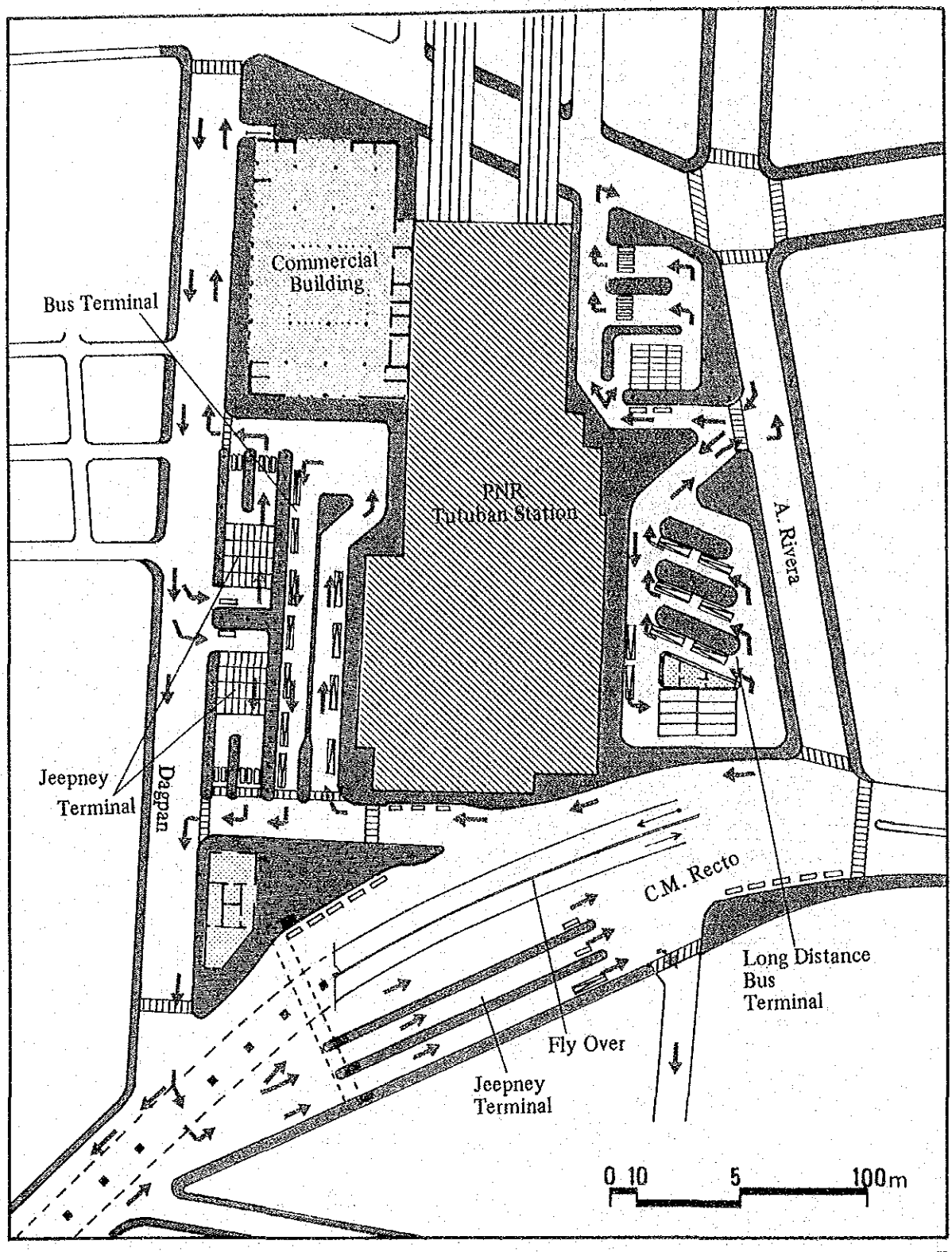


Bus/Jeepney Circulation

Figure 6.41
Proposed Terminal Development Plan for Divisoria MIA at PNR Tutuban Station

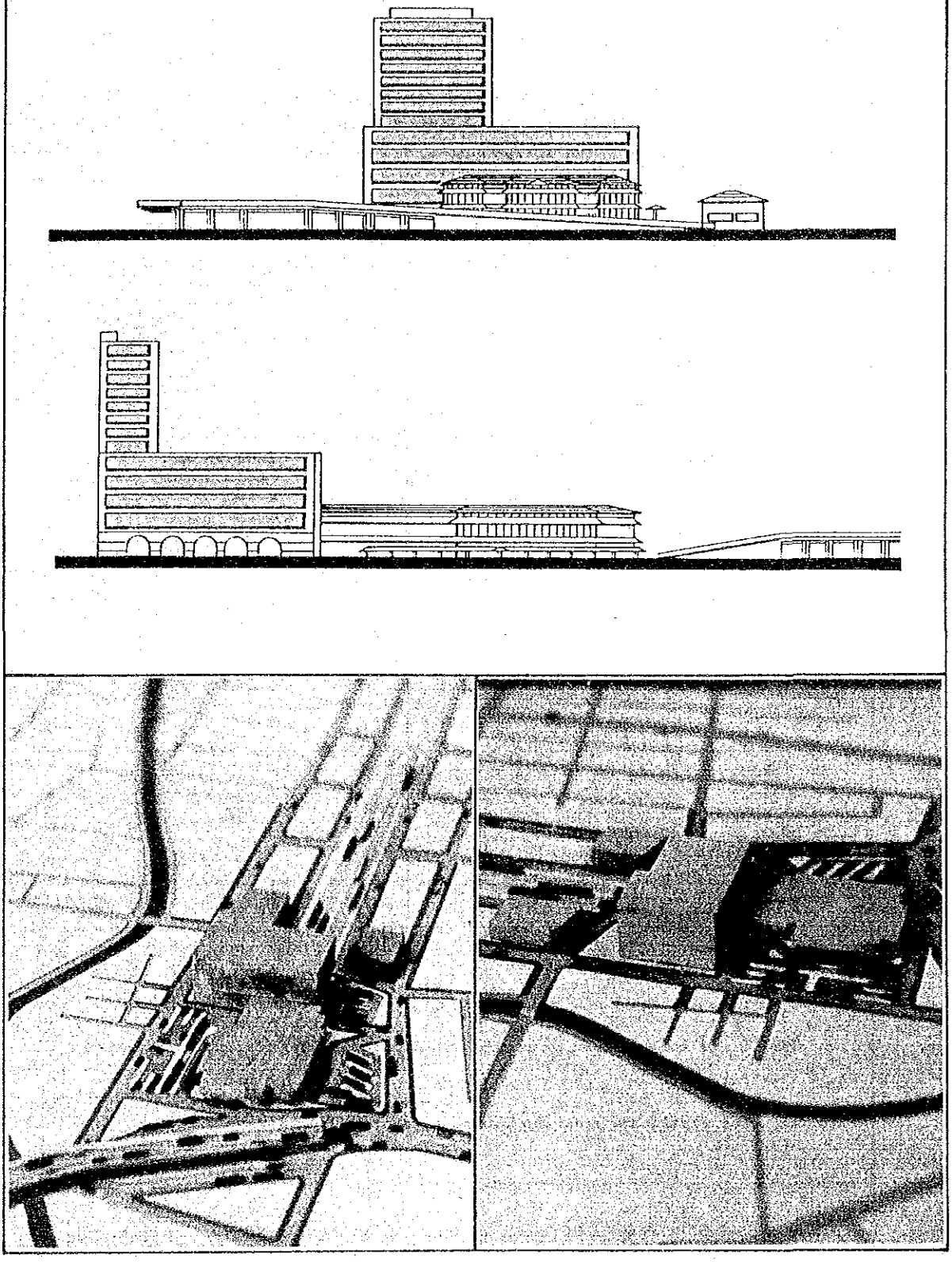


Figure 6.42
Images and Sectional
Plan of Terminal at
PNR Tutuban Compound

6.4.5 Summary of Recommended Actions

Table 6.15 summarizes the recommended actions for different time periods for Divisoria MIA. Estimated cost for implementing such tasks are shown in Table 6.16; P9 million for short-term, P92 million for mid-term and P191 million for long term actions.

Table 6.15
Recommended Actions for the Divisoria Mode Interchange Area

ACTION AREAS	RECOMMENDED ACTIONS		
	SHORT-TERM	MID-TERM	LONG-TERM
A. JEEPNEY ROUTE RESTRUCTURING			
A-1 EASTBOUND TERMINATING JEEPNEYS VIA C. M. RECTO - A. RIVERA	●	→	○
A-2 NORTHBOUND TERMINATING JEEPNEYS	●	→	○
A-3 SOUTHBOUND TERMINATING JEEPNEYS	NA	●	○
A-4 TAYUMAN/NORTH HARBOR TERMINATING JEEPNEYS	●	→ ●	○
A-5 CBD BOUND TERMINATING JEEPNEYS	●	→	○
A-6 SOUTHBOUND TERMINATING JEEPNEYS VIA DEL PAN	●	→	→
A-7 JEEPNEYS RUNNING COUNTER TO ONCOMING VEHICLE AT C. M. RECTO	●	→	→
A-8 CREATION OF NEW ROUTE	●	→	→
B. BETTER UTILIZATION OF C.M. RECTO	●	→ ●	●
C. EFFECTIVE USE OF SIDE STREETS	NA	●	→
D. IMPROVEMENT OF PEDESTRIAN FACILITIES	●	→ ●	→
E. DEVELOPMENT OF INTEGRATED PUBLIC TRANSPORT TERMINALS	●		● 1/

LEGEND

● PROPOSAL AVAILABLE FOR IMPLEMENTATION.

○ REROUTING SHOULD BE REVIEWED IN CONNECTION WITH DEVELOPMENT OF LONG-TERM.

NA NOT AVAILABLE OR NO SCOPE FOR ACTION

→ PROPOSALS FROM PREVIOUS PHASE STILL VALID.

1/ WIDENING OF MORIONES BETWEEN J. LUNA AND DAGUPAN IMPERATIVE TO THE DEVELOPMENT OF AN INTEGRATED PUBLIC TRANSPORT TERMINAL AT TUTUBAN.

Table 6.16
Summary of Project Costs Required
for Improvement/Development of Divisoria MIA

Projects	Short-Term (P000)	Mid-Term (P000)	Long-Term (P000)	TOTAL
A. Jeepney Route Restructuring	4,683	10		4,693
1) Improvement of Roads/Sidewalks	4,683			4,683
2) Traffic Management		10		10
3) Removal of Vendors				
B. Better Use of C.M. Recto	1,652	82,155	100,307	184,114
1) Traffic Management between J. Luna and Dagupan	872			872
2) Oneway couple of C.M. Recto and Zaragoza	780			780
3) Better use of C.M. Recto between J. Luna and Asuncion		234		234
4) Widening of C.M. Recto between Asuncion and R10		81,921		81,921
5) Construction of Fly-Over			100,307	100,307
C. Effective Use of Sidestreets		5,596		5,596
1) Improvement of Roads for Vehicular Traffic		2,981		2,981
2) Improvement of Roads for Pedestrian/ Vendor Zones		2,615		2,615
D. Improvement of Pedestrian Facilities	300	4,109		4,409
1) Pedestrian Crossing Markings	300			300
2) Installation of Traffic Signals		3,328		3,328
3) Widening of Sidewalk of C.M. Recto between Asuncion and R10		481		481
4) Improvement of Pedestrian/Vendor Zones		300		300
E. Development of Integrated Public Transport Terminal	2,335		90,727	93,062
1) Utilization of Del Pan as Terminal	2,335			2,335
2) Development of MIF at Tutuban Station			90,727	90,727
TOTAL	8,970	91,870	191,034	291,874

6.4.6 Financial Aspects–Divisoria MIA

As in the first two MIAs, the profitability of the Tutuban Terminal is marginal. To provide a broad-gauge estimate of the revenue potentials of such an operation, Table 6.17 illustrates 3 possible income situation using similar assumptions as in previous sections, except the number of users (760 jeepneys, 1,300 city bus-trips and 750 provincial bus trips per day). The sales level would be lower for the Del Pan Interim Terminal but the expenses would also be smaller.

