

14-3. Urban Development Project

14-3-1. Outline of Project

1) Project Area

The project area, as shown in FIG. 14-2, is 1,588,222 m² in area. The area excluding land within the boundaries of Calle 30 and the Riverside Bypass is 1,489,844 m².

2) Land Use Plan

The area by use is shown in TABLE 14-3, comparing the planned land use with the existing one. The public land increases by about 95,000 meters because of newly constructed parks of about 171,000 m², although the area of roads decreases a little. One of the objects of this project is to utilize vast vacant lots and to improve the usage of lots inhabited by squatters. As shown in TABLE 14-3, "Other Use" and vacant lots amounting to nearly 500,000 m² will be converted into residential, commercial and industrial areas.

3) Planned Land Use by Block

TABLE 14-4 shows the future planned land use by block corresponding to the block number indicated in FIG. 14-2.

The price valuation of developed land and land sale are conducted based on this land use by block.

TABLE 14-3 EXISTING AND FUTURE LAND USE OF PROJECT AREA

(unit: m², percent)

	Existing		Future	
Public Land				
Road	435,613	(27.6)	381,416	(24.1)
Terminal Plaza	-		16,844	(1.1)
Water Area	82,362	(5.2)	43,740	(2.8)
Park	-		171,459	(10.9)
Subtotal	517,975	(32.8)	613,459	(38.8)
Lots				
Residential	2,320	(0.1)	295,222	(18.7)
Comm. & Res.	-		53,413	(3.4)
Commercial	234,739	(14.9)	306,612	(19.4)
Industrial	274,230	(17.4)	276,537	(17.5)
*1 Institutional	8,703	(0.6)	34,979	(2.2)
*2 Other Use	134,071	(8.5)	-	
Vacant	352,716	(22.3)	-	
Subtotal	1,006,779	(63.7)	966,763	(61.2)
*3 Not classified	55,468	(3.5)	-	
Total	1,580,222	(100.0)	1,580,222	(100.0)

Note:

- *1: The lot for the future sewage treatment plant is classified here. The lots for other public service facilities, for example schools, hospitals, post offices, etc., are considered to be located in other land use categories.
- *2: Most of the area is inhabited by squatters, and abandoned building lots are included.
- *3: Areas around the outlet of Tramposos Canal.

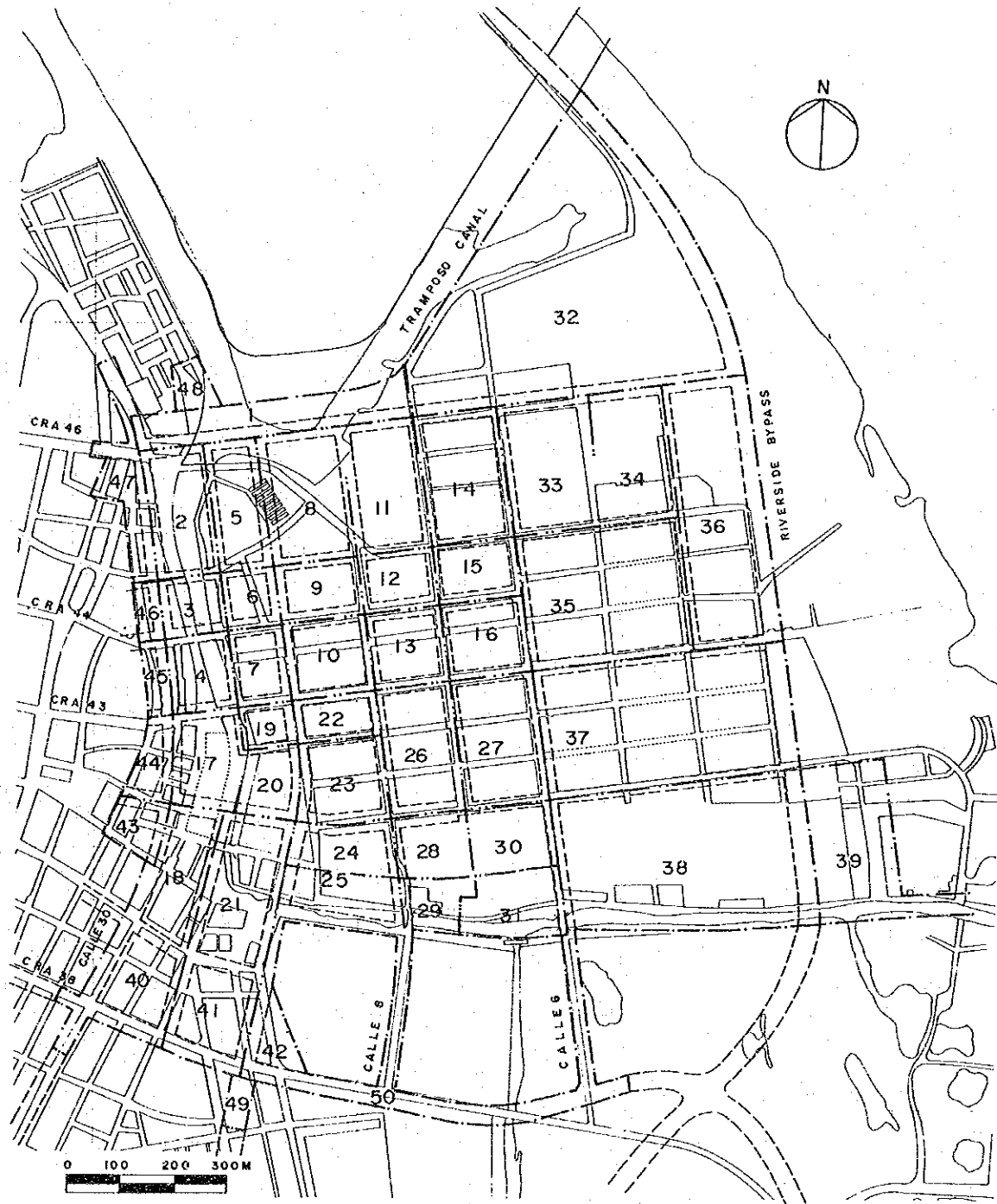


FIG. 14-2 PROJECT AREA AND BLOCK DIVISION

TABLE 14-4 PLANNED LAND USE BY BLOCK

No.	Public Lands				Sub-total	Lots				Total	
	Road	Pedestrian	Park	Water		Residential	Com & Res.	Commercial	Industrial		Sub-total
1.	7,630		16,630		24,260						24,260
2.	8,671		22,424		31,095						31,095
3.	3,864	1,200	10,078		15,142						15,142
4.	5,020	1,200	14,419		20,639						20,639
5.	6,935				6,935			17,353		17,353	24,288
6.	2,700	950			3,650			5,992		5,992	9,642
7.	3,741	950			4,691			9,421		9,421	14,112
8.	9,000				9,000		28,292			28,292	37,292
9.	3,515	1,450			4,965			9,687		9,687	14,652
10.	4,948	1,450			6,398			15,358		15,358	21,756
11.	5,890	2,300			8,190	26,726				26,726	34,916
12.	2,420	2,220			4,640			9,121		9,121	13,761
13.	3,258	2,670			5,928			14,358		14,358	20,286
14.	6,142	2,300			8,442	29,002				29,002	37,444
15.	2,644	2,420			5,064					9,687	14,751
16.	3,452	2,870			6,322		9,687			15,434	21,756
17.	4,970	2,173	19,934		27,077						27,077
18.	6,802	4,079			10,881			14,804		14,804	25,685
19.	3,241				3,241			4,899		4,899	8,140
20.	2,290	1,975			4,265			7,738		7,738	12,003
21.	6,777	4,869			11,646			23,099 4)		23,099	34,745
22.	4,453				4,453			8,127		8,127	12,580
23.	4,055	3,753			7,808			18,962		18,962	26,770
24.	1,912	3,753			5,665			20,805 4)		20,805	26,470
25.	8,308		14,959		23,267						23,267
26.	16,844 1)	4,915			25,842			8,422		8,422	34,264
	4,083				4,083						
27.	7,496	2,150			9,646			27,008 2)		27,008	36,654
28.	1,210	4,215			5,425			16,537 3)		16,537	21,962
29.	1,320		10,572		11,892						11,892
30.	6,209				6,209			18,359 3)		18,359	24,568
31.	1,045			20,652	21,697						21,697
32.	28,623				28,623	174,877				174,877	203,500
33.	6,370				6,370			34,869		34,869	41,239
34.	5,153				5,153			31,815		31,815	36,968
35.	11,397				11,397	64,617				64,617	76,014
36.	19,467		54,884		74,351						74,351
37.	17,659				17,659			94,666		94,666	112,325
38.	10,072			10,001	20,073			107,602		107,602	127,675
39.	3,761			13,087	16,848			34,979		34,979	51,827
40.	12,926	1,500			14,426			15,928		15,928	30,354
41.	6,837	1,500			8,337			15,567 4)		15,567	23,904
42.	5,200				5,200			7,585		7,585	12,785
43.	2,093	1,283			3,376			7,963		7,963	11,339
44.	2,876	1,283			4,159			5,884		5,884	10,043
45.	2,708	200	3,142		6,050						6,050
46.	2,369	200	1,419		3,988			2,837		2,837	6,825
47.	8,271				8,271			8,383		8,383	16,654
48.			2,998		2,998						2,998
49.	6,155				6,155						6,155
50.	25,650				25,650						25,650
Total	16,844 1)										
	321,588	59,828	171,459	43,740	613,459	295,222	53,413	306,612	311,516	966,763	1,580,222
	21.4%	3.8%	10.9%	2.8%	38.8%	18.7%	3.4%	19.4%	19.7%	61.2%	100.0%

Note : 1) Terminal Plaza
 2) Intermunicipal Bus Terminal
 3) Public Market
 4) Open Market

14-3-2. Development System

Development systems applicable to the urban development of Barranquillita are as follows:

- a. Total purchase system
- b. Valorizacion system
- c. Land readjustment system
- d. Land trust system

These systems each have merits and drawbacks; it is not easy to conclude which among them is the best. In the following Chapter 15 ("Evaluation of Projects"), each system will be examined in detail. A hypothetical application of each system will be used to determine the best elements of each; from this will be formed a new combined system designed to apply to the urban development of Barranquillita.

14-3-3. Price Valuation of Development Land and Land Sale Schedule

Considering the existing market land price and the urban environment of developed Barranquillita, the land price by use is assumed as shown in TABLE 14-5 at 1987 prices. Based on observations of price levels around Calle 72, these unit prices are at the maximum level for a developer to purchase land and construct a commercial building or an apartment house for rental business.

TABLE 14-5 VALUATED PRICE OF DEVELOPED LAND BY USE

(in pesos/m² at 1987 price)

Land Use	Unit Price
Bus Terminal	5,000
Markets	5,000
Residential	20,000
Commercial & Residential	25,000
Industrial	25,000
Commercial	30,000
Business	40,000

The executive body should recover the investment cost by selling prepared land or by collecting a type of contribution levied in proportion to the valuated land price. In order to get a revenue estimation, a land sale schedule is prepared. This is based on the investment schedule and future urban formation according to the development scenario.

Relating to the development system, this schedule is applied not only to the total purchase system, but also to other systems, because, for example, the valorization system requires the executive body to decide the total amount of contribution below the estimated increase of property value.

TABLE 14-6 has been prepared deliberately to determine the investment and repayment of loan schedule if the total purchase system is adopted.

TABLE 14-6 LAND SALE SCHEDULE

Zone No.	Area (Ac)	Unit Price (\$)	1990		1991		1992		1993		1994		1995		1996		1997		1998		1999		2000	
			1st half	2nd half	1st half	2nd half	1st half	2nd half	1st half	2nd half	1st half	2nd half	1st half	2nd half	1st half	2nd half	1st half	2nd half	1st half	2nd half	1st half	2nd half	1st half	2nd half
Phase I																								
24 M	20,805	5,000	100.0%																					
26 C	8,422	30,000	100.0%																					
27 I	27,008	5,000	100.0%																					
28 M	16,537	5,000	100.0%																					
30 M	18,359	5,000	100.0%																					
33 I	107,602	25,000	10.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	
Phase II																								
5 N	17,352	40,000			27.0%	25.0%	25.0%	25.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%
6 N	5,992	40,000			5.0%	10.0%	10.0%	10.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
7 N	9,421	40,000			5.0%	10.0%	10.0%	10.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
8 CR	28,292	25,000			27.0%	25.0%	25.0%	25.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%
9 N	9,687	40,000			5.0%	10.0%	10.0%	10.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
11 R	15,528	40,000			5.0%	10.0%	10.0%	10.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
11 R	6,176	40,000			5.0%	10.0%	10.0%	10.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
13 N	9,128	40,000			5.0%	10.0%	10.0%	10.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
13 N	16,358	40,000			5.0%	10.0%	10.0%	10.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
14 R	29,003	30,000			10.0%	10.0%	10.0%	10.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
15 CR	9,687	25,000			10.0%	10.0%	10.0%	10.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
16 CR	15,434	25,000			10.0%	10.0%	10.0%	10.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
18 C	14,804	30,000			10.0%	10.0%	10.0%	10.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
19 C	4,899	30,000			10.0%	10.0%	10.0%	10.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
20 C	7,736	30,000			100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
21 M	23,999	5,000			10.0%	10.0%	10.0%	10.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
22 C	8,127	30,000			10.0%	10.0%	10.0%	10.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
23 C	18,962	30,000			10.0%	10.0%	10.0%	10.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
40 C	15,928	30,000			10.0%	10.0%	10.0%	10.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
41 M	15,567	5,000			100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
42 I	7,585	25,000																						
43 C	7,963	30,000																						
44 C	5,884	30,000																						
46 C	2,837	30,000																						
47 C	8,383	30,000																						
Phase III																								
32 R	174,877	20,000																						
Phase IV																								
34 I	31,815	30,000																						
35 R	64,917	20,000																						
37 I	94,666	25,000																						
Total																								
		896,915																						

M : Public and Open Market
 C : Commercial
 I : Industrial
 N : Business
 CR : Commercial and Residential
 R : Residential

14-4. Intermunicipal Bus Terminal Construction Project

14-4-1. Outline of Project

1) Project Site

The project site except Terminal Plaza is Block No. 27 shown in FIG. 14-2. The area is 27,008 m².

2) Facilities

The main bus terminal building and a repair shop building are constructed.

Total construction area is 6,704 m² and total floor area is 12,296 m².

