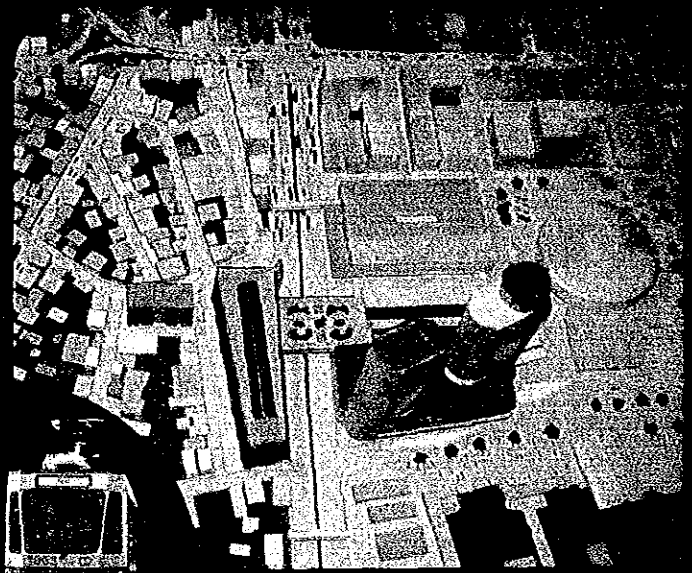
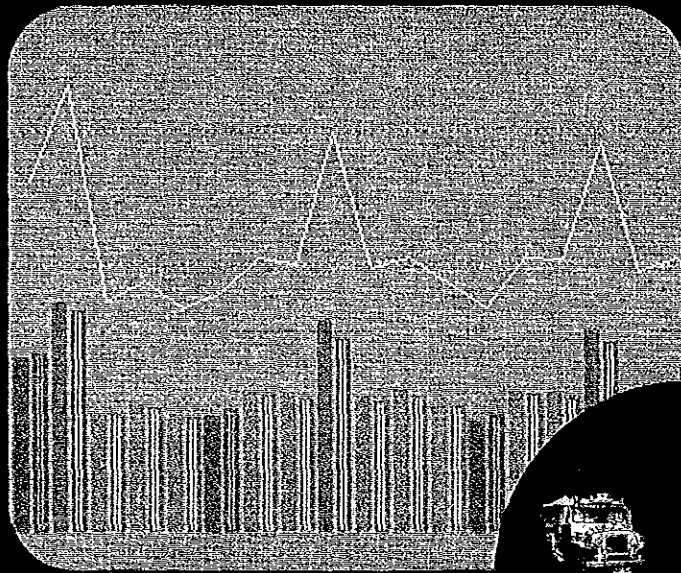


# The Metro Manila Transportation Planning Study Phase II - Final Report

## EXECUTIVE SUMMARY



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**REPUBLIC OF THE PHILIPPINES**

**The Metro Manila  
Transportation Planning Study  
Phase II Final Report**

**EXECUTIVE SUMMARY**

**SEPTEMBER 1985**

**JAPAN INTERNATIONAL COOPERATION AGENCY**

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## PREFACE

In response to the request of the Government of the Republic of the Philippines, the Japanese Government decided to conduct a study on the Metro Manila Transportation Planning (JUMSUT) Phase II and entrusted the Study to the Japan International Cooperation Agency.

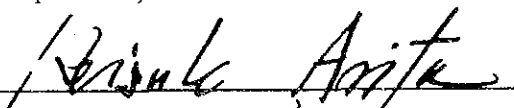
The J.I.C.A. sent to the Republic of the Philippines a study team headed by Mr. Shizuo Iwata, ALMEC Corporation, from June 1984 to March 1985.

The team exchanged views with the officials concerned of the Government of the Republic of the Philippines and conducted a field survey in Metro Manila.

I hope that this report will serve for the development of the Project and contribute to the promotion of friendly relations between our two countries.

I wish to express my deep appreciation to the officials concerned of the Government of the Republic of the Philippines for their close cooperation extended to the team.

September, 1985

A handwritten signature in black ink, appearing to read 'Keisuke Arita', is written over a horizontal line.

Keisuke Arita

President

Japan International Cooperation Agency





Mr. Keisuke Arita  
President  
Japan International Cooperation Agency  
Tokyo, Japan

September 1985

Dear Sir:

#### LETTER OF TRANSMITTAL

We are pleased to formally submit herewith the final report on "The Metro Manila Transportation Planning Study (JUMSUT) Phase II". This study report comprising an Executive Summary, a Main Text, and nine (9) Technical Reports embodies the results of the study undertaken by ALMEC Corporation during the period from June 1984 to September 1985.

The main objective of the study was to formulate proposals for the further improvement of the public transportation route structures and for the development of selected mode interchange areas, both from the short-term and mid-term planning periods. Complementary to this objective, a series of seminars were conducted for effective transfer of technology.

We hope that this study would be of valuable assistance to the Government of the Republic of the Philippines not only for the present transportation improvement of Metro Manila but also for the future development of its transportation schemes.

We wish to express our appreciation and sincere gratitude to the officials of your Agency, Advisory Committee, the Embassy of Japan to the Republic of the Philippines, as well as to the officials and individuals of the agencies concerned of the Government of the Republic of the Philippines, particularly the Ministry of Transportation and Communications for the assistance and cooperation extended to the Study Team.

Very truly yours,



Shizuo Iwata  
Managing Director  
ALMEC Corporation  
Project Manager  
Metro Manila Transportation  
Planning Study (Phase II)



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## GLOSSARY

BLT	Bureau of Land Transportation	MOTC	Ministry of Transportation and Communications
BOT	Board of Transportation		
CBD	Central Business District	MPWH	Ministry of Public Works and Highways
CHPG	Constabulary Highway Patrol Group	NCR	National Capital Region
EDSA	Epifanio de los Santos Avenue	OBA	Old Bilibid Area
GRDP	Gross Regional Domestic Product	OD	Origin-Destination
HIS	Home Interview Survey	PC/INP	Philippine Constabulary/Integrated National Police
JICA	Japan International Cooperation Agency	PNR	Philippine National Railway
JUMSUT	JICA Update of Metro Manila Study on Urban Transportation (The Metro Manila Transportation Planning Study)	TEAM	Traffic Engineering and Management
		TRANSEC	Transportation Secretariat
LRT	Light Rail Transit	TTC	Transport Training Center
MIA	Mode Interchange Area	UP	University of the Philippines
MMC	Metro Manila Commission	URPO	Urban Roads Projects Office
MMUTSTRAP	Metro Manila Urban Transportation Strategy Planning Project		

## 1.0 INTRODUCTION

### STUDY BACKGROUND AND OBJECTIVES

The Metro Manila Transportation Planning Study (JUMSUT) Phases I and II have been undertaken by JICA Study Team under the Ministry of Transportation and Communications, Government of the Philippines with a technical assistance grant provided by the Government of Japan, through the Japan International Cooperation Agency (JICA), for the following general objectives:

- a) Enhance the data base for transportation planning;
- b) Develop practical methods and procedures for public transportation route planning;
- c) Formulate short- and medium-term proposals for public transportation route improvements;
- d) Assess the feasibility of selected passenger interchange terminals or mode interchange area (MIA) facilities; and
- e) Upgrade local staff capability through technology transfer.

Phase I of JUMSUT commenced in October 1982 and was completed in April 1984. Its main focus was on the collection and management of primary base data, such as the 1980 Home Interview Surveys. Data on public transportation supply, demand, and operating conditions were also collected and utilized in the restructuring of the bus/jeepney routes along the Light Rail Transit (LRT) Corridor.

JUMSUT Phase II began in June 1984 to improve the performance levels of public transportation service, two (2) critical parameters open to government intervention, viz., routes and mode interchange areas. Route modifications for the short-term periods have been detailed for the eastern corridor and broad restructuring schemes presented for mid-term consideration for the entire Metro Manila area. These necessitated the conduct of supplemental surveys and the forecasting of land use distribution and transportation demand by 1990. Development plans and feasibility studies have been prepared for five (5) strategically-located mode interchange areas, namely: Cubao, Recto, Divisoria, Novaliches, and C-3/Quezon Avenue junction.

This volume is the Executive Summary of JUMSUT Phase II. It summarizes the contents of the Main Text, which in turn synthesized the nine (9) technical reports prepared in the course of the Study. While recommendations contained therein are the product of extensive consultations with the Government agencies concerned, they do not necessarily reflect firm commitments. They are the best proposals the Study Team could marshal based on careful analysis and evaluation of available data and attendant constraints.

## 1.2 STUDY AREA

The study area is depicted in Figure S-1. While the metropolitan region is the focus, the planning work has concentrated on the following:

- a) Towns and communities in the periphery of Metro Manila that were within a 30 kilometer radius, for the 1984 Supplemental Home Interview Survey (HIS);
- b) Eastern sector of Metro Manila generally defined by Quezon Avenue, Gil Puyat Avenue (Buendia Avenue) and C-2, as the second corridor subjected to detailed public transportation route planning (the first, being the LRT Corridor considered under JUMSUT Phase I);
- c) Major road networks of the entire metropolitan area, for the mid-term public transportation route planning component;
- d) Passenger interchange facilities at Cubao, Recto, Divisoria, Novaliches, and C-3/Quezon Avenue for the public transportation terminal or mode interchange area (MIA) planning and development component.

## 1.3 ANALYTICAL FRAMEWORK

The methodology, scope, and interrelationships between the study components are illustrated in Figure S-2.

It is to be noted that JUMSUT Phase II addresses public transportation operations (mainly buses and jeepneys), at the strategic and tactical planning levels. Hence, it concretizes the transportation regulation aspects in terms of routes and terminal development. Improvements on these two factors have provided impetus for greater efficiency from the public transportation system and reduction of traffic congestion. Coverage-wise, therefore, it fills up the planning gaps left out by TEAM II, MMUTSTRAP – Parts B1 and B2, and JUMSUT Phase I.

## 1.4 FORMAT

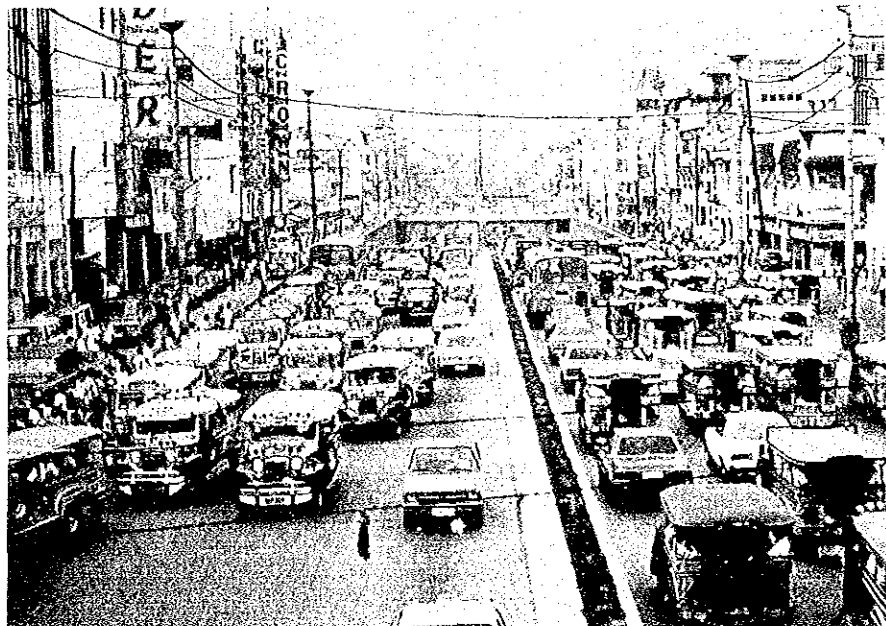
This Executive Summary starts with a concise itemization of the conclusions and recommendations generated by the Study. This is followed by a brief exposition on the supplemental surveys and supporting data, combined with previous information, have been inputs into the 1990 forecast of land use and transportation demand. The latter provides the backdrop for medium-term public transportation route planning. Each of the five (5) mode interchange areas is described, in turn, on several aspects, such as physical characteristics, problems, rerouting options, traffic management, ancillary roads, related commercial facilities and economic and financial implications.

## 1.5

### FINAL REPORT COMPOSITION

JUMSUT Phase II Final Reports are contained in the following volumes:

- a) An Executive Summary
- b) A Main Text
- c) Technical Reports in 9 separate covers:
  - 1) Supplemental Surveys and Analysis
  - 2) Transportation Demand Analysis
  - 3) Public Transportation Route Structure Improvement Study
  - 4) Cubao Mode Interchange Area Study
  - 5) Recto Mode Interchange Area Study
  - 6) Divisoria Mode Interchange Area Study
  - 7) Novaliches Mode Interchange Area Study
  - 8) C-3/Quezon Avenue Mode Interchange Area Study
  - 9) User's Reference on Microcomputer Seminar for Transportation Planning



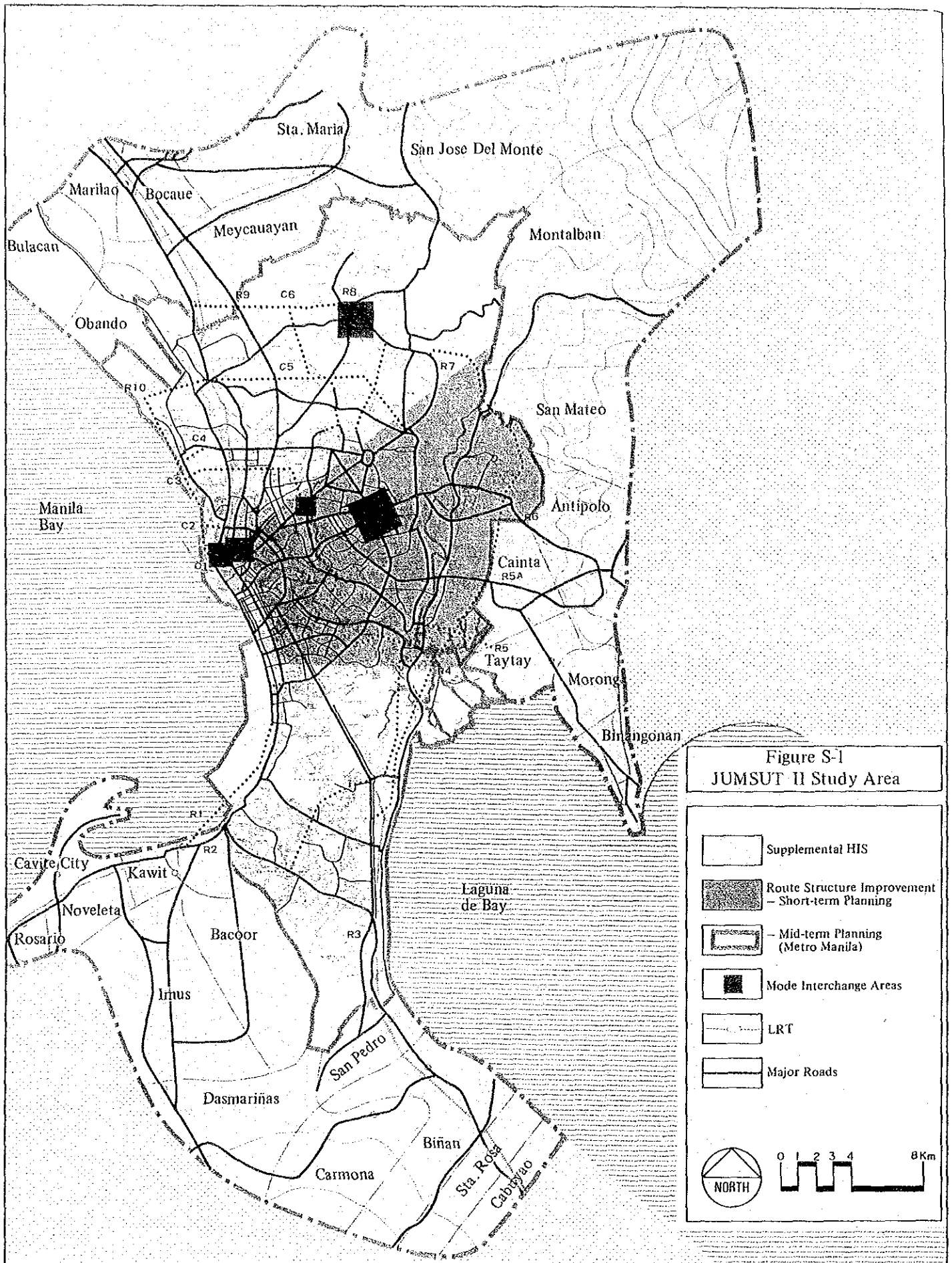








Figure S-1  
JUMSUT II Study Area

-  Supplemental HIS
-  Route Structure Improvement - Short-term Planning
-  - Mid-term Planning (Metro Manila)
-  Mode Interchange Areas
-  LRT
-  Major Roads