Table 6.17
Proforma Annual Income Statement for Divisoria MIA

Item	% of Own Capital		
	100%	50%[1/]	50%[2/]
Revenue (P/year)	4,663,750	4,663,750	4,663,750
Expenditure (P/year)			
– Depreciation	1,796,350	1,796,350	1,796,350
– Operating Costs	1,200,000	1,200,000	1,200,000
– Rent of Land	825,000	825,000	–
– Interest on Loan	0	538,900	538,000
Sub-Total	3,821,350	4,360,250	3,535,250
Profit (P/year)	842,400	303,500	1,128,500
Investment (terminal construction cost) (P)	35,927,000	35,927,000	35,927,000
Return on Investment[3/]	2.3%	0.8%	3.1%

1/ 50% owners' equity and 50% loans.
2/ 50% owners' equity together with land owned and 50% loans.
3/ *Computed for each items only with assumption of profit being constant.*

6.4.7 Economic Aspects – Divisoria MIA

It is not unreasonable to except that the benefits of constructing a flyover would be the same as that of a terminal at Tutuban. Either way, there would be savings in vehicle operating costs (reduction in distance and time) and in passenger time if all the counter-productive activities are diverted or evaded, accordingly. The first type of benefits may even be higher for the flyover option since the through traffic will be unhampered by street activities. Passenger time savings, on the other hand, could be higher for the other option because of the more compact site and layout which simplify intermodal interchange.

Estimates placed the daily savings in vehicle-kilometers at 40,000 and in vehicle-hours at 13,000. These translate to P140 thousand and P468 thousand per day, respectively, or an annual economic benefits of P182 million. Even assuming a 50% margin of error, the savings would compensate many times over the project cost.

Summary of economic impacts due to the development of Divisoria MIA are given in Table 6.18

Table 6.18
Economic Impact of Divisoria MIA Development

TYPE OF ACTIONS / SYSTEM INVENTIONS	LINKAGE	CATEGORY OF BENEFITS/ CONSEQUENCES	PUBLIC TRANSPORTATION				OTHER ROAD USERS		LOCAL NEIGHBORHOODS	GOVERNMENT
			PROVIDERS		USERS					
			DRIVERS	OPERATORS	PASSENGERS	BUSINESS	PEDESTRIANS	VEHICLES		
REROUTING OF JEEPNEY BETTER USE OF CLARO M. RECTO EFFECTIVE USE OF SIDE STREET IMPROVE PEDESTRIAN FACILITIES CONSTRUCT FLYOVER OVER C.M. RECTO DEVELOP AN INTEGRATED TERMINAL		● DIRECT SAVINGS IN THE FORM OF : - REDUCED VEHICLE OPERATING HOURS AND COST - REDUCED PASSENGER TIME	●	●	●	●	●	●	△	△
		● INCREASE IN COMFORT AND SAFETY	●	●	●	●	●	●	△	●
		● BETTER CONTROL OF PUBLIC UTILITY VEHICLE SCHEDULES	△	●	△	△	—	—	—	●
		● INCREASE IN THE VALUE OF LAND	—	—	—	—	—	—	●	●
		● HIGHER VOLUME OF BUSINESS TRANSACTIONS	△	△	—	—	—	—	●	△

LEGEND :

● SIGNIFICANTLY BENEFITED
△ BENEFITED TO LESSER EXTENT
— NEUTRAL

6.4.8 Management Aspect – Divisoria MIA

A. Implementing Responsibilties

1) For the jeepney rerouting, the responsibility for adopting the proposals contained in this report falls on the BOT. Once the franchises or CPCs have been modified accordingly, compliance can be enforced by the Police. Installation of required traffic signs (for PU turning points) and markings (loading/unloading zones) should logically be assigned to the City of Manila or to TEAM/TCC.

2) As to the traffic signals and geometric improvement works, TEAM/TCC is the natural choice. The provision of pedestrian barriers, sidewalks, pedestrian overpasses and crosswalks should also be assigned to TEAM who may execute them through or with another MPWH unit – the NCR office.

3) The main issue is who shall be responsible for the proposed integrated public transport terminal in Tutuban. Since the only site available for the purpose is the property of PNR, its redevelopment should be a PNR undertaking. This can be pursued as an internal PNR project, in which case no new organization (except perhaps another department or its PMO) needs to be mobilized. However, the lack of funds that afflict PNR and the doubts expressed about its competence for semi-commercial ventures suggest another option. It is more feasible to set up a new subsidiary with, private sector participation or to sub-contract a private developer for the undertaking. The latter is prefered to give as much leeway as possible to the "risk-takers".

B. Private Sector Participation

The "father" or the driving force for the realization of the Tutuban MIA should be the MOTC. PNR's role will be that of a "midwife"; by taking the initiative to scout, invite and court private developer who can then function as the financier and manager. To make the deal as attractive to a private group as possible, the following incentives may be considered:

- low rental fee or virtually free use of the land at the start, say for five years;
- more space devoted to PU use, the lower should be the "rates" charged by PNR;
- 25 years lease period, renewable for another 25 years;
- penalty for completion beyond the grace period of five years.

The arrangement should not hamper nor assume that profit-making is immoral. PNR (nor the GOP) does not lose by the amount of profits earned by the investor since the mere conversion of a land to more economic uses is intrinsically beneficial. Financially, of course, it will generate future positive cash flows for PNR on an asset which is at present a cash drain. If the rate is set as a percent of gross sales, the upside potential is immense.

6.5 NOVALICHES MODE INTERCHANGE AREA

6.5.1 The Present Situation

A. Land Use and Socio-economic Characteristics

Land use characterized by a strip/linear pattern of development activities occur along both sides of the highway with settlements tending to stretch parallel to the main thoroughfares. (Figure 6.47) Commercial activity is concentrated at the moment around the intersection of Quirino Highway and Susano Street – where two commercial complexes and a wet market are under construction. At the Novaliches town proper can be observed low to medium density commercial areas at the center while low-density residential developments are on the outskirts with the institutional blocks interspersed among them.

Residents of the area belong to the low-middle income class with an average income ranging from P980 to P1,160 per month. Low car ownership rates are reflected for Novaliches and dependency on public transport system is high.

B. Road System and Traffic

The road structure of Novaliches is still simple. It consists of only three (3) national roads, some city roads, and a large group of subdivision roads. The major roads are Quirino Highway, Gen. Luis Avenue, and Susano Street (see Figure 6.48).

Location of economic activities along the primary roads have not yet induced construction of the secondary road network. Intensity of road use can be seen from Figure 6.49 where the traffic flows and congestion indices are noted.

Traffic in Novaliches is analyzed under three categories;

1) Passing through traffic

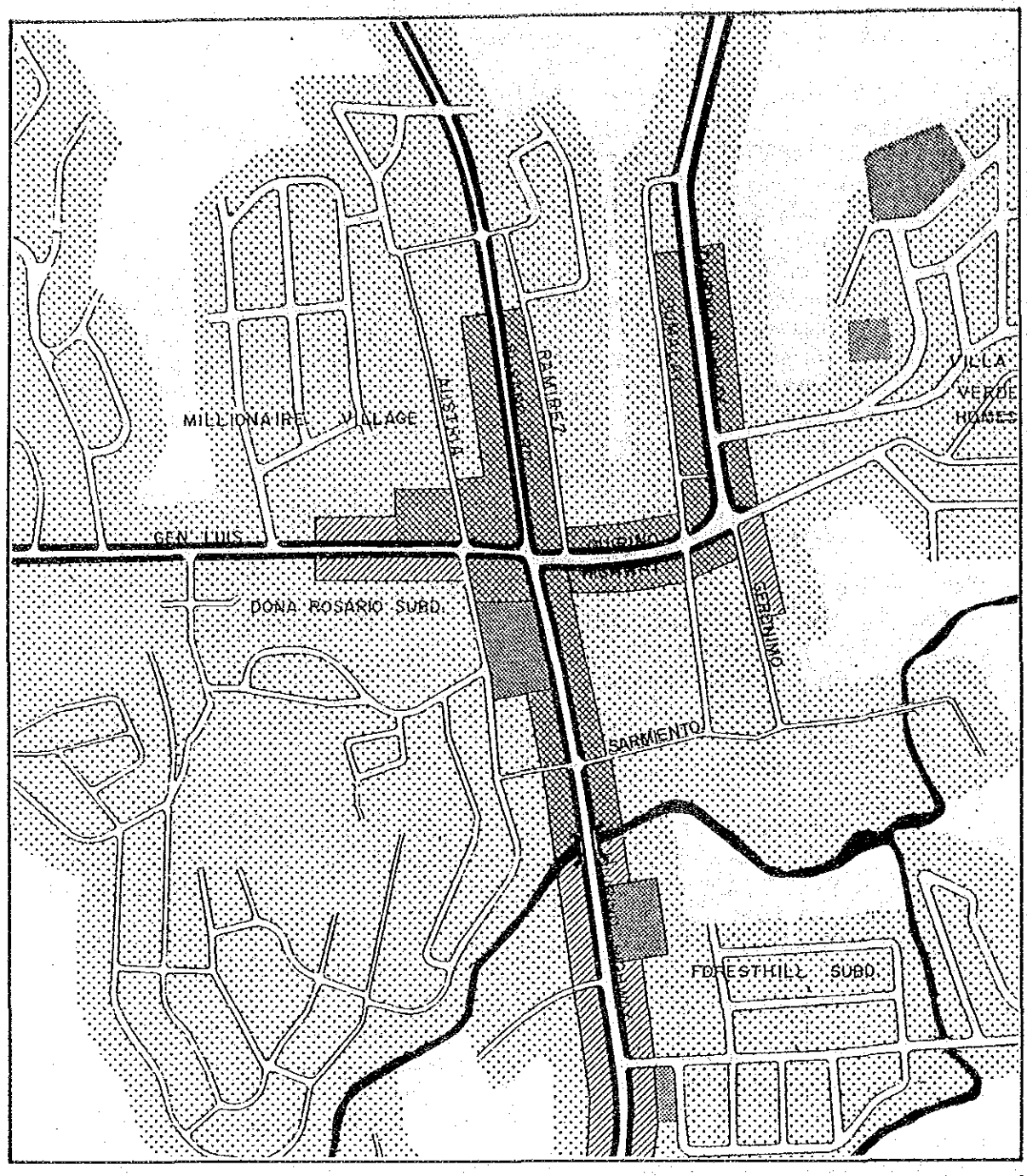
2) Generated/attracted traffic from/to subdivision

3) Traffic associated with the Novaliches town proper.