3) Construction Period

Second half of 1990	: Land acquisition
From the second half of 1990 through the first half of 1992	: Construction work
Second half of 1992	: Start of operation

14-4-2. Business Objectives and Sources of Revenue

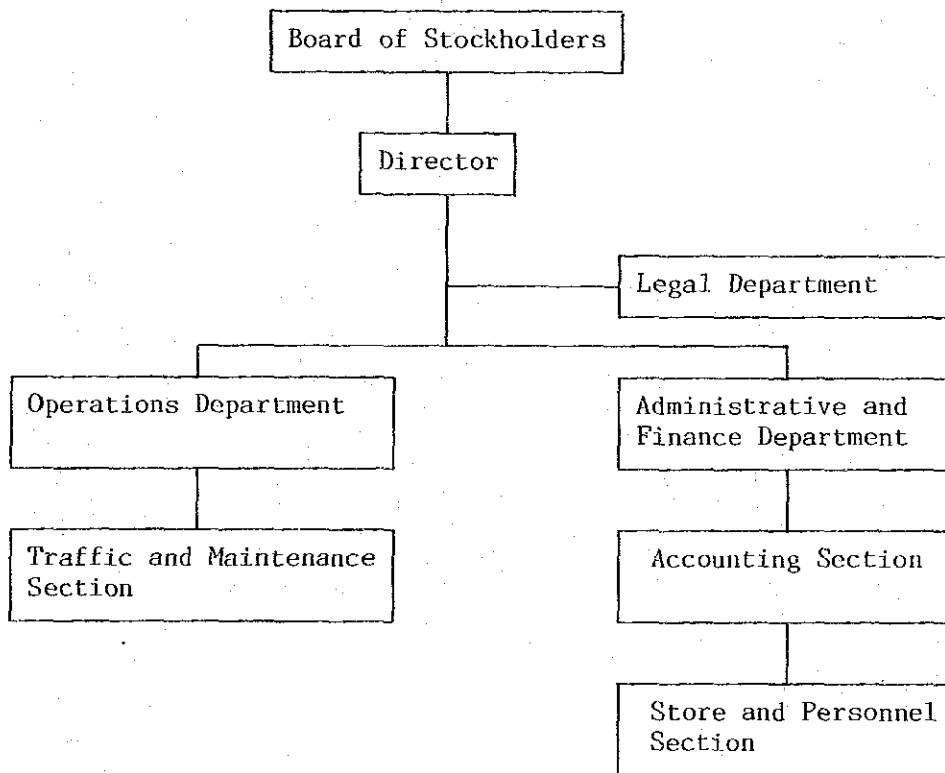
In addition to supplying intermunicipal bus services, this terminal aims to be a commercial center of the area. Therefore, it follows that the sources of revenue are various; commercial rental spaces and coffee shops, rental of the fueling station, baggage charges, sales of commercial and business sections, and advertisement charges are expected to provide revenue in addition to the bus charges.

14-4-3. Executive Body

It is assumed that the executive body of the intermunicipal bus terminal will be established by the second half of 1990 when the construction site land acquisition is scheduled. The organization is similar to the existing bus terminal companies in other cities of semi-public sector. During the preparative period (1990 to 1992), it is proposed that the company be operated by 8 members, including a director, a supervising architect, and an accountant.

At the operating stage, the administrative structure should be reorganized wholly, especially separating the operation department from the administration and finance department. See FIG. 14-3. The number of employees will be nearly 30.

FIG. 14-3 ORGANIZATIONAL STRUCTURE OF BUS TERMINAL (AT OPERATING STAGE)



14-5. Market Reorganization Project

14-5-1. Outline of Project

1) Project Site

The project site is composed of Block No. 28 and No. 30 for the public market, and No. 24, No. 21 and No. 41 for the open market. The area is 34,896 m² for the public market and 59,471 m² for the open market.

2) Facilities

Public Market:

There will be five main markets buildings; an administration office building, and three depots. The total floor area is 20,953 m².

Open Market:

Three types of facilities are constructed.

Type A (open)	1
Type B (semi-open)	2
Type C (covered)	2

The total floor area is 49,968 m².

3) Construction Period

Public Market

Second half of 1990	: Land acquisition
From the second half of 1990 through the first half of 1992	: Construction work
Second half of 1992	: Start of operation

Open Market (Phase I)

Second half of 1990 : Land acquisition
From the second half of 1990
through the second half of 1991 : Construction work
First half of 1992 : Start of operation

Open Market (Phase II)

First half of 1993 : Land acquisition
From the first half of 1993
through the first half of 1994 : Construction work
Second half of 1994 : Start of operation

14-5-2. Business Objectives and Sources of Revenue

The public market project is intended to replace and relocate the existing public market. The sources of revenue are limited to the rental of selling sections, depots, and cold storage for retailers. The open markets are to accommodate street vendors. The sources of revenue are rental of selling spaces and depots.

14-5-3. Executive Body

It is proposed that the executive body which is engaged in the operation of both the public market and the open market be established by the second half of 1990. During the pre-operative period, the company is operated by 10 persons. It is important that the new organization succeeds the various matters related to the existing administrative body.

At the operating stage, the number of employees amounts to more than 70. Many laborers for transportation of wastes are necessary. The organizational chart is shown in Chapter 9.

14-6. Road Construction Project

14-6-1. Outline of Project

1) Location and Length

(1) Calle 30: From Carrera 1F to Carrera 46. 5,815 meters

(2) Riverside Bypass: From access road to Pumarejo Bridge to Via 40. 7,313 meters

2) Construction Period

(1) Calle 30

From 1989 through 1992: Land acquisition

From 1993 through 1994: Construction work

1995 : Open for Use

(2) Riverside Bypass

From 1993 through 1996: Land acquisition

From 1997 through 1999: Construction work

2000 : Open for Use

14-6-2. Development System

As for Calle 30, the Municipal Valorizacion Office has requested BCH to give credit for the projected cost of the road. The repayment of loan is planned by way of valorizacion contribution.

Whatever the methods of obtaining finances are, it is recommendable to recover the cost by the system of valorizacion.

The Riverside Bypass has a role of closing the Circunvalar constructed by the national government. This road is used not only by urban motorists but by regional and national motorists as well.

The circunvalar was constructed by MOPT and the right of collection of Valorizacion contribution was ceded to the municipality. If possible, it is recommendable to adopt the same system.

Chapter 15

EVALUATION OF PROJECT

15-1. Basic Method of Evaluation

As described in the previous chapter, the six major projects of the Study are reorganized to facilitate the evaluation process as four groups:

1. Urban development project (infrastructure and parks)
2. Bus terminal construction project
3. Market reorganization project
4. Road construction project

In this Chapter, the evaluation of each project group is conducted at first, then an evaluation of the combined projects is tried using numbers where they are available or can reliably be projected.

Two methods of analysis may be used for evaluating the success of the projects: financial analysis or economic analysis. The most effective method for each project is summarized as follows:

1) Urban Development Project

Both financial analysis and economic analysis are used for evaluating the Urban Development Project. However, financial analysis of the executive body will provide the most evaluation data. If the land trust system is adopted, the financial analysis is done for both the executive body and the land owners. The object of evaluation of this project is to find what development system and institutional measures are necessary to increase the financial feasibility of the executive body.

This development is a major scale project for Barranquilla, and therefore, it is inevitable that economic and social impacts to the community will occur and may be evaluated economically.

Therefore, the steps of evaluation of this project are as follows:

- a. Studying financial statements of executive body by development system.
- b. Proposing new system and institutional measures.
- c. Preparing projected financial statements by new system.
- d. Studying economic and social impact.

2) Bus Terminal Construction Project

Based on the conditions, proposed in Chapters 13 and 14 a financial analysis of executive body is conducted.

3) Market Reorganization Project

A financial analysis of the proposed new executive body is conducted. To differentiate the characteristics of the public market from the open market, the projected financial statements are prepared separately.

4) Road Construction Project

Economic analysis of road construction is conducted. The conditions of evaluation are as follows:

- a. Only Calle 30 is constructed
- b. Only Riverside Bypass is constructed
- c. Both of them are constructed

15-2. Urban Development

15-2-1. Methodology

The social benefit of urban development accrues from an effective use of land for economic production, comfortable residences, and recreation. The value of land is a comprehensive index of urban property. Therefore, the land price is adopted as the index for measuring the benefit of urban development.

Profitability of an urban development project depends on the land price increase by investment. The share of investment costs for urban facilities and public service facilities borne by the executive body affects its profitability. Generally speaking, if the total development cost is paid by the executive body, the profitability of the development is likely to be below.

Therefore, the fundamental profitability of the project must be established first. A discounted cash flow analysis is conducted assuming that the executive body pays all investment cost, and, once the land has been developed, sells the land at its assessed price.

Some development systems are applicable to this project; therefore, projected financial statements of the executive body by each system are prepared and compared.

Each development system has its own merits and demerits financially and socially. So, a new combined development system is proposed for this project.

Finally using economic cost, economic analysis of urban development is tried for reference.

In this section, the project area of urban development is 1,489,844 m², excluding 43,670 m² of Calle 30 and 46,708 m² of Riverside Bypass.

15-2-2. Fundamental Profitability of Project

When the urban development project is completed the projected assessed total land price of the project area is 20,417.4 million pesos at 1987 prices. Existing total land price is 2,025.6 million pesos, so the difference amounts to 18,391.8 million pesos. Total investment cost is 11,159.7 million pesos, of which construction cost is 9,333.8 million pesos and building acquisition cost is 1,825.9 million pesos.

The result of the discounted cash flow analysis shows that the FIRR (Financial Internal Rate of Return) of this project is 14.5% according to the assumed investment and land sale schedule. It means that this project is financially feasible if the real interest rate falls lower than 14.5%.

According to the present system of Colombian development fund, FFDU provides 70% of the construction costs including interests during the construction period at an average interest rate of 28.5% per annum. The rest and the costs of land and building acquisition should be covered by the own capital or loans from commercial banks.

71% of the total cost of this project is the construction costs and 29% is the land and building acquisition costs. If the ratio of own capital to the investment costs which are not covered by FFDU is 20%, 57% of the total cost is financed by FFDU, 37% by commercial banks and 6% by the own capital. If the interest rate of the loan from commercial banks is 36% per annum, the average interest rate is calculated at 29.5% per annum according to this fund composition.

By the way, a real interest rate is lower than a nominal interest rate under inflationary economy. From the viewpoint of income and expenditure of a project, if increasing rates of income and expenditure are equal, profit increases at the same rate and the burden of repayment of principal and interest decreases to a level of an interest rate discounted by the increasing rate. But, if increasing rate of income is

lower than that of expenditure, increasing rate of project varies with relative amounts of income and expenditure. The highest increasing rate is equal to that of income and the lowest one becomes minus.

In Barranquilla at present, the increasing rate of construction costs is about 22% per annum and the increasing rate of revaluation of land is about 14%. As this project plans to get profit by selling prepared lots, the increasing rate of income is much lower than that of expenditure. Therefore, it is difficult to calculate a real interest rate. However, because of the long period between 1988 and 1993 in which expenditures exceeded incomes, the average increasing rate of profit is considered to be between plus and minus several percent. Thus the real interest rate of project fund is estimated to be in a range several percent point above and below 29.5% per annum.

The fact that the real interest rate is around 29.5% per annum means that it is difficult for an executive body to undertake this project under existing conditions, for the internal rate of return of the project is 14.5%.

15-2-3. Study of Measures for Realization of Project

It is not realistic to raise the assumed levels of land price and its increasing rate. It is difficult, too, to lower the assumed increasing rate of construction costs. In addition, a drastic change of the development and land sale schedule is not easy if the development scenario should not be changed.

Therefore, following measures should be studied for realization of the project.

- a. Lowering of average interest rate
 - a-1 Lowering of interest rate of FFDU
 - a-2 Expansion of limit of FFDU
 - a-3 Raise of ratio of own capital

- b. Share of development costs
- c. Combination of these measures

1) Lowering of average interest rate

FIG. 15-1 shows loci of lowering of the average interest rate corresponding to the raise of the rate of own capital for each interest rate of FFDU within the existing loan limits.

It is necessary to raise the rate of own capital to 49% of the total cost to get an average interest rate of 14.5% per annum within the existing loan limits.

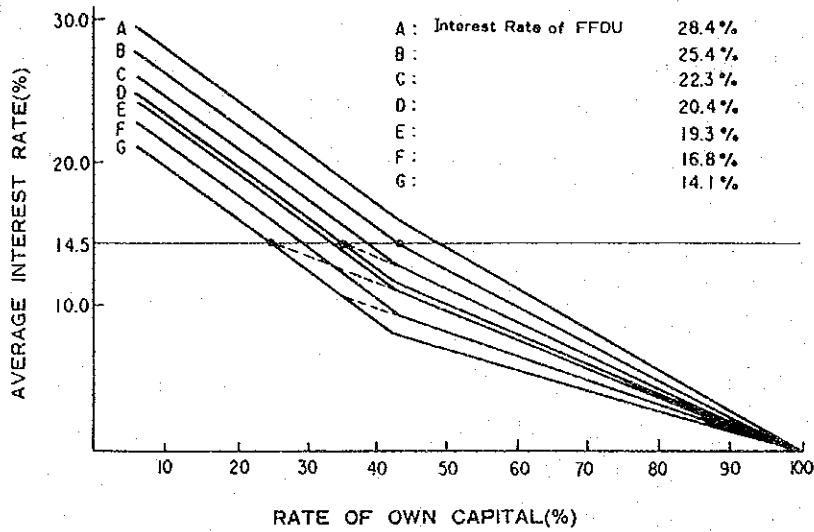


FIG. 15-1 AVERAGE INTEREST RATE AND RATE OF OWN CAPITAL BY INTEREST RATE OF FFDU

TABLE 15-1 shows interest rates of FFDU in 5 cases of fund composition, in order to get the average interest rate of 14.5% per annum.

TABLE 15-1 INTEREST RATE OF FFDU BY FUND COMPOSTTION
FOR AVERAGE INTEREST RATE OF 14.5%

(Percent)

Case	Fund Composition			Interest Rate of FFDU
	Own Capital	FFDU	Commercial Bank	
Case 1	25	65	10	16.8
Case 2	25	75	0	19.3
Case 3	35	57	8	20.4
Case 4	35	65	0	22.3
Case 5	43	57	0	25.4

Note : The interest rate of loans from commercial banks is assumed to be 36.0% per annum.

For example, in the case 2, the ratio of own capital is raised to 25% of the total cost and the loan limit of FFDU is expanded to 75% of the project cost including land and building acquisition cost, not depending on loans from commercial banks. The annual interest rate of FFDU should be lowered to 19.3% per annum in this case.