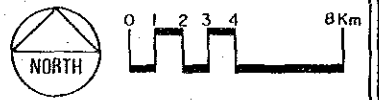
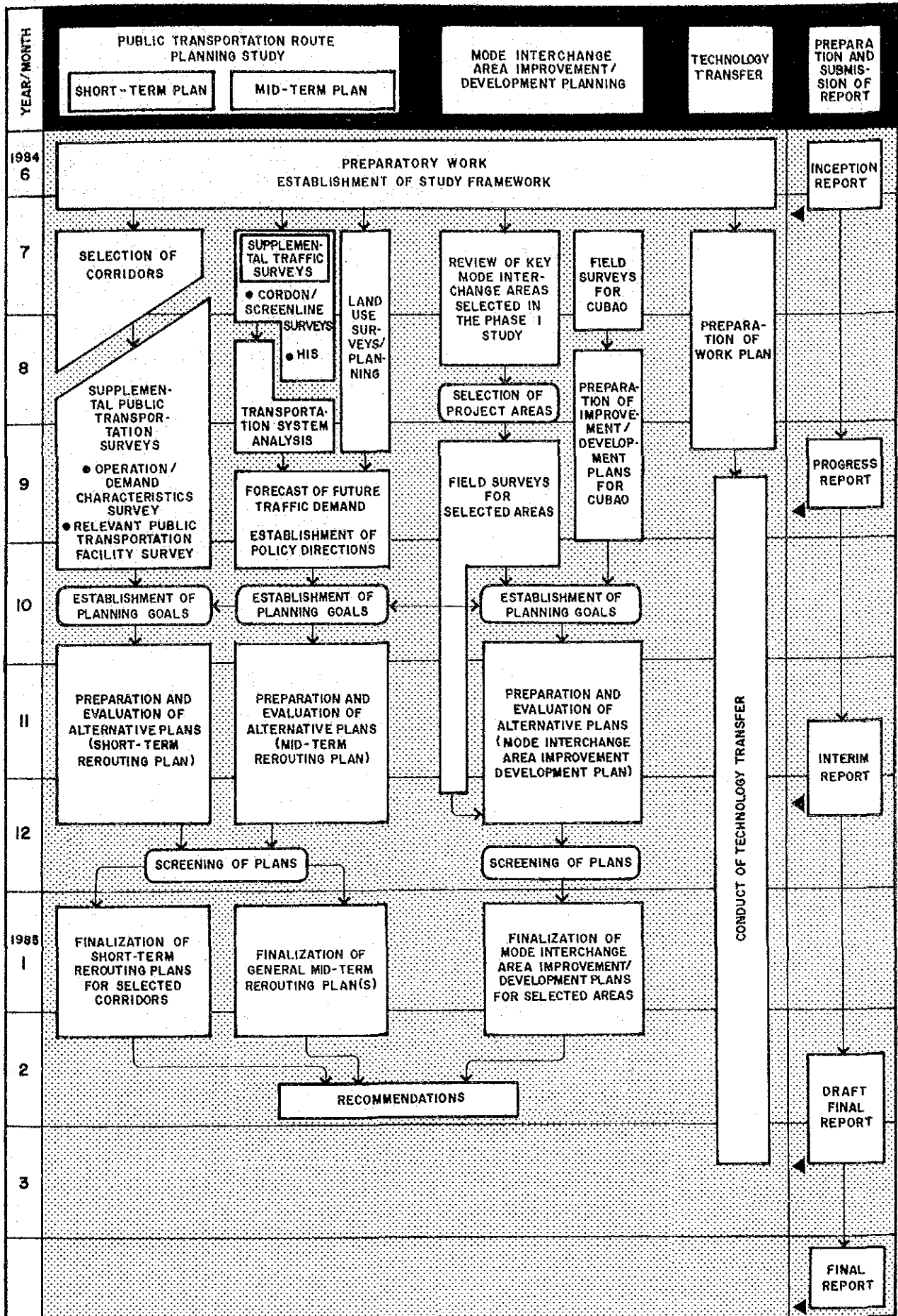




Figure 1.1  
Overall Study Framework and Flow



## 2.0 SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

### 2.1 SUPPLEMENTAL SURVEYS

Inclusion of the peripheral areas in future planning activities for Metro Manila, since the areas surveyed have been found to be on the urbanizing path as a part of metropolitan area. Twenty-six (26) municipalities of 4 adjoining provinces (Bulacan, Rizal, Cavite, and Laguna) were covered for the supplemental HIS data collection and analysis. The trip information were merged into 1980 HIS trip data base.

General increase of approximately 14% in overall person trips or 4% in passenger traffic across screenline from 1980 to 1984 has been noted although there is an overall reduction in vehicle volume in almost all major road sections of the Metro Manila. Up-to-date traffic count along cordon/screen lines was also conducted.

### 2.2 1990 FORECAST RESULTS

Adoption of the land use and transportation demand forecast as common base for planning the various sectors of Metro Manila; the advisability of such a practice has been ably demonstrated in the planning of primary and secondary roads by MPWH-URPO using the JUMSUT II demand forecast for 1990.

Number of trips will increase by 37%, from 12.6 million in 1980 to 17.4 million by 1990, with a substantial portion to be absorbed by public transportation due to income deterioration.

No major shifts in land use could possibly occur up to 1990. Remarkable continuing growths are, however, foreseen in Muntinlupa, Las Piñas, Taguig, Pasig, Navotas, and Malabon.

### 2.3 ROUTE STRUCTURE PLANNING AND IMPROVEMENT

Implementation of various low cost measures for jeepneys operating in the central-eastern sector of Metro Manila, particularly modified route schemes that demonstrate effective alleviation of traffic congestion, improvement of schedules, ease in regulation, and in response to new roads and other developments.

Expansion, over the medium-term period, of bus services in congested corridors such as Shaw Boulevard, E. Rodriguez Avenue, Aurora Boulevard, España Boulevard, C-2, Buendia Avenue, and McArthur Highway.

Moratorium of jeepney units at present levels (authorized and colorum units), without necessarily restricting their relocation to other feeder or poorly-served routes.

Use of fare differentiation between buses and jeepneys, to enhance modal complementation.

Limitation of jeepney routes to 15 kilometers or less could be considered with no general adverse effects on their financial viability.

## 2.4 MODE INTERCHANGE AREA PLANNING

### Cubao:

Develop integrated mode interchange facilities at both sides of EDSA, Araneta Center and Pinatubo area.

The Araneta Center should incorporate, in lieu of car parking, terminal spaces for public transportation in their future redevelopment plans, while the redevelopment of Pinatubo area should be initiated by public sector.

Disperse six (6) jeepney routes bound for Cubao to relieve congestion on Aurora-EDSA intersection.

Improve queuing of buses along EDSA, through combination of dispatching control and additional loading bays.

Expand the capacity of external access to Cubao by means of one-way pair-street systems (Ermin Garcia and New York, and P. Tuazon, and Banahaw), a new bridge at Diliman Creek to link Aurora with Kalayaan Avenue, and a road extension of G. Araneta Street to 7th Avenue.

### Recto:

Develop about 14,600 sq.m. of the Old Bilibid site as a public transportation terminal, in conjunction with the phased redevelopment of Recto.

Extend Doroteo Jose Street to A. Mendoza; also, Evangelista across C. M. Recto, to feed into the Old Bilibid site.

Reroute northbound and southbound jeepneys.

Improve the condition of Doroteo Jose Street through repaving, lane markings, and new loading bays.

### Divisoria:

Use the Del Pan approach as an interim on-street terminal in order to provide partial relief at Divisoria.

Construct a flyover as bypass facility for the congested sections of C. M. Recto towards R-10. Alternatively or simultaneously, develop PNR Tutuban Station to accommodate buses and jeepneys as well as further urban development into its 20 hectares of compound.

Study the feasibility of extending Moriones to Rizal Avenue or up to Old Bilibid.

**Novaliches:**

Initiate a land consolidation program north of and around the existing town proper; the program to prime future urban redevelopment.

Construct a bypass road, utilizing as much of the subdivision roads as possible, to relieve traffic at the intersection of Quirino and Gen. Luis.

Encourage and promote the development of small terminal sites to cater to public transport serving the Town Proper.

Develop separate and distinct public transportation routes; trunk service, feeder service, and local or neighborhood links.

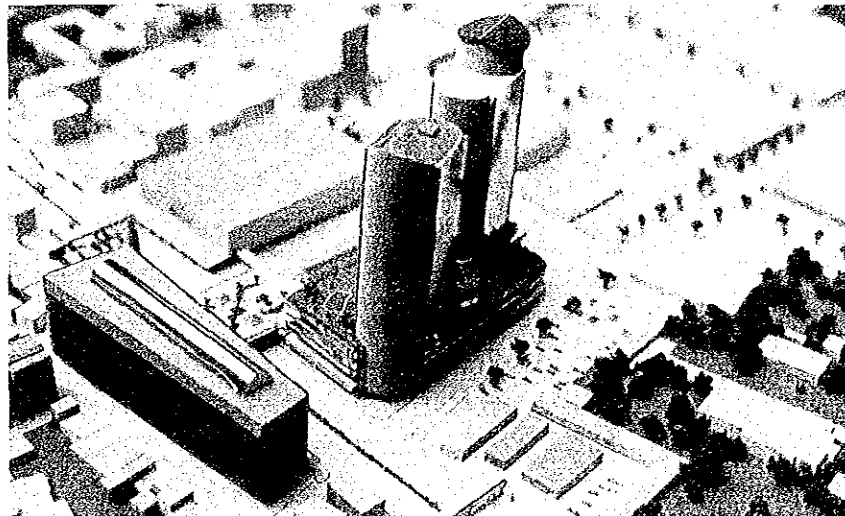
**C-3/Quezon Avenue:**

Acquire 1,970 sq.m. land for public transport interchange in conjunction with the proposed grade separation for C-3.

Open up C-3 to higher capacity public transportation modes such as buses and mini-buses.

**General Policy Direction:**

Encourage and promote private development of public transportation interchange areas in major urban/commercial nodes or sub-centers with the institution of fiscal incentives e.g., waiver of real estate tax in proportion to public use/benefit, and administrative controls e.g., building regulations on parking bays, land use control, and through land banking. Introduction of development methods such as, "Urban Renewal" and "Land Readjustment" currently widely practiced in Japan could also be duly considered.



### 3.0 SUPPLEMENTAL HIS SURVEY AND OTHER TRANSPORTATION SURVEYS

Two primary surveys have been conducted during the study; the supplemental Home Interview Survey (HIS) and the Cordonline/Screenline Surveys. The first one covers 18 zones in the provinces of Bulacan, Laguna, Rizal, and Cavite on the outskirts of Metro Manila. The other surveys have determined traffic flows in vehicle and passenger counts at 29 screenline and 13 cordonline stations.

#### 3.1 SUPPLEMENTAL HIS

Comprising 1.5 million residents, the survey areas produced 2,031 samples from 18 zones or 26 municipalities. Households in these outlying areas have been found to be 30% poorer than average Metro Manila residents. Not surprisingly, they are more dependent on public transport (88.8% of total trips) and have low car-ownership rates (only 8.3% of households have cars).

Typical of an urbanizing periphery, these areas have shown higher population growths than Metro Manila. The lack of educational and employment places have caused residents to commute to the inner areas and elsewhere. Trip rate has been found to be still low at 1.4, against about 1.8 trips per person for the metropolitan area. In terms of trip purpose, "to school" trips account for the largest segment of trips next to "to home" trips. Most of these trips, about 34% of total flow into/out of Metro Manila. It is interesting to observe, however, that a substantial number of trips occur between Cavite and Laguna, indicating socio-economic interactions beyond the classical dependence of the periphery on the metropolitan core.

#### 3.2 SCREENLINE AND CORDONLINE SURVEYS

These surveys have been conducted to determine the quantitative changes from 1980 to 1984 in traffic volumes along the principal roads of Metro Manila (see Figure S-3 and Table S-1).

The most dramatic change observed has been the overall decline in vehicle flows across almost all sections of the city. Whether public or private transport, the decrease is general; nevertheless, public transportation seems to have suffered more than private cars. An exception to the reversal of trends is the traffic at the southern sector (i.e., from Alabang and Las Piñas), where car volumes have gone up by more than 50%.

Significantly, a general increase in the number of passengers across these imaginary lines is noted. Consequently, load factors have increased. Again, the biggest growths have occurred to the South. Between the bus and jeepney modes, it would appear that the bus fares rather well during the four-year period as to capture a larger share of the passenger market.

Cars/taxis have constituted more than 50% of the traffic mix at screenlines but less than 34% at cordonlines. This implies that public transport is relied more for trips emanating from outside the city.

Figure S-3  
 Vehicular and Passenger Traffic Flow Across  
 Screenlines and Cordonlines, 1984

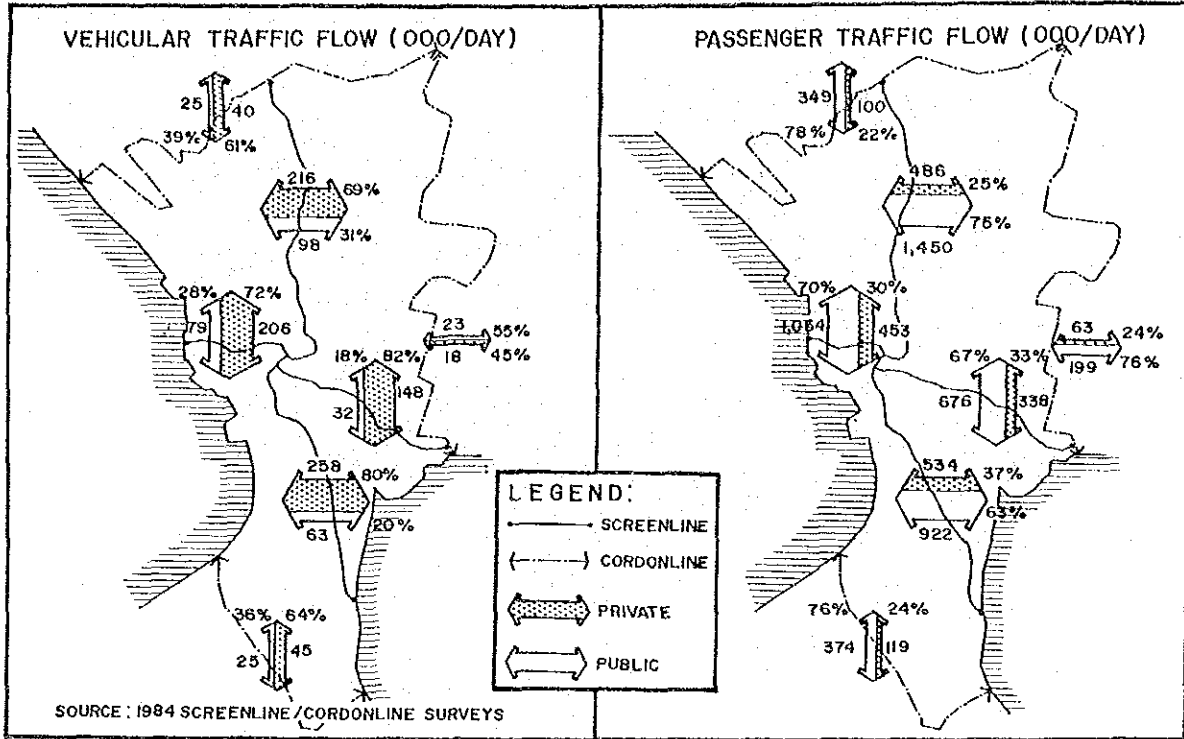


Table S-1  
 Changes in Traffic Flow and Volume,  
 Comparison of 1980 and 1984\*

1980 = 1.00

Section		Vehicular Traffic					Passenger Traffic				
		By Mode			By PT Mode		By Mode			By PT Mode	
		Pub.	Prvt	Total	Bus	Jpy.	Pub.	Prvt.	Total	Bus	Jpy.
Screenline	East-West	0.92	1.00	0.98	0.94	0.89	1.09	1.23	1.13	1.32	0.95
	North-South	0.94	0.97	0.96	0.85	0.96	0.99	0.94	0.98	1.05	0.95
	Total	0.93	0.98	0.97	0.89	0.93	1.04	1.06	1.04	1.16	0.95
Cordonline	North	0.84	1.08	0.97	0.97	0.74	1.07	1.01	1.06	1.31	0.89
	East	1.06	0.92	0.98	0.78	0.93	0.94	0.89	0.93	0.89	0.95
	South	1.00	1.50	1.27	1.16	0.90	1.08	1.27	1.12	1.12	1.03
	Total	0.95	1.17	1.07	1.00	0.84	1.04	1.07	1.05	1.16	0.95

\*1980 MMUTIP data, 1984 JUMSUT II data

## 4.0 TRANSPORTATION DEMAND FORECASTS

### THE ANALYTICAL BASE

One of the major shortcomings of urban cum transportation planning in Metro Manila is the absence of a common forecast data with which to base the programs of the different agencies. This study sought to fill up this gap by constructing the 1990 land use distribution and deriving therefrom a 1990 origin-destination (OD) table.

