$	
			Po: Standard Public land ratio	20~30
			P : Actual public land ratio	
			Qo: Standard street density	200~300 m/ha
			Q : Actual street density	
	Y	:	Value index of drainage, water Supply and natural conditions	0.1~-0.5 -0.1~ 0.2

⇩

INDIVIDUAL LOT VALUE = (Calculation Formula by Type) x (Adjustment Coefficient)

• Calculation Formula by Lot type

1. Normal Lots
2. Corner Lots
3. Dual Frontage Lots
4. Unaccesible Lots

←

• Adjustment coefficient

1. Depth coefficient	Depend on Depth
2. Cul-de sac -	0.90~0.95
3. Unaccesible -	0.80~0.90
4. Low level -	0.90~0.95
5. Land use limitation-	0.90~1.1
6. Private road -0.1~0.5	

1) It is empirically known, and also true in Thailand, that the grade and conditions of frontage roads are the most influential locational conditions (or factors) determining land values of lots.

As shown in the street coefficient formula in **Figure 4.4**.

The evaluation of the street is a combination of the functional values which vary depending upon the grades of streets (arterial road, access road, and so on), and the physical or spatial value of the street which is dependent upon the condition of the streets (side walks, paved, etc.) The functional value also should be adjusted with the width of the right of way and locational conditions such as those in commercial/residential areas.

In this manner, lots are to be valued based on the front street. The measured value is to be expressed in an index number for the "street coefficient", which is formalized as shown in **Figure 4.4.**

2) Secondly, influential locational conditions (factors) are the availability of, and accessibility to, public facilities around the lots.

It is natural that the land value is highly appraised if the lot is placed under the service area of the public facilities (transportation systems, markets, educational facilities, parks, etc.) And also, it is true that values decrease if the lot is located under adverse influences of public facilities (noise, air pollution, bad odors from public facilities, solid waste disposal, power plant, etc.)

The value accrued from such public facilities as stated above, whether favorable or unfavorable, is measured by the index number, "Accessibility coefficient", which is formulized as shown in **Figure 4.4.**

3) When land value is determined, great attention is paid to the evaluation of the area where the lot is located as a whole.

The value of the area is estimated through the valuation of the social, physical and natural environment and is represented by such indicators as those of the public land ratio, road density, infrastructure improvement, natural conditions, and others.

The value accrued from the environment is to be measured in the index number of the "Land Coefficient", which is formularized as shown in **Figure 4.4.**

(4) Individual lot evaluations

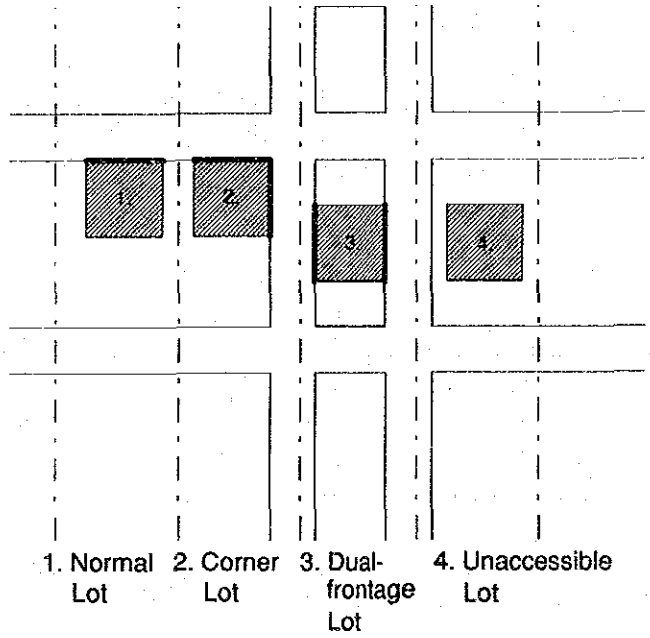
As described above, street values are indicators of land values for standard lots facing the street. Therefore, the land value of actual lots is to be calculated by adjusting for the street value in accordance with the differences between the standard lot and the actual lot based on the following physical conditions.

1) Variation of locational relation to the street

It is understandable that land utility and the utility value of lots with the same area and shape vary dependent upon locational relations to the street, and are classified into 4 types (refer to **Figure 4.5**).

Lot value calculation methods must be applied according to the type of lot and in relation to the street due to significant differences in land utilization.

Figure 4.5-Types of lot in locational relation to street.



2) Variation of shape and other physical conditions.

It is apparent that efficiencies of land use of lots are likely to differ in accordance with the shape, depth, and length of frontage and levels of ground. It suggest that the differences of the actual lots in shape and other physical conditions as compared to standard lots must be taken into account in the evaluation of the individual lots.

3) Land use limitation

It is reasonable that land utility value must be discounted where the lots are in special locations and limited land use prevails (private road, site for high voltage electric line and so on.)

Considering the individual lot conditions as discussed, the land value of lots can be measured as follows.

a. All the lands and lots are to be classified into the type of lot in locational relation to street.

b. Adjusting calculation formulas[1] by type of lot are to be established.

c. Coefficients[2] adjusting the street value in accordance with the difference between the standard and actual lot in the shape, other physical conditions, and land use limitations must be properly established. The above mentioned formulas with the coefficients set above are to provide accurate individual lot evaluation.

(5) Index and coefficient

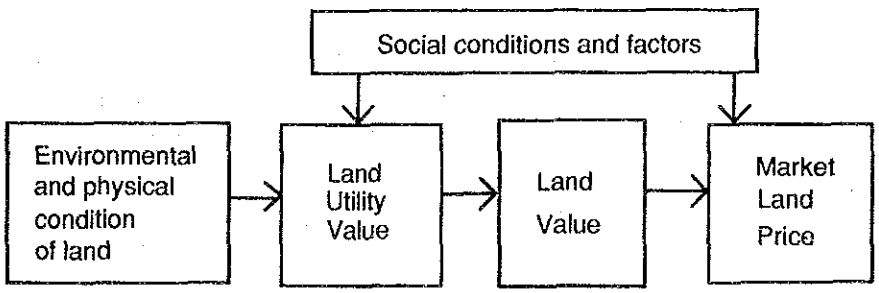
With the calculation of street values and individual lots proposed in the preceding sections, the numerical value of an index and coefficient suitable to the Thai system must be practically established. It is believed that all the factors employed in the formulas have more or less influenced land values in Thailand.

The extent of influence exerted on land values by each factor is represented by the indices and coefficients.

1) Social conditions and factors in the land value mechanism.

Land value is generally determined through social mechanisms observed in the land market. **(Figure 4.6)**

Figure 4.6-Land Value Mechanizm



In principle, the environmental and physical conditions (all the factors for the evaluation) are determinants of land utility value, which in turn reflect land values. Thus, land values become the basis for market prices.

The social conditions and related factors effect the land utility value and market price as follows.