Traffic congestion is marked throughout Quirino Highway's length due to the absence of alternative link aside from a roadwidth of two lanes. Many subdivisions are located along Susano Road, which explains the predominant private car traffic. Total generated/attracted traffic of the subdivision is 450 to 1,500

Traffic flow in the Novaliches area has reached saturation along Quirino Highway. Severe congestion is observed at the intersection of Quirino Highway and Susano Road due to:

1) Skewed alignment and poor geometric structure at intersections



LEGEND:

- COMMERCIAL (MEDIUM DENSITY)
- COMMERCIAL (LOW DENSITY)
- INSTITUTIONAL
- RESIDENTIAL AREA
- OPEN SPACES
- PRIMARY ROAD
- LOCAL ROAD
- WATER WAY

0 50 100 300 M

Figure 6.43
Existing Land Use of Novaliches
Mode Interchange Area

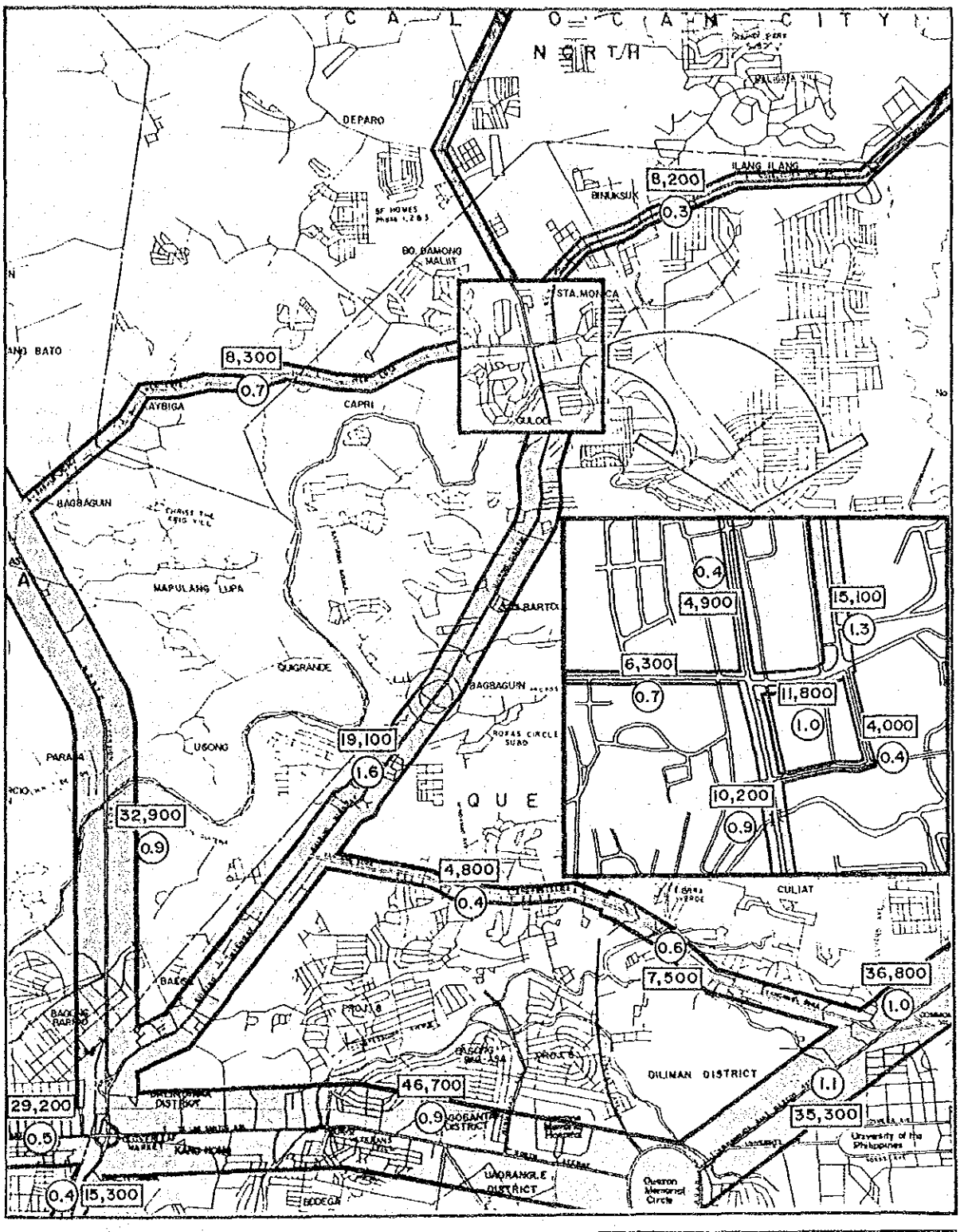


Figure 6.44
Road Traffic Flow and Congestion Index of Novaliches MIA

2) Mixed vehicle and pedestrian traffic

3) Unsuitable location of YBL bus stop along Gen. Luis (too near the intersection)

4) Use of sidewalks by vendors

5) Lack of traffic signs.

C. Public Transportation Aspects

Novaliches area is served by 37 jeepney and 19 bus routes. Approximately 1,100 jeepneys and 750 buses operate in these lines. There are 10,000 public transport vehicles over 16 hours in the densest section of Quirino Highway. Jeepney routes along Quirino Highway, Susano Road and Gen. Luis are not integrated in the sense that each makes a U-turn without overlapping each other.

By the very nature of the profit-maximizing public transport, terminals or turning points tend to locate where passengers converge – which is Novaliches town proper. For the PUJs and PUBs, the total number of passengers counted as boarding and alighting in the Novaliches area is 84,000 in 16 hours. Of these, 66,000 or 78.7% are jeepney passengers. Nine out of ten passengers are taking intracity trips (see Table 6.19). Ratio of transfer passengers to total is as high as 57.6% and 52.2% for jeepney and bus, respectively. Intermodal transfer occur largely between jeepneys (60.9% of the total transfers), followed by jeepney-bus (35.1%). Distribution of passengers boarding and alighting at Novaliches is shown in Figure 6.45.

Table 6.19
Public Transportation Passenger Traffic
in Novaliches Mode Interchange Area

	Number of Boarding/ Alighting Passengers/16 hrs.					
	Intra-City		Inter-City		Total	
Mode	000	%	000	%	000	%
Jeepney	625	(74.3)	37	(3.9)	662	(78.7)
Bus	146	(17.4)	33	(3.9)	179	(21.3)
Total	771	(91.7)	70	(8.3)	841	(100.0)

Source: JUMSUT I

Redistribution of passengers within the Novaliches study area concluds that traffic is concentrated around Susano Market, along Quirino Highway between Susano and Geronimo, and north of Geronimo where terminals and commercial or business establishments abound.

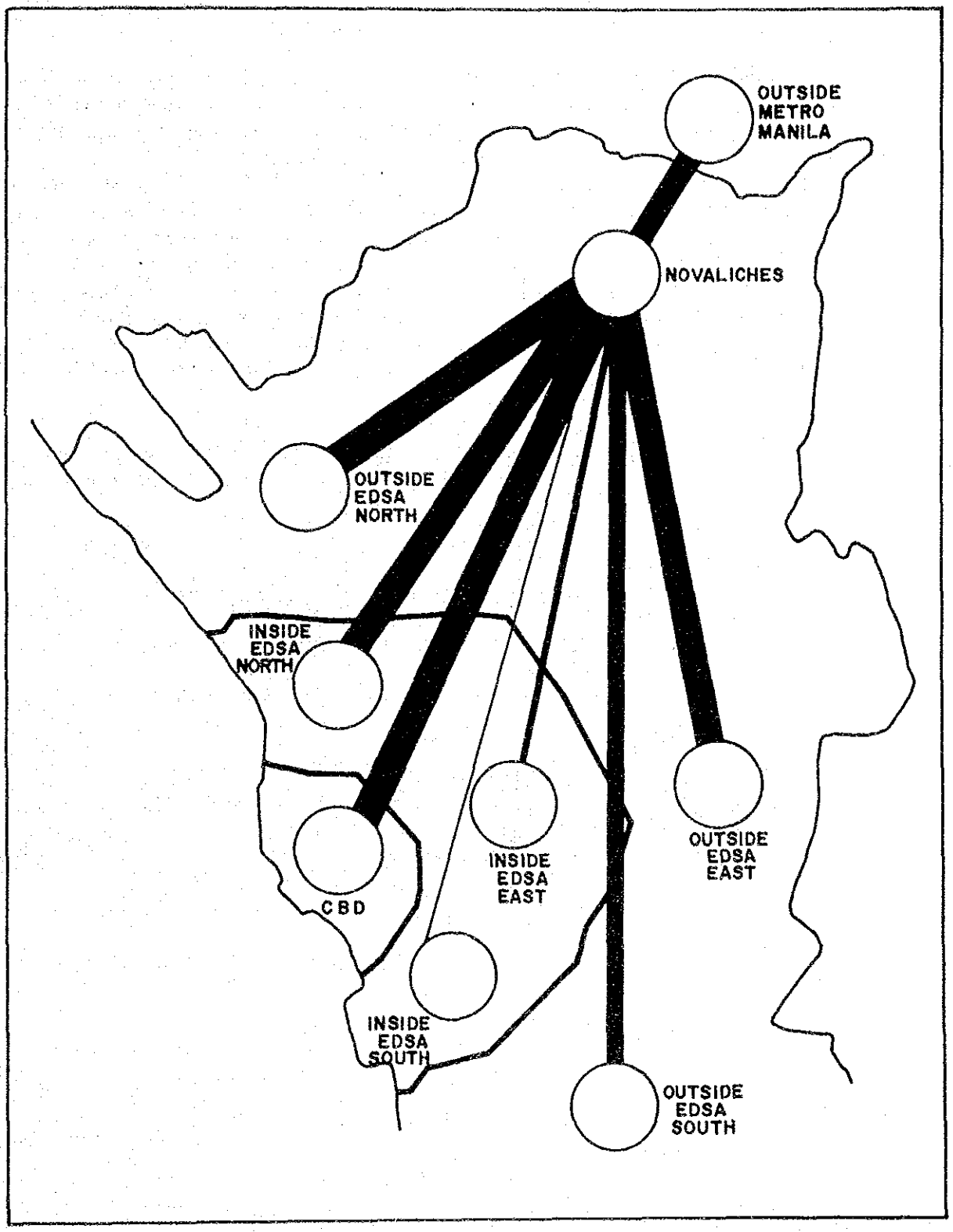


Figure 6.45
Origin/Destination Pattern
at Novaliches MIA

6.5.2 Summary of the Problems

Development of a comprehensive suburban core integrating commercial, business, social and administrative services, with corresponding improvements in the transportation system is the key for a balanced and sound development of this area as well as the metro region. Considering that the trunk road system is still undeveloped, the uptrend in transportation demand will mean greater reliance on existing major roads (such as Quirino Highway and Gen. Luis). Lack of alternative access means exacerbation of existing traffic congestion at several sections of the town proper. It will not be difficult to visualize this bottleneck becoming the main constraint to future urban growth. It is hard to imagine major improvement in public transport without a change in the existing road network. Nevertheless, by strengthening two types of services, some relief may be induced. The first one concerns direct link to/from CBD while the second refers to feeder services between Novaliches town proper and various subdivisions.