It is obvious that a drastic raise of the rate of own capital, a considerable lowering of the interest rate and an expansion of loan limits of FFDU and an effort not to depend on loans from commercial banks are necessary to get an average interest rate of 14.5% per annum.

2) Share of development cost

There are existing administrative bodies of urban utilities. For lightening of the burden of the land developer, it is to be desired that these bodies share a reasonable part of the costs of urban utilities.

FIG. 15-2 shows relations between net present value of the project and discount rate for each ratio of the developer's share of the costs of urban utilities. When net present value is zero, discount rate shows internal rate of return.

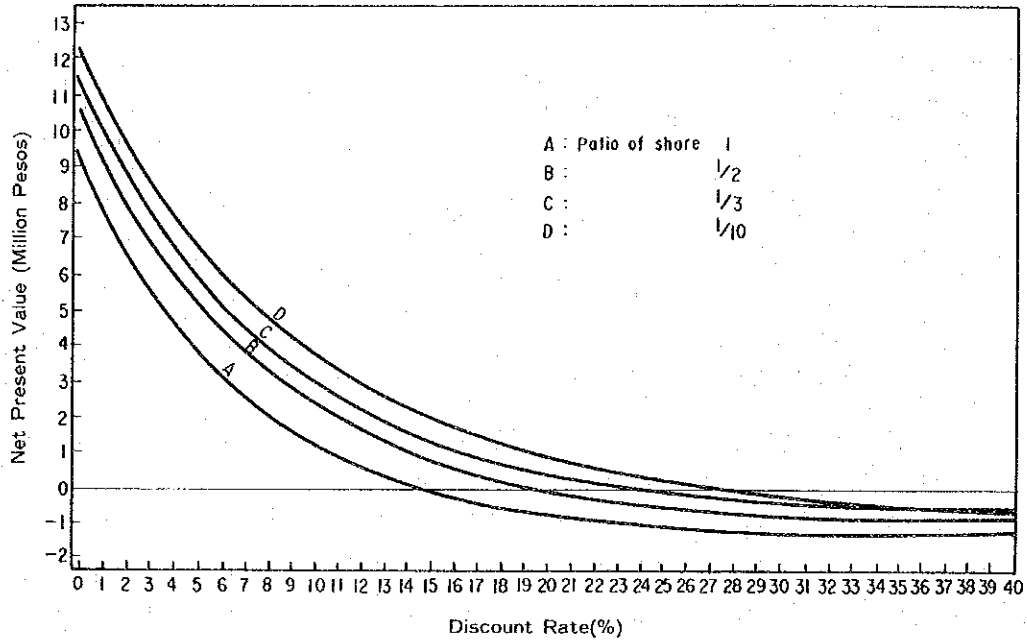


FIG. 15-2 NET PRESENT VALUE AND DISCOUNT RATE BY RATIO OF SHARE.

TABLE 15-2 INTERNAL RATE OF RETURN BY RATIO OF SHARE

Case	Rate of developer's share	FIRR
Case 1	Whole	14.5
Case 2	1/2	20.2
Case 3	1/3	23.6
Case 4	1/10	28.1

Internal rate of return rises when ratio of developer's share decreases (See TABLE 15-2.). When ratio of share is 1/10, internal rate of return is 28.1% which is near to the average interest rate of 29.5%. If a share of 1/2 or 1/3 is required, it is still difficult financially for a developer to undertake the project.

- 3) As each administrative body has its own financial problems, it is not easy for them to share the costs. If the executive body shares the costs half and half with existing administrative bodies, the average interest rate of investment funds should be below 20% per annum according to TABLE 15-2.

Seven cases of the interest rate of FFDU by fund composition for obtaining the average interest rate of 20% per annum are shown in TABLE 15-3. If the ratio of own capital is raised to 32%, the average interest rate is lowered to 20% under the existing system of FFDU. However, it is not easy to prepare 3,300 million pesos equivalent to one third of about 10,300 million pesos at 1987 prices which is scheduled to be invested during 7 year period between 1987 and 1994.

Therefore, aiming to achieve the level of cases 3, 4, 5, 6, it is recommendable to take following measures.

- a. Lowering of interest rate of FFDU to about 25%

- b. Expansion of limit of FFDU to cover land and building acquisition costs
- c. Raise of ratio of own capital to 20 - 25% of project cost
- d. Sharing of costs of urban utilities about half and half between executive body and administrative bodies.

TABLE 15-3 INTEREST RATE OF FFDU BY FUND COMPOSITION
FOR AVERAGE INTEREST RATE OF 20%

(Percent)

Case	Fund Composition			Interest Rate of FFDU
	Own Capital	FFDU	Commercial Bank	
Case 1	15	70	15	20.9
Case 2	15	80	5	22.8
Case 3	20	75	5	24.3
Case 4	20	80	0	25.0
Case 5	25	70	5	26.0
Case 6	25	75	0	26.7
Case 7	32	57	11	28.4

15-2-4. Comparison of Financial Situation by Development System

1) Conditions of Development System

Hereinafter, the ratio of the executive body's share of the cost of urban utilities is assumed to be one tenth, considering that the project is conducted under the existing FFDU system.

Characteristics of each development system are summarized as follows:

a. Total purchase system

The executive body purchases all the lots and existing buildings except those of the Phillips factory and those belonging to the site of the planned sewage treatment plant. The executive body will demolish existing buildings and develop land including land preparation, arrangement of infrastructure and construction of parks. After completion of development works, they will sell prepared lots at assessed current prices, in order to recover the investment cost and obtain profits.

b. Valorization system

The executive body purchases only the land which belongs to planned public land. All existing buildings are bought in order to conduct overall development works. The investment cost is recovered by collecting the valorization contributions levied on land owners in the project area. The influence zone for distributing valorization contributions is assumed to be the same as the project area.

c. Land readjustment system

The executive body does not purchase land, but it does purchase all the existing buildings. The investment cost is recovered by selling reserved land which is decided under the limit of increased land value.

The executive body could independently be a newly established development company or a readjustment association composed of land owners.

d. Land trust system

The land owners form an association for land trust and contract with the executive body to sell their land at higher prices after development. The executive body conducts all aspects of development including project financing instead of the land owners association. When the development work is finished, the executive body sells the land and pays the association the remaining of land sale amount after deducting the costs and trust fee.

TABLE 15-4 shows the conditions of each development system.

TABLE 5-4 CONDITIONS OF DEVELOPMENT SYSTEM

	Total Purchase System	Valorizacion System	Land Readjustment System	Land Trust System
Land	Complete (900,584 m ²)	Part planned as public land (199,105 m ²)	None	None
Building Acquisition	Complete	Complete	Complete	Complete
Recovery of Cost	Land sales	Valorizacion* contribution	Sales of** reserved land	Land sales (pay 10 to 20 % as trust fee)
Recovery Schedule	According to the sale schedule	From the starting year of investment by phase, first year 50% second year 20% third to fifth year: 10%	According to the sale schedule	According to the sale schedule

* The amount of contribution of each development phase is the investment cost including interests of loan.

** The rate of reserved land is decided to be the following formula.

$$\text{Rate of reserved land} = \frac{\text{Investment cost} + \text{Interest of loan}}{\text{Land sale of phase}}$$

$$\text{The maximum rate} = \frac{\text{Land price after development} - \text{Land price before dev.}}{\text{Average unit land price after development}}$$

2) Finance Conditions

The investment cost is assumed to be financed mainly by FFDU of BCH.
Sources of investment fund are distributed as follows:

$$\text{FFDU : Fund 1} = 0.7 (P + Cf)$$

$$\text{Commercial Bank Loan : Fund 2} = 0.8(P + Q - \text{Fund 1})$$

$$\text{Own Capital : Fund 3} = P + Q - (\text{Fund 1} + \text{Fund 2})$$

where;

P : Construction Cost by Development Phase

Cf: Interest of F1 during the Construction period

Q : Land and Building Acquisition Cost by Phase

When operating fund is short of the demand, a short-term loan from a financial market is obtained to cover it.

The financial conditions of each loan are as follows:

(1) FFDU

a. Loan period : 8 years

b. Grace period : 2 years

c. Repayment system

1) Principal : Biannual gradual repayment

2) Interest : Payment for outstanding principal

d. Interest rate

Portion rediscounted by BCH (80% of Fund 1) : 28%

Portion decided by intermediate bank(20% of Fund 1) : 30%

Average : 28.4%

e. Commission

1) Investigation commission

1% of the total amount of loan is deducted from the first disbursement.

2) Engaged commission

The engaged commission is deducted from each after the second disbursement. The amount is decided by applying annual interest rate of 0.5% to the outstanding amount of loan.

(2) Fund of commercial bank

- a. Loan period : 8 years
- b. Grace period : 2 years
- c. Repayment system
 - 1) Principal : Biannual equal payment
 - 2) Interest : Payment for outstanding principal
- d. Interest rate : 36%

(3) Short-term loan

- a. Loan period : 6 months
- b. Grace period : none
- c. Repayment system
 - Repayment of principal and interest after 6 months
- d. Interest rate : 40%

3) Financial Situation by Development System

Financial analysis is conducted at current prices, using the following increase rates per annum:

- a. Construction cost
 - 22%
- b. Land value
 - until 1994 : 13.8%
 - after 1995 : 22 %
- c. Current expenditures
 - 20%

(1) Distribution of Development Profit by System

The distribution of development profit by system is summarized as shown in TABLE 15-5.

In this table, the cost and profit of urban development are seen from the viewpoint of both of the executive body and land owners. If land is not purchased by the executive body, it is considered as cost for land owners. From this point of view, the total investment cost is equal regardless of system.

TABLE 15-5 DISTRIBUTION OF BENEFIT BY DEVELOPMENT SYSTEM

(in million pesos)

	Total Purchase		Valorizacion		Land Readjustment		Land Trust	
	E.B.	L.O.	E.B.	L.O.	E.B.	L.O.	E.B.	L.O.
Future Total Land Price	82,765.8		82,765.8		82,765.8		82,765.8	
	82,765.8	-	60,758.5	22,007.3	59,048.5	23,717.3	8,276.6	74,489.2
Investment								
Construction	18,455.0		18,455.0		18,455.0		18,455.0	
	18,455.0	-	18,455.0	-	18,455.0	-	-	18,455.0
Building Acquisition	3,671.1		3,671.1		3,671.1		3,671.1	
	3,671.1	-	3,671.1	-	3,671.1	-	-	3,671.1
Land	4,269.2		4,269.2		4,269.2		4,269.2	
	4,269.2	-	956.6	3,312.6	-	4,269.2	-	4,269.2
Interest Paid	33,263.8		29,201.9		28,031.1		28,031.1	
	33,263.8	-	29,201.9	-	28,031.1	-	-	28,031.1
Current Expenditure	9,096.3		8,473.9		8,891.3		9,096.3	
	9,096.3	-	8,473.9	-	8,891.3	-	4,283.3	4,813.0
Difference	14,010.4		18,694.7		19,448.1		19,243.1	
	14,010.4	-	-	18,694.7	-	19,448.1	3,993.3	15,249.8

Note: E.B. : Executing Body
L.O. : Land Owner

In the case of total purchase system, the executive body obtains a value added of 14,000 million pesos, after deducting investment cost, loan interest and current expenditures. Land owners get cash when they sell their lots but do not get development profit.

If the land readjustment system is adopted, the result is similar to the result obtained using the valorization system.

The difference between the two systems lies in the form of project cost payment by land owners, that is, one is by valorization contribution (money) and the other is by reserved land.

If the land trust system is adopted, the development profit is shared by the executive body and land owners. The ratio of share depends on the rate of trust fees.

The financial profitability is influenced by the amount of the interest payment. In the total purchase system, the value added is 4,000 to 5,000 million pesos lower than those in other systems, because of the interest payment for land acquisition cost.

(2) Comparison of financial statement by development system

The crucial points of financial statements are as follows:

- a. Is it necessary to depend on a short-term loan? And if so, what amount?
- b. Until the year 2000 when land sale is completed, is it possible to reserve enough funds for repayment of the outstanding loan?

When these crucial points are considered, the total purchase system has some problems.

a. Total purchase system

Around 1995 when the amount of investment will have become large and the repayment of the initial loan starts, short-term loans amounting to about 3,000 million pesos every six months are to be introduced for the management. After 1997 this burden vanishes and the revenue from the operation of surplus fund starts to increase. And up to the year 2000, the reserved fund reaches the amount required to pay further debt. The reason why the short-term loan is necessary is that the revenue from land sale is short of the large repayment amount brought about by the loan commercial banks for land acquisition.

b. Valorizacion system

If the valorizacion contribution is collected during 5 years from the starting year of construction and 70% is collected in the first 2 years, the financial situation remains good and borrowing short-term loans is not required.

c. Land readjustment system

If the maximum rate of reserved land is adopted for Phase I and V, the revenue from sale of the reserved land is enough to cover the loan repayment and can keep the executive body in a sound financial situation. The same way is true if the case of valorizacion system is adopted. This case assumes the same land sale schedule as the total purchase system and the revenue is smaller than that. Nevertheless the executive body can avoid financial crisis by this system, because they are free from the burden of repayment of land acquisition costs.

However, as the ratio of reserved land is very large in Phase I and Phase II, the replotted land is located mainly in the area of Phase III and Phase IV.

If land owners want to remain in the central part of the project area, the purchasing priority is to be given to existing land owners.

d. Land Trust system

In the Land Trust System, the financial situation of land owners should be examined. It is enough for the executive body to receive the trust fee and compensate their current expenses plus profit or, when they invest their own capital, obtain a profit higher than the opportunity cost. The rate of trust fee could be set at between 10 and 20 % of land sales. Land owners can maintain a sound financial situation after paying the trust fee, investment cost, and necessary expenditure to the executive body.

TABLE 15-6 SUMMARY OF PROFIT/LOSS STATEMENT BY DEVELOPMENT SYSTEM
(at the end of 2004)

(in million pesos)

	Accumulated Net Income	Income Tax Paid	Short-term Loan Period
Total Purchase	27,954.4	13,110.4	1990 II - 1996 II 2)
Valorizacion	422,865.4	- 1)	-
Land Readjustment	80,300.8	- 1)	-
Land Trust	71,141.0	30,629.3	-

1) Valorizacion system and Land readjustment sytem do not require to pay income tax.

2) II means the second half of each year

15-2-5. Proposal of New Development System

From the characteristics of each system and the study in the previous subsection, the following can be pointed out.

a. The total purchase system is vulnerable to the loan repayment.