1 Calculation formulas for normal lot, corner lot, dual frontage lot, and unaccessible lot

2 Coefficients for adjustment by depth, of Cul-de-Sac, unaccessible, low level, land use limitation, and private road.

<Utility value>

The following special consideration must be made for evaluating the utility value of land in Thailand

a. Regulation

In Thailand, large scale buildings can be located along the arterial road as well as the narrow access roads called Soi. This suggests that there is not any difference in the volume of space which can be utilized. In this respect it may be said that there is not a difference in land utility value between the lands along the arterial and access roads.

In such countries as Japan, there are land use regulations and building controls which tend to permit larger buildings and more intensive land use to locate along arterial roads than low grade roads such as access roads. Due to these regulations, land utility value is likely to be costlier along arterial roads than access roads. For this reason, such physical condition as the grade of a road appears to be an influential determinant of land value.

In Thailand, land use is an elusive factor for determining land values. This has occurred principally because effective land use regulations are not established. For example, Bangkok's general plan for commercial land use allows such development in residential areas.

Thus, effective land use regulations and building control limits appear to be a basic factor for regulating land utilization values and land prices.

In spite of the absence of effective land use regulations in Thailand, land use factors were proposed for inclusion in land value calculations as discussed before. Primarily because the land use plan proposed in the project area was established so that development potentials are well represented.

b. Value consciousness

It can be stated that land values are a reflection of social and economic behaviour and are observed in land utility values, and environmental /physical improvements.

It is apparent that large scale buildings such as hotels, offices, and others located along narrow access roads (Soi), lack convenience and promote dysfunctional transportation characteristics. However, these problems appear unable to deter developers from locating along narrow roads. This may indicate that the improvement of transportation services for lots does not effect land utility values the same in Thailand as in Japan.

It is also considered that environmental improvements in the area do not increase the utility value the same in Thailand as in Japan regarding urbanization patterns where large expensive residential compounds are isolated in environmentally deteriorating developed areas.

However, it is predicted that land utility values will generally reflect environmental improvements in accordance with increased resident awareness about the environmental value of developed areas.

In conclusion, the land value mechanism is elusive without effective land use and building controls which regulate land utility values and established, social awareness of land values.

<Market land price>

It has been observed that market land prices are likely to fluctuate dependent upon the demand and supply conditions in the market, economic boom/recession, land speculation, et cetera. The upward movement of land prices due to the construction/speculation boom of the late 1980's remains in the minds of people aware of that period.

Land prices should reflect individual land transactions (buying/selling) because the real estate market is not well established in Thailand.

2) Land value based on Utility Value

It appears difficult to convince landowners of land evaluation taking into account the above mentioned conditions. It is more so at the initial stage of an L/R project's implementation. Also, it is difficult for landowners to be conscious of the utility value and land value of their land after the L/R project implementation since they have not experienced the comfort and convenience provided after a project.

Accordingly, the following measures will be preconditions for establishing a land evaluation method agreed upon among the landowners for the successful implementation of the L/R project.

a. To inform the land owners that an L/R land evaluation is not necessary to present the actual market prices, more importantly the increase of utility value, in proportion to which their costs (contribution) are to be determined.

b. To increase peoples' consciousness of environmental values which form the basis of land utility values.

Based on the above-mentioned discussions the basic policies for assigning weighted and establish indices and coefficients are set forth as follows.

a. The indices and coefficients are established to measure the land utility values indicating the value of services of the lots.

However, it must be noted that the measured value should not significantly deviate from official and market land prices.

b. Attention must be paid to the other aspect of an L/R land evaluation system, which is, at the same time, to determine cost sharing (contribution) and hence the land area of the replot.

Therefore, the indices and coefficients must be carefully established in consideration of contributions of each lot which are socially believed to be reasonable. (The extremely high contributions on specific lots and unequal contributions among the land owners should be halted).

2.4 Replotting Designing System

The tools for replotting designs such as replotting area calculation method, and the L/R land evaluation method, have been set forth as shown in the preceding sections. The next step is to exercise the replotting design and mak use of the tools.

The major components of a replotting design are to calculate the land area of the replot worthy of the calculated total amount of land value to be allotted to the replot and to design the replot with the calculated land area of the maps. As shown in Figure, the calculation of area and designing reciprocally proceed in the feed back process between the two (First, the replot area is to be calculated and with the calculated area the replot is designed.) The replot area is to be revised based on the replotting design and this is to be repeated until there are not any gaps between the two.

(1) Final decision for a replotting base and frame work

Before beginning the replotting design, the base and framework for it, including the existing status of land use, public facilities, cadastrial maps, etc., before the project and the L/R plan (land use, public facilities, and the like) and block plan after the project, must be decided upon.

Special considerations are given to the following points.

- Total cost of the project in terms of total contributions with the average contribution ratio of "d" is fixed in the implementation plan. This is one of the preconditions for replotting. It implies that the replotting is to determine the fair share of the total costs among the original lands or the landowners. In other words, it is to distribute the remaining lands other than the contribution lands to the landowners.

- The replots are block designed formed by the road network fixed in the implementation plan. The block plan is also one of the preconditions for the replotting design.

To start replotting, the usual procedure is to make an "over-lay map", where the block plan is over laid on the cadastrial map to indicate the locational relations between the original lots and blocks.

(2) Land evaluation

Land values in index number before and after the project are shown in Figure - and must be measured by because the replot area is to be delivered in proportion to the increase of the land values before and after the replot design.

While the unit replot value "e*i*", replot area "E*i*", and replot value "E*ie**i*" are to be calculated in the course of the replotting design, the remaining indices (Ai ai) and block indices "eo" and others, are to be obtained before the replot.

1) Major indices before the project.

Street value, unit value, total value, and area of the original lots are listed.

2) Major indices after the replot

a. Street values after the project

Street value are to be calculated on the L/R and the road network plans in the implementation plan.

The street values set become the basis for all land evaluations and the replotting design follows.

b. Block evaluation after the project.

Block evaluation is one of the technical devices of the replotting exercises.