The forecasting methodology followed the steps as shown in Figure S-4. It utilized three information base, viz., the 1980 and 1984 HIS, the 1980 Land Use Map, and the 1980 OD Table.

### THE MACRO ASSUMPTIONS

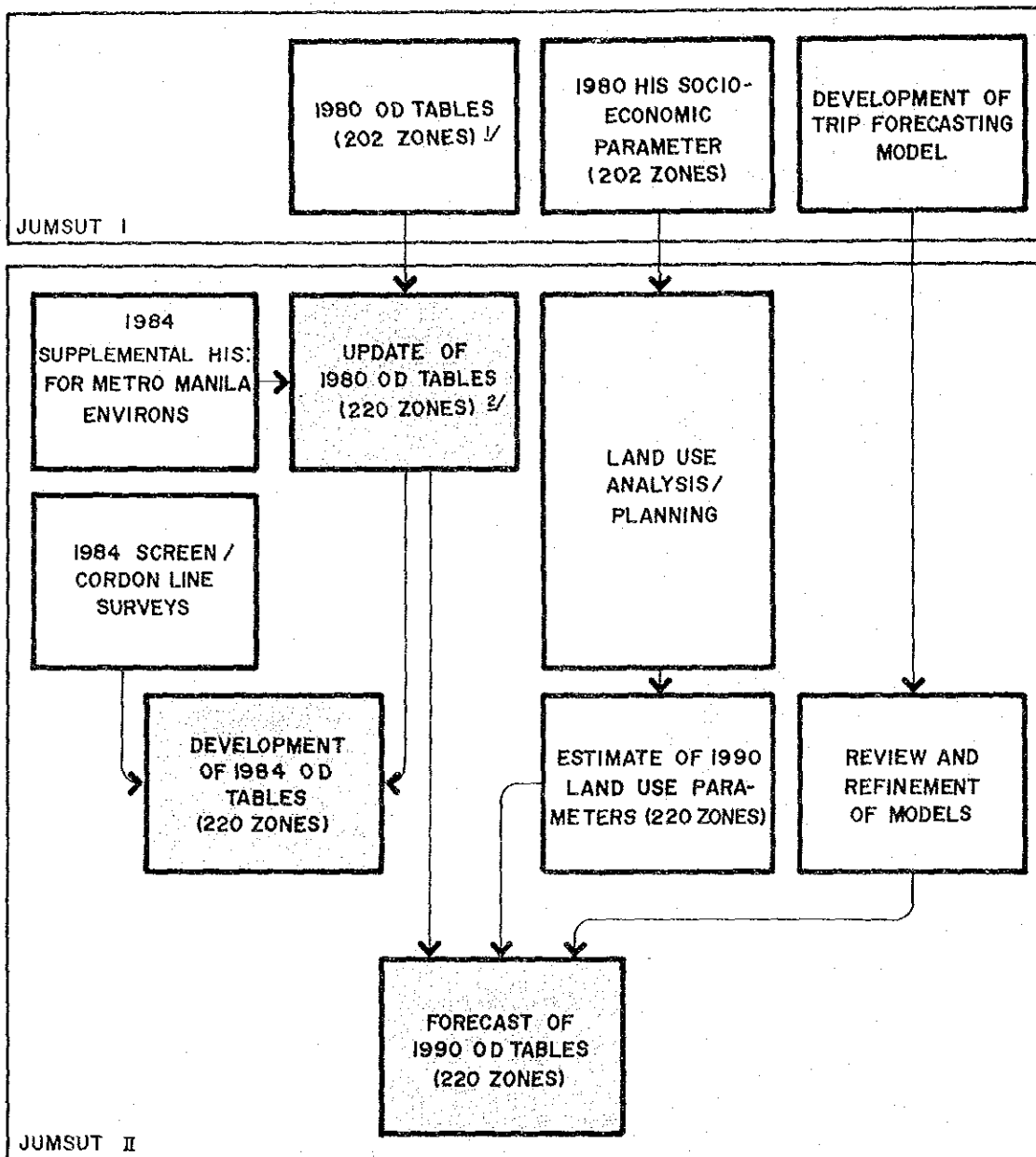
Exogenous inputs to the whole forecasting activity is the set of socio-economic variables defined for the whole region and summarized in Table S-2. These figures have been subsequently refined at the municipal and traffic zone levels along the following guidelines:

- a) Population growth has been treated as a function of population density and household income, where growth tends to be higher for low density and low-income zones.
- b) Employment forecast according to residence is assumed to follow the change in population levels. However, employment by work places are differentiated into primary (taken as static), secondary (a function of the GRDP), and tertiary (either proportional to current levels or as determined from known or planned employment generators).
- c) School attendance, whether by residence or school location, is assumed to grow more or less proportional to the population; but secondary and upper level courses are assumed to maintain the same ratio among the zones.
- d) Average household income to behave in accordance to changes in the Gross Regional Domestic Product (GRDP).

### NOTABLE OBSERVATIONS FOR 1990 FORECASTS

While population is expected to grow by 3 per cent per annum for the entire National Capital Region, the municipalities of Muntinlupa, Las Piñas, Pasig, Navotas, Malabon, and Valenzuela will exhibit higher growth rates at or above 4.7 per cent.

Figure S-4  
 Framework of Transportation Demand  
 Analysis and Forecasting



<sup>1/</sup> 202 Zones cover Metro Manila only

<sup>2/</sup> 220 Zones cover additional 18 Zones of adjoining areas of Metro Manila



Table S-2  
General Socio-Economic Indicators

		1980	1990	Average Growth Rate (%/ year)
Population	Number	5,925,844	7,974,000	3.0
	Households	1,103,563	1,812,273	5.1
	Ave. HH Size	5.4	4.4	--
Employment	Primary	122,621	122,621	0
	Secondary	627,000	746,000	1.8
	Tertiary	1,346,812	1,511,000	1.2
	Total	2,096,433	2,379,621	1.3
School Attendance	Primary	791,761	1,030,200	2.7
	Secondary & Up	933,349	1,129,900	1.9
	Total	1,725,110	2,190,100	2.3
Ave. HH Income/Month (P)		1,152	781	(3.8)
Real GDP (P million)		29,987	33,402	1.1
Per Capita GDP (P)		5,080	4,189	(1.9)

Source: MMC

Employment places would multiply faster than population growth in the municipalities of Navotas, Valenzuela, Taguig, Marikina, and Pasig.

The number of students will have continued growth of 2.8 per cent per annum, with Las Piñas, Taguig, Muntinlupa, Pasig, and Malabon again showing growth above 4.0 per cent. While schools could be located near the areas of fast growth, no perfect matching could be expected as to induce a reduction of interzonal trips.

#### 4.4 THE 1990 OD TABLES

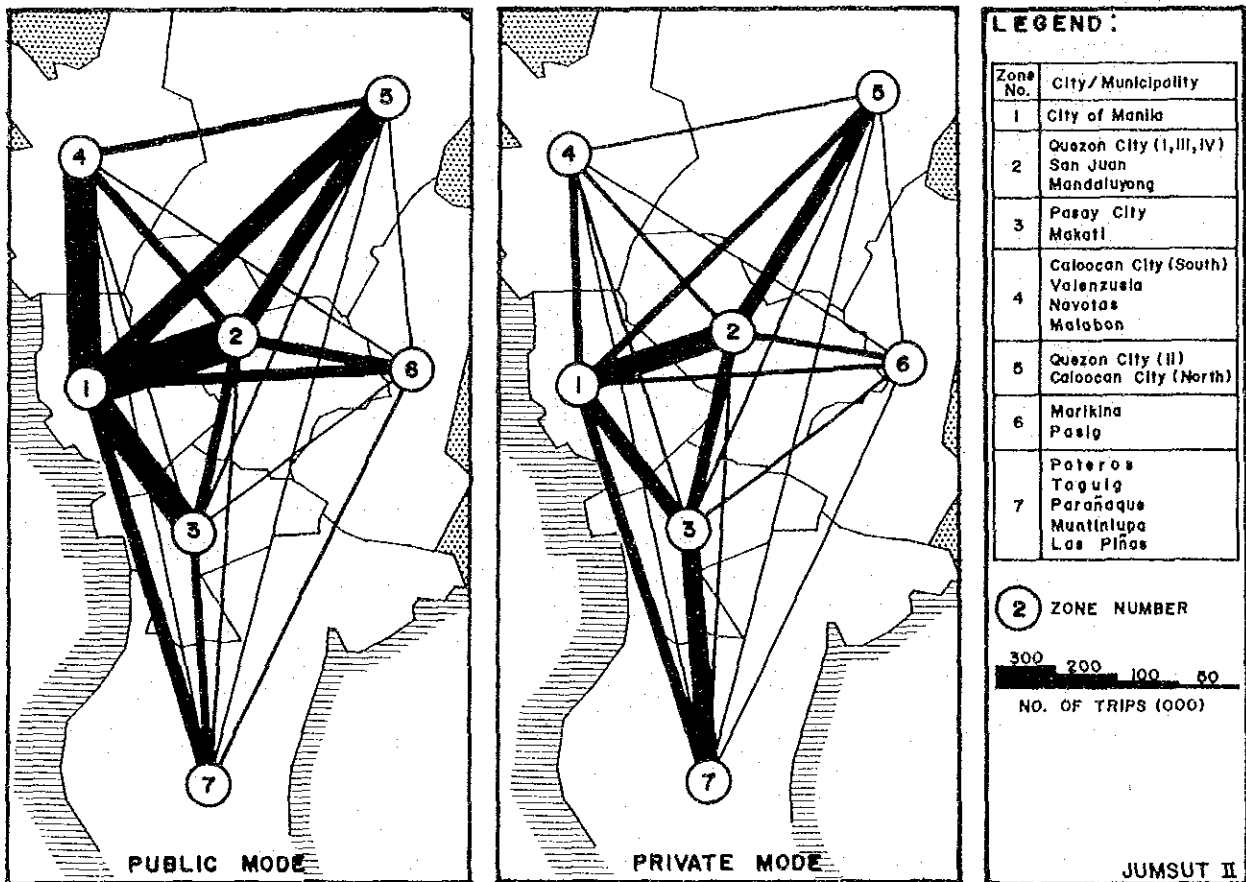
As a derived demand, the OD table presents the breakdown and direction of person movements according to socio-economic and land use factors. Table S-3 indicates the total number of daily trips by 1990 will be 17.9 million, up by 37% from the 1980 figure of 13.1 million trips. Larger growth is anticipated in the peripheral areas of Metro Manila. These are decomposed to different trip purposes, as shown in Figure S-6. Private and business trips are forecasted to grow faster. Due to the predicted decline in household incomes, public transportation will take up more of the trips in 1990. This also means that there will be a surge in demand mainly for buses, jeepneys and tricycles.

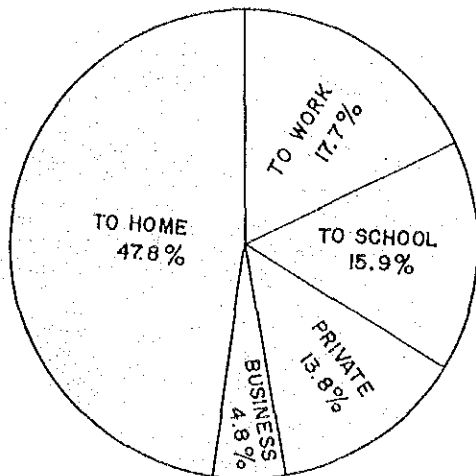
Table S-3  
Overall Transportation Demand  
and Its Changes

	No. of Person Trips (000)/Day			Ratio		
	1980	1984	1990	1984/80	1990/84	1990/80
Movement within Metro Manila	10,972	12,534	14,820	1.14	1.18	1.35
Movement related to Metro Manila and Environs	2,120	2,250	3,120	1.06	1.39	1.47
Total	13,092	14,784	17,940	1.13	1.21	1.37

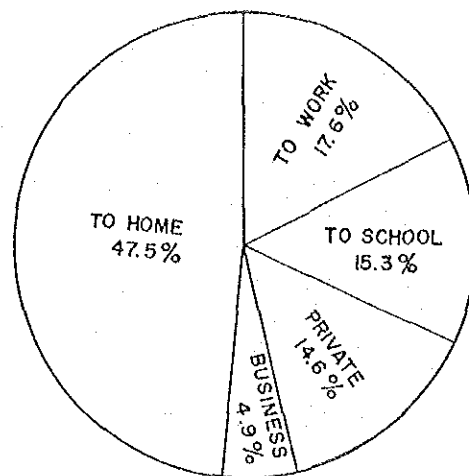
Source: JUMSUT I and II

Figure S-5  
OD Distribution of Person Trip Demand, 1990  
(Movement Within Metro Manila Only)





1980

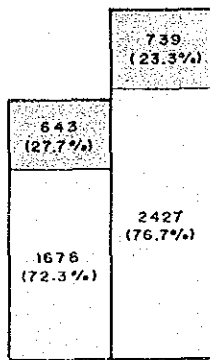


1990

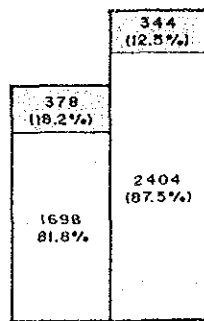
TOTAL NO. OF TRIPS (000/DAY)  
13092  
100%

	PRIVATE	PUBLIC	PUBLIC	PRIVATE	
	9849	3443	14176	3764	TOTAL NO. OF TRIPS (000/DAY)
	26.3%	73.7%	79.0%	21.0%	17940
					100%

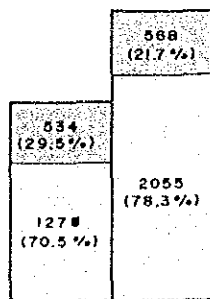
TOTAL NO. OF TRIPS (000/DAY)  
17940  
100%



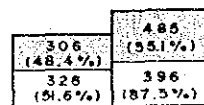
1980 1990  
TO WORK



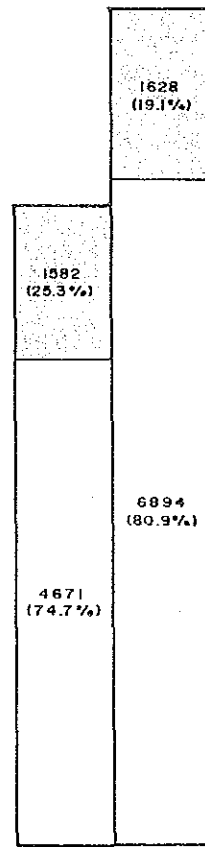
1980 1990  
TO SCHOOL



1980 1990  
PRIVATE



1980 1990  
BUSINESS



1980 1990  
TO HOME

LEGEND :

- PRIVATE
- PUBLIC

Figure S-6  
Travel Demand Characteristics  
(By Trip Mode and Purpose)  
1980, 1990

JUMSUT II

## 5.0 PUBLIC TRANSPORTATION ROUTE PLANNING

### 5.1 BACKGROUND

A brief review of the operating condition and characteristics of the public transportation system is made as a prelude to the analysis of route structures. In particular, the central-eastern sector of Metro Manila is subjected to in-depth analysis. It illustrates the kind of planning work which the newly-created Land Transportation Commission could adopt, aimed towards improving the route structure, and reducing the congestion impact of public transport vehicles, among others.

The analysis has not only focused on route changes in the short-term and mid-term planning periods, but also touched on ancillary traffic management and road works.