The main cause of this vulnerability is due to the land acquisition

cost. In addition, it is considered financially and socially difficult for the executive body to purchase all the land of the project area.

- b. For the executive body, the current expenditure, especially the facility maintenance cost, is not a negligible burden, regardless of the development system.
- c. The land readjustment system can be managed financially, if the rate of reserved land assessed at a very high level. But it is considered difficult for land owners to submit such a large portion of land and move to other replotted places.
- d. The valorization system has similar merits and demerits to the land readjustment system. The condition under which this system can be applied is only if land owners pay expensive valorization contributions for this unprecedented urban development project.
- e. The land trust system is originally a system applied to a single lot or lots belonging to one owner. Even though it is profitable on a calculation it might be difficult to get various land owners together and to form an association.
- f. Assumed conditions for preparing the financial statements are a little too unrealistic socially; for example, a high rate of reserved land, or expensive valorization contribution. In order to set more realistic conditions, it is necessary to get some recovery fund from outside of the project area in a way and to an extent acceptable to the public.
- g. The financial situation of the executive body is unstable depending on adopted development system and loan conditions, because they are expected not only to be single land developer but also to play a leading role in the new urban formation of this city.
In order to strengthen it and allow executive flexibility, it is

recommendable that they keep their own land and use it for part of the recuperation of investment cost, as a contingency fund for land sale, special and public use if the occasion arises, and as part of resources for another projects.

Considering above mentioned problems, a new development system is proposed. This is a combined system of studied development systems, physically as well as conceptually.

- a. Free submission of public land (before: lot, after: public land)
Land owners submit a part of their land for public land (road, park and water area) free of charge.
- b. Land trust system (share of development profit) (before: lot, after: lot)
Land owners form a land trust association and the association contracts with the executive body to dispose comprehensively it's land, the area of which is equivalent planned lots prepared from existing lots. The executive body pays to the association the amount after deducting the trust fee and expended costs from land sales.
- c. Keeping of reserved land for executive body (before: public land, after: lot)
The executive body keeps as reserved land the part of planned lots which were prepared from existing public lands.
- d. Transference of public land and utilities
Developed public land and urban utilities are transferred to each administrative body which is engaged in maintenance.
- e. Valorization for public land
The executive body recovers the costs of streets and parks by valorization contributions. The influence zone is assumed to be the Barranquilla Metropolitan Area, including Calle 30 and

Riverside Bypass projects. It is recommendable to form a network package for valorization.

Applying this system of development, the distribution of development profit is shown in TABLE 15-7.

The executive body gains 34,300 million pesos of future total land price of 82,800 million pesos from sale of reserved land, valorization contributions and trust fee. Deducting the investment cost, interests payment and current expenditures, the final capital gain is 4,900 million pesos. On the other hand, the land owner association gets the final gain of 18,600 million pesos. In addition, the executive body collects valorization contributions of 11,800 million pesos from land owners outside of the project area.

TABLE 15-8 shows the summary of the profits/loss statements and the cash flow table of both the executive body and the land owners. Each side maintains financial solvency. In this case, the short-term loans are not necessary except during the initial stage when the executive body does not have its revenue.

The results of the sensitivity analysis are also shown in TABLE 15-6. The reduction of revenue from land sales affects the financial situation of land owners but not seriously. The increase of cost does not affect the executives body much.

Since the bus terminal and market projects are not highly profitable, the land price may need to be lowered. So, two alternatives are studied: one is of 3,000 pesos/m² and the other if the land is free. Although the financial situation is tight from 1990 to 1991, from 1992 on it improves.

TABLE 15-7 DISTRIBUTION OF BENEFIT BY PROPOSED DEVELOPMENT SYSTEM

	Total Purchase System		Proposed System	
Future Total Land Price	82,765.8		82,765.8	
	E.B.	L.O.	E.B.	L.O.
	82,765.8	-	34,272.2	48,493.6
Investment				
Construction	18,455.0		18,455.0	
	E.B.	L.O.	E.B.	L.O.
	18,455.0	-	10,127.0	8,328.0
Building Acquisition	3,671.1		3,671.1	
	E.B.	L.O.	E.B.	L.O.
	3,671.1	-	858.0	2,813.1
Land	4,269.2		4,269.2	
	E.B.	L.O.	E.B.	L.O.
	4,269.2	-	-	4,269.2
Interest paid	33,263.8		27,951.3	
	E.B.	L.O.	E.B.	L.O.
	33,263.8	-	13,945.8	14,005.5
Current Expenditure	9,096.3		4,905.7	
	E.B.	L.O.	E.B.	L.O.
	9,096.3	-	4,424.6	481.1
Valorizacion from outer area			11,800.0	
Difference	14,010.4		23,513.5	
	E.B.	L.O.	E.B.	L.O.
	14,010.4	-	16,716.8	18,596.7

Note : E.B.: Executing Body L.O.: Land Owner

TABLE 15-8 SUMMARY OF FINANCIAL STATEMENTS BY PROPOSED SYSTEM

(in million pesos)

Case		Accumulated Income		Accumulated Surplus	Short-term Loan		Additional Capital	
		Net Income	Tax Paid		Amount	Year	Amount	Year
Base Case	E.B.	72183.1	30972.0	64325.5	-	-	23.2	1991 I 1992 II
	L.O.	61587.0	26838.8	56850.3	-	-	637.5	1995 I
Land Sales 10% down	E.B.	65012.7	27907.5	57155.1	-	-	43.0	1991 II 1992 II
	L.O.	40142.5	17873.1	35405.8	8.8	1990 II	1413.9	1995 I,II
Cost 10% up	E.B.	66701.0	28634.6	59107.1	-	-	43.5	1991 II 1992 II
	L.O.	54169.8	23783.1	49987.5	0.8	1990 II	894.2	1995 I
Terminal, Market 3000 pesos/m ² (land)	E.B.	71465.3	30666.5	63635.7	-	-	28.0	1991 II 1992 II
	L.O.	58296.0	25458.8	53559.4	76.4	1990 II	731.0	1995 I
Terminal, Market 0 pesos/m ² (land)	E.B.	70364.0	30197.7	62506.4	64.9	1991 II 1990 II	-	- 1992 II
	L.O.	53276.5	23354.1	48539.8	406.6	1991 I	874.0	1995 I

Note : "Additional Capital" means that they compensate the deficit by a part of their accumulated surplus

15-3. Bus Terminal Construction

15-3-1. Investment Schedule

The construction period is from the second half of 1990 to the first half of 1992. The operation is planned to start in the second half of 1992.

The land acquisition and design work are made in 1990, and the construction of buildings starts in the same year.

TABLE 15-9 ANNUAL INVESTMENT AMOUNT OF INTERMUNICIPAL BUS TERMINAL
(in million pesos)

	1990	1991	1992
I. Investments for Fixed Assets			
1. Non-depreciable Assets	81.0	-	-
Land	81.0	-	-
2. Depreciable Assets	154.3	307.8	155.1
Building	153.5	307.0	153.5
Equipments	0.8	0.8	1.6
II. Deferred Charges	26.1	119.9	93.8
Administration Cost before Op.	3.6	7.2	3.6
Interest during Construction	22.5	112.8	90.2
Total	261.4	427.7	248.9

15-3-2. Financing

It is assumed that 30% of the project cost is provided by bus company capital, and 70% is financed by FFDU.

The loan conditions are as follows:

- a. Loan Period: 12 years
- b. Grace Period: 2 years
- c. Repayment system
 - c-1 Principal: biannual gradual payment
 - c-2 Interest : payment for outstanding principal
- d. Interest rate: 28%

15-3-3. Revenue

This terminal has several kinds of revenues: bus charges, rental of shops and cafeterias, rental of fuel station, baggage fees, sales of commercial and business sections and advertisement charges.

1) Bus Charge

The projected number of trips and annual revenue are shown in TABLE 15-10. At present these figures are not to be adopted as the revenue of the terminal. By the Resolution 5250 of 1984 it is provided that the revenue of a terminal is 40% of the figure. In any case, the revenue from bus charges is very small.

TABLE 15-10 PROJECTED REVENUE FROM BUS CHARGE

Year	No. of Bus trips	Average Fare per trip (\$)	Daily Revenue (pesos)	Annual Revenue (million pesos)
1992	224	53.0	5,028	1.81
1993	461	53.0	10,333	3.72
1994	476	53.0	10,611	3.82
1995	492	53.0	10,944	3.94
1996	509	53.0	11,278	4.06
1997	525	53.0	11,611	4.18
1998	543	53.0	12,000	4.32
1999	562	53.0	12,333	4.44
2000	581	53.0	12,722	4.58
2001	600	53.0	13,111	4.72
2002	622	53.0	13,556	4.88
2003	642	53.0	14,000	5.04

2) Rentals of Shops, Cafeterias, Public Offices and Fuel Station

Unit price of monthly rental is projected as 1,800 pesos/m² for floor areas in the main building. The fuel station is projected to pay 400,000 pesos monthly.

TABLE 15-11 RENTALS BY FACILITIES

	Floor Area (m ²)	Unit Price (pesos/m ²)	Annual Revenue (million pesos)
Shops	676.35	1,800	14.6
Public Offices	1,223.24	1,800	26.4
Cafeterias	764.64	1,800	16.5
Fuel Station			2.4
Total			59.9

3) Sales of Floor Area

The terminal company sells a half of the floor area for shops and 1,083 m² of the business section at prices of 120,000 pesos/m² and 90,000 pesos/m², respectively.

TABLE 15-12 SALE REVENUE FROM FLOOR AREAS

	Floor Area (m ²)	Unit Price (pesos/m ²)	Amount (pesos)
Shops	676.35	120,000	81,162,000
Business	1,083	90,000	97,470,000
Total			178,632,000

4) Baggage Fees

It is projected that 5% of passengers will use the baggage storage and the baggage fee will be 100 pesos for each piece of baggage.

5) Advertisement Charges

The number of advertisement spaces is planned to be 117. And it is projected that the advertisement charge is 80,000 pesos/year for a advertisement space.

15-3-4. Expenditures

1) Salary and Social Security

When the terminal enters into operation, the organizational chart is planned as in FIG. 14-3. Under the director, two departments are established; operations department and administrative/finance department.

The former is responsible for traffic control in the terminal and the maintenance of facilities, while the latter manages personnel affairs, accounting and other general affairs. A legal department is put directly under the director. The decision making unit is the board of stockholders. The number of employees is 28 persons. The personnel expenses are as shown in TABLE 15-13.

2) Insurance Expense

The terminal company insures its property against damage caused by fire, explosion and riots. The insurance rate is shown in TABLE 15-14.

TABLE 15-13 ANNUAL AND MONTHLY WAGE OF BUS TERMINAL

(in thousand pesos)

Department	Change	Number of Personnel	Salary	Social Security	Monthly Wage	Annual Wage
Manager's Office	General Manager	1	110.0	47.30	157.30	1887.6
	Secretary	1	35.0	15.05	50.05	600.6
	Messenger	1	26.0	11.18	37.18	446.2
Operation Department	Department Chief	1	70.0	30.10	100.10	1201.2
	Secretary	1	26.0	11.18	37.18	446.2
	Inspector	3	90.0	38.70	128.70	1544.4
	Information	2	54.0	23.22	77.22	926.6
	Porter	2	52.0	22.36	74.36	892.3
	Maintenance	1	26.0	11.18	37.18	446.2
	Supervisor	1	30.0	12.90	42.90	514.8
	Sweeper	3	78.0	33.54	111.54	1338.5
	Guardman	2	52.0	22.36	74.36	892.3
	Secretary	1	26.0	11.18	37.18	446.2
Administration/Finance Department	Department Chief	1	70.0	30.10	100.10	1201.2
	Secretary	1	26.0	11.18	37.18	446.2
	Assistant Accountant	1	35.0	15.05	50.05	600.6
	Cashier	1	35.0	50.05	50.05	600.6
	Messenger	1	26.0	11.19	37.19	446.3
	Personnel Chief	1	50.0	21.50	71.50	858.0
	Department Chief	1	45.0	19.15	64.35	772.2
Jurisdiction Department	Secretary	1	26.0	11.18	37.18	446.2
Total		28			1412.85	16954.2

TABLE 15-14 RATE OF DAMAGE INSURANCE

Classification	Formula for Calculation of Insurance Rate
Fire Building:	$E1 = (C1 - Bc) \times 1.03/1000 (1-15/100)$
Contents:	$E2 = C2 \times 1.13/1000 (1 - 15/100)$
Explosion :	$E3 = (C1 + C2) \times 0.35/1000$
Riots :	$E4 = (C1 + C2) \times 5.4/1000$
Total :	$Te = (E1 + E2 + E3 + E4) (1 + 10/100)$

Where,

C1 : Total Construction Cost

Bc : Ground Work

C2 : Cost of Furnitures and Equipments

3) Public Services

The costs for water, electricity and telephone are estimated as follows:

TABLE 15-15 MONTHLY COST OF PUBLIC SERVICES

		(in pesos)
Services		Amount
Water	$14.70 \text{ pesos/m}^3 \times 2409 \text{m}^3 = 35,412.3$	36,840.95
	(Basic charge) 1,428.65	
Electricity	$16.407 \text{ pesos/kwh} \times 70,545.6 \text{kwh} =$	1,157,441.66
Telephone	$2.25 \text{ pesos/min.} \times 2400 \text{ min/line} \times 8 \text{ line} =$	43,200
	(Basic Charge) $1.000 \text{ pesos/line} \times 8 \text{ line} =$	8,000
	(Tax) $152.59 \text{ pesos/line} \times 8 \text{ line} =$	1,220.72
		52,420.72
Total		1,246,703.33

4) Other Expenditures

The expenditures for maintenance and repair, contingency and other general expenses are projected as follows, based on the rule established by E.S.A.P. (an organization which is engaged in the studies about the public administration.

TABLE 15-16 FOR PROJECTION BASES OF OTHER COST ITEMS

Item	Description
Maintenance and Repair	1% of the depreciable assets
Contingency	7% of the fixed operation cost
General	20% of the salary and social security.

15-3-5. Analysis Result

A discounted cash flow analysis shows that FIRR of this project is only 9.2%. The repayment of loan continue until the year 2003, so the cash flow of operation cannot exceed the amount of the net cash flow of investment until the year 2002.

Two new sources of revenue are assumed to be introduced. One is to increase the bus charge and the other is to establish a passenger charge.