Problems extant in Novaliches are arranged in Table 6.20 and summarized below. The same table also presents discussions and possible solutions for each problem.

a) *Traffic Management Component*

1) Traffic congestion at Quirino Highway/G. Luis intersection

2) Vehicular flow hampered by pedestrians and vendors along Susano Road

3) Risk due to vehicle and pedestrian mix along Quirino Highway

4) Obstructed flow of tricycles particularly along Susano Road and G. Luis

5) Induced detour traffic due to one-way control at key road segments

6) Reduction in road capacity due to curbside parking.

b) *Public Transport Component*

1) Delays due to left-turn traffic at G. Luis/Austria and Quirino Highway/Sarmiento

2) Conflict between pedestrians and vehicles at the entrance/exit points of the jeepney terminals which are scattered along Susano Road

3) Slowdown in vehicular flow due to U-turn movements of jeepneys on Quirino Highway

4) Environmental disturbance in residential areas due to the intrusion of jeepneys and abuses and buses in private streets

5) Inconvenient transfers due to the scattered terminals

6) Growth of colorum due to insufficiency of public transport regulation

7) Low profitability of jeepney operation servicing the subdivisions.

c) *Road Component*

1) Confluence of vehicular traffic on a limited number of roads compounded by lack of secondary/tertiary roads

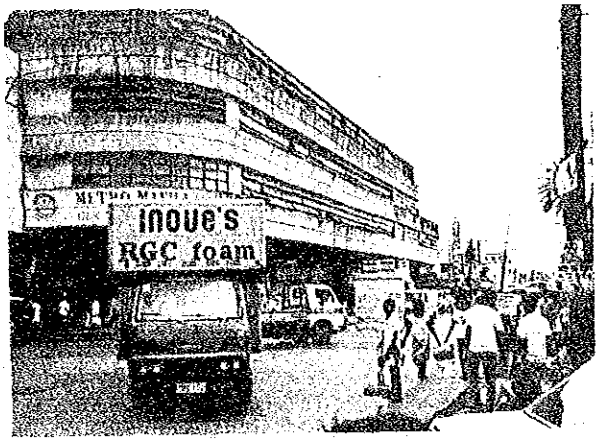
2) Speed slowed down by poor road surface

3) Narrow road width of G. Luis which functions as a primary road

4) Unimaginative layout of subdivision roads vis-a-vis the existing and proposed road network.

Pedestrians and Vendors Mix Along Susano Road

Detour Traffic due to One-Way Control



Scattered On-road Terminals in Novaliches

Reduced Road Capacity due to Curbside Parking of Vehicles

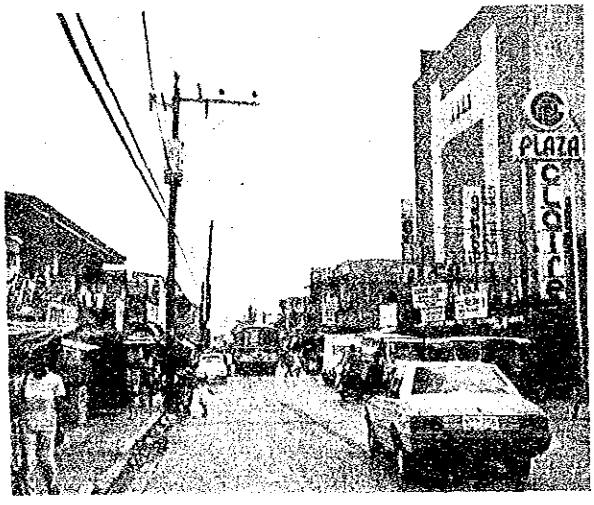


Table 6.20
Problems in the Novaliches MIA

	PROBLEM STATEMENT	DISCUSSIONS	POSSIBLE SOLUTIONS
Traffic Management Component	a) Traffic Congestion at Quirino Highway/Gen. Luis intersection	*Impeded smooth traffic flow due to improper geometric features of the intersection. *Restricted through-traffic flow due to the bus stop on G. Luis side. *Dangers due to the mixture of vehicle and pedestrian traffic. *Ineffective traffic control of traffic aides.	*Geometric improvement of intersection and installation of traffic signal. *Improvement of directional traffic control. *Alternation of bus stop location (set a distance from intersection). *Control of pedestrian traffic and improvement of sidewalk and crossing facilities.
	b) Hampered vehicular flow by pedestrians and vendors along Susano Road	*Pedestrians' almost exclusive use of road towards Susano Market, it being the only route leading to the subdivisions in the north.	*Improvement of sidewalk to segregate pedestrian and vehicle traffic (widening of sidewalks is limited due to narrow road width). *Control of on-road vendors. *Diversion of one direction of private car flow to Austria.
	c) Peril of vehicle and pedestrian mixture along Quirino Highway	*Sidewalk function inhibited by vendors and physical discotinuity of facilities. *Insufficient pedestrian crossing facilities along Quirino Highway.	*Contron of on-road vendors. *Improvement of arcades and sidewalks by parts. *Provision of pedestrian crossing facilities.
	d) Hampered vehicular flow by tricycles particularly along Susano Road and Gen. Luis	*Large tricycle volume (40% to 60% of total traffic) causes congestions.	*Examination of the viability of introducing tricycle exclusive lanes. *Monitor of tricycle congested intersections and road sections.
	e) Generation of detour traffic due to directional control of traffic	*Inconveniced north to south traffic along Susano Road and left turn traffic from Geronimo because of required directional traffic control.	*Improvement of traffic management. *Installation of traffic signal.
	f) Reduction in road capacity due to on-road parking	*Lack of off-road parking space.	*Provisions of off-road parking space. *Control of on-road parking.

	PROBLEM STATEMENT	DISCUSSIONS	POSSIBLE SOLUTIONS
Public Transport Component	g) Attracted and transfer passenger inconvenience	*Attracted passengers are forced to walk because of the looping at Quirino/Sarmiento and the consequent terminating at an inconvenient location with respect to the attraction. *Inconvenient transfer between CBD bound and subdivision routes at the town proper and Susano Road. * Current traffic congestions worsened if routes are designated to Quirino Highway.	*Study alteration of loop routes.
	h) Hampered vehicular flow by left-turn traffic at Gen. Luis/ Austria and Quirino Highway/Sarmiento	*Bus detour to avoid the narrow road width of G. Luis between Quirino Highway and Austria which is prone to a traffic bottleneck.	*Rerouting of bus to resolve detour. *Improvement of Quirino/G. Luis intersections.
	i) Conflicting traffic flow between pedestrians & vehicles at the entrance/exit of the jeepney terminals w/c are scattered along Susano Road.	*Although an off-road terminal=, traffic flow lines to/ from.the terminal are disordered. *Large number of pedestrians verge due to Susano Market.	*Improvement of accesses by integrating terminals. *Simplication of jeepney traffic flow lines along Ramirez and Austria. *Improvement of sidewalks and traffic control at the entrance of terminals.
	j) Hampered vehicular flow due to U-turn of jeepney on Quirino Highway	*U-turning causes a bottleneck along the road section.	*Provision of left-turn movement by removing police outpost at the Quirino/ Geronimo intersections. *Development of new off-road turning points.
	k) Environmental disturbance in the residential areas due to the jeepneys and buses entering narrow streets	*Jeepney and bus routes are permitted along Sarmiento, Geronimo and Austria which are bounded by residential areas and with narrow widths posing pedestrian danger.	*Study rerouting.
	l) Inconvenience of transfer due to scattered terminals	*Despite transfer passengers at 60%, terminals are scattered along Susano Road and Geronimo.	*Development of integrated terminals for increased convenience.

	PROBLEM STATEMENT	DISCUSSIONS	POSSIBLE SOLUTIONS
Public Transport Component	m) Generation of colorum due to the absence of public transportation management and control	*Two types exist: 1) Those which cut their routes short at Novaliches due to low profitability 2) New routes servicing subdivisions where public transportation services are unavailable. *Public transportation management does not meet the existing local needs.	*Provision of public transportation management guidelines for the suburban areas. *Strengthening of route management and control *Provision of new routes to areas of inadequate service.
	n) Low profitability of jeepney operation servicing the subdivisions	*Demand is low and mainly "to work" and "to school" trips. *Inlucrative to the operators but badly needed by developers/residents.	*Enforce provision of feeder services on developers
Road Component	o) Heavy convergence of road traffic to a limited number of trunk roads due to the lack of secondary/tertiary roads; local traffic impede through traffic greatly, causing congestions.	*Regional network trunk roads are limited to Quirino Highway, G. Luis and Susano Road which have to meet the increasing traffic demands. *Maintenance of a good and reliable access to/from CBD as the key to the development of the area.	*Improvement/expansion of trunk road network and a supplementing/secondary system. *Increase of traffic capacity by better utilization of existing roads. *Study of the construction of a by-pass road to Novaliches town proper (avoiding Gen. Luis, Susano congested areas)
	p) Hampered vehicular flow due to poor road surface.	*The generous right-of-way of Quirino Highway is ineffectively used with its detiorated shoulder and poor surface conditions. *Poor road surface of G. Luis and Sarmiento reduce the travel speed significantly.	*Improvement of road surface and sidewalk.
	q) Inadequate road width of G. Luis as a trunk road.	*With its width of only 7-9 meters, it does not function a trunk road toward Malinta and North Diversion Road. *Sidewalks wanting in development pose dangers in that it results to a mixture of vehicles and pedestrians.	*Feasibility study of an alternative route or existing road widening. *Improvement of sidewalks and pedestrian crossing facilities.
	r) Difficulties in plan lay-out of subdivision roads with the existing road network.	*Significant benefits from integrating subdivision roads with local road system, although the reluctance of developers for security reasons.	*Feasibility study and planning guidelines preparation. *Network plan preparation including development of existing roads.

6.5.3 Planning Opportunities in Novaliches MIA

Public transportation problems in these growing suburban areas have not been examined before. Planning opportunities can be identified in the short and long-term horizons in the following aspects:

- public transport route management
- local rerouting of jeepneys
- traffic management within the Novaliches town proper
- trunk road construction
- terminal development.

A. Public Transport Route Management

Transport services in Novaliches can be improved by functional segregation of the following and is further explained in Table 6.21.

a) Bus service between the Novaliches town proper (as the suburban center) and CBD or downtown Manila

b) Jeepney service between the town proper and subdivisions and surrounding areas

c) Tricycle service for intra-area trips.

Types of public transportation services in conjunction with different size of subdivisions around Novaliches can be described in Figure 6.46.

B. Local Rerouting of Jeepneys

Rerouting proposals have been formulated for the following types of routes:

B1 Southbound jeepney loop routes

B2 Northbound jeepney loop routes

B3 Westbound jeepney U-turn routes

B4 Susano Road based jeepney U-turn routes

B5 Gen. Luis bus routes.

Figure 6.47 shows the schematics of the route restructuring which are constrained by the existing road network within the Novaliches town proper.