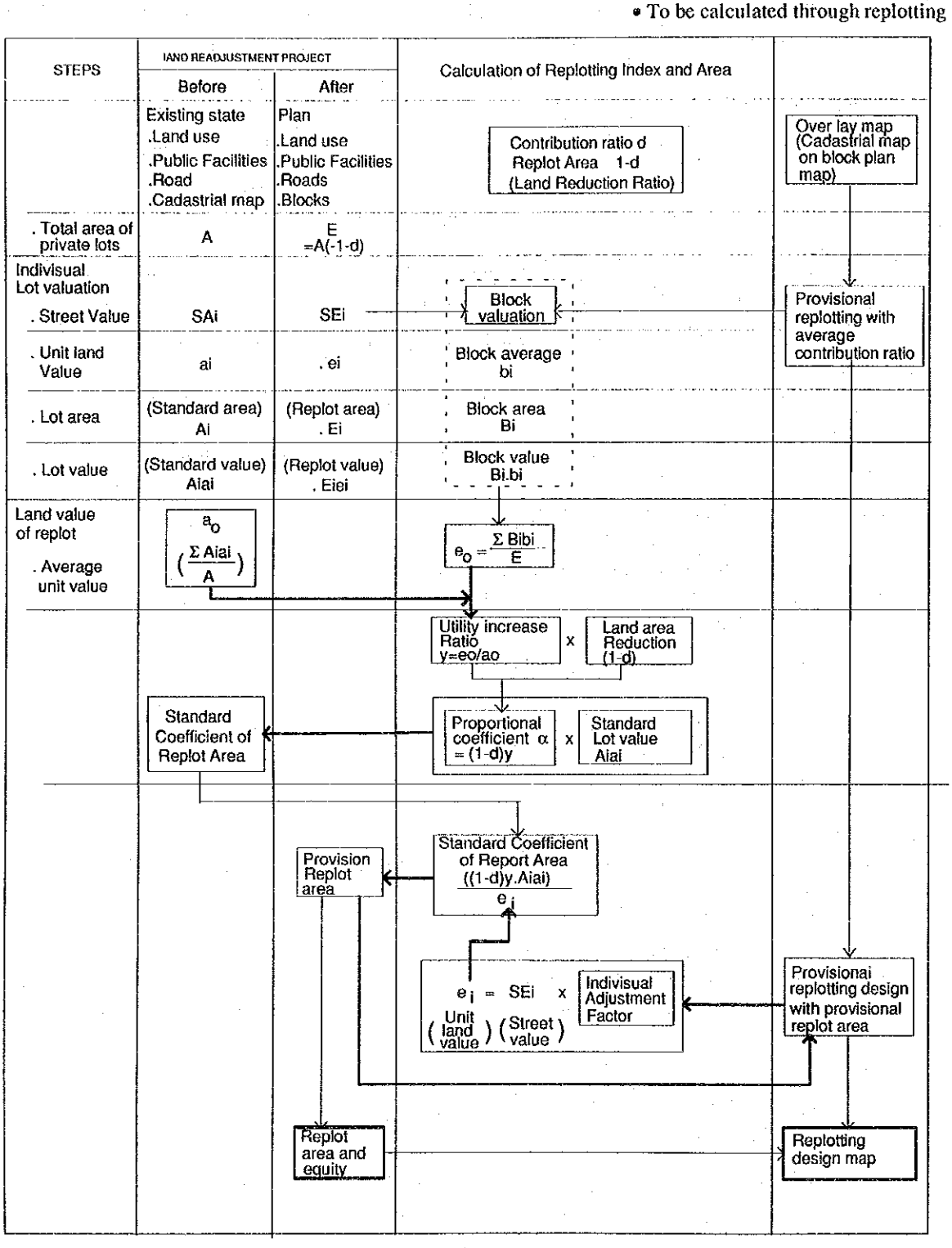
With the street values calculated above "SEi" applied, the total land value "Bibi" within the block can be calculated so that an average unit value of the project area after the project "eo" are measured as shown in **Figure 4.7**.

With the calculated eo applied, the utility increase ratio "y=e*o*/a*o*" can be established.

The block evaluation is made on the provisional replotting design map based on an average contribution ratio applied to all lots.

Through this exercise, appropriate locations and combinations of the replots in the blocks are examined before proceeding to the next replotting step.

Figure 4.7-Procedure of Replotting Design



(3) Land value (index number) of replot

The land value of a replot is defined as the amount of value which is duly delivered to the replot. The replot area is calculated by applying the formula established in section 2.2. The land value corresponds to the numerator of the formula.

The principle of replotting establishes that all replots are to be evenly assigned an amount of land value in proportion to the increase of total land value in the project area. In this respect, the land value of the replot should be equal to "the standard lot value before the project multiplied by the proportional coefficient of "α (Aiai x (1-d)y)".

On the other hand, "Ei" and "ei" are outputs of the replotting design applied to the map. For the case that "E*i*x*ei* (designed replot value)" is less than "α x A*i*a*i* (calculated replot value)", equity payments are to be paid to balance the discrepancy, and in the reverse case, to be collected.

(4) Replotting area

It is apparent that the replot value calculated above must be divided by the unit land value (index of e*i*) of the replot in order to calculate the replotting area.

First, the provisional replot area is caluculated based on of "e_o" (average unit land value of the block) instead of "e*i*".

With the provisional replot area applied to the calculations above, the replot is provisionally designed on the block map.

Remembering the land evaluation formula "e*i*=street value (SE*i*) x (Lot adjustment factor)", "e*i*" is calculated as a result of the replot designed above.

With "e*i*" again applied, the replot area is calculated. This should continue until the difference between "E*iei*" and "α*Aiai*" is minimized.

3. General Replotting Design in the Planning Area

The replotting method and system replotting design were applied to covering 300ha of the planning area.

3.1 Land Evaluation Standard and Replotting Design Standard.

In line with the land evaluation method and replotting design system proposed in the preceding sections, standards for land evaluation and replotting design must be set forth for the actual implementation of the L/R project. And, special attention must be paid to the following characteristics of the project area in establishing the standards to be applied.

1) There is a substantial gap in land prices between the lots along Rama IX road and others. If the land evaluation system is designed to reflect the gap as it is,

the contributions calculated on the land evaluation system will have substantial gaps, resulting in unfair application of the evaluation among the land owners.

2) Since there is minimal public land before the project, the land evaluation system in this project area requires special measures to cope with this situation.

3) The land for the large-scale transportation projects in the project area (Express way, Skytrain and Royal City Avenue) must be categorized under special lands in the L/R project for which special replotting meausres are required.

The other items discussed for establishing the standards are summarized as follows.

(1) Sheets with street value

- All the public roads without limitations of right of way even though impassable, should be included in the street evaluation road network regardless of right of way widths, because of the possibility that the roads can be improved.
- The canals and others should also be included in the street value evaluation roads because these are utilized as transportation as well.
- Private roads should also be included if not extended as part of private lots.

(2) Street value

- Taking into account that there is only one public road intersecting with Rama IX Road, the "t" value which represents the standard of the road should be 1.0 for the private road before the project and also 1.0 for the access roads after the project to maintain value balance.
- As the width of the existing roads are more than 4m, the F(w) used to modify the "t" value based on the width should be formalized as

$$F(w) = \frac{w}{w+4}.$$

- The accessibility coefficient was set at 0.2 in consideration of general influences of commercial facilities on Ratchada Pisek Road. Also, an "m" value was set at 0.3 in order to value the effect of the Skytrain after the project.
- A "U" value representing the area's evaluation where the lots are located was set at a range of 1.4 to 2.0, in consideration of potential commercial development in the area.

(3) Individual lot evaluation

- It seems reasonable that inaccessible lots should be evaluated using the accessibility and land coefficients with street coefficients excluded. However, as

this threatens to to skew the contribution ratio with those of other lots, the adjustment coefficient was set at 0.8.