Actual level of the bus charge is set at 40% of the average bus fares. It should be studied to increase this. The passenger charge can be collected in addition to the ordinary bus fare, as in this country this collection is recommended sometimes.

In this Study, for bus charges 100% level is assumed and the passenger charge is settled at 5 pesos per passenger.

In this case, FIRR can be increased to 15.4%. But it is still very low level, so another way to cost down the investment is necessary.

15-4. Market Reorganization

15-4-1. Method of Evaluation

The executive body is considered to be a single responsible for construction of the public market and the open market, and for operation of them after construction is completed. However, the characteristics of both markets are considerably different each other. In addition, it is possible that each market will have its own administration. So, the financial analysis of the markets is conducted in two ways: at first as two administrations then as one administration.

15-4-2. Investment Schedule

The construction period of the markets are phased into two steps. Phase I is from the second half of 1990 to the first half of 1992, when the public market is completed and a part of the open market is constructed. Phase II is from the first half of 1993 to the first half of 1994, when the main part of the open market is constructed.

Land acquisition for Phase I is made in the second half of 1990, and that for Phase II in the first half of 1993.

The investment schedule is shown in TABLE 15-17.

15-4-3. Financing

It is projected that 30% of the project cost of the public market is financed by the capital of the public market, and 70% is financed by FFDU. As for the open market, the construction cost is financed by FFDU and the land acquisition cost is the open market's capital, because the latter exceeds 30% of the total project cost.

The loan conditions are as follows:

a. Loan Period: 12 years

TABLE 15-17 ANNUAL INVESTMENT AMOUNT OF MARKETS

(in million pesos)

	1990	1991	1992	1993	1994
Public Market					
I. Investment for Fixed Assets	304.9	399.2	199.4		
1. Non-depreciable Assets	104.7				
Land	104.7				
2. Depreciable Assets	200.2	399.2	199.4		
Building	199.4	398.8	199.4		
Equipments	0.8	0.4	-		
II. Deferred Charges	32.6	153.0	120.4		
1. Administration Cost before Op.	3.3	6.6	3.3		
2. Interest during construction	29.3	146.4	117.1		
Subtotal	337.5	552.2	319.8		
Open Market					
I. Investments for Fixed Assets	159.7	146.0		417.3	129.1
1. Non-depreciable assets	62.4			116.0	
Land	62.4			116.0	
2. Depreciable Assets	97.3	146.0		301.3	129.1
Building	97.3	146.0		301.3	129.1
II. Deferred Charges	14.4	59.2		67.4	61.4
1. Administration cost before Op.	0.8	1.3		1.1	1.1
2. Interest during construction	13.6	57.9		66.3	60.3
Subtotal	174.1	205.2		484.7	190.5
Total	511.6	757.4	319.8	484.7	190.5

- b. Grace Period: 2 years
- c. Repayment system
 - c-1 Principal: Biannual gradual payment
 - c-2 Interest : Payment for outstanding principal
- d. Interest rate: 28%

15-4-4. Revenue

The public market and the open market both receive revenues from the rentals of stalls and storage facilities.

1) Rentals of Stalls

Unit of rent per m^2 are varied depending on the location, the size and the kind of goods.

The average unit of public market is 799.8 pesos/ m^2 , while ones of open market are 500 pesos/ m^2 for type A, and for other types 682.6 pesos/ m^2 for the Phase I and 705.8 pesos/ m^2 for the Phase II, respectively.

2) Rental of storage facilities

Based on some commodity samples, it is assumed that 1 m^3 of a storage facility can store 85.7kg of goods, and that the average occupancy ratio is 70%. The unit price of storage rental is set at 1.3 pesos/kg. For cold storage, the occupancy ratio is 80% and the unit rental price is 12 pesos/kg.

3) Premium

Users of stalls will have to pay premiums to use them. The amount varies from the lowest of 6,000 pesos for a stall of 2.56 m^2 to the highest of 17,600 pesos for a stall of 7.5 m^2 .

The premium is paid on the installment plan biannual during 5 years.
 The premium is not levied for type A of the open market.

4) Summary of Revenue

(1) Public Market

The revenue of the public market is summarized as shown in
 TABLE 15-18.

TABLE 15-18 ANNUAL REVENUE OF PUBLIC MARKET

		(in million pesos)
Item		Amount
Rental of Stalls:	$8,300\text{m}^2 \times 799.8\text{pesos/m}^2 = 6,639,000\text{pesos/month}$	
	$6,639,000\text{pesos} \times 12 = 79,660,000 \text{ pesos}$	79.66
Rental of Warehouse:	$3,940\text{m}^3 \times 85.7\text{kg/m}^3 \times 0.7 = 236,300\text{kg/day}$	
	$1.3\text{pesos/kg} \times 236,300\text{kg} = 307,200 \text{ pesos}$	
	$307,200\text{pesos/day} \times 360 \text{ day} = 110,600,000\text{pesos}$	110.60
Rental of Cold Storage:	$26\text{m}^3 \times 85.7\text{kg/m}^3 \times 0.8 = 1,780\text{kg/day}$	
	$12\text{pesos/kg} \times 1,780\text{kg} \times 360 = 7,700,000\text{pesos}$	7.70
Premium		3.88
Total		201.84

(2) Open Market.

Open market is constructed in two phases. TABLE 15-19 shows the annual revenue of open market by phase.

TABLE 15-19 ANNUAL REVENUE OF OPEN MARKET

(in million pesos)	
Item	Amount
Phase I	
Rental of Stalls: $6,135.6\text{m}^2 \times 682.6\text{pesos/m}^2 = 4,188,000\text{pesos/month}$	
$4,188,000\text{pesos} \times 12 = 50,260,000$	50.26
Rental of Warehouse: $438\text{m}^3 \times 85.7\text{kg/m}^3 \times 0.7 = 26,300\text{kg/day}$	
$1.3\text{pesos/kg} \times 26,300 \times 360 = 12,300,000$	12.30
Premium 1)	2.87
<hr/>	
Total	65.43
Phase II	
Rental of Stalls: $8,400\text{m}^2 \times 705.8\text{pesos/m}^2 = 5,929,000\text{pesos/month}$	
$5,929,000\text{pesos} \times 12 = 71,150,000$	
(Type A) $8,709\text{m}^2 \times 500\text{pesos/m}^2 = 4,355,000 \text{ pesos/month}$	
$4,355,000 \times 12 = 52,260,000$	
$71,150,000 + 52,260,000 = 123,410,000$	123.41
Rental of Warehouse: the same as the phase I	12.30
Premium 1)	3.94
<hr/>	
Total	139.65

1) Premium is only for first 5 years.

15-4-5. Expenditures

1) Salary and Social Security

It is assumed that one organization manages both the public market and the open market, but 70% of employees are dedicated to the former and 30% to the open market.

The total number of employees at the operating stage is planned to be 72. The annual wages are shown in TABLE 15-20.

2) Other expenditures

Other expenditures are estimated with the same method as the case of the Bus terminal.

15-4-6. Analysis Result

The result of discounted analysis shows that FIRR is 12.3% for the public market. And 14.9% for the open market, respectively.

This figures are also very low same as the Bus Terminal.

It is difficult to find another source of revenue. So, it is necessary to lower the initial investment.

TABLE 15-20 ANNUAL WAGE OF PUBLIC MARKET

(in pesos)

Charge	Number of Personnel	Monthly Salary per person	Total Annual Salary	Social Security	Total Annual Wage
General Administrator	1	90000	1080000	464400	1634400
Assistans	7	48000	4032000	1733760	5813760
Secretary	2	26000	624000	268320	918320
Cashier	1	48000	576000	247680	871680
Collectors	2	26000	624000	268320	918320
Public Relations	2	48000	1152000	495360	1695360
Maintenance Chief	1	48000	576000	247680	871680
Warehouseman	2	26000	624000	268320	918320
Maintenance Assistant	3	26000	936000	402480	1364480
Electrician	2	38000	912000	392160	1342160
Warehouse Keeper	6	26000	1872000	804960	2702960
Workshop Assistant	2	26000	624000	268320	918320
Garbage Collection Chief	1	38000	456000	196080	690080
Garbage Collection	24	26000	7488000	3219840	10733840
Carrier	12	26000	3744000	1609920	5379920
Garbageman	4	26000	1248000	536640	1810640
Total	72		26568000	11424240	38584240

15-5. Evaluation of Road-Projects

15-5-1. Methodology

The benefits which are produced by the improvement or construction of roads are classified as direct or indirect benefits. The former includes the savings in vehicle operating cost and savings in trip maker travel time. The latter is, for example, a raise of land value by

improvement of accessibility and an activating effect to the regional economic activity in terms of both production and consumption.

In this study only the direct benefits are analyzed, because they are definitely known to exist and are comparatively easy to quantify.

In the evaluation of road projects, the benefits which accrue each year up to the year 2010 are determined by what, if anything, is done to construct and improve the Riverside Bypass and Calle 30, respectively. Therefore, benefits become the difference between the sum of total vehicle operating cost (VOC) and total travel time cost (TTC), in the "do-nothing" case (in which no roads except ones in Barranquillita are constructed or improved and the existing road network is maintained up to the year 2010) and the sum of total VOC and total TTC if Calle 30 or Riverside Bypass is constructed according to schedule.

When conducting an economic evaluation of a project, benefits and costs are measured as economic cost rather than in market prices. For this reason, the project investment amount given in Chapter 13 are converted into economic cost prior to evaluation by deducting taxes and applying the shadow wage rate, etc. Vehicle operating cost per km and time value per hour used in benefit estimation, likewise, are adjusted to economic cost.

Benefit estimations are made up to the year 2010, so project costs will correspond to these benefits, the costs are defined as depreciation expenses up to the year 2010 of the constructed road. In other words, the residual value (the non-depreciated part) of a project in the year 2010 is included as minus cost in the year 2011 of the cost stream.

Benefits and costs thus quantified are used in the discounted cash flow analysis, and then the indices for project evaluation (Internal Rate of Return, Net Present Value, Benefit/Cost Ratio) are calculated.

15-5-2. Vehicle Operating Cost and Travel Time Cost

1) Vehicle Operating Cost

The vehicle operating cost is divided into that which is proportionate to the running distance and that which is proportionate to the running time. The former includes costs of fuel, lubricating oil, tires, parts and repairs, etc. The latter includes interests, crew wages, insurance costs, company overhead, etc. Depreciation is considered to belong to both because vehicles depreciate due to both operation and the passage of time.

For the sake of convenience, the cost which is proportionate to the running distance is called the running cost, and that which is proportionate to the running time is called the running time cost.

(1) General Characteristics of Representative Vehicles

Those shown in TABLE 15-21 were selected as the representative vehicles. These include vehicles such as buses and passenger cars which at present do not represent a large share of traffic but are expected to do so in the future, because their assembly production has been started in Colombia.

TABLE 15-21 VEHICLE CHARACTERISTICS AND COST IN BARRANQUILLA, 1987

Vehicle Characteristics	Car	Taxi	Light Truck	Truck	Bus
Make/model	Renault 9 GTL	Chevy Taxi	Chevrolet C-30	Chevrolet C-70, 189	Chevrolet B-60
Fuel Type	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Financial Cost (000 pesos)	3,221.5	2,335.0	4,764.3	8,017.7	8,524.8
Economic Cost (000 pesos)	2,661.1	1,928.9	3,935.7	6,623.3	7,042.2
Annual Operating (hours)	1,200.	2,500.	1,500.	1,500.	3,000.
Annual Operating (kms)	15,000.	25,000.	45,000.	45,000.	57,000.
Average Vehicle Life (year)	10	15	12	12	8.5

Source : CRUMP LTDA. and MOTOCOSTA.

Note : The financial cost = economic cost + value added tax (10%)

(2) Fuel and Lubricating Oil Cost

The price of gasoline in Barranquilla in mid-1987 is 145 pesos (the average of regular and super gasoline market prices). Colombia imports some petroleum products, but the country is basically able to satisfy its domestic needs itself. The advance in petroleum production has been so favorable that the exportation of this hydrocarbon brought an appreciable amount of foreign currencies to this country.

The following formula is used to determine the economic cost of gasoline based on international market price:

Economic cost of gasoline = (international price of crude oil) x (refinery loss coefficient) x (exchange rate) + (oil refining cost)

$$= \frac{\text{US \$ 20/barrel} \times 1.10 \times 245 \text{ pesos/US \$}}{42 \text{ gallons/barrel}} + 24.4 \text{ pesos}$$

$$= 152 \text{ pesos/gallon}$$

The economic cost of lubricants was estimated by deducting the value added tax from the market price (290 pesos per 1/4 gallon), for lubricants are not under price control as gasoline is.

TABLE 15-22 FUEL AND LUBRICANT COST

	(in pesos/gallon)	
	Financial	Economic
Gasoline	145	152
Lubricants (1/4 gallon)	290	264

TABLE 15-23 CONSUMPTION RATE

	Car	Taxi	Light Truck	Truck	Bus
Gasoline (km/gallon)	35	30	30	5	5
Lubricants(gallon/5000km)	0.75	0.9	0.9	6.25	6.04

(3) Tire Cost

Cars, taxis and light trucks have 4 wheels and the rest have 6 wheels. The economic cost of tires is obtained by deducing value added tax (10%) from the market price. The useful life of a tire is 15,000km for cars, 17,000km for taxis and light trucks and 30,000km for trucks and buses.

TABLE 15-24 TIRE COST

	Car	Taxi	Light Truck	Truck	Bus
Number of tires	4	4	4	6	6
Financial Cost (pesos/tire)	12,132	12,132	17,145	26,703	26,703
Economic Cost (pesos/tire)	11,029	11,029	15,586	24,275	24,275
Tire Life (1,000 km)	15	17	17	30	30

(4) Cost of Parts and Repairs

The cost of spare parts is estimated by applying a fixed rate to the price of a new vehicle minus the tire cost, based on the collected data in the study and World Bank survey results.

The annual number of working hours of a mechanic is obtained by multiplying the average number of repairs made in a year by the number of working hours required per repair. The labor cost of a mechanic includes wages, workshop overhead and profit. Since mechanics include unskilled labor such as job assistants, the shadow wage rate is applied to obtain the economic cost.

TABLE 15-25 SPARE PARTS AND MAINTENANCE LABOR COST

	Car	Taxi	Light Truck	Truck	Bus
Spare Parts Requirement*	3.0	7.0	7.0	8.5	16
Maintenance Labor per Annual (hr)	30	80	80	250	380
Unit Labor Cost					
Financial (pesos/hr)	195	195	195	234	234
Economic (pesos/hr)	170	170	170	208	208

* % of new vehicle cost minus tire cost.