### 5.2 SHORT-TERM ROUTE IMPROVEMENTS

Figure S-7 is a mapping of the problem areas where some short-term solutions may be initiated. The problem areas are categorized according to the magnitude of the problem:

A. *Multi-Dimensional Problem Areas*: where the magnitude of the problem is severe and a multi-dimensional approach is needed. Under this group belong:

- |                         |               |
|-------------------------|---------------|
| 1) Marikina Town Proper | 6) Kalentong  |
| 2) N. Domingo           | 7) Guadalupe  |
| 3) Sta Mesa             | 8) J.P. Rizal |
| 4) Pasig Town Proper    | 9) Paco       |
| 5) EDSA/Shaw            | 10) Buendia   |

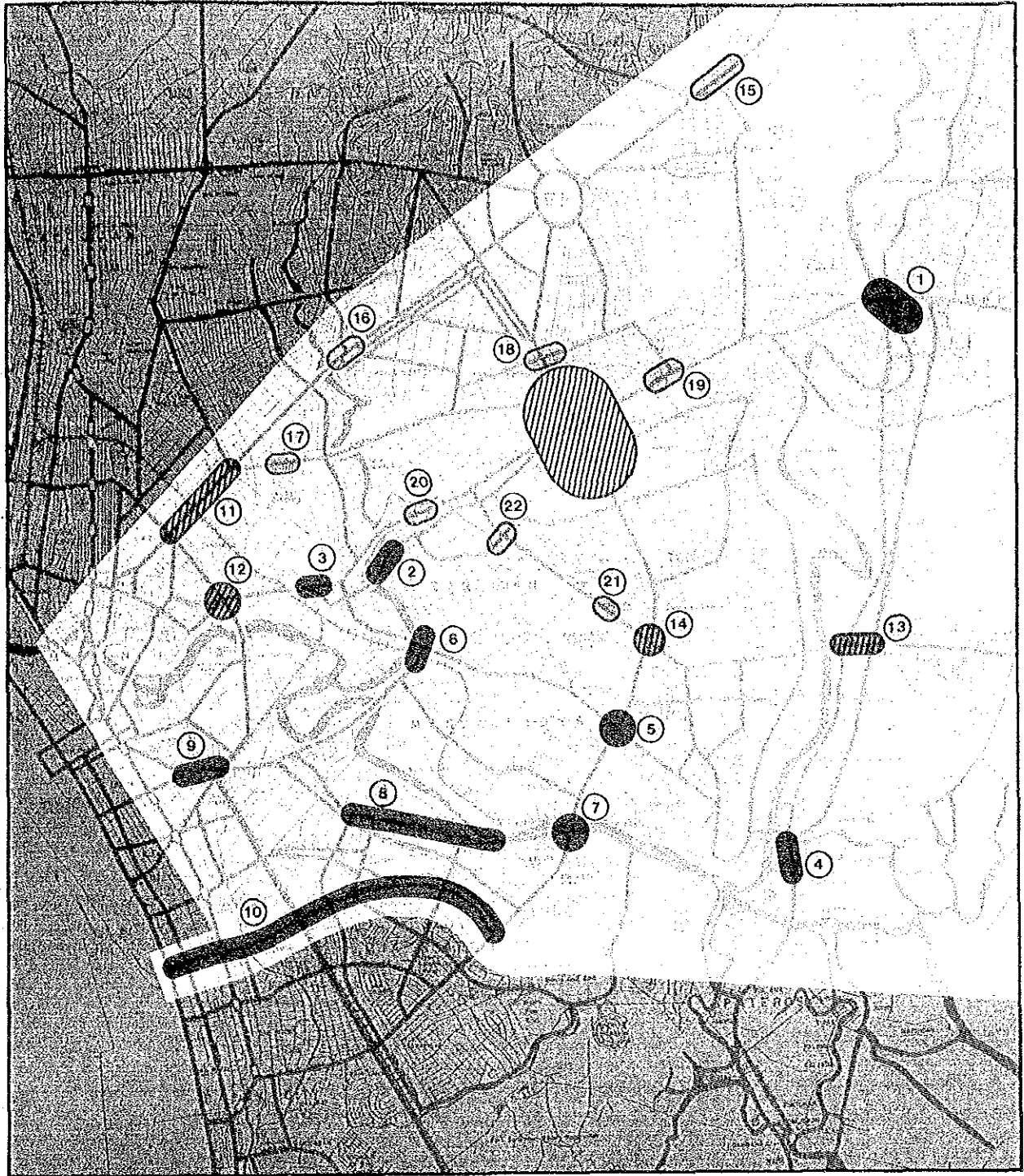
B. *Capacity-Constraint Problem Areas*: where the magnitude of the problem is the same as those of major problem areas. However, short-term countermeasures are limited due to the nature of the problems which stems from the absolute lack of physical capacity.




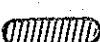
- |                           |                      |
|---------------------------|----------------------|
| 11) España                | 13) Rosario Junction |
| 12) Nagtahan/R. Magsaysay | 14) EDSA/Ortigas     |

C. *Minor Problem Areas*: where the magnitude of the problem is of a lesser severity and the possible solutions are relatively simple. The areas listed below come under this category:

- |                                |                      |
|--------------------------------|----------------------|
| 15) Ortigas/Santolan           | 19) EDSA/Kamias      |
| 16) D.M. Marcos/Tandang Sora   | 20) Aurora/Anonas    |
| 17) Quezon Ave./Roosevelt Ave. | 21) La Salle         |
| 18) E. Rodriguez               | 22) Broadway Centrum |

A simplification of route structure/configuration and other associated improvements relative to pedestrian facilities are the main features of the possible solutions recommended for minor problem areas.

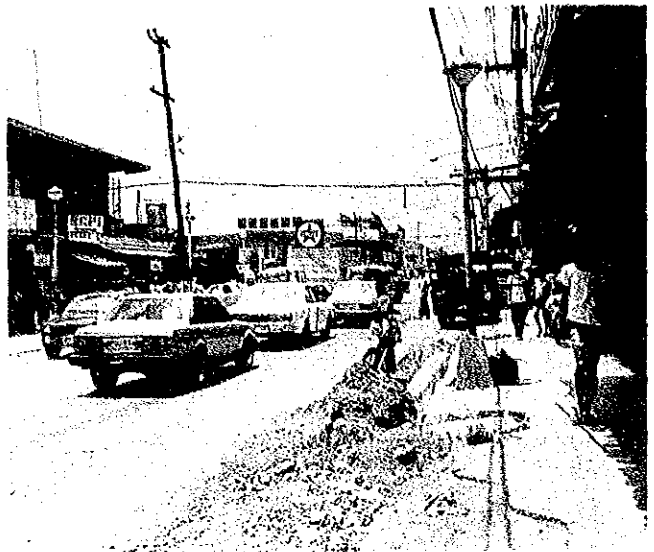
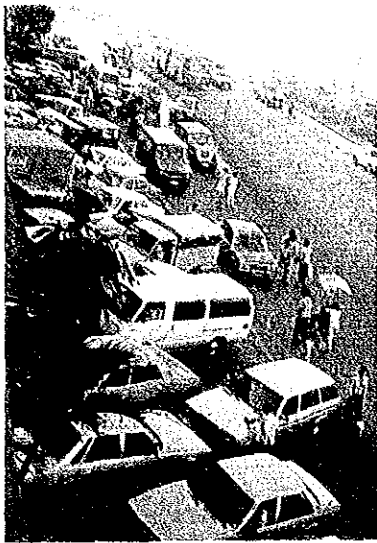


-  Multi-Dimensional Problem Areas: ①-⑩
-  Capacity-Constraint Problem Areas: ⑪-⑭
-  Minor Problem Areas: ⑮-⑳
-  Study Area for Cubao MIA

Note: No. corresponds to the areas explained in text.



Figure S-7  
 Identified Problem Areas  
 for Short-term Planning  
 of Route Structure Improvement  
 Study



<p>A. Guadalupe:</p> <ul style="list-style-type: none"> <li>- angle parking in front of ABC</li> <li>- risky situation of pedestrians</li> </ul>	<p>D. J.P. Rizal</p> <ul style="list-style-type: none"> <li>- Street digging which aggravates present traffic situation</li> </ul>
<p>B. LRT Stations</p> <ul style="list-style-type: none"> <li>- Sidewalk vendors are a common sight in most LRT stations forcing pedestrians to encroach on the carriageway.</li> </ul>	<p>SELECTED PROBLEM AREAS</p>
<p>C. EDSA/Shaw</p> <ul style="list-style-type: none"> <li>- Haphazard bus and jeepney maneuver coupled with disregard of traffic rules by pedestrians.</li> </ul>	





<p>F. Marikina – Conflict among pedestrians, jeepneys and tricycles at W.C. Paz</p>	<p>I. Kalentong – Pedestrians walk on the carriage-way under PNR overpass due to non-existence of sidewalks</p>
<p>G. Pasig – Inefficient traffic management – Lack of pedestrian facilities</p>	<p>SELECTED PROBLEM AREAS</p>
<p>H. N. Domingo – jeepney queuing along carriage-way</p>	



The recommendations partake of one or a combination of the following measures:

- a) Simplification of route structure/configuration;
- b) Minimization of traffic conflicts at turning points/circuits;
- c) Use of sidestreets where available;
- d) Installation or construction of minor civil works, e.g., channelization, corner cutting, opening of central median, provision of pedestrian barriers, etc.; and
- e) More consistent enforcement.

The more significant proposals at specific locations (see Figure S-7), are as follows:

1. Marikina Town Proper

- a) Reroute SSS-bound jeepneys from J. P. Rizal to E. Rodriguez Street
- b) Reroute jeepneys from E. de la Paz to Shoe Avenue
- c) Ban tricycles on W. C. Paz.

Other measures proposed include minor road improvement and signposting.

2. N. Domingo

- a) Prohibit parking from the corner of Blumentritt to Pinaglabanan
- b) Use the parking area in front of the elementary school
- c) Reroute jeepneys bound for Crame and Tropical/Meralco and those bound for Kalentong.
- d) Change the turning point of Cubao-bound jeepneys.

3. Sta. Mesa

- a) Reroute jeepneys taking Santol-Stop & Shop line, Divisoria-Sta. Mesa line
- b) Provide terminal/waiting areas for the jeepneys on above lines
- c) Separate lanes for passing-through jeepneys and those bound for Sta. Mesa.
- d) Undertake channelization at the foot of R. Magsaysay overpass.

In addition, road pavement, installation of pedestrian railings and provision of pedestrian crossings are necessary.

4. Pasig Town Proper

- a) Reroute Crossing, Rosario and Ugong bound-jeepneys from Dr. S. Antonio to M. H. del Pilar/Raymundo Streets
- b) Use Market-Mercedes-Raymundo Avenues for jeepneys bound for Marikina, Cainta, Taytay, Antipolo, Quiapo, JRC, and Stop and Shop.
- c) Make S. Antonio and Raymundo Avenue into one-way street pairs.

The banning of tricycle at the intersection of Dr. S. Antonio/Pasig Boulevard and A. Mabini Avenue is proposed. Furthermore some other traffic management and pedestrian facilities improvement are necessary.



5. EDSA/Shaw Boulevard

- a) Reroute U-turning jeepneys from this intersection to the new bridge across Pasig River and Libertad
- b) Convert existing jeepney terminal along EDSA into bus bays
- c) Shorten the JRC-Kalentong route which converges on the gas station at the SW corner of EDSA/Shaw.
- d) Reroute Kalentong-Crossing jeepney to the sidestreets in order to avoid Crossing EDSA.
- e) Cut islands at the intersection.

Since the activities around the bus bay also contribute to traffic difficulties, appropriate measures are also recommended such as the change in geometric design, improvement of the dispatching system and the segregation of bus routes which use either the bus bay or the EDSA service road.

The pedestrian facilities improvement calls for the installation of waiting sheds and pedestrian railings.

6. Kalentong

- a) Reroute jeepneys from Pinatubo and Vergara to sidestreets, in lieu of Kalentong
- b) Cut the route at Crossing for the JRC-bound jeepneys
- c) Restrict parking and change the turning point of the San Juan-Kalentong line.

Furthermore, the traffic signal at the intersection of Kalentong/Shaw Boulevard has to be transferred to the corner. With regards to pedestrian facilities, the removal of stalls along the sidewalk plus the installation of pedestrian railings and waiting sheds are proposed.

7. Guadalupe

- a) Reroute the Crossing-Guadalupe line after the opening of Makati bridge.
- b) Cut the Cartimar-Guadalupe line at the Puyat-EDSA intersection
- c) Divert westbound jeepneys to J. P. Rizal, EDSA, ramp, Bernardino and Carballo
- d) Various civil works on both sides of EDSA, which includes widening of the sidewalks, installation of waiting sheds and pedestrian barriers, among others.

Associated improvements include improvement of road surface, channelization and signalization.

8. J. P. Rizal (Makati)

- a) Reroute jeepneys between South avenue and Makati Avenue
- b) Prohibit parking on entire stretch.

9. Paco

- a) Reroute jeepneys along P. Gil and those southbound
- b) Remove vendor stalls along P. Gil.

10. Gil Puyat Avenue (Buendia Avenue)

- a) Modify traffic signal operations on entire stretch
- b) Improve access to the PNR and LRT stations.
- c) Strict control of on- and off-road parking

Aside from those mentioned above, there are other proposed solutions for Buendia on a mid- to long-term range. These include the widening of Buendia (between SSH and Tripa de Gallina, construction of R-4, Makati-Mandaluyong Road, grade separations of EDSA/Buendia and R-4/EDSA and opening of PNR crossing at strategic locations.

11. R. Magsaysay/Nagtahan

- a) Detour jeepneys to sidestreets like Loreto and G. Tuazon
- b) Introduce traffic management measures or grade-separation

12. Rosario Junction

- a) Designate Dr. S. Antonio and Raymundo Avenue as one way couple
- b) Improve turning circuit using the available vacant lot

13. España

- a) Ban private vehicles at some sections of España.
- b) Use well-developed sidestreets

14. Ortigas/EDSA and Ortigas/Santolan

- a) Modification of traffic signal phasing

15. Quezon Avenue/Roosevelt Avenue

- a) Enforce no-parking regulation
- b) Designate and enforce loading/unloading zones
- c) Reroute terminating jeepney routes from Gen. Lim to Quezon Avenue.

16. EDSA/Kamias

- a) Reroute terminating jeepney routes
- b) Improve dispatching system

17. E. Rodriguez

- a) Enforce strict prohibition against PUJ loading/unloading at intersection
- b) Cut routes coming from Proj. 8 and Muñoz at the Welcome Rotonda.

18. Aurora/Anonas

- a) Reroute to Tindalo jeepneys coming from Kamias (Westbound)
- b) Relocate tricycle terminal to sidestreets
- c) Remove/cut the median island on Anonas.

19. La Salle

- a) Extend the open time periods of Gate 7
- b) Expand the existing parking area.

### 5.3 MID-TERM ROUTE IMPROVEMENTS

Underlying these proposals is the 1990 forecast of transportation demand. The problem areas are shown in Figure S-8. Despite the completion of such roads as C-3, R-10, R-1 Extension, and Makati-Mandaluyong bridge, several congested spots will still remain. Roads in the eastern, northeastern and southern corridors will be saturated. This includes Legarda, R. Magsaysay, Aurora, Shaw, Ortigas Avenue, McArthur Highway, Quirino Highway, España, Kamuning-Kamias, Santolan, Gil Puyat Avenue, and Pasay Rotonda.

Conversely, traffic flow will ease on sections of EDSA, C-2, Mayon and part of E. Rodriguez on the northeastern corridor; H. Lopez, Juan Luna, J. Abad Santos, Dimasalang, Rizal Avenue, and Del Monte on the northern corridor.