- An adjustment coefficient for the low level lots was set at 0.90 for lots with more than 1.0m difference at ground level.

- The coefficient for the cul-de-sac lot was set at a 5% reduction taking into consideration existing conditions.

- The value of private roads was set at 10% to 30% for generally used lots because original lands were used as roads.

3.2 Outline of General Replotting Design

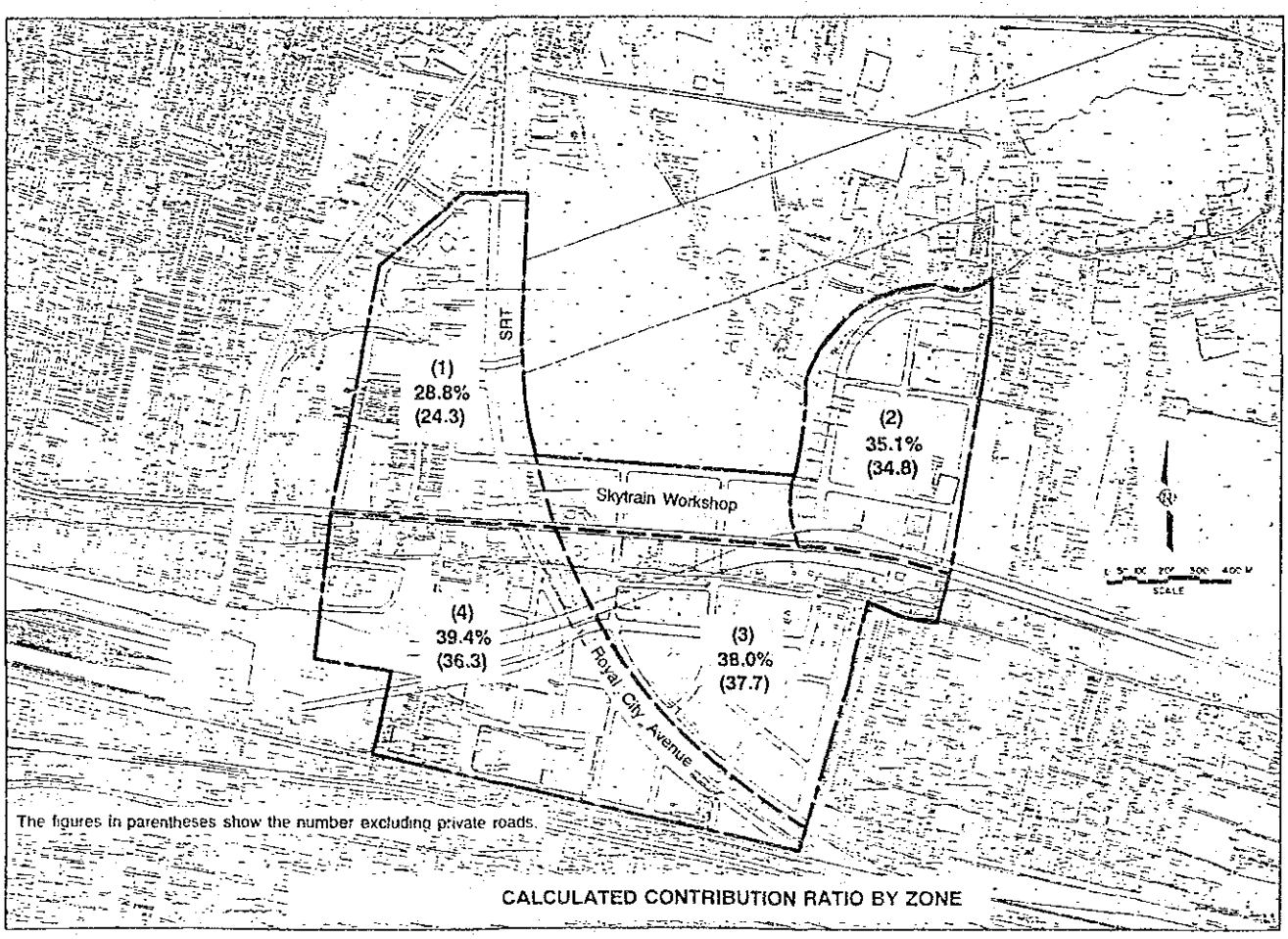
The general replotting design for the planning area was conducted on the basis of the standard set above with the utility increase ratio as shown in **Table 4.1** and **Figure 4.8.**

Table 4.1-Increase Ratio and Contribution Ratio by Zone
(Lands for public use are not included)

	Before Replotting		After Replotting		Increased Ratio	Contribution Ratio (%)
	Original Area	@	Replotted Area	@		
Zone 1	397,500	730	283,100	1,327	1.818	28.8
Private lots	(374,000)	(772)	(283,100)		(1.719)	(24.3)
Private roads	(23,500)	(75)	-	-	-	-
Zone 2	391,800	545	254,300	1,093	2.006	35.1
Private lots	(389,800)	(548)	(254,300)		(1.995)	(34.8)
Private roads	(2,000)	(45)	-	-	-	-
Zone 3	459,400	560	284,900	1,175	2.098	38.0
Private lots	(457,600)	(562)	(284,900)		(2.091)	(37.7)
Private roads	(1,800)	(44)	-	-		
Zone 4	544,500	564	329,700	1,205	2.137	39.4
Private lots	(517,400)	(590)	(329,700)		(2.042)	(36.3)
Private roads	(27,100)	(57)	-	-	-	-
Total	1,793,200	596	1,152,000	1,205	2.022	35.8
Private lots	(1,738,800)	(612)	(1,152,000)		(1.969)	(33.7)
Private roads	(54,400)	(64)	-	-	-	-

The major issues for L/R project were discussed as follows.

Figure 4.8-Contribution Ratio by Zone



Zone (1): Although a low contribution ratio and a utility increase ratio were calculated because developed areas were included in Zone (1), it appears difficult to create lands for contribution because the lands were already subdivided and developed.

Zone (2): The contribution ratio is as high as about 38% because parks, greens, and roads which have a wider right of way are planned in Zone (2). It will be necessary to provide measures for reducing contribution ratios since the calculated land areas of replots exceeded the total area of private lands after the project.

Zone (3): The land characteristics of Zone (3) are observed to be mostly open and inaccessible, and there are many lots with more than 1000 m^2 of land area. The calculated contribution ratio is 10 to 15% on the lots along Rama IX road, and 45% to 55% for the inaccessible lots. Because of the significant difference of land values evaluated among the lots, replotting must be designed with an emphasis on replots in the original location.

Zone (4): Urban sprawl is prominent in Zone (4). The replotting must be carefully carried out with attention paid to compensations for the relocation and removal of buildings.

4. Replotting Design for the Project Area

The replotting design for the project area was executed in compliance with the implementation plan set forth in Chapter 3.