(5) Depreciation

Depreciation applies to the cost of a new car minus the tire cost. The residual value after the useful life of a vehicle has passed is determined as 5% for taxis, 10% for light trucks and 15% for other types of vehicles. The reason why such high values are assumed is because there is a strong demand for used cars in Barranquilla, where even quite old cars are being sold.

TABLE 15-26 DEPRECIATION

	Car	Taxi	Light Truck	Truck	Bus
Vehicle Life (years)	10	15	12	12	8.5
Residual Value Ratio (%)	15	5	10	15	15
Distance to time proportion	50:50	50:50	70:30	70:30	85:15

Depreciation is divided into that which applies to the running cost and that which applies to the running time cost. The ratio used is the average of such ratios in developing countries as reported by the World Bank.

(6) Capital Opportunity Cost (Interest)

In this study an interest rate of 26% is applied when calculating the capital opportunity cost. The interest rate in economic cost is considered to be 12% which is used by MOPT.

The capital opportunity cost is obtained by multiplying the residual value of a vehicles, or generally one half of the price of a new vehicle, by the above mentioned rate.

(7) Crew Wages, Overhead and Insurance Cost

Crew wages, or wages paid to drivers and conductors of taxis, trucks and buses, are assumed to be as shown in TABLE 15-25. Since most light trucks are used for business purposes by private individuals and small retail shops, crew wages are not considered for these vehicles. A shadow wage rate of 80% is applied to crew wages given in financial cost. Insurance costs and company overhead are obtained by an interview survey to insurance companies and transportation companies.

TABLE 15-27 CREW COST, OVERHEAD COST AND INSURANCE COST

	Car	Taxi	Light Truck	Truck	Bus
Crew Cost (pesos/hr)					
Financial	-	125	-	240	241
Economic	-	100	-	192	193
Overhead Cost and Insurance (pesos/hr)					
Financial	205.4	202.0	231.4	434.6	280.5
Economic	188.9	190.4	212.3	402.4	263.3

(8) Running Cost and Running Time Cost

The above mentioned costs are listed in TABLE 15-26.

Total vehicle operating cost in the metropolitan area of Barranquilla is estimated by multiplying the total running distance and total running time of each vehicle type obtained from traffic assignment calculations, by the running cost and running time cost of each vehicle type, respectively.

TABLE 15-28 SUMMARY OF VEHICLE OPERATING COST IN
BARRANQUILLA, 1987

(1) Running Cost (Distance related)	(in pesos/vehicle/km)				
	Car	Taxi	Light Truck	Truck	Bus
Financial Cost:					
1) Fuel	4.14	4.83	4.83	22.16	29.00
2) Lubricant Oil	0.17	0.21	0.21	1.45	1.40
3) Tire	3.24	2.85	4.03	5.34	5.34
4) Spare Parts	6.34	6.40	7.30	14.84	23.62
5) Maintenance Labor	0.39	0.62	0.34	1.30	1.56
6) Depreciation (distance related)	9.00	2.89	5.47	8.65	12.47
Total	23.28	17.80	22.18	53.74	73.39
Economic Cost:					
1) Fuel	4.36	5.09	5.09	26.33	30.55
2) Lubricant Oil	0.16	0.19	0.19	1.32	1.27
3) Tire	2.94	2.60	3.66	4.85	4.85
4) Spare Parts	5.76	5.82	6.64	13.38	21.34
5) Maintenance Labor	0.34	0.54	0.30	1.15	1.39
6) Depreciation (distance related)	7.41	2.38	4.52	7.13	10.28
Total	20.97	16.62	20.40	54.16	69.68

(2) Fixed Cost (Time related)	(in pesos/vehicle/hr)				
	Car	Taxi	Light Truck	Truck	Bus
Financial Cost:					
1) Depreciation (time related)	112.37	28.96	70.43	111.31	41.82
2) Capital Oppor- tunity Cost	343.74	118.90	406.96	680.98	362.46
3) Crew Cost	-	125.00	-	240.40	241.36
4) Overhead and Insurance Cost	205.35	202.04	231.41	434.55	280.50
Total	661.46	474.90	708.80	1467.24	966.14
Economic Cost:					
1) Depreciation (time related)	92.68	23.87	58.10	91.76	34.48
2) Capital Oppor- tunity Cost	130.85	45.23	154.93	259.10	137.93
3) Crew Cost	-	100.00	-	192.30	193.08
4) Overhead and Insurance Cost	188.89	190.85	212.32	402.36	263.32
Total	412.42	359.95	425.35	945.52	628.81

2) Travel Time Cost

The hourly value of Barranquilla inhabitants is estimated based on the labor productivity as follows.

As shown in the Master Plan Study, the 1983 and 1990 Gross Regional Domestic Product (GRDP) of Atlantico was estimated to be 31,160 million pesos and 44,920 million pesos at 1975 prices, respectively. The 1987 GRDP is estimated to be 38,400 million pesos at 1975 prices, which is equivalent to 431 billion pesos in terms of 1987 prices. At the same time, the employment in Atlantico is estimated to be 493,000 persons in 1987. Thus, the annual value added productivity comes to about 874,000 pesos per person. Dividing this figure by 1,950 hours of annual working time results in about 450 pesos of average hourly productivity.

Since the current average distributive income of workers is about 300 to 350 pesos per hour, it is considered to be appropriate to adopt the value of 450 pesos per hour for the time of production activity.

For estimating the travel time cost, the value of 450 pesos per hour is applied to production-related trips only, that is, only trips for business and work purpose shall be subject to this calculation and the time value of trips for school commuting, shopping and other personal purposes will be disregarded. For the benefit of calculating time saving, half of the time saved in commutation trips is assumed to be spent in business activities.

Converting the hourly productivity value of 450 pesos into the equivalent value for per p.c.u. of vehicle results in TABLE 15-29 below. In other words, the 450 pesos is multiplied by the share of commutation and business trips, and further, by the average number of passengers per vehicle (excluding taxi drivers and truck drivers), and then the result is multiplied by the passenger car conversion coefficient (p.c.u. coefficient), resulting in a passenger car hourly value of 225.9 pesos and a bus hourly value of 1,463.5 pesos per p.c.u.

15-5-3. Economic Cost of the Project

The economic evaluation uses the economic cost converted from the project cost which is calculated in market price, based on a review of

the national and/or regional economies. What must be corrected in particular with regard to urban transport projected are 3 points: 1) deduction of taxes contained in the financial cost, 2) re-evaluation of labor cost, and 3) adjustment of land cost.

The estimated financial direct construction costs of Calle 30 and Riverside Bypass are shown in TABLE 15-30.

TABLE 15-29 TRAVEL TIME COST BY TYPE OF VEHICLE

	Car	Taxi	Light Truck	Truck	Bus
Trip Composition (%)					
travelling Work/Business	23.9	13.3	47.3	47.3	20.2
Average No. of					
Passengers	2.1	0.9	2.1	2.1	32.2
P.C.U. Unit	1.0	1.0	1.0	2.0	2.0
Travel Time Cost (pesos/hr/p.c.u)	225.9	53.9	447.0	223.5	1463.5

TABLE 15-30 FINANCIAL DIRECT CONSTRUCTION COSTS OF ROAD PROJECTS

(in thousand pesos)

	Total Cost	Tax	Unskilled Labor Cost
Calle 30	389,607	48,736	12,475
Riverside Bypass	1,890,971	318,917	74,427

At present the unemployment rate in Barranquilla is 12%. According to the Haveman's formula, the shadow wage rate under a 12% unemployment rate is as follows:

$$\begin{aligned}\text{Shadow wage rate} &= (\text{wage rate in the existing market}) \times \\ &\quad (1.25 - 0.12/0.20) \\ &= (\text{wage rate in the existing market}) \times 0.65\end{aligned}$$

Land is freely traded in Barranquilla and there are no special restrictions. The project land area includes few public lots, therefore no correction shall be made on the land cost.

Estimating the economic costs of the road projects through the foregoing procedure results in 828,797 thousand pesos for Calle 30 and 2,939,410 thousand pesos for Riverside Bypass, respectively, including land cost.

15-5-4. Evaluation Results

1) Calle 30

Under the discount rate of 12%, the net present value (NPV) is 1009 million pesos and the benefits-cost ratio (B/C) is 3.24, which assures a high economic return by the construction of Calle 30. The internal rate of return (IRR) is also a favorable 25.9%.

Since Calle 30 will be provided in 1995, the accumulated benefit up to the year 2010 is large and the cost is relatively small. This is the reason why this project gets such high economic feasibility.

2) Riverside Bypass

NPV is 365 million pesos and B/C ratio is 1.42 for the Riverside Bypass project.

Riverside Bypass will generate a smaller benefit than Calle 30 until the year 2002, but from 2003 onwards it will bring about a larger benefit than Calle 30.

This fact shows that it is efficient to improve Calle 30 at first and then to construct Riverside Bypass, corresponding to the development process of the city.

TABLE 15-31 DISCOUNTED CASH FLOW OF CALLE 30 PROJECT

(in million pesos)

Year	Discounted Cost	Discounted Benefits	B-C
1988	0.0	0.0	0.0
1989	52.5	0.0	-52.5
1990	46.8	0.0	-46.8
1991	41.9	0.0	-41.9
1992	48.5	0.0	-48.5
1993	138.3	0.0	-138.3
1994	123.4	0.0	-123.4
1995	0.0	51.2	51.2
1996	0.0	63.3	63.3
1997	0.0	72.3	72.3
1998	0.0	78.6	78.6
1999	1.0	82.7	82.7
2000	0.0	85.0	85.0
2001	0.0	94.8	94.8
2002	0.0	101.4	101.4
2003	0.0	105.6	105.6
2004	0.0	107.7	107.7
2005	0.0	108.1	108.1
2006	0.0	107.2	107.2
2007	0.0	105.3	105.3
2008	0.0	102.5	102.5
2009	0.0	99.2	99.2
2010	0.0	95.3	95.3
Total	451.4	1,460.2	1,008.8

TABLE 15-32 DISCOUNTED CASH FLOW OF RIVERSIDE BYPASS PROJECT

(in million pesos)

Year	Discounted Cost	Discounted Benefits	B-C
1992	0.0	0.0	0.0
1993	22.8	0.0	-22.8
1994	20.4	0.0	-20.4
1995	25.2	0.0	-25.2
1996	56.5	0.0	-56.5
1997	225.2	0.0	-225.2
1998	325.8	0.0	-325.8
1999	204.6	0.0	-204.6
2000	0.0	50.5	50.5
2001	0.0	76.5	76.5
2002	0.0	96.3	96.3
2003	0.0	111.0	111.0
2004	0.0	121.4	121.4
2005	0.0	128.4	128.4
2006	0.0	132.4	132.4
2007	0.0	134.1	134.1
2008	0.0	134.0	134.0
2009	0.0	132.3	132.3
2010	0.0	129.4	129.4
Total	880.5	1,246.3	365.8

TABLE 15-33 DISCOUNTED CASH FLOW OF CALLE 30/RIVERSIDE BYPASS

(in million pesos)

Year	Discounted Cost	Discounted Benefit	B-C
1988	0.0	0.0	0.0
1989	52.5	0.0	-52.5
1990	46.8	0.0	-46.8
1991	41.9	0.0	-41.9
1992	48.5	0.0	-48.5
1993	161.2	0.0	-161.2
1994	143.8	0.0	-143.8
1995	25.2	51.2	26.0
1996	56.5	63.4	6.9
1997	225.2	72.3	-152.9
1998	325.8	78.6	-247.2
1999	204.6	82.7	-121.9
2000	0.0	101.1	101.1
2001	0.0	132.2	132.2
2002	0.0	155.5	155.5
2003	0.0	172.2	172.2
2004	0.0	183.6	183.6
2005	0.0	190.6	190.6
2006	0.0	194.0	194.0
2007	0.0	194.4	194.4
2008	0.0	192.6	192.6
2009	0.0	188.9	188.9
2010	0.0	183.8	183.8
Total	1,332.0	2,237.1	905.1

3) Calle 30 and Riverside Bypass

When both of the two roads are constructed according to the proposed schedule, IRR is estimated at 19.7%. As TABLE 15-33 shows NPV is 905.1 million pesos and B/C is 1.68.

By the way, in case that Calle 30 will be constructed on schedule and the Riverside Bypass will be constructed earlier, (for example opening in 1996), the benefit during the period, 1996-1999, will increase a little, but the cost during the period, 1996-1999, will reduce to zero. However costs during an earlier period are larger than those during a later period, then the total amount of discounted costs will increase much. As a result, the evaluation indices will be lowered.

Some development effects, however, could be gained if the Riverside Bypass is constructed earlier, for example, as follows:

- a. Promotion of location demand into the industrial zone in Barranquillia.
- b. Earlier improvement of accessibility to the Bus Terminal.
- c. Contribution to improvement of the industrial zone along Via 40, Barranquilla Port and Free Zone.
- d. Earlier creation of job opportunity by construction work.
- e. Economic effects on related construction industries.

4) Sensitivity Analysis

The result of sensitivity analysis is shown in TABLE 15-34. The elasticity coefficient of the B/C ratio of the construction cost is 0.93 and that of the traffic demand is 1.02 for the Calle 30 project. The situation is almost the same for other projects (Riverside Bypass only, or both Calle 30 and Riverside Bypass). The evaluation indicators of the Riverside Bypass project are rather low, so the feasibility of the single Riverside Bypass case will run short if the demand decrease more than 20%.

TABLE 15-34 SENSITIVITY ANALYSIS OF ROAD PROJECTS

Projects		IRR (%)	B/C	NPV (million pesos)
Calle 30	Base Case	25.9	3.24	1,008.8
	Cost: 10% up	24.6	2.94	963.8
	Demand: 10% down	24.4	2.91	862.9
Riverside Bypass	Base Case	17.0	1.42	365.8
	Cost: 10% up	15.6	1.29	277.6
	Demand: 10% down	15.4	1.27	241.0
Both Calle 30 and Riverside Bypass	Base Case	19.7	1.68	905.1
	Cost: 10% up	17.9	1.53	771.8
	Demand: 10% down	17.8	1.51	681.2

5) Conclusion

The result of economic analysis shows that the road projects are economically feasible as a whole. So, it can be recommended that both roads be constructed according to the schedule.

It is recommended that the Valorizacion system be used for the implementation of these projects. Usually, the influence zone of valorizacion is delimited independently. But these roads are located very near each other, so it would be convenient to demarcate only one influence zone including both projects.