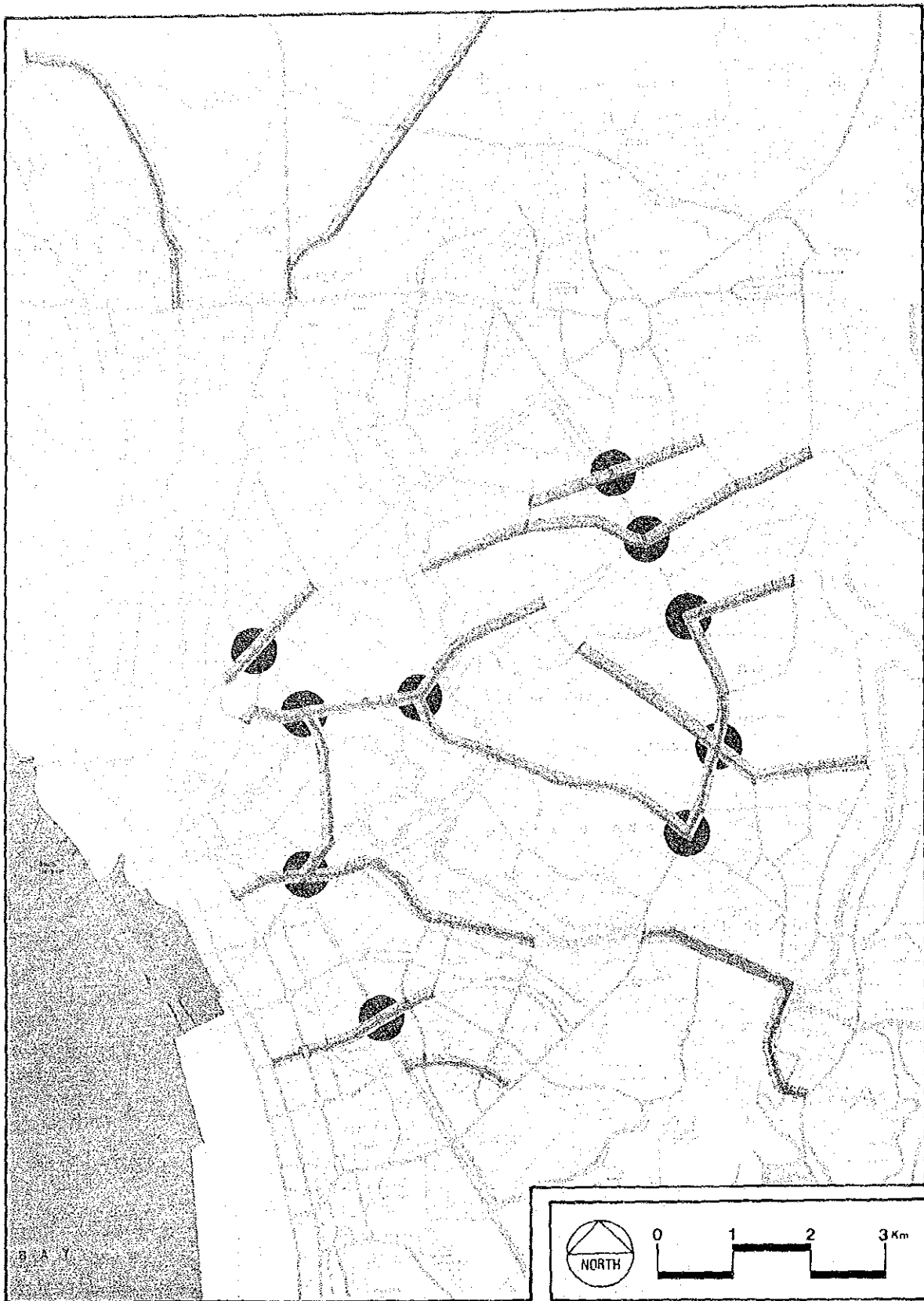
Since most of the growth in transportation demand up to 1990 would be borne by public transport, substantial efforts to improve and expand public transportation services should be invoked. A pivotal issue is the modal share between buses and jeepneys. The best results from four alternative scenarios come from a strategy of bus priority, i.e., jeepney operations should be maintained at current levels and new bus-only routes be opened on newly-constructed primary roads. All jeepney routes extending more than 15 kilometers on the eastern corridor should be replaced with bus service. It is estimated that the bus fleet would have to grow to 11,600 units by 1990, or 193% above the current fleet size of about 6,000 buses. More than 55% of the increase will be on existing bus routes: the balance of 2,500 units will be for the identified new routes. Additional Love Bus service to Makati will be needed from EDSA, and South Expressway.

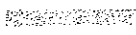

Since it would be difficult to redeploy jeepneys away from their existing routes, the most practical method is to have a moratorium, vis-a-vis issuance of new jeepney franchises. This should, however, permit the voluntary conversion of lines from major congested roads to sidestreets and to outlying areas.

### 5.4 INTERMODAL COMPLEMENTATION

The search for the regulatory instruments for effecting the desired complementation among the different public transportation modes has led to the evaluation of a Disaggregate Behavior Model. Statistical tests have produced a good fit and some interesting observations, as follows:

- a) The basic choice between public and private modes is determined largely by income. Households earning above P4,000/month tend to use private transportation.
- b) Differences in the operating characteristics of bus and jeepney (such as travel time, fare, and number of transfers) influence passenger choice between them. Assuming transfers are the same, the jeepney is preferred over the bus, unless the latter mode is faster by 4 minutes. Bus ride is also preferred, when the fare is cheaper by P0.23 or when it has less transfers than jeepney. In the latter case, the extra transfers could be overcome by faster travel time of the jeepney as long as it is more than 13 minutes.



 CRITICAL CORRIDORS / ROADS  
 CRITICAL INTERSECTIONS

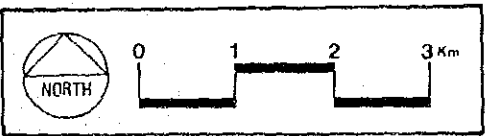


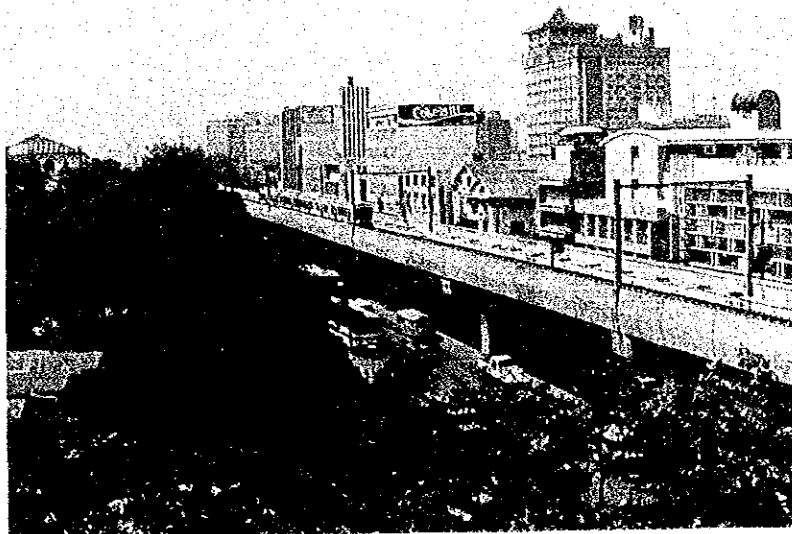
Figure S-8  
 Determined Mid-term Problem  
 Corridors/Roads and  
 Intersections

- c) Income level and occupation determine to a large extent the choice between a jeepney or a Love Bus. Higher income and/or administrative-professional groups tend to choose Love Bus. This is the same behavior apparent on the rivalry between an ordinary bus and Love Bus.
- d) There is also passenger differentiation between the Love Bus and Metrorail, with occupation and trip purpose as principal determinants.

## 5.5 PNR/METRORAIL ROLE

To assess the advisability of improving PNR services, simulation runs have been undertaken on the assumption of an operational East Line and a doubling of the frequency on the Southern Commuter service. Results tend to indicate that the impact on the South Expressway is a 2 per cent improvement in total traffic and a 7-9 per cent diversion of passengers from the other public transport mode. On the other hand, Boni Avenue and part of Shaw would experience 3-5 per cent improvement in the total traffic and 5-7 per cent diversion from bus/jeepney modes.

At the time of the study, only the South Line of LRT Line No. 1 was operational. Hence, only a limited analysis was made of its impact. On a normal weekday, approximately 111 thousand passengers ride the LRT. Sampling of passenger reactions elicited favorable comments about the LRT's cleanliness, speed, safety, comfort, and affordability. About 13 per cent of them were "novelty-riders" and 87 per cent have been regular commuters along Taft Avenue. Only 20 per cent of the interviewees resided along the corridor. Although about 92 per cent came from jeepneys, the ridership data could not be interpreted as a corresponding decline in patronage considering that 55 per cent of LRT passengers had been fed into the LRT system by jeepneys.



## 6.0 MODE INTERCHANGE AREAS

### 6.1 THE PLANNING CONCEPT

As the demand for public transportation services and vehicles grow, their terminals and turning points would subsequently create bottlenecks in the road network of Metro Manila. This is so because the initial advantage of on-street loading and unloading is overcome by the adverse impacts of standing vehicles in a system of moving traffic. Especially at saturation levels, use of streets for non-moving activities exacerbates the congestion and diseconomies.

Five (5) selected terminal areas have been studied in accordance with the preceding concept to relieve traffic congestion at important transfer points and to improve the service efficiency of buses and jeepneys. Rather than view them as mere terminals in the physical sense (i.e., a space for loading, unloading, sorting, parking, waiting), this study takes the broader perspective of mode interchange centers where vehicles, passengers and socio-economic activities converge, occur, and interact to create a dynamic urban space.

Site-specific recommendations have been prepared for each of the five (5) selected mode interchange areas including concrete recommendations for their phased implementation.

### 6.2 CUBAO

An example of private sector commercial development which capitalized on its transport accessibility, Cubao is one sprawling yard for commuters bound for other places in the metropolis. The public transport vehicles and passenger flows suggest two terminal sites; the Arayat block west of EDSA, and the Araneta Center on the east side (see Figure S-9).

The most viable solution is for the Araneta Center Management to incorporate terminal spaces at ground level in the future redevelopment plans of the areas. Instead of forcing buses and jeepneys into occupying public roads, it should accommodate them inside the Center with the same, if not more, priority provided private cars. Government should encourage this type of development on both sides of EDSA by means of tax incentives and land/building controls. Otherwise, profit motives will convert almost all of Cubao's ground space into commercial buildings (see Figure S-10).

Complementary recommendations in the short to medium term periods are the following:

- a) Rerouting of jeepneys to 6 different directions, principally to relieve the congested Aurora-EDSA intersection.
- b) Improve bus queueing along the EDSA service roads by a combination of dispatching control and more loading bays (see Figure S-11).
- c) Provision of additional pedestrian facilities in the area, both within and outside the Center.

- d) Implementation of the revised and improved traffic management measures along Aurora, which rely heavily on traffic enforcement (see Figure S-12).
- e) Expanding the capacity of the external access to Cubao through one-way couples for Ermin Garcia and New York and for P. Tuazon and Banahaw, a new Bridge at Diliman Creek to link Aurora to Kamias, and extension of G. Araneta Street to 7th Avenue (see Figure S-13).