Following the replotting design system described in section 2.4, the study was carried out as shown in **Figure 4.9**.

4.1. Preparatory Works for Replotting Design

The most important thing in the preparatory works is the final determination of the existing lands (boundary area and others) which are the basis of all replotting design works (datum land areas and cadastrial map).

The data for the lands compiled in the land office was selected for this design in comparison with the surveyed map. The "overlay map" (finalized block map over laid on the cadastrial map) was prepared for beginning the design.

4.2 Setup of Standards for Replotting Plan and Others

Land evaluation and replotting standards was set up for the replotting design in the project area following the Thai replotting method and system proposed in section 2.

4.3 Land Evaluation

Land evaluation was conducted based on the standards as set above as shown in **Figure 4.10** of the study procedure.

Through this work, the land utility increase ratio and proportional coefficient, and others were calculated.

(1) Street value

The important aspects of street value evaluations are summarized as follow.

- Rama IX road, a private road and a road near Royal City Avenue were included in the street value evaluations.
- The street value was established from the land evaluations of the Land Office, survey site, and others.
- The canals were included in the street value evaluations since passenger boats are in operation along the canals. The street value of canals was evaluated similar to the street value from which the value of road functions and continuity are excluded.

The results of the street value are given in **Table 4.2** and **Table 4.3**. The largest part of street values are taken by the land coefficient both before and after the L/R.

Figure 4.9-Study Procedure of Replotting Design

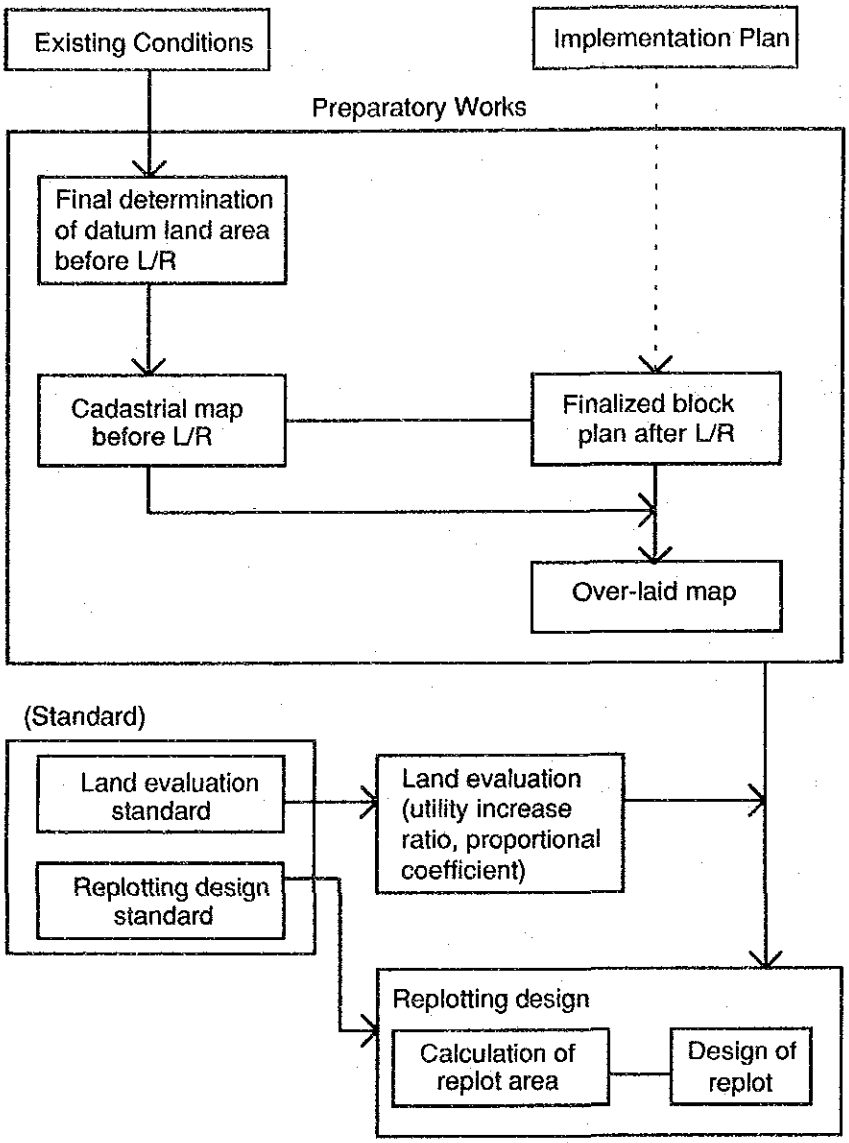


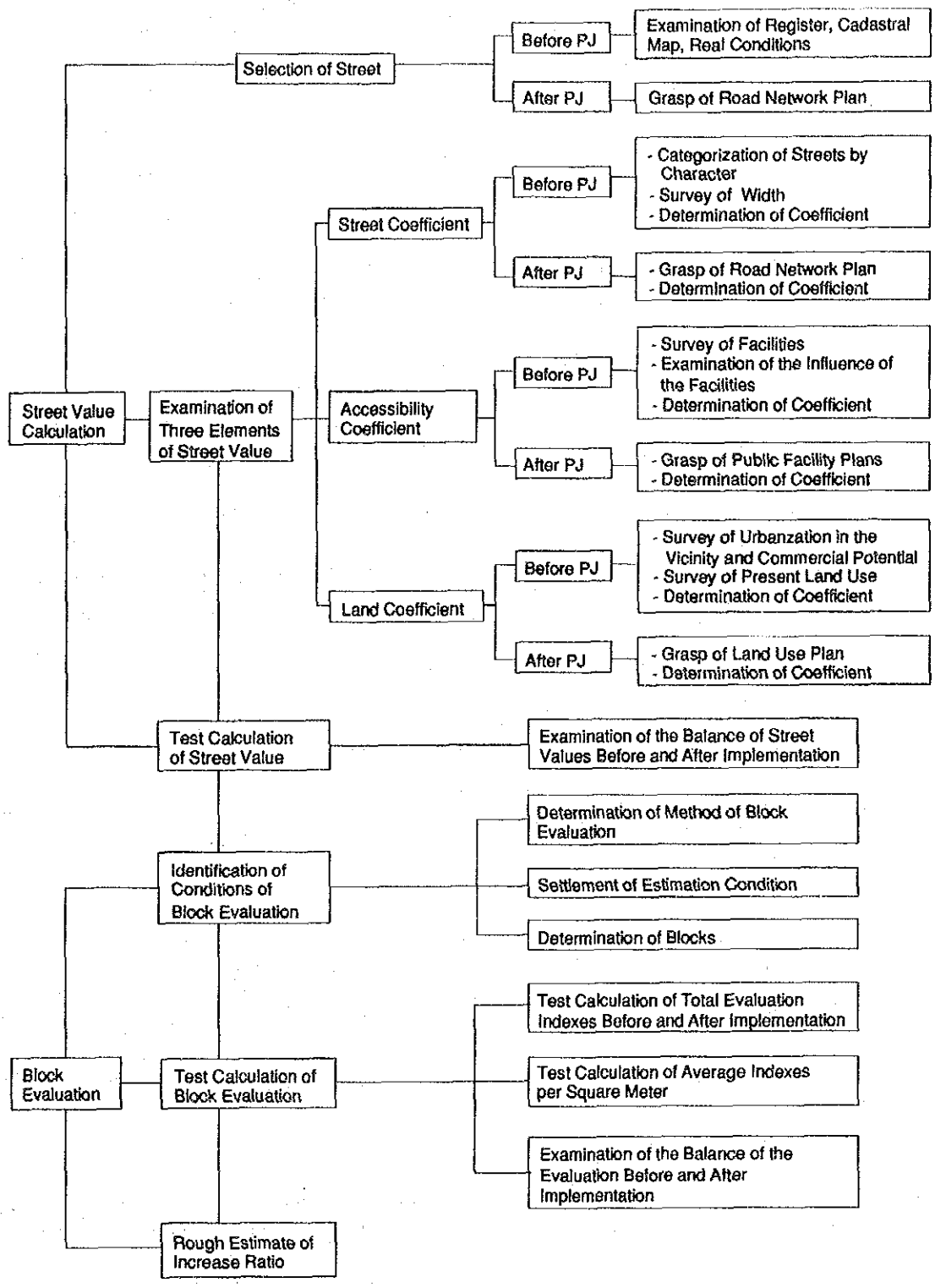
Table 4.2 Street Index of Maximum, Minimum and Mean