The economic benefits of these projects are generated in the total metropolitan area. Therefore, it is recommended that the influence zone be delimited as the total metropolitan area.

15-5-5. Estimation of Valorizacion Contribution (Calle 30)

Riverside Bypass is planned to start its construction in 1997, so it is not realistic to estimate the project cost of current prices.

Here only the Calle 30 project is treated.

1) Project Cost before Financial Cost

The project cost of Calle 30 is estimated as follows:

Total construction cost at 1987 price : 626,488 thousand pesos

Total construction cost at the beginning year (1992):

$$626,488(1 + 0.22)^5 = 1,693,214$$

Adjustment during the construction period

Direct and indirect construction cost (1992):

$$1,693,214 \times 1.3/1.608 = 1,368,892$$

Adjustment for 1993 and 1994 : (1993) 684,446(1 + 0.22) = 835,024

$$(1994) 684,446(1 + 0.22)^2 = 1,018,729$$

Increased cost during the construction period:

$$(1,018,729 + 835,024) - 1,368,892 \\ = 484,861$$

Total construction cost before financial cost:

$$1,693,214 + 484,861 = 2,178,075$$

Land and building acquisition cost at 1987 price: 263,377 thousand pesos

Adjustment between 1989 and 1992: (1989) 65,845(1 + 0.138)² = 85,272

$$(1990) 65,844(1 + 0.138)^3 = 97,038$$

$$(1991) 65,844(1 + 0.138)^4 = 110,429$$

$$(1992) 65,844(1 + 0.138)^5 = 125,669$$

2) Financial Cost

If FFDU is utilized for this project, the system of deciding the amount of the loan is as follows:

$$M = 0.7 (P + CF)$$

Where: M = Amount of loan

P = Project budget before financial cost

CF = Financial cost

CF depends on the loan condition. Supposing that the loan of a project continuing during n halves of year is disbursed equally n times, the interest (CF_i) for the first disbursement M₁ = M/n is as follows:

$$CF_1 = M_1 \times r/2 (n - 1) = M/n \times r/2 (n - 1)$$

where r = annual interest rate of the loan

Then:

$$CF = \sum_{i=1}^{n-1} CF_i = \sum_{i=1}^{n-1} M_i \times r/2 (n - i) = M/n \sum_{i=1}^{n-1} r/2 (n - i)$$

$$M = 0.7 (P + CF) = 0.7 \times M/2n \sum_{i=1}^{n-1} r(n - i)$$

$$M = (2n \times 0.7) / [2n - r \sum_{i=1}^{n-1} (n - i)] \times P \text{ ---- (1)}$$

It is difficult to get FFDU for land and building acquisitions.

If for the first equation, the following numbers are substituted.

$$P = 2,178,075 \text{ thousand pesos}$$

$$n = 4$$

$$r = 28.4\%$$

Then:

$$r \sum_{i=1}^{n-1} (n-i) = 0.284 (3 + 2 + 1) = 1.704$$

$$M = (2 \times 4 \times 0.7) / (2 \times 4 - 1.704) \times 2,178,075$$

$$= 1,937,297$$

$$= 1,937,000 \text{ thousand pesos}$$

TABLE 15-35 shows an example of the repayment schedule of the loan, under the condition that the total amount for the loan is repayed at the average interest rate of the rediscounted portion and the non-rediscounted portion. In this case, the total payment of interests amounts to 2,470 million pesos.

3) Base for Deciding Valorizacion Contribution

In this case, the total amount of recovery is as follows:

Construction cost before financial cost	2,178,075
Total financial cost	2,469,984
Land and building acquisition cost	418,408
Total	5,066,467

Additionally, the administration body capital or loan from commercial banks for land and building acquisition and for the residual of construction cost financed by FFDU amounts to 659,483 thousand pesos.

TABLE 15-35 EXAMPLE OF REPAYMENT SCHEDULE

(in thousand pesos)

	Total Payment	Interests	Repayment	Balance
0	0	0	0	1,937,000
1	275,054	275,054	0	1,937,000
2	275,054	275,054	0	1,937,000
3	275,054	275,054	0	1,937,000
4	275,054	275,054	0	1,937,000
5	449,384	275,054	174,330	1,762,670
6	424,629	250,299	174,330	1,588,340
7	438,614	225,544	213,070	1,375,270
8	408,358	195,288	213,070	1,162,200
9	436,212	165,032	271,180	891,020
10	397,937	126,525	271,180	619,840
11	397,937	88,017	309,920	309,920
12	353,929	44,009	309,920	0
Total	4,406,984	2,469,984	1,937.00	-

Note: Loan period: 6 years
 Grace period: 2 years
 Repayment system: Principal: Biannual gradual payment
 Interest : Payment for outstanding principal
 Interest rate: 28.4%

The valorization contribution amount should be decided after examining these figures carefully. The road construction administration body capital of about 660 million pesos is considered to be a heavy burden to the existing Municipal Valorization Office.

15-6. Overall Evaluation

15-6-1. Trial of Economic Analysis

1) Benefit of Urban Development.

The social benefit of urban development accrues from an effective use of land for economic production, comfortable residences, and recreation facilities. The value of land as a property is increased by development. From the stand point of economic activity, the value of a land is measured, by the value added by the production activity located there. Not only manufacturing or agricultural activities but also business and commercial activity produce economic value. However, in urban areas there are many instances of non-productive land use, such as residential areas and parks. These land usages do not generate value added directly, but as places of habitation and relaxation they are more important for inhabitants of city.

The market price of a residential area reflects its quality. The increase of total land price between before and after development is considered as the economic benefit of the development. It is assumed that public service facilities such as schools, hospitals, and public administration buildings are constructed buying their sites at reasonable prices to maintain and develop their activities. Here is an example of economic evaluation of urban renewal in which total costs and benefits are given as follows:

Let:

GPC = gross project cost.

AC = cost of acquired real state in site (Acquisition Cost).

Lo = Market value of land acquired in site.

Io = Market value of improvements acquired in site.

R = Resource expenditures in project other than acquisition cost.

TC = Total resource costs of project.

Then:

$$GPC = AC + R$$

$$AC = Lo + Io$$

$$TC = Io + R$$

(Since Io , but not Lo , is lost to society through the project).

So:

$$TC = (AC - Lo) + R = GPC - Lo$$

And total benefits (TB) is given by:

$$TB = (L1 - Lo) + (\text{spillover effects}) + (\text{change in social costs of slums}).$$

("Economic Evaluation of Urban Renewal", Jerome Rothenberg, The Brookings Institution, 1967).

Referring to this concept, it is assumed that the minimum benefit of Barranquillita development is expressed by difference of market land price of lots between land acquisition cost and land sales revenue.

In addition, it is considered that the very large area of newly constructed parks in the project area have some value as public properties. The project will change the existing dirty canals into comfortable spaces where people can enjoy their free hours. It is difficult however, to measure the value of parks. If inhabitants of Barranquilla Metropolitan Area pay the construction cost of parks in the form of valorizacion contribution they accept the value of parks at an equal price to the construction cost, the construction cost of parks (including reclamation cost of canals) is assumed to be the value of them. This is illustrated in an example in which the public investment to parks and schools are assumed to have net social values equal to their costs ("Efficiency in Public Urban Renewal Expenditures through Capital Budgeting" James. C.T. Mao, Univerity of California, 1965).

2) Economic Cost of Development

The future market price of Barranquilita will be decided on the conditions that not only the urban development project but also Calle 30 and Riverside Bypass projects are executed together. The economic cost of development is assumed to be the total of economic costs of urban development and road projects.

The construction of the intermunicipal bus terminal and the reorganization of markets will generate economic benefit to society. But the benefit is very difficult to measure. Therefore, the construction costs of these facilities are excluded, in exchange, the land prices relating to them are set at an incentive level almost equal to the existing one.

3) Analysis Result

The indices of a discounted cash flow analysis are shown in TABLE 15-34. NPV at 12% of discount rate is 1,655.8 million pesos and EIRR is 17.2%.

TABLE 15-36. RESULT OF ECONOMIC ANALYSIS

Index	Figure
IRR	17.2%
NPV	1,655.8 million pesos
B/C	1.21

The figure is not very high, but in this calculation some benefits generated along the Calle 30 and Riverside Bypass are excluded.

Thus, it can be concluded that this project is economically feasible.

15-6-2. Employment Creation by Construction Work of Project

Many employment opportunities will be created by this project. Limiting to the direct employment effect of the project the number of employment is estimated. As shown in TABLE 15-37, total employment of about 900,000 man-day will be created by this project.

In addition, when the construction works of various buildings will start, the number will increase remarkably. Comparing building construction with civil work, the former will create more employment especially in unskilled laborers than the latter at the same construction cost.

TABLE 15-37 EMPLOYMENT CREATED BY CONSTRUCTION

Project	Employment (man x day)
Urban Development	484,700
Calle 30	26,500
Riverside Bypass	174,200
Bus Terminal	54,000
Markets	153,100
Total	892,500

15-6-3. Other Socio-economic Impacts

1) Employment Creation by Building Construction

According to the bus terminal and market projects, employment will be created at the rate of 100 man-day/million pesos. Total building construction cost of Barranquillita is roughly estimated at 50,000 million pesos, so, the employment of about 5 million man-days will be created until the time Barranquillita development is completed.

2) Other intangible effects

The project may also create the following effects:

- a. The effects to relating industries would be considerable, especially for construction material producer.
- b. The retailers in the central district will enjoy the increase of sales, by removing obstacles caused by street vendors.
- c. Some motivation for urban renewal of the central district will be generated.
- d. Number of visits to Barranquilla will be increased by executing big project.

15-6-4. Conclusion

According to the project evaluation, the urban development project and road projects are feasible, but the intermunicipal bus terminal and market projects have difficulties in financial feasibility.

The feasibility of urban development project is heavily dependent on the conditions that other existing administrative bodies agree to share the construction cost of the related facilities. Economic analysis shows the economic feasibility of urban development including the investment cost for these facilities.

So, it is important to find financial measures to implement these projects as a whole.

It is considered that Phase I and Phase II, form the foundation for the succeeding phases. It is necessary to make efforts to hold out against the financial difficulties until 1996, when the benefits of development start to be realized.

The total investment schedule assumed before evaluation is not to be changed, but some considerations about the share of investment cost between administrative bodies and the cost reduction should be taken into account.

TABLE 15-38 DISCOUNTED CASH FLOW OF BARRANQUILLITA URBAN DEVELOPMENT

	1988	1989	1990	1991	1992	1993	1994	1995	1995	1997	1998	1999	2000	Total	
BENEFIT															
Land Value	0.0	0.0	935.2	1076.0	1226.8	1765.2	2430.8	3077.7	2926.3	2697.7	2598.6	1711.2	828.3	0.0	21273.8
Parks	0.0	0.0	935.2	1076.0	1156.7	1765.2	2430.8	2576.6	2926.3	2412.5	2598.6	1711.2	828.3	0.0	20417.4
	0.0	0.0	0.0	0.0	70.1	0.0	0.0	501.1	0.0	285.2	0.0	0.0	0.0	0.0	856.4
COST															
Land preparation	493.6	1077.2	2855.6	1739.2	1672.1	1875.3	1668.7	1059.1	511.0	981.9	1551.4	797.2	0.0	-7651.9	8630.4
Seware	0.0	5.7	72.3	82.5	50.4	28.6	2.2	61.5	0.3	8.9	0.0	0.0	0.0	0.0	1579.3
Drainage	0.0	7.9	165.2	74.7	311.5	212.0	28.9	26.9	3.0	84.7	0.0	0.0	0.0	0.0	116.6
Water Supply	0.0	0.0	0.6	17.2	0.0	84.9	0.5	12.6	0.0	3.2	0.0	0.0	0.0	0.0	320.0
Electricity	0.0	0.0	700.7	283.4	519.1	393.8	1.6	41.1	0.0	6.2	0.0	0.0	0.0	-1172.0	41.5
Telephone	0.0	0.0	0.0	0.0	0.0	12.5	312.5	316.0	0.0	12.1	303.7	0.0	0.0	-1172.0	773.9
Sewage Treatment Plant	0.0	0.0	77.9	264.1	0.0	89.1	106.5	204.8	0.0	97.3	90.8	0.0	0.0	-748.7	208.1
Street Pavement	0.0	0.0	52.7	178.0	0.0	153.5	277.1	19.6	35.4	13.0	23.6	0.0	0.0	-648.3	282.2
Pedestrian Street	0.0	0.0	10.6	36.2	0.0	68.5	124.2	0.0	0.0	0.0	0.0	0.0	0.0	-505.2	247.7
Pedestrian Overbridge	0.0	2.8	63.2	15.8	0.0	53.0	25.3	0.0	0.0	0.0	0.0	0.0	0.0	-160.6	78.9
Urban Park	0.0	0.0	20.3	36.9	15.4	218.4	218.4	0.0	0.0	0.0	0.0	0.0	0.0	-99.8	60.3
Recreation Park	0.0	0.0	0.0	0.0	0.0	0.0	0.0	86.1	155.9	0.0	0.0	0.0	0.0	-348.0	161.4
Calle 30	0.0	0.0	0.0	0.0	19.5	273.0	272.9	0.0	0.0	0.0	0.0	0.0	0.0	-193.6	48.4
Riverside Bypass	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-395.8	169.6
Land Cost of B/quita	493.6	987.3	828.6	670.0	410.5	151.1	134.2	117.5	58.7	619.0	1133.3	797.2	0.0	-2511.8	132.2
Land Cost of Roads	0.0	65.8	65.8	65.9	65.9	45.1	45.1	62.4	62.3	80.5	0.0	0.0	0.0	0.0	3851.5
	-493.6	-1077.2	-1920.4	-663.2	-445.3	-110.1	762.1	2018.6	2415.3	1715.8	1047.2	914.0	828.3	7651.9	12643.4
Discounted Benefit	0.0	0.0	745.5	765.9	779.7	1001.6	1231.5	1392.2	1181.9	972.8	836.7	491.9	212.6	0.0	9612.3
Discounted Cost	493.6	961.8	2276.5	1237.9	1062.7	1064.1	845.4	479.1	206.4	354.1	499.5	229.2	0.0	-1753.6	7956.6

EIRR = 17.24%
DISCOUNT RATE = 12.00%
NPV = 1655.8
B/C Ratio = 1.21

Chapter 16

PROJECT IMPLEMENTATION PROGRAM

16-1. Basic Consideration

Based on the results of project evaluation, the following are considered for the preparation of the project implementation program.