Table 6.21
Types of Public Transportation Service
Required for Novaliches

Types	Planning Directions
* Trunk Services	
a) Novaliches town proper CBD, EDSA areas	* Encourage diversion from jeepneys to buses and the establishment of a premium bus system to entice cars-riders
b) Proposed suburban center in Novaliches CBD, EDSA area	
* Feeder Services	
a) Long services linking several subdivisions Novaliches town proper	* Expand jeepney services * Introduction of mini-aircon bus to encourage diversion from private cars
b) Novaliches town proper Subdivisions	* Expand jeepney or tricycle services according to subdivision size and requirements
c) Subdivision CBD, EDSA areas	* Strengthen bus services and consider premium-bus class
d) Proposed sub-urban center in Novaliches subdivisions	* Expand jeepney services
* Local Services	
a) Within subdivisions	* Expand tricycle services
b) Novaliches town proper Surrounding areas	* Expand tricycle services

Figure 6.46

Public Transportation Services to Subdivisions at Novaliches MIA

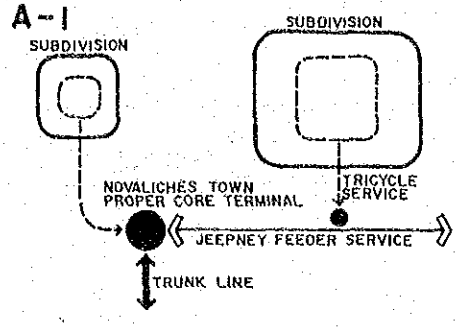
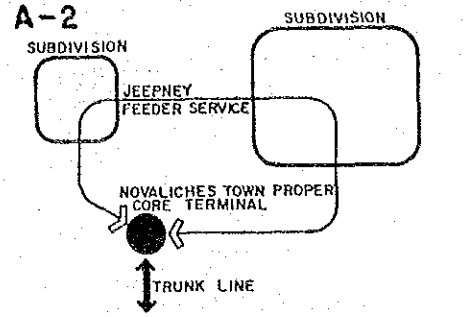
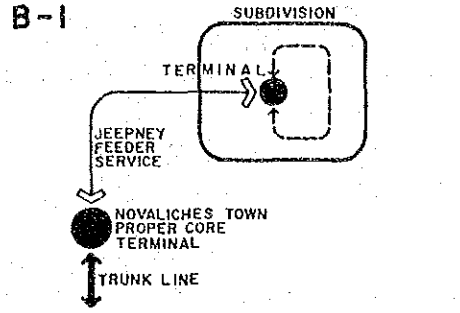
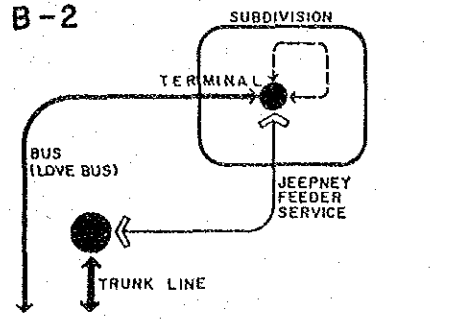
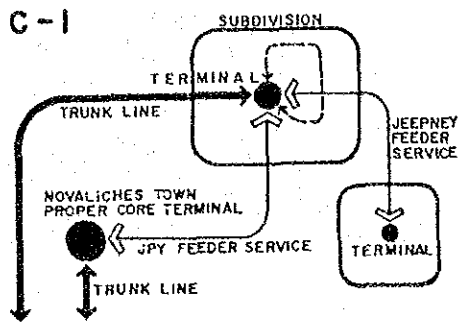
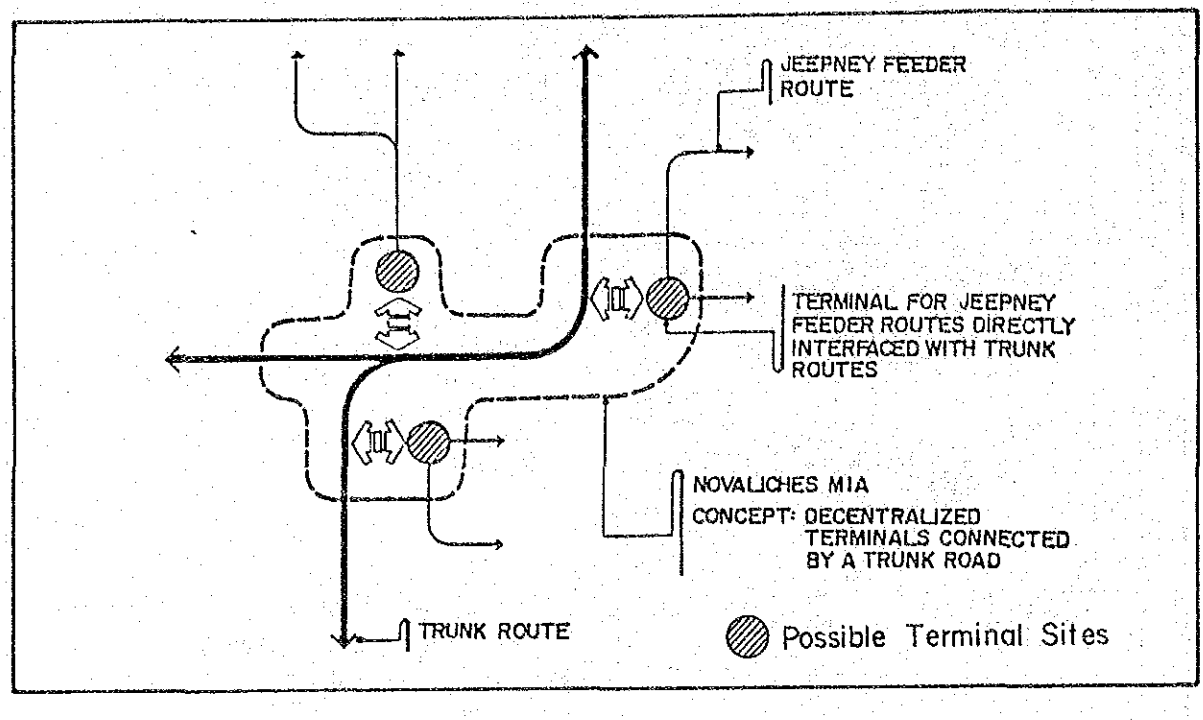
SMALL SCALE SUBDIVISIONS	(A)	A-1  	* Bus service between Novaliches town proper and CBD * Tricycle services between existing routes or town proper and subdivisions * Tricycle services from existing routes to the subdivision interior
		A-2  	* Feeder jeepney services with loop routes linking a number of subdivisions and ultimately to the Novaliches town proper
MEDIUM SCALE SUBDIVISIONS	(B)	B-1  	* Feeder jeepney route between town proper and subdivisions * Tricycle services within subdivisions
		B-2  	* Addition of bus service including premium bus to the system as proposed in B-1
LARGE SCALE SUBD.	(C)	C-1  	* Trunk route linking terminal in the subdivision to CBD; consideration of premium bus system. * Jeepney feeder service linking Novaliches town proper and subdivision terminal; same feeder service between subdivisions. * Tricycle services internal to the subdivision.

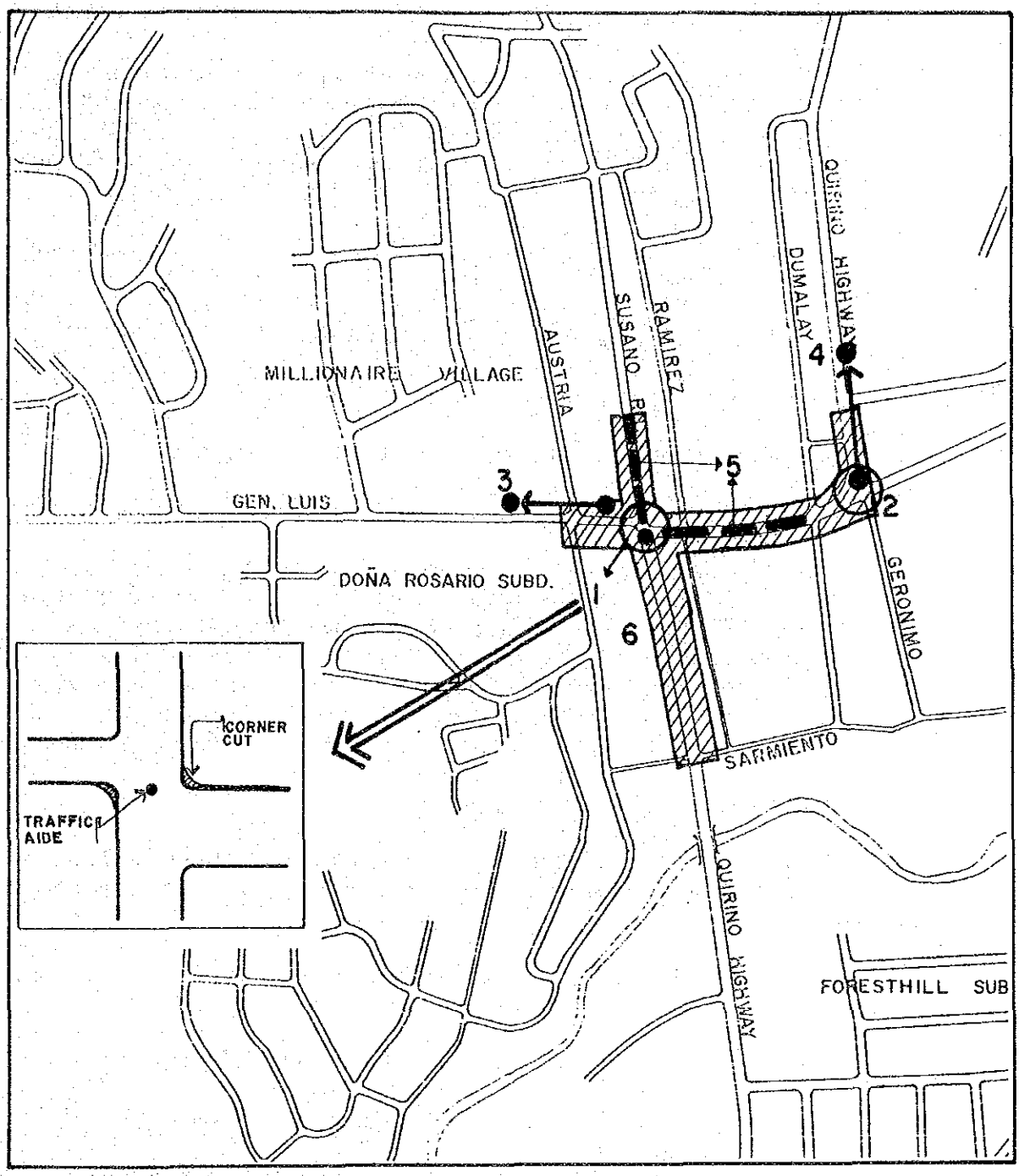
Figure 6.47
Concept of Route Restructuring
for Novaliches MIA



C. **Traffic Management in Novaliches Town Proper**

Maximum use of existing road facilities is the only step in the short-term (i.e., before the realization of plans for primary roads). To achieve this, through-traffic must be given priority, viz (see Figure 6.48).

- Improvement of Quirino/Susano intersection through better traffic control from trained traffic aide.
- Improvement of Quirino/Geronimo intersection, revision of one-way flow, and better traffic control from traffic aide.
- Installation of traffic signals.
- Transfer of bus stop
- Transfer of mini-bus stop
- Removal of on-street vending
- Designation of road segments banned to tricycles.



1. Geometric improvement and traffic management by traffic aide (see insert)
2. Improvement of traffic flow management and removal of police post.
3. Relocation of bus stop.
4. Relocation of mini-bus stop.
5. Prohibition of on-road vendor.
6. Implementation of tricycle banned sections.