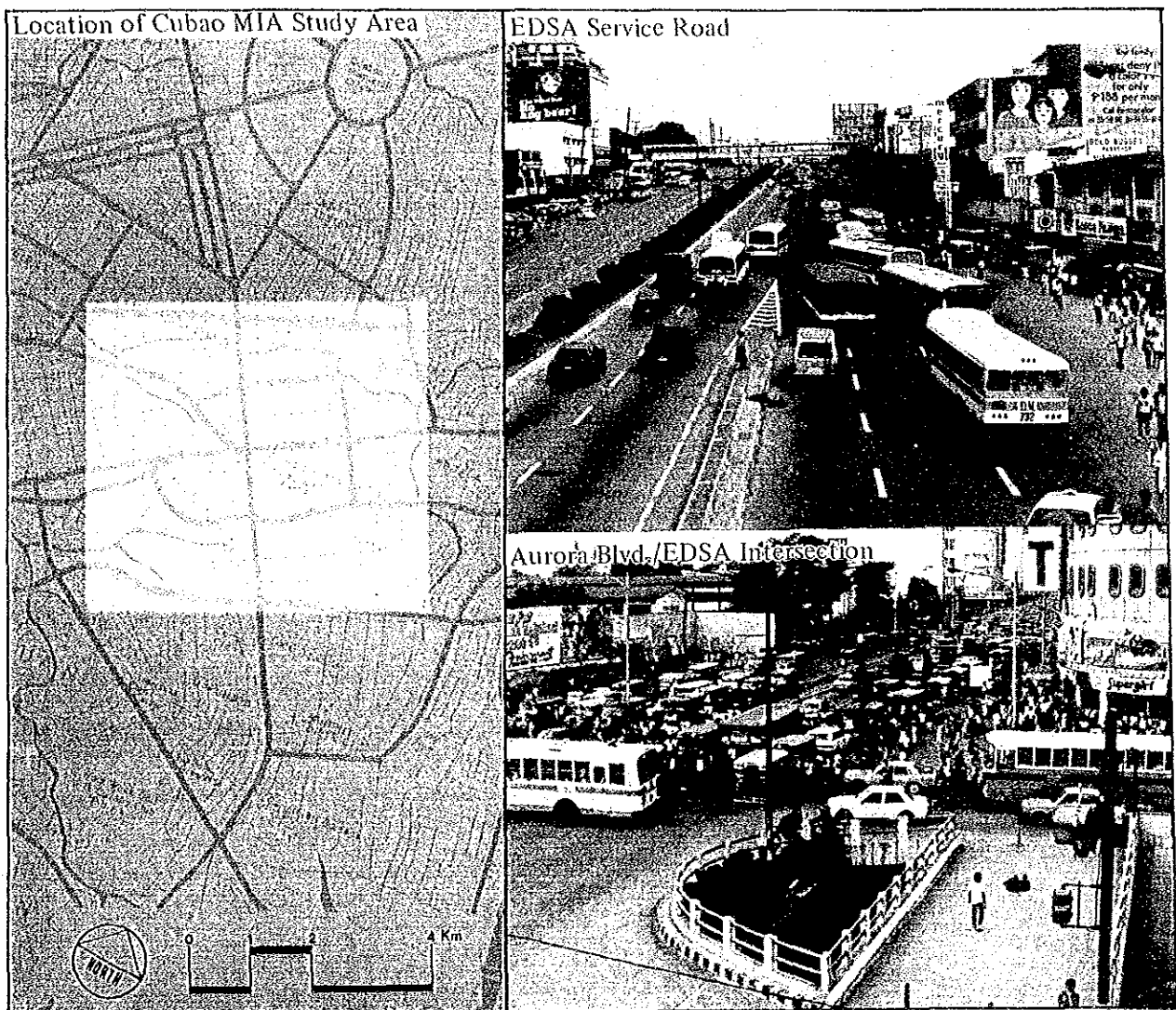


Figure S-9

Need and Concept of Mode Interchange Facilities for Cubao MIA

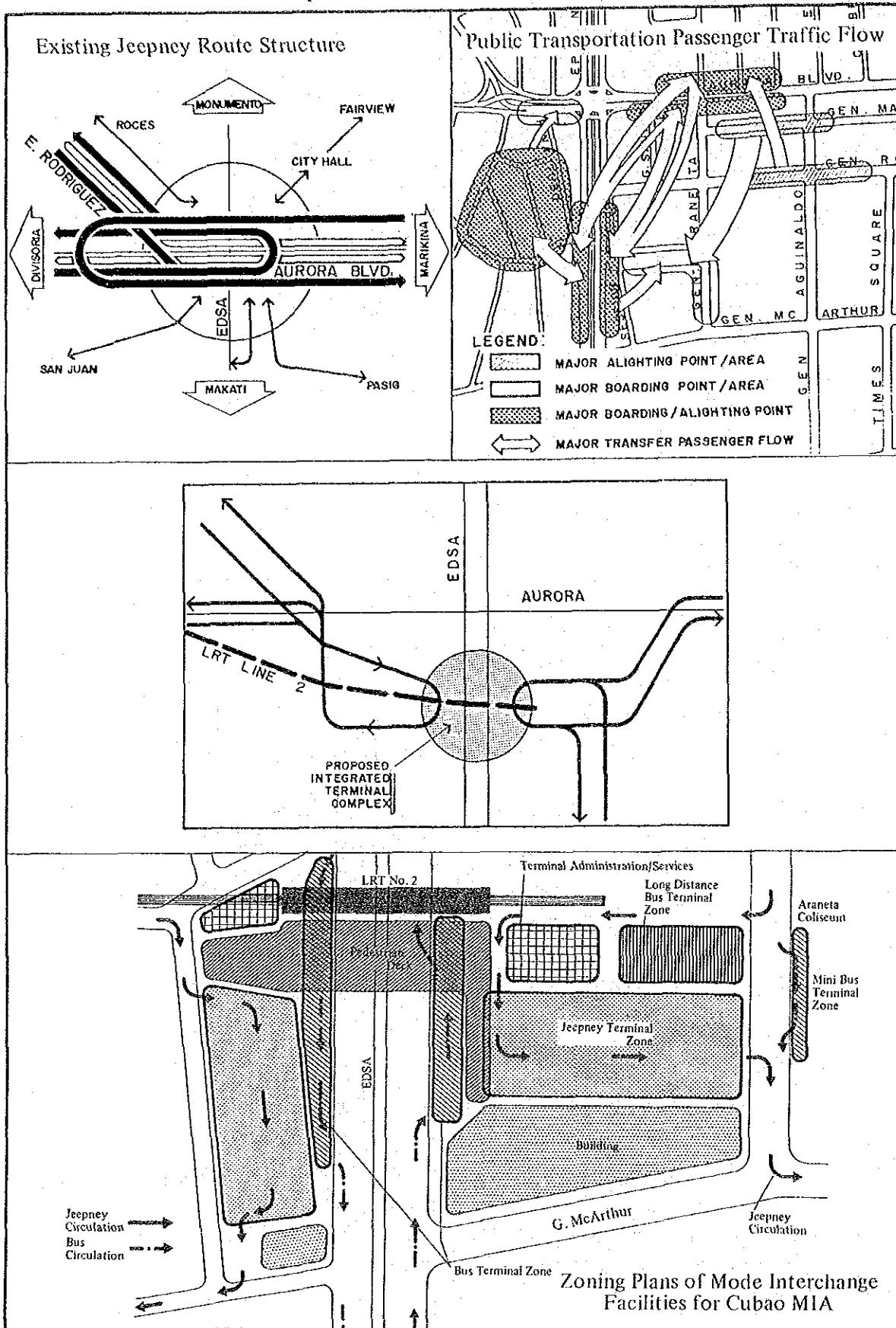
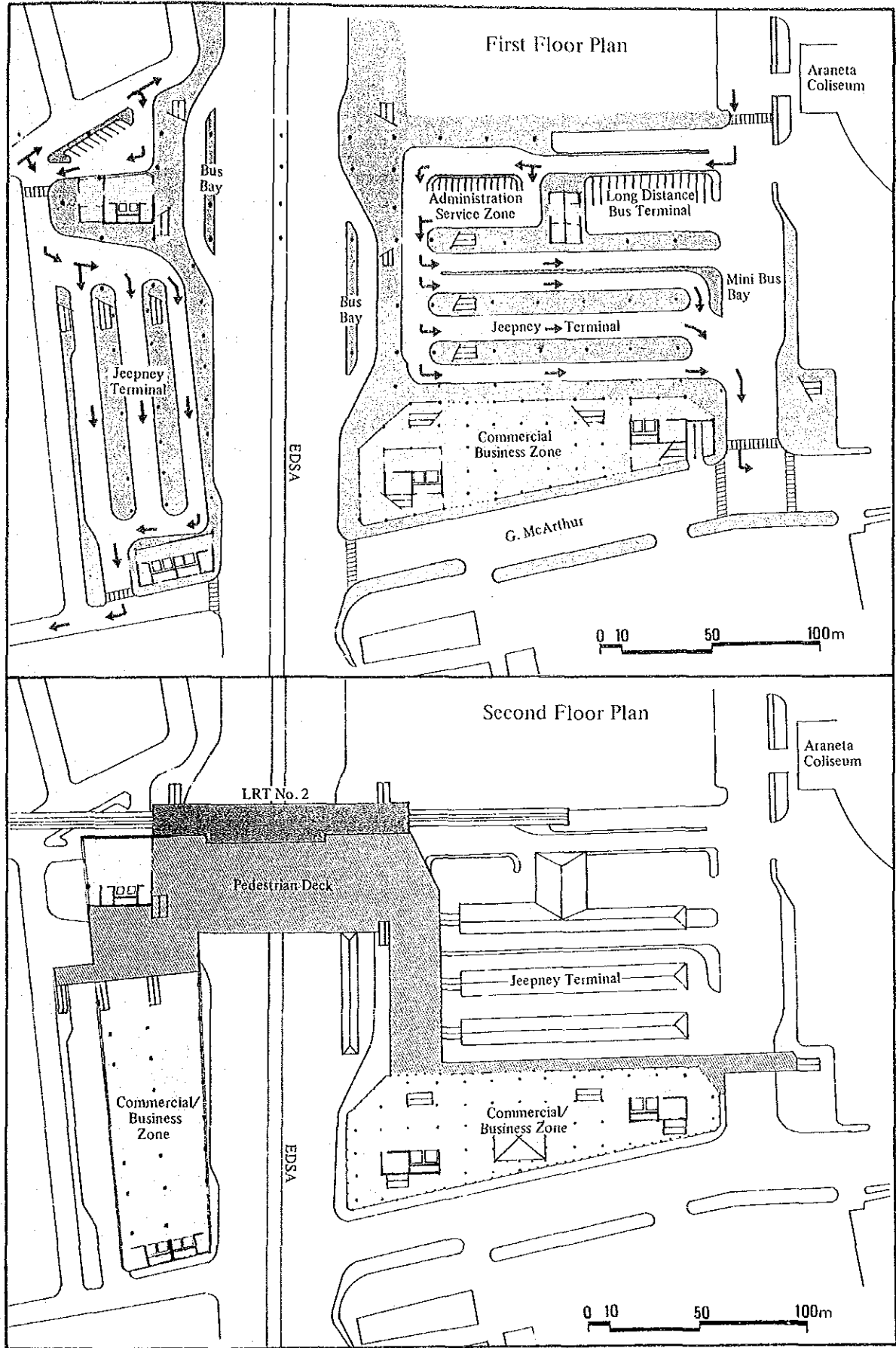




Figure S-10  
 Floor Plan of Mode Interchange Facilities for Cubao MIA



Existing Condition

Planned Development

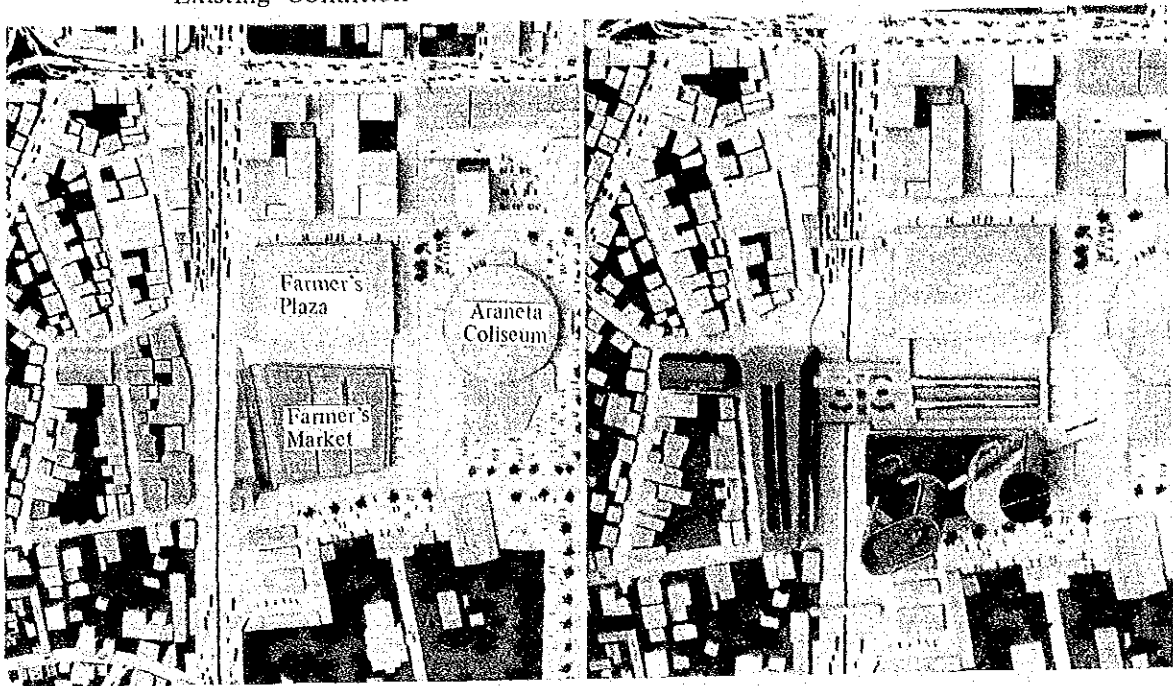


Figure S-11  
Improvement of Bus Operation Along EDSA

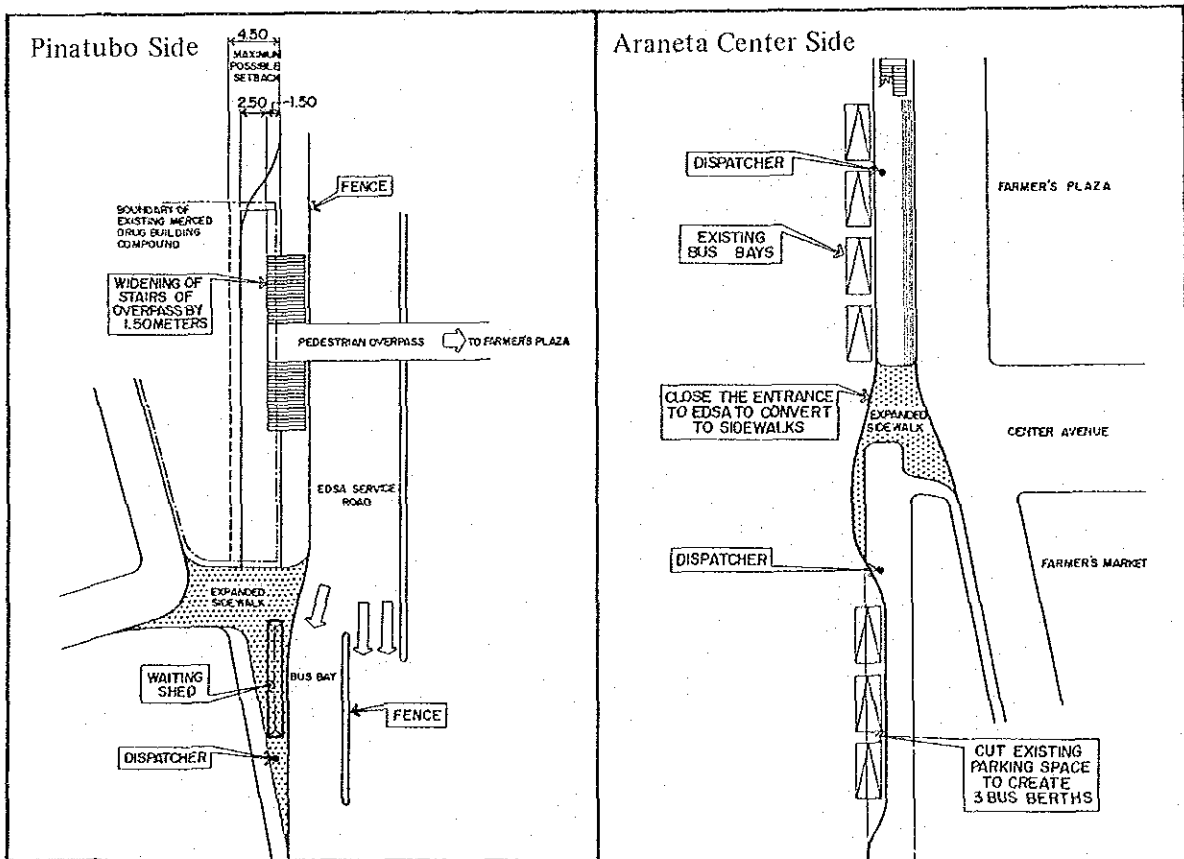


Figure S-12  
Better Utilization of Aurora Boulevard

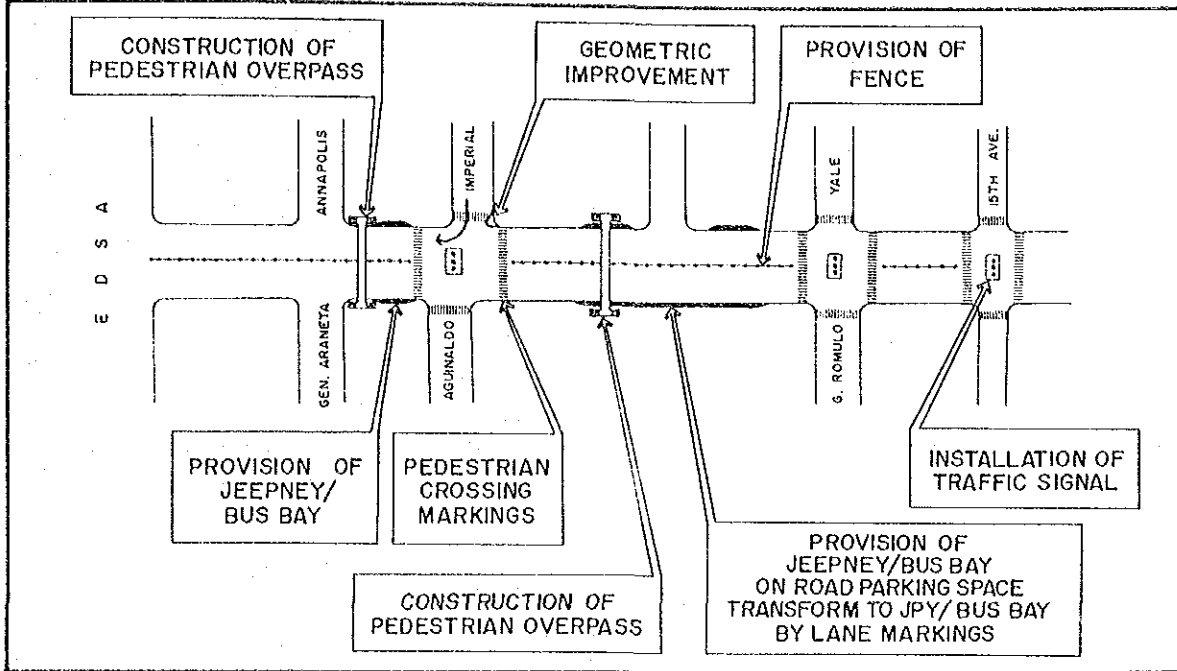
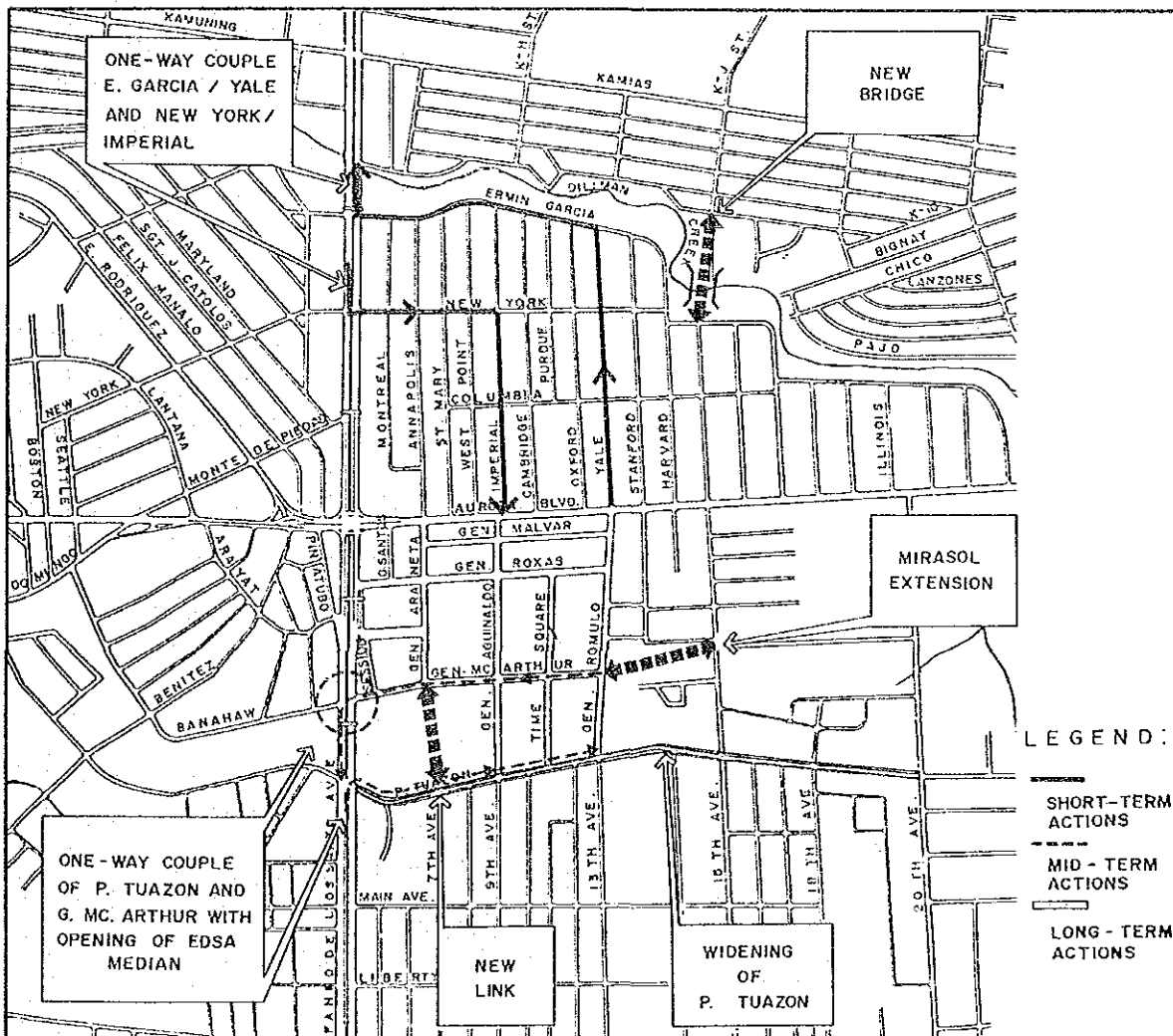


Figure S-13  
Improvement of External Access to Cubao



### 6.3 RECTO

The central location and availability of Recto market attract mode interchange area development, especially in relieving the traffic congestion of Quiapo and easing pedestrian conflicts.