- a. The schedule of investment remains the same as proposed.
- b. The project cost is shared as much as possible.
- c. Land acquisition cost of the bus terminal and markets should be free of charge, the executive body of urban development will rent the land to bus terminal and market administrations.
- d. The costs for the public facilities like roads, streets and parks should be paid by the inhabitants in the Barranquilla Metropolitan Area, considering the benefits to residents generated by these projects.

16-2. Executive and Administrative Bodies of Development

The executive and administrative bodies which participate in this development project are as follows:

1. New Urban Development Company is responsible for:
 - a. Land preparation
 - b. Arrangement of urban utilities (sewer, water supply, drainage).
 - c. Construction of streets and pedestrian facilities.
 - d. Construction of parks.

2. Municipal Valorizacion Office:
 - a. Construction of Calle 30.
 - b. Collection of valorizacion contribution (Calle 30, Riverside Bypass, street pedestrian facilities and parks in Barranquillita).
3. MOPT:
 - a. Construction of Riverside Bypass
4. Municipal Public Works Department:
 - a. Maintenance of streets and pedestrian facilities.
5. Public Recreation Corporation:
 - a. Maintenance of parks and recreation zone in Barranquillita.
6. EPM
 - a. Construction of sewage treatment plant.
 - b. Maintenance of sewere, water supply and drainage.
7. EMT:
 - a. Construction and maintenance of telephone facilities.
8. ELECTRANTA:
 - a. Construction and maintenance of electric facilities.
9. Gas Companies:
 - a. Construction and maintenance of gas facilities.
10. New Bus Terminal Company:
 - a. Construction and operation of intermunicipal bus terminal.
11. New Market Operating Company:
 - a. Construction and operation of public market and open market.
12. New Land Trust Association:
 - a. Submission of land for development.

13. Other Public and Private Sectors:

a. Construction of various buildings.

Descriptions of the participating bodies follow:

16-2-1. New Urban Development Company

This entity is a semi-public organization, the stock holders of which are composed of Departamento del Atlántico, Municipality of Barranquilla and their related public organizations in the public sector, and trade associations in the private sector. This development company conducts financially profitable development projects and gain profits for other new projects.

A project team will be organized for each project. The team is charged to execute the project, and when the project is finished, it will be broken up.

For Barranquillita development, it is engaged in forming a total development strategy and join in the Terminal and Market Company as a main stockholder to support their financial operations.

16-2-2. Municipal Valorizacion Office

This organization has been making efforts to execute important road projects in Barranquilla. But the difficulty in getting financial resources makes it difficult to execute projects. In this project the influence zone of valorizacion should be extended to the whole metropolitan area and the collection right of contributions is not limited to the Calle 30 project but should be extended to the Riverside Bypass and public facilities in Barranquillita, which will help them to manage funds.

These are transferred to the New Urban Development Company finally, but in the meantime be used as a relief fund.

16-2-3. MOPT

MOPT will construct important roads from the standpoint of national interest. Riverside Bypass has the potential to promote new industry and improve the access for other regions in the country to the industrial zone along Via 40, the Port of Barranquilla, and the Free Zone. It is expected that the road is constructed by MOPT and then the collection right of valorizacion contribution is ceded to the municipality.

16-2-4. Municipal Public Works Department

As in the past, the Municipal Public Work Department is expected to maintain the streets and pedestrian facilities as municipal roads.

16-2-5. Public Recreation Corporation

This organization is already established. However, because of the lack of financial resources and clear objectives, it does not yet function. For the parks and recreation areas in the project area, the organization should be reestablished with sufficient resources and clearly defined objectives for promoting public recreational activities.

16-2-6. EPM, EMT, ELECTRANTA and Gas Companies

In this project, the urban utilities for which each is responsible will be executed by them. But they, also do not have abundant funds, therefore it is necessary to discuss how costs may be shared.

16-2-7. New Bus Terminal Company and New Market Operating Company

Much thought must be given to the establishment of the intermunicipal bus terminal company. It is clear that the bus terminal and markets will be important factors in the overall development of Barranquillita.

In order to avoid the financial difficulty, the following measures are proposed.

- a. Participation of the New Urban Development Company.
- b. Utilization of properties belonging to existing related organization.
- c. Lowering of land acquisition cost.
- d. Lowering of building acquisition cost.

16-2-8. New Land Trust Association

It is recommended that the land owners in Barranquillita form a land trust association. This association will contract with the New Urban Development Company to sell the land at a higher price after development.

There are about 30 large land owners, including the Nation, the Department, the Municipality and EPM, who could be leader to form the association.

16-2-9. Other Public and Private Sectors

The planned floor area of the project site is about 1 million sq. meters. Most of the buildings are expected to be constructed by the private sector.

16-3. Development Systems

Here a development system is defined as a measure to execute project by a consented way of share of the project cost.

Main projects of this Study have their respective difficulties in implementation. To overcome these difficulties, some new ideas are introduced. It is considered that the society is accustomed to the traditional systems of development. And no one wants to pay more than he admits to be reasonable.

The following are some new ideas introduced for executing the main projects.

- a. Extension of influence zone of valorization system to metropolitan area.
- b. Establishment of administrator charge system
- c. Extension of land trust system
- d. Combination of system

16-3-1. Extension of Influence Zone

Considering the execution of Calle 30, Riverside Bypass and streets and Parks projects in Barranquillita, the influence zone of valorization system is recommended to extend to the wole Barranquilla Metropolitan Area.

Essentially the influence zone should be limited to the area, as far as the benefit of a project will reach. The benefits of the main projects are considered to be of the metropolitan area. But it is important to make efforts to get people agree to this.

At least, for land owners in and around the project area, this concept will be accepted because if the influence zone is delimited separately,

they have to pay contributions several times, and above all, their share will decrease.

16-3-2. Establishment of Administrator Charge System

The urban development project is feasible on condition that several urban utilities are constructed by existing administrative bodies. Sewage treatment plant, under ground electric facilities or moving telephone exchange are very expensive and become a heavy burden to the land developer especially at the initial stage. On the other hand, the existing administrators are not easy to share the costs. Thus, there should be a certain rule how to share the costs of urban development between related entities.

For example, the developer pays first but is compensated for interest payment by the administrators, or vice versa.

16-3-3. Extension of Land Trust System

For conducting the urban development project, it is indispensable to get a broad consensus of land owners. The first 5 to 6 years of development is a period of patient endurance. It is difficult, therefore, to conduct by the total purchase system. The valorization and land readjustment system have also problems to land owners.

Land owners have to pay much money or land especially at the Phase I and II. But these two systems are still effective measures to conduct a public development work. These systems are aimed only to recover the project cost. If the project cost and the increase of land price is at an appropriate proportion, the public sector can conduct an urban development project satisfying not only themselves but also land owners.

Land trust system has been applied only to small scale area of land owned by one person. The merits of this system consists in the fact that

land owners do not have to engage in troublesome works relating to trade of properties and get profits after paying trust fee and required expenses to the trustee company. And, if land owners want to sell land at higher price, this is better for them than the total purchase system. So, as for the developer, this is a safe system from the danger of getting into difficulty in financial situation on condition that the prepared land can be sold at planned prices, because the development cost is shifted to land owners.

But the fundamental requirements are to form a land owners association for land trust.

There about 30 large land owners including Nation, Department, Municipality and EPM. These large owners could be leaders to form the association.

16-3-4. Combination of System

Considering that the valorization system is a traditionally accepted system in this country and the concept of land readjustment system which treat and settles the land totally based on the area of land without regard to the location is useful to introduce for the development of Barranquilita, a combination system of these two systems and land trust system with Administrative Charge System is recommendable. A comprehensive land trust system requires for land owners to abandon the attachment to their own lots. Land owners receive profits distributed proportionally to their before-project property values, regard less of the sales price of their old lots.

In this system the public facilities like streets and parks are constructed by valorization system. The contributions are collected not only from the land owners in the project area but also from the outside of the project area.

16-3-5. Development System for Main Projects

The development system by project is considered as follows:

Riverside Bypass	}	Valorizacion
Calle 30		
Streets and Pedestrian Facilities	}	Combination System
Parks		
Utilities		
Land Preparation		

In addition, for Bus Terminal and Market projects, a special incentive measure by New Urban Development Company should be done, for example free charge rent of land and share of construction cost.

16-4. Implementation Program

16-4-1. General

The tentative investment schedule for project evaluation is to start in the second half of 1989 by the design study for urban development project, and to finish in the second half of 1999 by the completion of the Riverside Bypass.

Under existing high inflation rate, it is difficult to grasp the real financial state of the project which starts two years ahead. And recently some movements to realize this project are becoming active, so it is considered to be important that people feel first hand the nearness of the development and start preparing for that seriously.

But on the other hand, the New Urban Development Company which is expected to play a leading role of the development has not yet been established.

After establishing the company, preparatory works such as preparation of a proposal document to finance, negotiation or promotion activity to the land owners usually take time considerably.

Thus, the schedule remains unchanged, although it is possible to shift earlier about half a year.

16-4-2. Overall Investment Program

TABLE 16-1 shows the overall investment program. From 1988 up to 1999 about 19,500 million pesos are scheduled to be invested.

TABLE 16-1 OVERALL INVESTMENT PROGRAM

(in million pesos, at 1987 price)

Investment Body	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Total	
Urban Development	NUDC 1)													
Construction		31.3	1585.9	1144.7	1377.9	1602.6	1405.0	1031.6	336.3	311.7	506.8		9333.8	
Building Acquisition	229.5	459.1	403.1	347.1	204.0	61.0	53.4	45.8	22.9				1825.9	
Land Submission	(LO) 2)	264.0	528.1	425.4	322.7	206.5	90.2	81.0	71.8	35.9			2025.6	
Bus Terminal Const.	BEST 3)			153.5	307.0	153.5							614.0	
Market Reorganization	MART 4)			296.7	544.8	199.4	301.3	129.1					1471.3	
Calle 30 Improvement	MVO 5)													
Construction					19.5	303.5	303.5						626.5	
Land & Building Acq.		65.8	65.8	65.9	65.9								263.4	
Riverside Bypass Const.	MOPT 6)													
Construction									94.5	715.3	1309.6	921.3	3040.7	
Land & Building Acq.						45.1	45.1	62.4	62.3	80.5			295.4	
Total		493.5	1084.3	2930.4	2732.2	2226.7	2403.7	2017.1	1211.6	551.9	1107.5	1816.4	921.3	19496.6

- 1) New urban Development Company
- 2) Land Owner
- 3) Bus Terminal Company
- 4) Market Company
- 5) Municipal Valorizacion Office
- 6) Ministry of Public Works

The peak of annual investment is in 1990, when the investment amount reaches 2,930 million pesos.

The New Urban Development Company will invest 11,160 million pesos until 1998, including building acquisition cost of 1,800 million pesos.

16-4-3. Short-term Investment Program (Urban Development)

Of the total investment period of 12 years, the period from 1988 to 1994 is selected as the short-term implementation period.

During this period, an estimation of investment by the executive body is shown on the condition that they pay only one tenth of the cost of urban utilities for avoiding financial tightness under the existing FFDU system.

TABLE 16-2 shows the short-term investment schedule. In 1988, the building acquisition is started. During the second half of 1989, the design work for land preparation and the pedestrian bridge around the Bus Terminal will be contracted. Until the end of 1989, the executive body should prepare the own capital or loan from commercial banks for building acquisition amounting to 1,000 million pesos.

TABLE 16-2 SHORT-TERM INVESTMENT PROGRAM (URBAN DEVELOPMENT)

(in million pesos at current price)

	1988		1989		1990		1991		1992		1993		1994	
	I	II	I	II	I	II	I	II	I	II	I	II	I	II
Land Preparation			14.5	328.8	134.1		41.4	292.5	740.0	379.9				
Drainage			13.5	172.5	154.8	127.1	48.5	426.2	516.4	548.4	199.4			
Utilities			10.6	13.5	153.7	254.5		8.7	170.0	122.7	350.9			
Street Pavement				16.9	105.6	230.5	252.1				59.2	61.39	670.2	735.0
Pedestrian Street				3.3	20.6	44.9	49.1				25.4	263.7	287.9	315.7
Pedestrian Bridge				5.2	64.6	70.5	38.5				10.3	214.0	117.2	
Urban Park					4.0	41.9	45.7	50.2		53.7	418.3	456.7	499.3	546.7
Building Acquisition			312.7	334.1	357.3	381.9	310.0	331.4	354.2	378.7				
Total			312.7	334.1	401.1	985.5	991.2	1072.6	795.5	1106.1	1480.1	1564.2	2098.6	1574.6

Note : Some part of construction work of Phase III is executed in 1994 and building acquisition for Phase III starts in 1992. These investments are not included.

Note: Some part of construction work of Phase III is executed in 1994 and building acquisition for Phase III starts in 1992. These investments are not included here.

TABLE 16-3 shows the loan schedule. According to the FFDU rule, about 70% of project cost (including interest during the construction period) is financed by FFDU. But 80% of building acquisition cost and the rest of construction cost is financed by commercial banks at the rate of 36% per annum. The rest is own capital.

TABLE 16-3 LOAN SCHEDULE

(in million pesos at current price)

	1988	1989	1990	1991	1992	1993	1994
Own Capital	62.6	66.8	73.0	84.1	90.0	84.0	93.8
Loan FFDU		36.5	504.2	570.8	622.9	375.8	637.3
Loan Com. Bank	250.1	267.4	291.7	385.2	336.4	359.8	335.7
						375.1	128.6
						132.4	128.6
						170.5	126.5
						1885.5	1416.5
						1319.5	1440.6
						1398.7	1440.6
						126.5	125.5

16-4-4. Necessary Measures to be Taken

For implementing the program, the following measures should be taken.

- a. Establishment of general and specified rules of share of urban development cost among related organizations.
- b. Clarifying of authorized power of the New Urban Development Company in the field of planning, project execution, financing and surplus appropriation, especially in connection with the municipal government and private sector.
- c. Earlier foundation of the New Urban Development Company, based on the above mentioned authorization.

- d. Study of institutional and legal status of large scale land trust system.
- e. Formation of land trust association based on the result of the study.
- f. Decision of compensation system and its amount.
- g. Clarification of public role of Bus Terminal and Markets and taking reasonable measures for financial assistance for them.
- h. Study of institutional and social possibility for extending the influence zone of valorizacion to the Metropolitan Area.
- i. Negociation with Nation to construct Riverside Bypass by national fund.
- j. Negociation with BCH to lower the interest rate of FFDU and to add land and building acquisition cost to the object of FFDU.