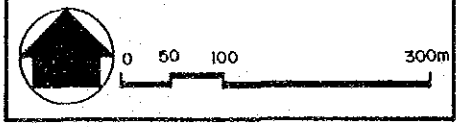


Figure 6.48
Short-term Plan for
Novaliches MIA

D. **Trunk Road Construction**

Mid- to long-term proposals include all measures dependent on the completion of the planned trunk roads. These would limit existing road sections within the town proper to local traffic and internal circulation, while through traffic would be diverted to the new trunk roads. The details are as follows (see Figure 6.49):

- Segregation of vehicles and pedestrians by improving sidewalks along trunk roads
- Widening of G. Luis between Susano and Austria
- Use of a section of Quirino Highway as a bus terminal
- Improvement of road between Susano Road and Ramirez
- Exclusive use of Ramirez (south of Susano Market) by pedestrians

It would be desirable for the portion of C-6 to be constructed soon. However, because of financial constraint, this is unlikely. A bypass road would relieve congestion in the town proper markedly and interim alternative to C-6 should be considered by local government. Possible alignments are shown in Figure 6.50, but Alternative I with road length of 3.2 kilometers is recommended. It will use as much as possible existing roads within subdivisions. Estimated traffic volume that will be diverted to this bypass road is approximately 5,000/day.

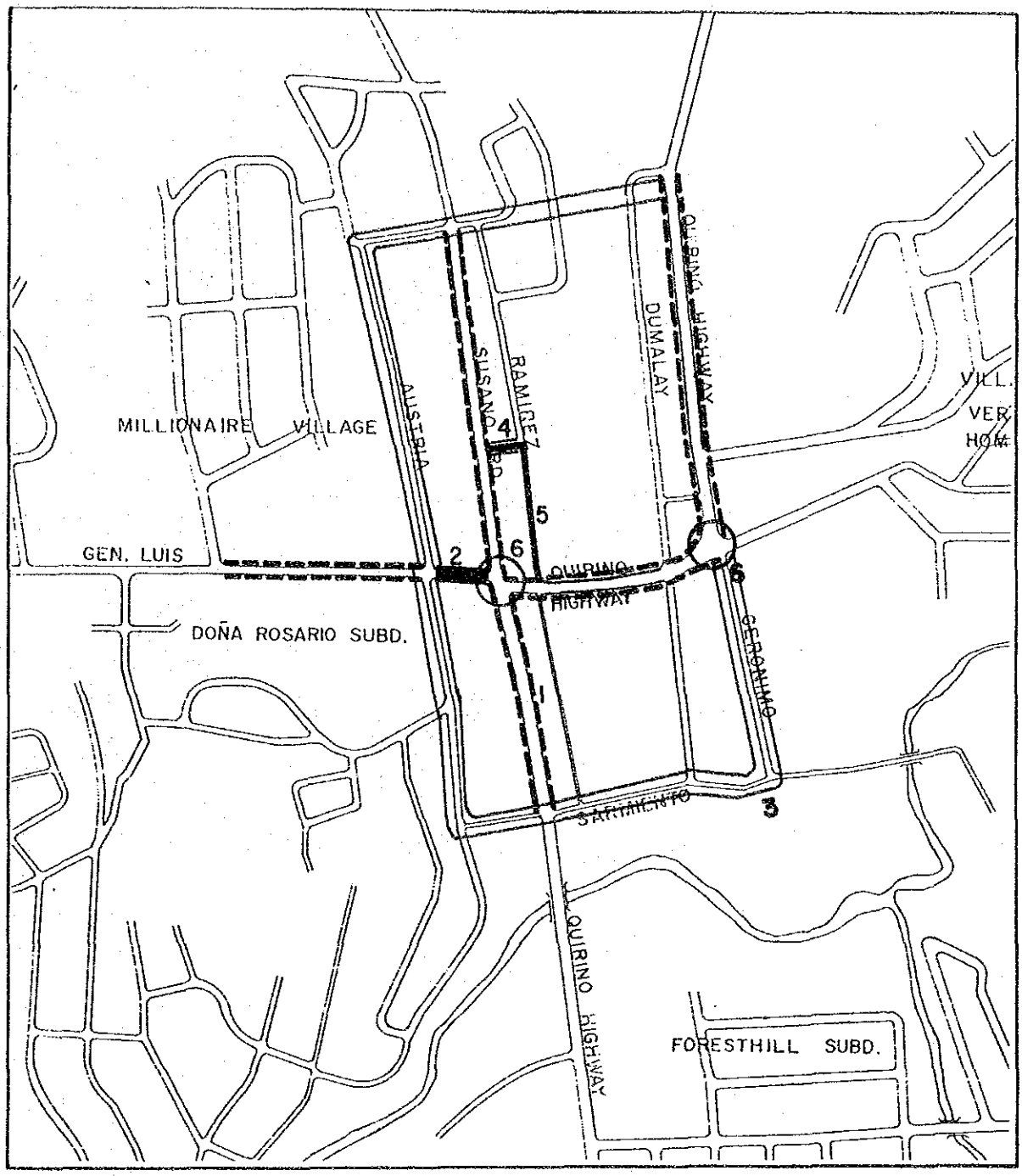
E. **Development of Mode Interchange Facilities**

The key to urban redevelopment of Novaliches town proper is the improvement/development of the mode interchange facilities integral to commercial structures.

a) From a mid-term standpoint, improvement of three off-street terminals (see Figure 6.51) appears viable:

   1) conversion of Old Pasvil Bus terminal or vacant lot located south of Novaliches Church to a jeepney terminal
   2) integration of the routes to the existing off-road terminal at the back of Susano Market
   3) redevelopment of Novaliches market area.

b) From a long-term viewpoint, however, major investment in new mode interchange facilities piggybacked to a commercial initiative is proposed for development in a new site north of but adjacent to the town proper.



LEGEND

1. Provision of sidewalk along primary roads.
2. Road widening of Gen. Luis between Susano to Austria.
3. Road Network improvement: widening and construction.
4. Road construction linking Ramirez and Susano associate associated with terminal development.
5. Exclusive use for pedestrians.
6. Installation of traffic signal.

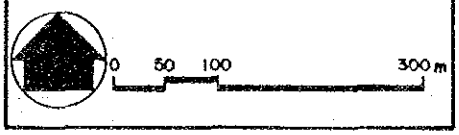
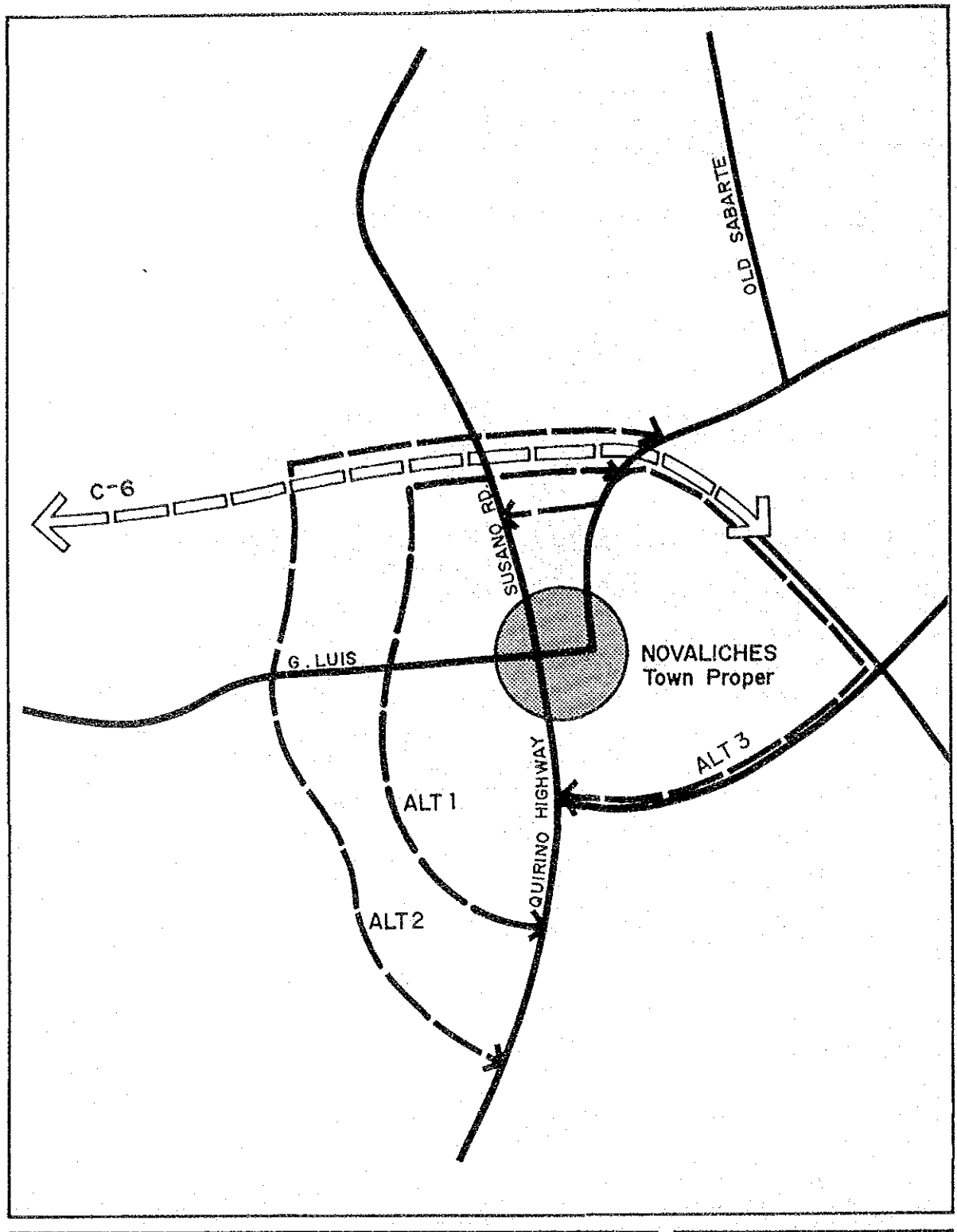


Figure 6.49
Mid-term Plan for
Novaliches MIA



LEGEND:

EXISTING ROADS

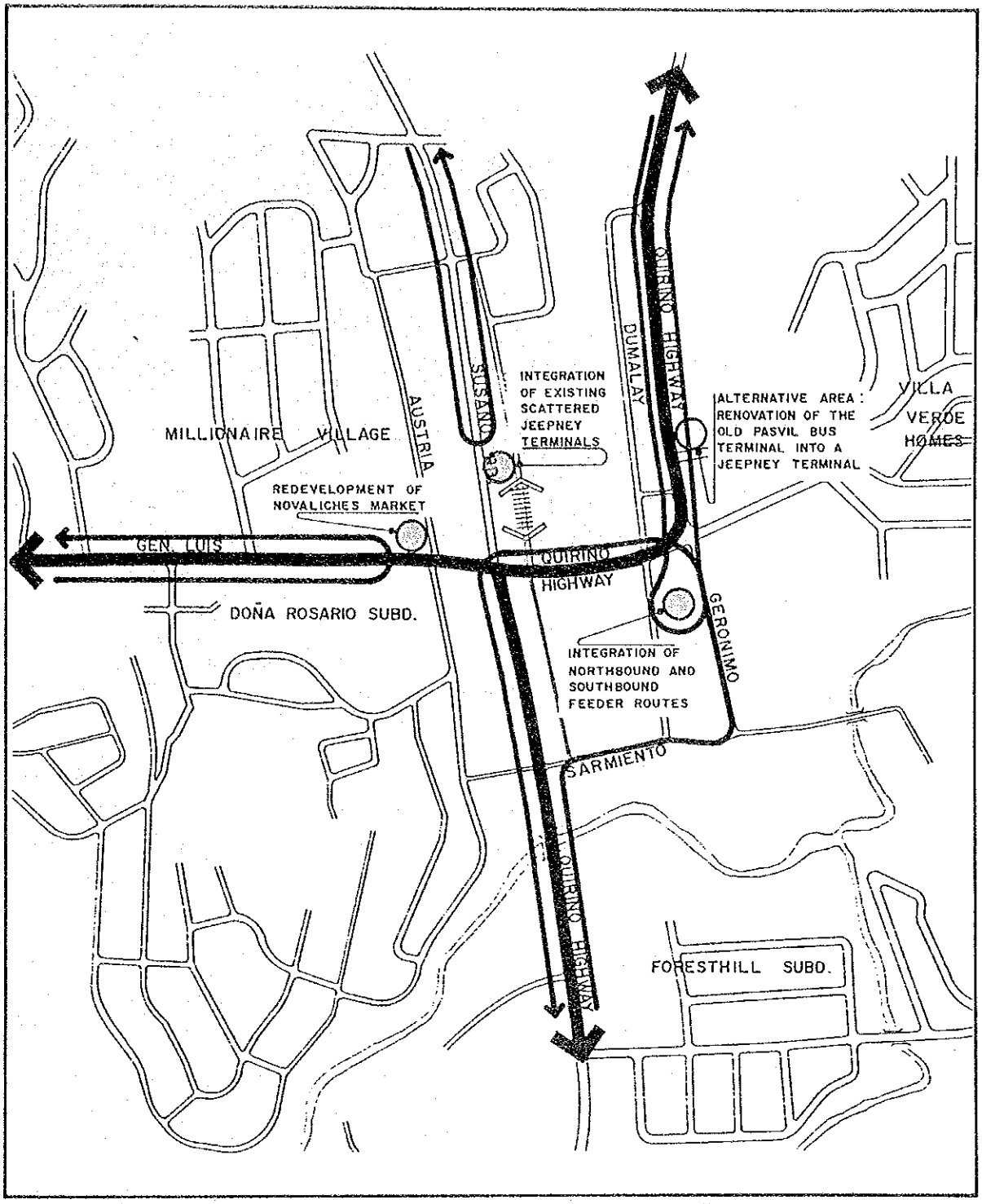
PLANNED ROADS

ALTERNATIVE 1 (3.2 KM.) Recommended

ALTERNATIVE 2 (4.2 KM.)

ALTERNATIVE 3 (1.9 KM)

Figure 6.50
Proposals for the Quirino Highway Bypass



LEGEND:

- JEEPNEY TERMINAL FOR FEEDER ROUTES
- BASIC ROUTE STRUCTURE OF JEEPNEY FEEDER ROUTES
- TRUNK ROUTE
- PEDESTRIAN FACILITIES

0 50 100 300m

Figure 6.51
Terminal Development in
Novaliches Town Proper

6.5.4 Concept Plan of Mode Interchange Facilities for Novaliches MIA

Plans were evolved for these possible terminals around Novaliches Town Proper as shown in Figure 6.52, 6.53 and 6.54. Space requirement is estimated in Table 6.22.

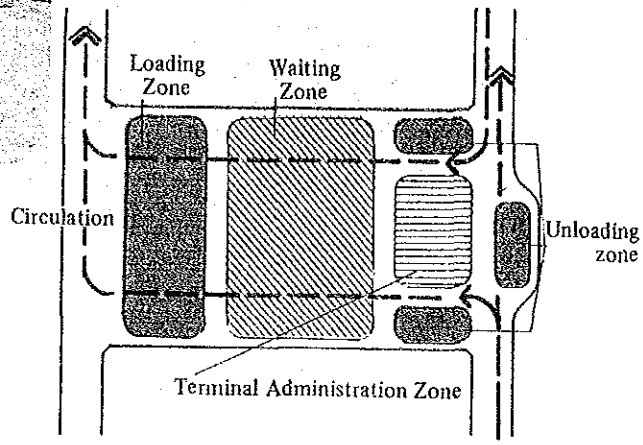
Table 6.22
Estimated Space Required for Novaliches MIA

	Proposed Terminals		
	Geronimo Rd. (Old Pasvil Terminal)	Susano Market	Novaliches Market
Jeepney Terminal Space 1/	2,240 m^2	1,640 m^2	700 m^2
Administration Facilities	150	80	30
Sub-Total	2,390	1,720	730
Road Space	–	260	–
Building Space 1/	–	720	670
Total	2,390	2,700	1,400

1/ Including unloading/loading berths/waiting spaces of 6/15/43 for Church South, 2/9/25 for Susano Road and 1/3/10 for Market
2/ For commercial development.

Novaliches is known as an fast-growing suburban residential area where, at the same time, suffers from sprawled and uncoordinated urban development making it difficult and expensive to provide an effective infrastructure system. The most critical issues dwell on the integration of scattered subdivisions and spontaneously grown communities in order to provide proper infrastructure including public transportation. This would promote the sound urban expansion of not only Novaliches area but also of Metro Manila as a whole. In order to tackle these problems which are currently common particularly outside EDSA, MMC has started to look into the possibility of applying the so-called "Land Readjustment Method" and conducted a case study in the environs of Novaliches.

Considering the growing urban development pressure on the area, it is inevitable (from a long-term viewpoint) to seek a means of developing a mode interchange facility as part of a comprehensive urban development for which possible project area can be initially defined and shown in Figure 6.65.



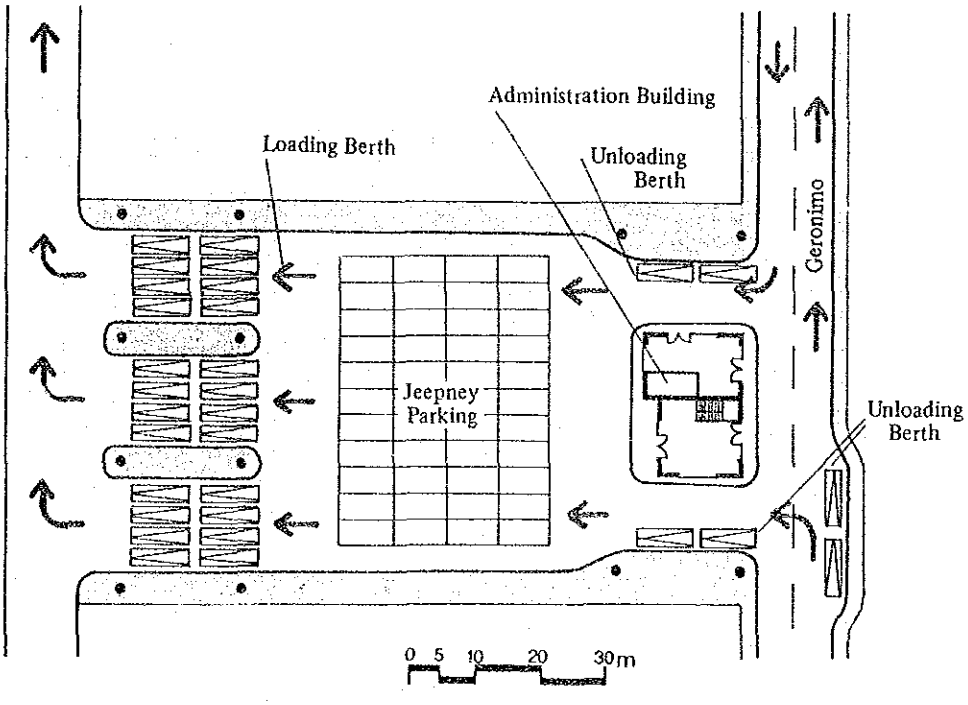
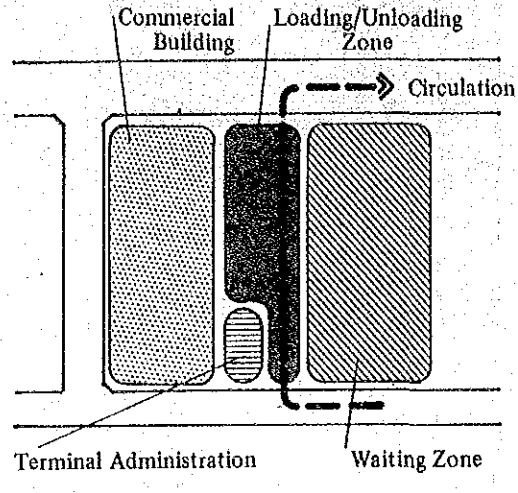