The short-to-medium term recommendations are intended to resolve existing traffic problems and cope with the opening of the north section of the LRT. The long-term proposals have been formulated in relation to the overall transportation problems of Quiapo and the redevelopment of Old Bilibid. A summary of the proposals for Recto MIA are as follows:

- a) Rerouting of northbound and southbound jeepneys
- b) Control of utilization of A. Mendoza service road to determine inner lane loading/unloading and waiting
- c) Realization of the full capacity of D. Jose roads near the LRT station through repaving, lane markings, and loading bays
- d) Construction of the pedestrian skyways across Old Bilibid (as proposed by MMC)
- e) Allocation of about 14,600 sqm. for terminal space on the northern half of the Old Bilibid site and its early opening, in phases, to public transportation use. This is shown in Figure S-15.
- f) Extension of Doroteo Jose to A. Mendoza and of Evangelista across C. M. Recto into the Old Bilibid area.

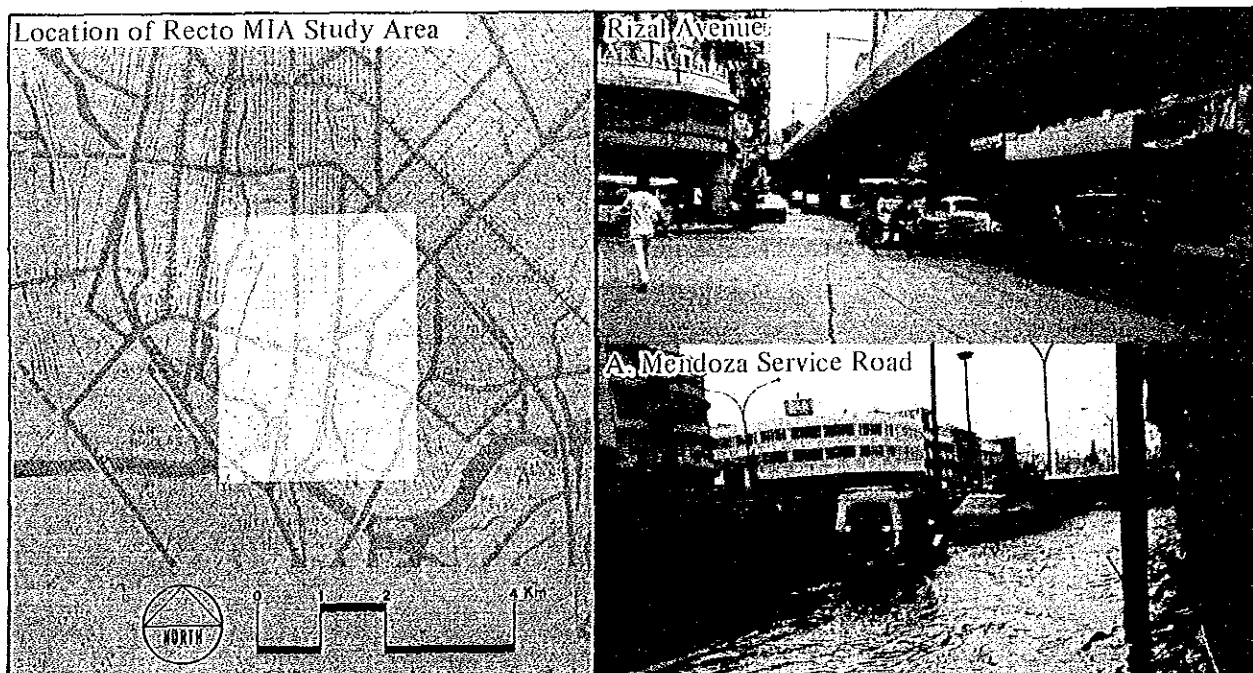


Figure S-14  
 Concept of Mode Interchange Facilities for Recto MIA

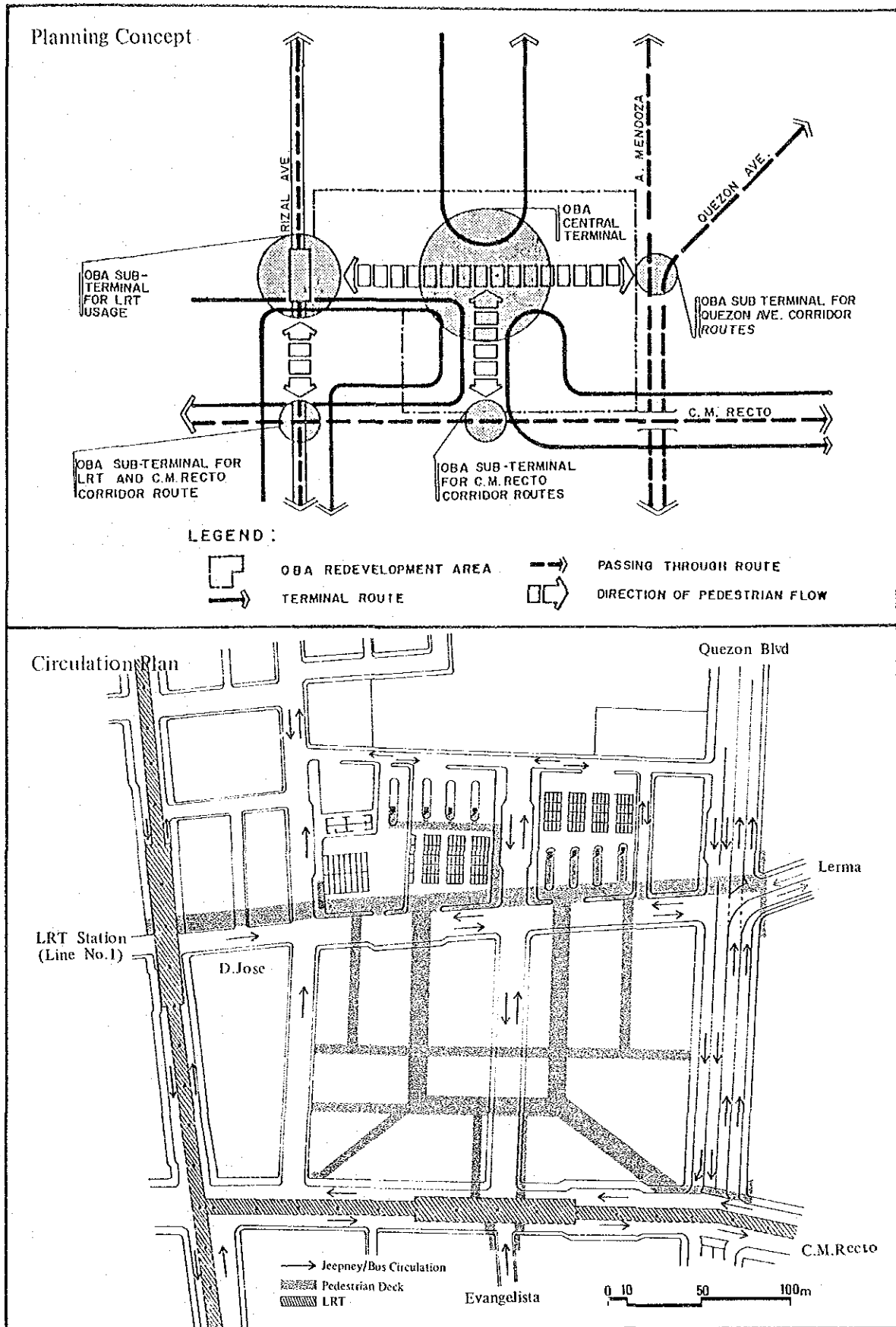
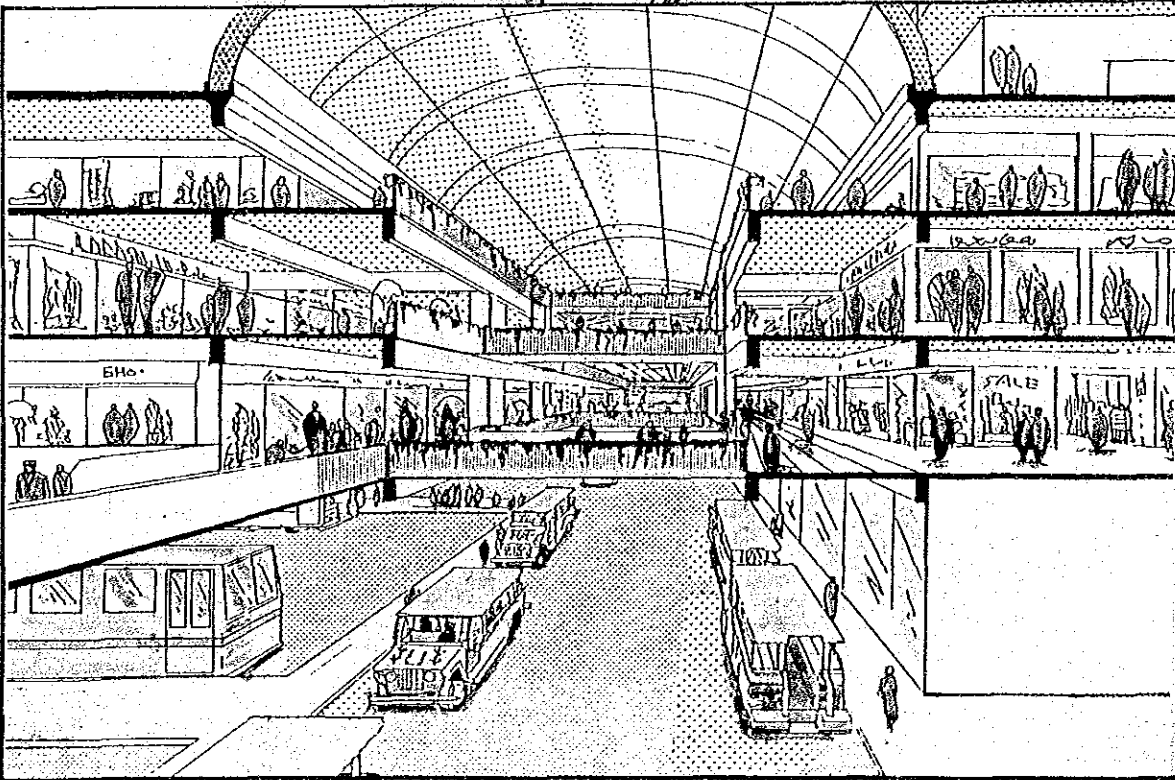
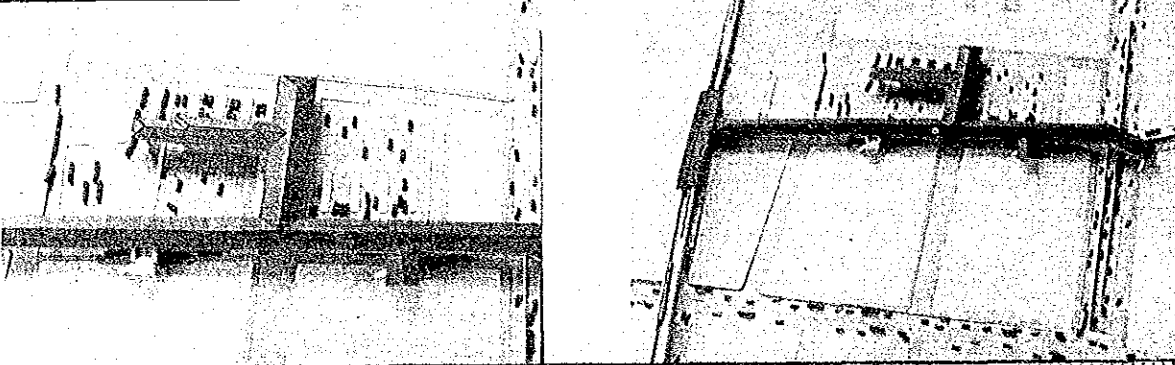
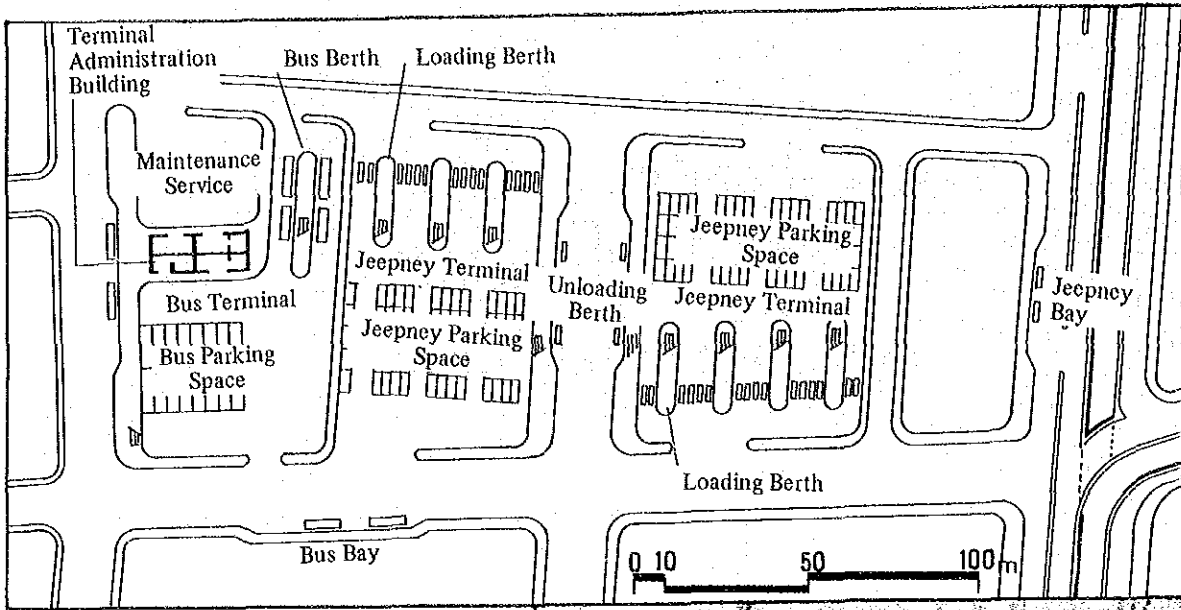


Figure S-15  
Proposed Transport Terminal Plan for Recto MIA



## 6.4 DIVISORIA

A traditional CBD which functions as a wholesale-retail-trading center. The continued viability of Divisoria depends on the resolution of its access problem.

Planning actions could be limited, without a deliberate policy decision on the urban role of Divisoria vis-a-vis Manila, now and in the future. Even short-term measures have doubtful efficacy considering the failures of past attempts. Some modest steps that may produce partial relief are:

- a) Rerouting of jeepneys converging on Divisoria, particularly their turning points.
- b) Limiting the use of C.M. Recto to vehicles with minor civil works such as barriers, markings, etc.
- c) Redefinition of the role and function of many sidestreets to pick up more of the traffic.
- d) Improvement of pedestrian facilities.

Interim use of Del Pan as on-street terminal (see Figure S-16) should be considered in the next 5 years. Over the long-term, the two options are the construction of a flyover to evade the surface activities in front of the market (see Figure S-17) and the redevelopment of the PNR Tutuban Station into an integrated public transport terminal (see Figures S-18 to S-20). The first option may need only P2.3 million and a corresponding rerouting of jeepneys away from Juan Luna; however, it may not succeed in persuading jeepneys and buses to abandon their disruptive behavior in C. M. Recto. The same uncertainty exists for the Tutuban Station which will require P35.9 million for development into an integrated terminal. Construction of the flyover (cost = P100.3 million) is unorthodox but represents the path of least resistance. It means accepting the chaotic Divisoria situation as is and formalizing a pedestrian mall and terminal function on C.M. Recto. Furthermore, it is emphasized that Tutuban Station compound provides ideal location to create new urban core for revival and further growth of the traditional CBD.