	Max. Rate	Min. Rate	Mean	Remarks
Before the project	1,000	606	747	
After the project	1,316	1,070	1,153	

Table 4.3 Coefficient for Street Value

	Street Coefficient	Accessibility Coefficient	Land Coefficient	Remarks
Before the project	30.81%	5.57%	57.62%	
After the project	24.09%	7.40%	68.51%	

Figure 4.10 Land Evaluation Flow Chart



(2) Individual lot evaluation

On the individual lot evaluation map with a scale of 1/1000 where the topographical map is overlaid by the cadastrial map, individual lots were evaluated in accordance with the land evaluation standard.

(3) Block evaluation after L/R

Blocks were evaluated on the finalized block plan in accordance with the land evaluation standard.

It is executed on the provisional replotting design with average contribution ratio applied.

(4) Utility increase ratio and proportional coefficient

The utility increase ratio was calculated at 1.9, and the proportional coefficient at 1.306 as shown in **Table 4.4.**

Table 4.4 Increased Ratio and Proportional Coefficient

	Before the Project		After the Project		Contribution	Increased	Proportional
	Area m^2	@	Replotting Area	@	Ratio (%)	Ratio	Coefficient
Private land	660,009	643	437,732	1,267	33.7	1.97	1.306
Reserve land	-	-	30,300	1,267	-	-	-
Exceptional land	173,396	-	139,847	-	19.3	-	-
Total	833,405	-	607,879	-	-	-	-

* @ defines value index per sqm.
* Increased ratio shall be calculated that @ after the project divides @ before the project.
* Proportional coefficient shall be calculated (1 - average contribution ratio) x Increased ratio.
* Exceptional land represents land belong to Expressway, Skytrain, Royal City Avenue and SRT.
* Private land area before the project differ from private land area in the Implementation Plan because area data on the certificate of land title come before.

The land value of all the lots is to increase at 1.306 of the proportional coefficient.

4.4 Replotting Design

The replot area is calculated based on the proportional coefficient and others set above, and the replots were designed in consideration of the location and other factors as shown in **Figure 4.11.**

(1) Location of replot

In the replotting design zone within which the original lots are to be located, the locations of replots were determined in or close to the original lots so as to keep geographical conditions in terms of land use the same as before the L/R project.

(2) Design of replot

In line with the location of replots as shown above, replots were block designed. Finally, the replot area calculation report, documents of replots by block, and replots in order of address and replot map with a scale of 1/1000 were prepared.

(3) Summarization of replotting design

The results of the replotting design are summarized as shown in **Table 4.5**.

Figure 4.11-Replotting Design Procedure

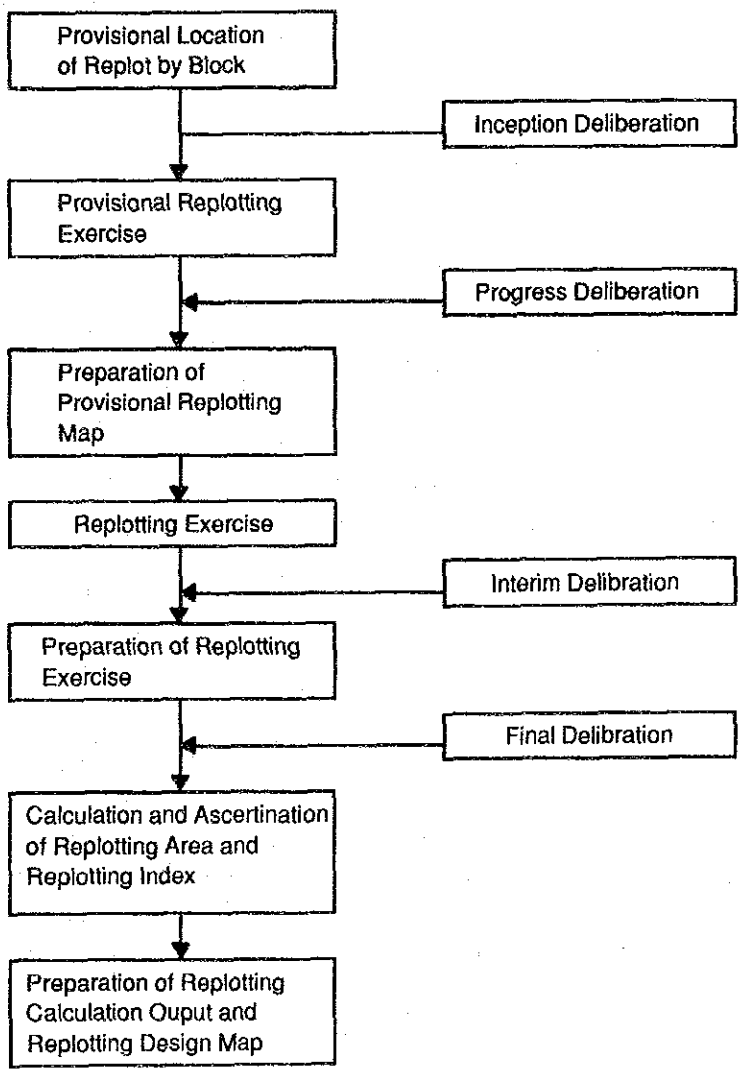


Table 4.5 Summary Table of Replotting Design

		Land before the Project		Land after the Project		Remarks
		Area	Total Index	Replot Area	Total Value Index	
Public Land		24,680	-	250,100	-	
Private land	Normal land	319 lots 660,009	553,972,844	192 lots 437,216	553,995,406	Contribution 22562
	Exceptional land	173,396	-	139,847	-	
	Reserve land	-	-	30,922	-	
Total		858,085	-	858,085	-	

* Total index before the project area means a total standard index to replot.
* Error of reserve land area between implementation plan and replotting design is caused by the calculation that increase ration and proportional coefficient is calculated to round four decimals down.
* Public land area after the project with Implementation Plan is 250,206 m^2 and that of area with replotting design is 250,106 m^2.

5. Remarks for the Replotting Design

(1) Implementation Plan and Replotting

Within the project area, land for the Expressway and Skytrain has already been defined and is categorized as private land for public use in the Implementation Plan. For the purpose of this study, the area enclosed by the intersection of this land with proposed new roads has been re-classified as public land when calculating land use areas after the project. It is considered to be a contribution to the public land area from the private land for public use.

During the replotting design, theoretical contribution rates of the private land for public use were calculated using the same calculation method as applied for other private land. After assuming that the intersecting areas are re-defined as public land, ie. a contribution to public land from the private land for public use, the unit land values of the intersecting lots were measured by applying fifty percent of the nearest street coefficient for evaluation of this land, based on land evaluation experience in Japan. The theoretical contribution rate calculated in the replotting design is then compared to the proposed contribution of the intersecting area as defined above, to give an indication of the amount of equity to be paid to or collected from the concerned agency.

The special treatment of these intersecting lots as mentioned above must be negotiated with the concerned agencies beforehand. Evaluation of the intersecting lots should be discussed during preparation of the implementation plan, before the actual replotting. The evaluation method for the equity adjustment should also be discussed.

(2) Private Road

For private roads on land classified as private land, and where alternative public roads are planned as part of the L/R, further detailed consideration is required to decide if replotting of these private roads as public roads is required. For the purposes of this study, it has been assumed that such private roads are replotted as public roads, however further detailed evaluation should be given to this aspect during implementation.

(3) Excessive Small Lots

The unit land value of very small lots is less than that of other lots and further consideration is required for the treatment of such lots in the replotting design. Furthermore, the method of measurement of such lots must be based on the consensus of landowners or on a decision by the L/R deliberation committee. In this study, there were five existing lots of less than $100m^2$. For replotting, these small lots were treated similarly to other lots and contribution ratios were assessed, but further detailed evaluation of these small lots is necessary.

(4) Replotting and Building Permission

It is stipulated in the BMA Building Code that buildings along Rama IX Road shall be set fifteen (15) meters back from the road. Since the planned Expressway alignment is not far from the Rama IX Road on the south side, a number of dual frontage lots are created between Rama IX Road and the Expressway alignment. These lots are shallow in depth and it would not in fact be possible according to the regulations to build on these sites. Consequently, this issue should be examined in more detail to resolve this problem during replotting.

(5) Shift Replotting

It is predicted that the increase in value of lots along Rama IX Road as a result of implementation of the L/R projects will be smaller than the increase for other sites. The main reason is that the land value is already high because of commercial use and high potential for further site development. Therefore, the contribution rates for these lots are not so high and it is difficult to replot in the original area.

However, public facilities, parks, open space and roads are planned along the canal, Khlong Sam Sen Nai, and Rama IX Road. Since the contribution rate for nearby private land is low, as explained above, some lots cannot be replotted within the vicinity due to the limited areas remaining between Rama IX Road and the canal. As a result, some lots must be replotted in another area (shift replotting). The method adopted for shift replotting requires further evaluation.

Chapter V.
Project Implementation

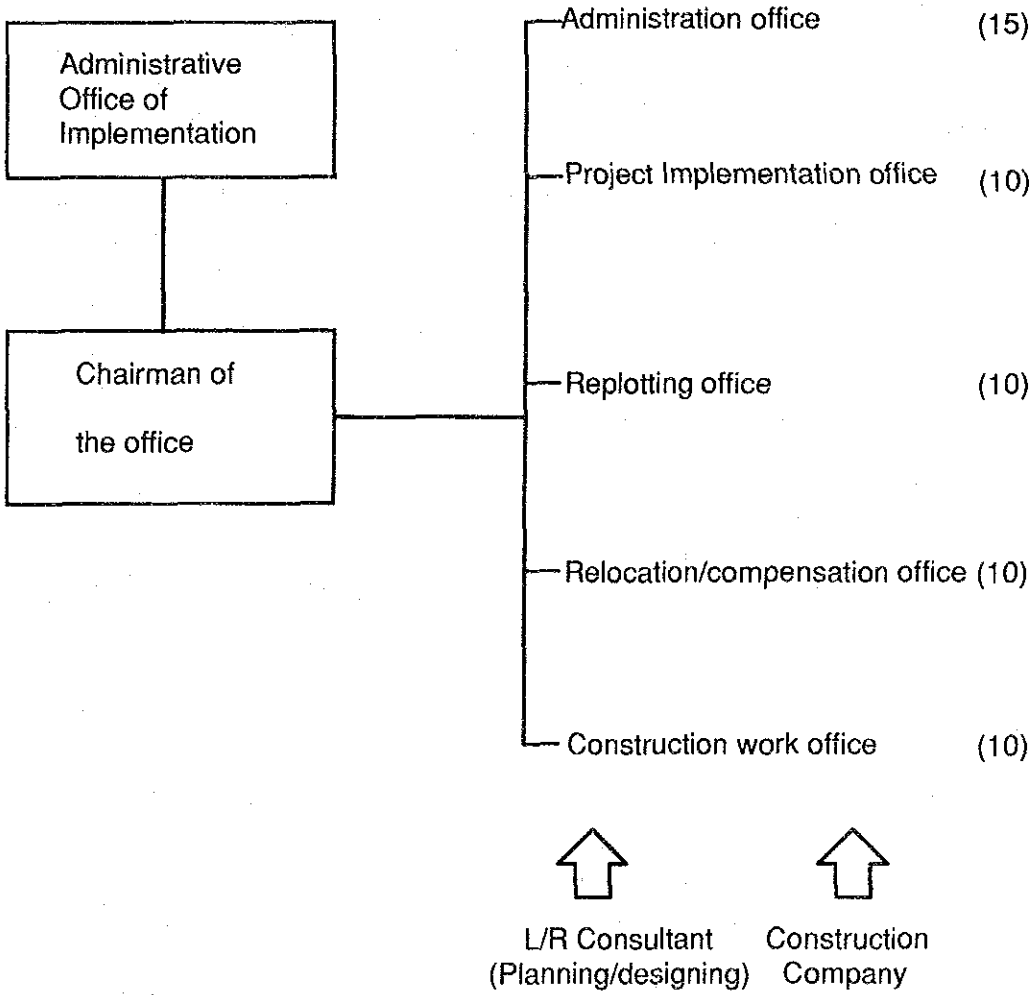
CHAPTER 5 PROJECT IMPLEMENTATION

1. Organization and Man-power

(1) Organization

The proposed organization for the L/R project implementation consists of five offices with a chairman, and a total staff of fifty six (56) persons as shown in **Figure 5.1.**

Figure 5.1-Organization Chart



(2) Manpower

Manpower is of great concern to establish an effective implementation system. The staff assigned to the L/R project must be equipped with a broad range of techniques and knowledge including city planning, public facilities, civil work, and specifically land evaluation for replotting designs. In addition, the project implementation requires staff skillful in funding, management of organizaitons, procedural works, negotiations with landowners.