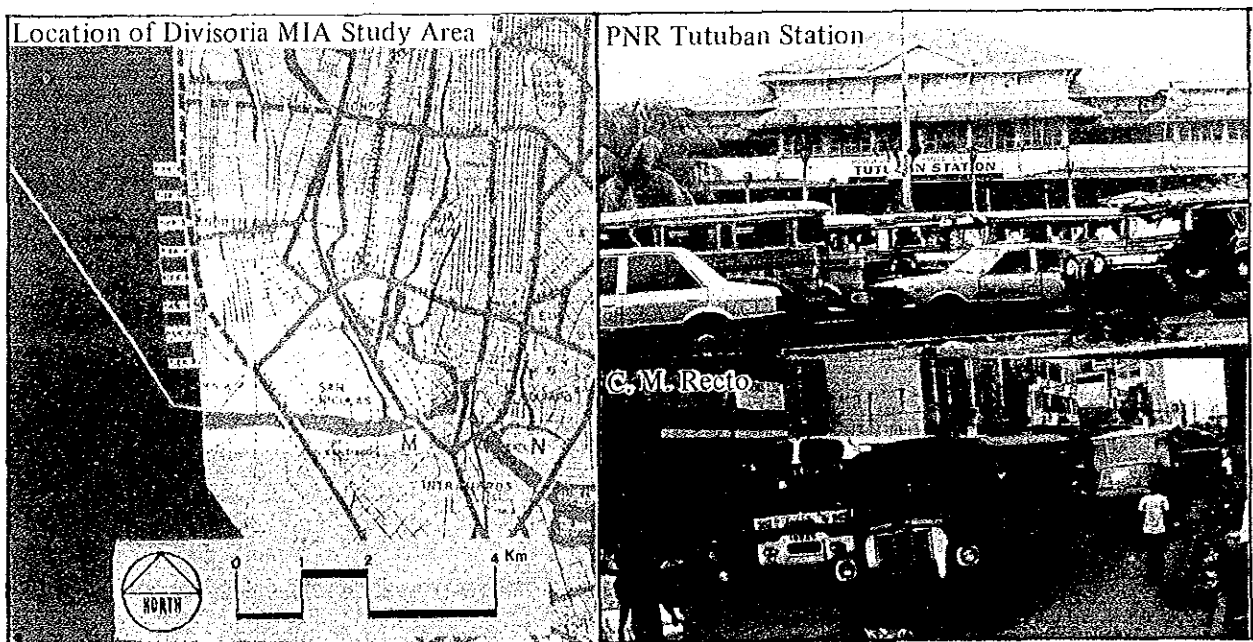


Figure S-16  
Proposed Terminal at Del Pan

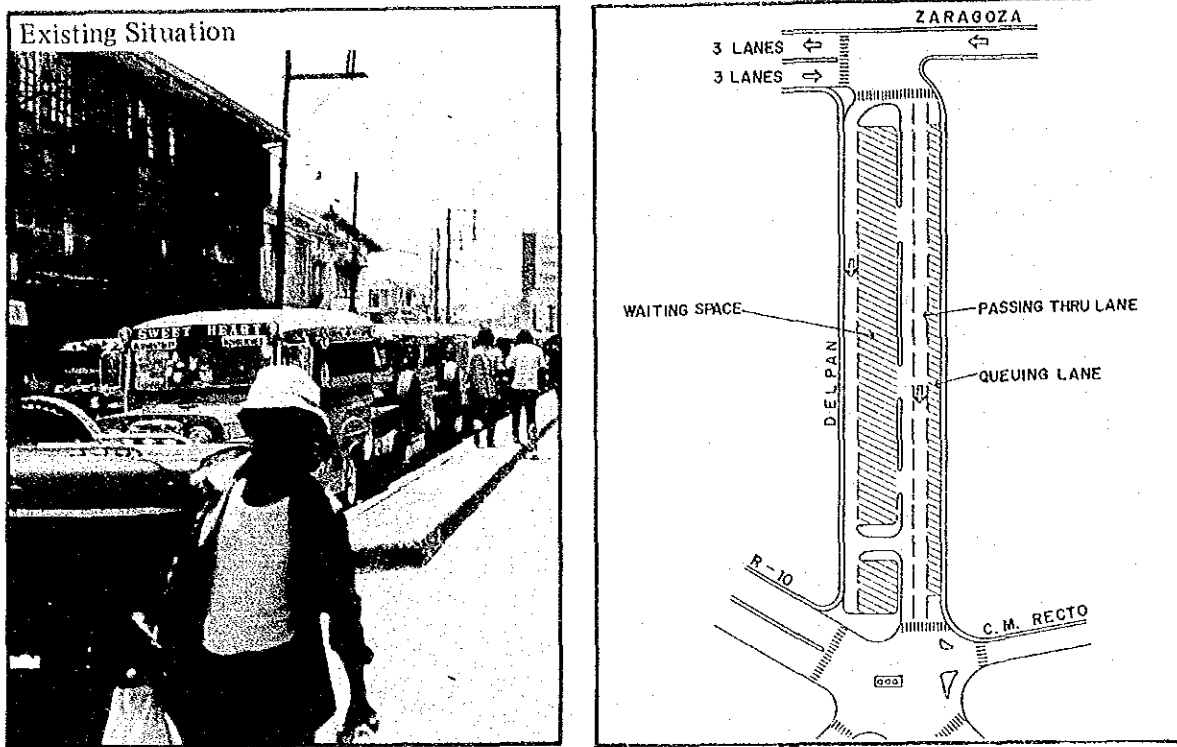


Figure S-17  
Proposed Flyover to Cater to Through Traffic

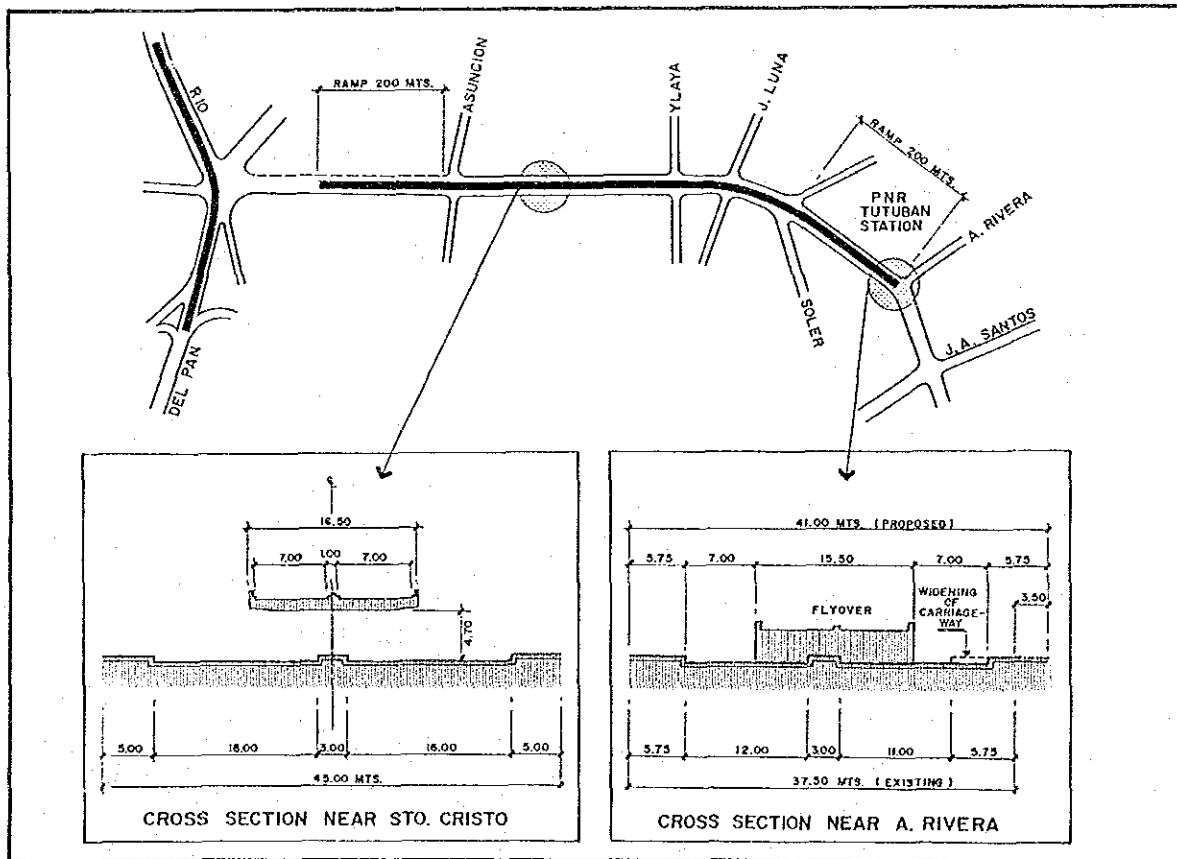




Figure S-18  
 Development Concept of PNR Compound as a  
 New Urban Core with Transport Terminal

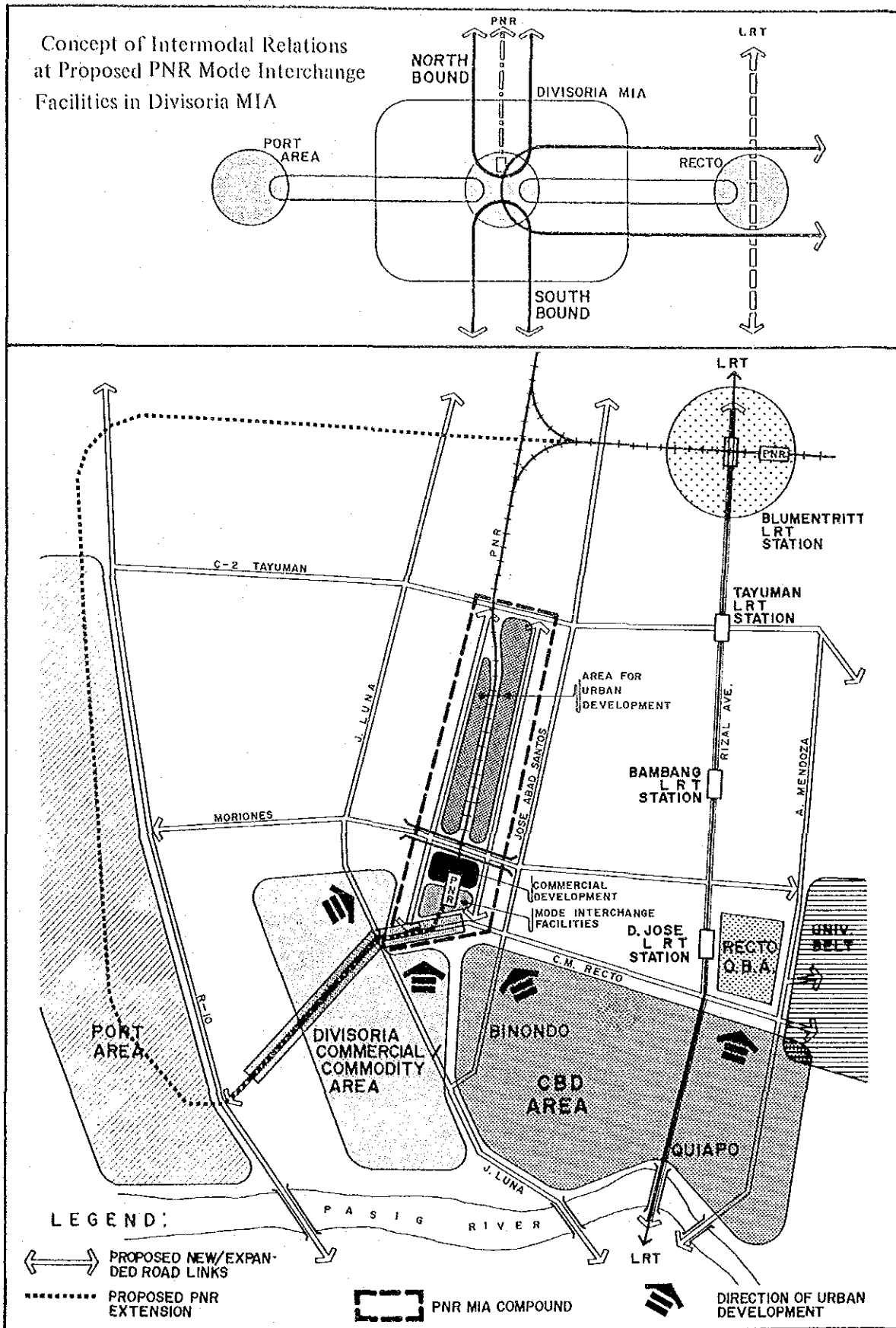


Figure S-19  
 Land Use Concept of PNR  
 Tutuban Compound Development

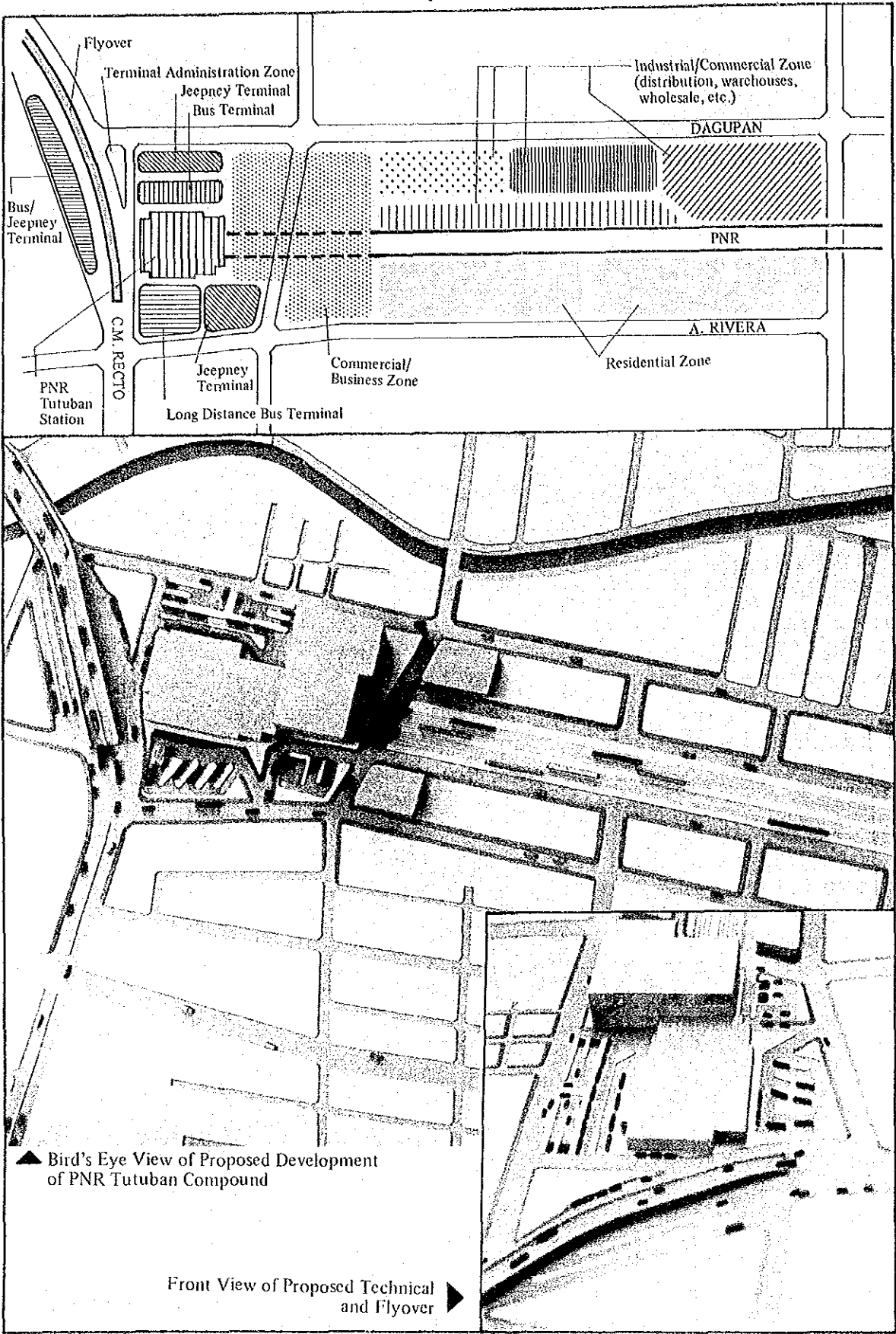


Figure S-20  
Concept and Plan of Mode Interchange  
Facility for Novaliches MIA