2. Project management

With the L/R planning/designing contracted to a private consultant firm and the L/R construction works to construction firms, the implementing body is to be responsible for the administrative, management, and consultations with landowners.

The five offices are to manage the project implementaiton as follows.

<Overall management and coordination>

With over all management the chairman's responsibility, coordination regarding scheduling and funding must be made. The coordination meetings held among concerned parties and the chairman are very effective for this purpose.

(1) Administration

In addition to technical ability, managerial capability, especially for negotiating with landowners and other concerned persons is vital for successful implementaiton.

(2) Planning

Well coordination regarding the L/R plan, implementation schedule, financial plan, and others must be made so as to avoid wasteful investments.

(3) Replotting

As the replotting is the core job of the L/R project implementaiton, it must be stressed that techniccal capability regarding replotting designs and social coordination should be improved.

(4) Replocation and compensation

It should be noted that negotiation for the relocation of buildings is an important task and time consuming.

It is important to further communiation and promote stable negotiations with landowners. To this end, it is recommended that the number of staff be increased during peak times.

(5) Construction works

The detail design, cost estimation, contract of construction, supervision of construction, and others are the responsibility of the implementing body, with the construction works implementation by the general contractor.

It is necessary for the implementing body to give direction and site supervision during construction.

3. Coordination/Adjustment works

It is often said that the L/R project is primarily coordination activities, and is needed throughout the implementation period of the L/R project.

(1) Coordination with the government agencies

The proposed L/R law states that public facilities such as roads, parks, canals, sewerage and so on, constructed at the L/R project area are to be tranferred to the authorities in charge of management.

The coordination and cooperation between the implementing body and the management authorities must continue during all stages of planning, implementaion, and through completion of the project. In addition, it is necessary to coordinate the schedules and procedures of urban facilities construction such as the Skytrain and others which are to be developed in/near the L/R project area.

(2) Achieving consensus among the landowners.

The Thai L/R law proposed in Chapter 2 will legitimize the coordination system through which mutual understanding betwen the implementing body, the land owners, and agencies can be achieved and assimilated into the L/R project implementation.

Apart from the legal system as stated above, substantial energy will be expended for achieving consensus among the landowners.

The consensus building activities involve the coordination of conflicting interests and requirements among the landowners as well as between the landowners and the implementing body.

A flexible approach is needed given the social charactaristics of the project area where landowners differ in terms of profession, value judgements, and others.

The most important aspect of consensus achieving building is to promote landowners' trust and confidence in the implementing body through appropriate responses to landowners' questions (on contributions compensations, and others).

The environmental nuisances such as noise, dust from construction work, and others must be carefully prevented in order not to impede the project works implementation.

The consensus building activities must be carried out during all the stages of preparation, implementation, and the termination of the project, with emphasis placed on the preparation stage.

The method of building consensus varies depending upon the actual condition of the project area. However, in any case it is considered most important that the implementing body must always remember its responsibility and proceed to fulfill this responsibility without seeming prejudicial against the landowners..

Some recommendations for consensus buildings activities are as follows.

1) Identify a leader among the landowners who can act as a facilitator to organize the community.

2) Hold informative meetings (contacts between the implementing body and the landowners must be periodically made). Promote complete landowner understanding of the L/R system and purpose of the L/R law).

3) Utilize pamphlets, models and photographs, et cetra.

4) Consult with academic and professional persons.

5) Allow landowners to visit the site and observe the urban development project.

Chapter VI.
Next Steps to Be Taken for Implementation

CHAPTER 6 NEXT STEPS TO BE TAKEN FOR IMPLEMENTATION

L/R system and project were proposed in the JICA study. It is obvious that they must be refined so as to be practical in the actual implementation course of the L/R project.

L/R system is the more social coordination method than the engineering method of urban development. Accordingly the practical process including coordination and consultation with the landowners and the government agencies concerned is more important.

In this regard it may be safely said that it is not until now that full swing drive for application of L/R system in Thailand starts.

The next steps and measures to be taken for the L/R project implementation are summarized as follows.

(1) Enactment of L/R Law

Legislative preparation of L/R law has been made in Thai government in parallel with the JICA study.

It is hoped that the preparatory work of legislation is wrapped up so as to enact the L/R law as soon as possible, taking into consideration the urgent need of urban development to cope with the current serious urban problems.

In addition to the legislation of L/R law related systems such as taxation, land registration, cost sharing of public facility and others must be also established through the coordination with the government agencies concerned.

(2) Review and Refinement of the Implementation Plan

The first step of the project implementation is consultation with the landowners and agencies concerned, through which the implementing conditions for the project should be scrutinized.

The implementation plan proposed in this study must be reviewed and refined in accordance with the finalized implementing conditions.

(3) Set-Up of Operational System and Manpower Development

Unlike other public works L/R project implementation requires a variety of works ranging from the coordination and consultation works with landowners and agencies concerned, replotting works to negotiation of compensation, design for construction and others. Therefore reliable operational system and manpower are indispensable for the project implementation.

In this respect special attention must be paid to the organization building up and manpower development.

Taking into account the massive volume of works of survey study planning designing and others, it is of great importance to promote local consultants to take charge of them.

(4) Implementing Conditions

The following two (2) conditions are vital for the project implementation.

1) Commitment of financing institute

It is no doubt that L/R project cost is to be recovered through the sales of reserve land. However loan is needed to finance the expenses including construction cost operation cost and others until the reserve land is sold out.

The L/R project proposed in this study requires as much as 453.7 million baht of loan totaled in 3 years.

It is vital for the project implementation to secure the fund resources and the commitment of financing institute.

2) Commitment of landowners

It must be stated that the landowners agreement is one of very important prerequisites for the project implementation.

The commitment of the landowners must be secured through the intensive public relation activities for reaching consensus, including public information, persuasion, adjustment of their conflicting interests, adoption of their requirements in the implementation plan and so on.

Consequently the commitments of the financial institute and the landowners have a hold on the project implementation.

It is hoped that with the measures as listed above being taken L/R project will be promptly implemented so as to improve and strengthen Thai city planning system.