Figure 6.52
Proposed Plan for a Terminal at Geronimo



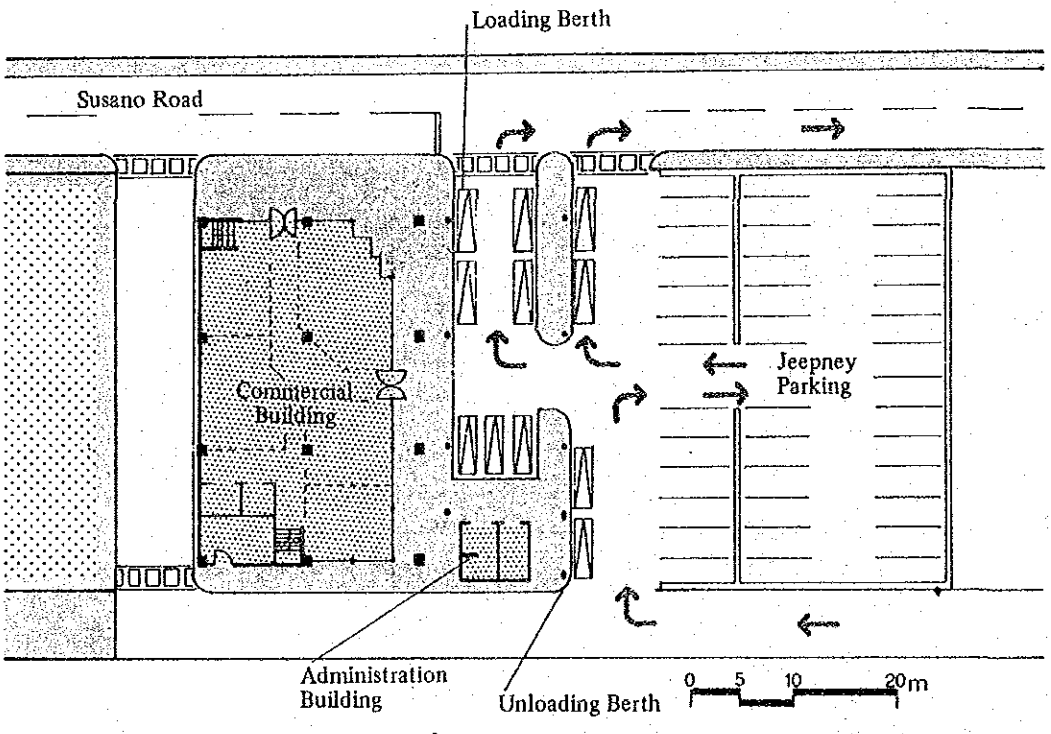


Figure 6.53
Proposed Plan for
Susano Market Terminal

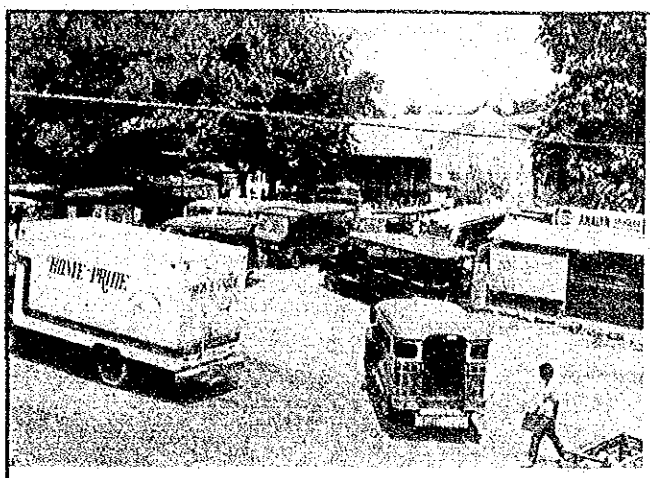
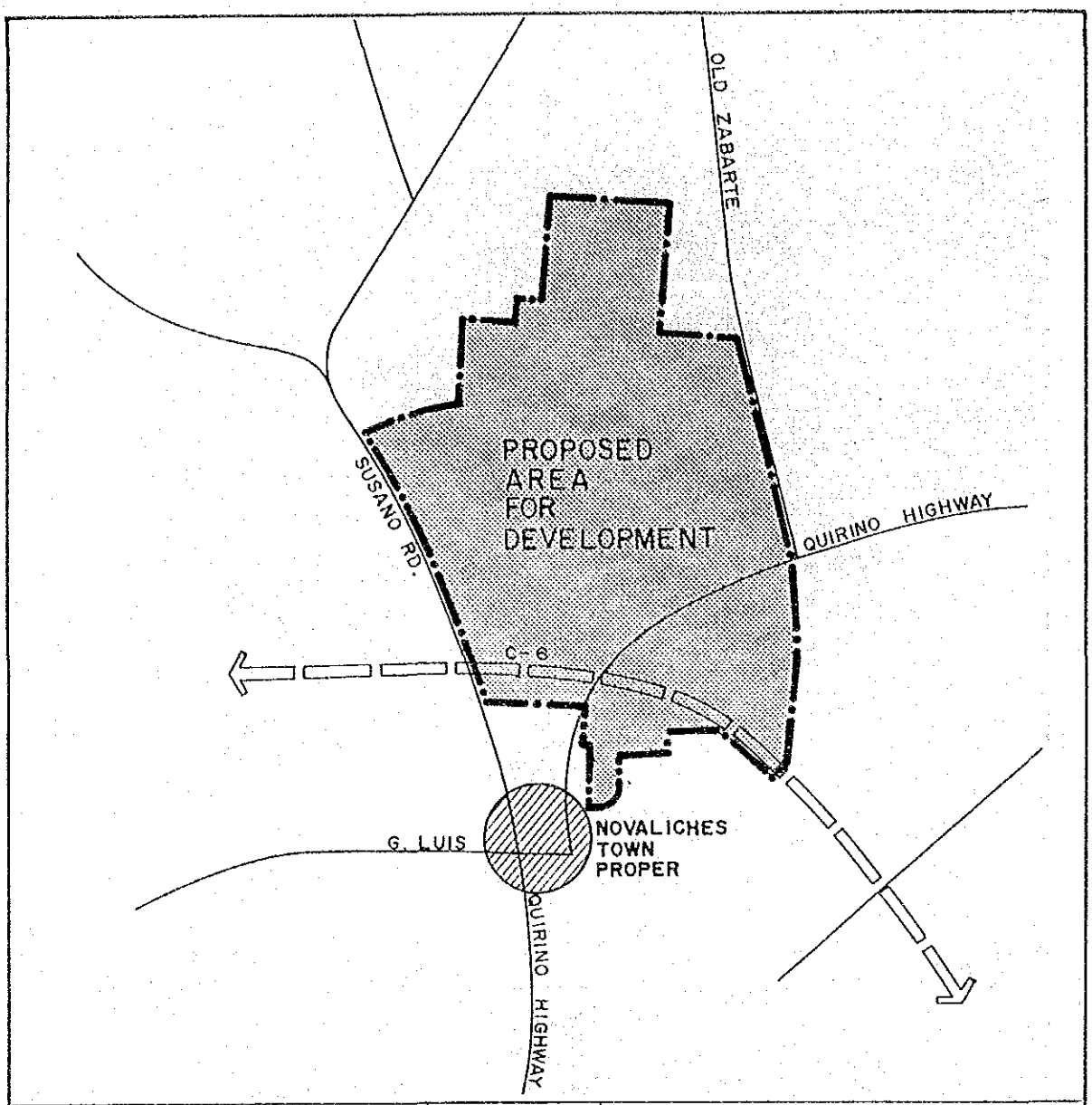


Figure 6.54
Proposed Plan for
Novaliches Market Terminal



Function	Area (ha.)	Description
1) Commercial/Business	10	• market, commercial/amusement business
2) Urban Services	10	• community center, sport/recreation administrative services
3) Residential	80	• row house and townhouses, mixed with shops
4) Infrastructure/Open Space	47	• road, parks, and open space
5) Mode Interchange Facilities	3	• bus/jeepney, and car parking with loading/unloading bays
Total	150	

Figure 6.55
Concept of Integrated Mode Inter change Facility as a Part of a Compre hensive New Urban Area Development

6.5.5 Summary of Recommended Actions

The table below enumerates the recommended actions for the improvement of the mode interchange area of Novaliches. These actions are classified by time frame for implementation. Further, the recommended tasks are translated into project costs as summarized in Table 6.24.

Table 6.23
Recommended Actions for the Novaliches
Mode Interchange Area

ACTION AREAS	RECOMMENDED ACTIONS		
	SHORT-TERM	MID - TERM	LONG - TERM
A. PUBLIC TRANSPORTATION MANAGEMENT			
A-1 PROVISION OF PT SERVICE TO AREAS WITH POOR SERVICE	●	→	→
A-2 CONTROL OF COLORUM ROUTES	●		
A-3 PROVISION OF PT SERVICES TO SUBDIVISIONS	●	→	→
A-4 CONTROL OF TRICYCLE OPERATION	●	→	→
B. REROUTING PLAN			
B-1 SOUTHBOUND LOOP JEEPNEY ROUTES	●	→	●
B-2 NORTHBOUND LOOP JEEPNEY ROUTES	●	→	●
B-3 WESTBOUND U-TURN JEEPNEY ROUTES	●	→	→
B-4 SUSANO RD. U-TURN JEEPNEY ROUTES	NA	NA	●
B-5 G. LUIS BUS ROUTES	NA	NA	●
C. TRAFFIC IMPROVEMENT WITHIN NOVALICHES TOWN PROPER	●	●	→
D. STRENGTHENING OF THE TRUNK ROAD SYSTEM	NA	●	●
E. DEVELOPMENT OF MODE INTERCHANGE FACILITIES			
E-1 TERMINAL DEVELOPMENT WITHIN NOVALICHES TOWN PROPER	NA	●	●
E-2 DEVELOPMENT OF NEW INTEGRATED MODE INTERCHANGE FACILITIES	NA	NA	●

LEGEND

● PROPOSAL AVAILABLE

→ PROPOSAL REMAINS EFFECTIVE

NA NOT AVAILABLE

Table 6.24
Summary of Project Costs Required
of the Improvement/Development of Novaliches MIA

Projects	Short-Term (P000)	Mid-Term (P000)	Long-Term (P000)	TOTAL
A. Jeepney/Bus Rerouting				
1) Improvement of Roads/Sidewalks	1,698	12,999		14,697
B. Traffic Improvement within Novaliches Town Proper	49	6,192		6,241
1) Improvement of Quirino/Geronimo Intersection	4			4
2) Relocation of Bus and Minibus Stops	2			2
3) Prohibition of On-road Vendors				
4) Prohibition of Tricycle Operation	23			23
5) Designation of Bus Terminal Area	20			20
6) Improvement of Quirino and G. Luis		357		357
7) Improvement of Sidewalk along Major Roads		2,520		2,520
8) Widening of G. Luis		1,329		1,329
9) Improvement of Road between Susano Road and Ramirez		61		61
10) Exclusive Use of Ramirez for Pedestrians		261		261
11) Installation of Traffic Signals		1,664		1,664
C. Strengthening of the Trunk Road System				
1) Construction of Bypass Road		38,918		38,918
D. Development of Mode Interchange Facilities		5,045	7,815	12,860
1) Improvement of Terminal at Geronimo		5,045		5,045
2) Development of Susano Market North Terminal			4,824	4,824
3) Development of Novaliches Market Terminal			2,991	2,991
4) Development of Integrated Terminal as a part of New Urban Center	—	—	—	—
TOTAL	1,747	63,154	7,815	72,716

6.5.6 Financial Aspect – Novaliches MIA

The first site – at the Geronimo Street – is estimated to cost P5.04 million inclusive of P2.5 million for land acquisition and compensation to building owners. Lot area 2,390 square meters to serve 302 northbound jeepneys and 514 southbound jeepneys. Gross revenues per year could reach P2.2 million. Operating margin will be relatively higher than comparable terminals within C-4 because of the lower cost; thus a net profit ranging from P1.3 million to P1.4 million could be realized depending on debt leveraging rental on land, and income tax (see Table 6.25).

Table 6.25
Proforma Annual Income Statement – Geronimo Terminal

Item	% of Own Capital		
	100%	50%[1/]	50%[2/]
Revenue (P/year)	2,255,750	2,255,750	2,255,750
Expenditure (P/year)			
– Depreciation	135,700	135,700	135,700
– Operating Costs	628,000	628,000	628,000
– Rent of Land	116,500	116,500	–
– Interest on Loan	–	40,700	40,700
Sub-Total	880,230	920,930	804,430
Profit (P/year)	1,375,520	1,334,820	1,451,320
Investment (terminal construction cost) (P)	2,714,670	2,714,670	2,714,670
Return on Investment[3/]	50.7%	49.2%	53.5%

1/ 50% owners' equity and 50% loans.
2/ 50% owners' equity together with land owned and 50% loans.
3/ Computed for cash items only (i.e., without depreciation) with the assumption of profit being constant.

The second site at Susano market is smaller, requiring only 1,640 square meters of land for 221 jeepneys. Estimated investment is P4.8 million, inclusive of P2.06 million for land acquisition and compensation to building owners. The returns, however, are marginal since gross revenues is expected to hit P495 thousand/year only (see Table 6.26).

As to the third site which is a terminal near the Novaliches Market, the capital requirement is P916 thousand for civil works and P1,440 thousand for land and other compensations, for a total of P2.4 million. Only about 700 square meters of land is needed since only 49 jeepneys are involved. Such a small volume in a relatively-central places translate to very marginal profitability, as shown in Table 6.27.

Table 6.26
Proforma Annual Income Statement – Susano Market Terminal

Item	% of Own Capital		
	100%	50%[1/]	50%[2/]
Revenue (P/year)	495,250	495,250	495,250
Expenditure (P/year)			
– Depreciation	109,600	109,600	109,600
– Operating Costs	181,000	181,000	181,000
– Rent of Land	131,620	131,600	–
– Interest on Loan	0	32,900	32,900
Sub-Total	422,220	455,100	323,500
Profit (P/year)	73,030	40,150	171,750
Investment (terminal construction cost) (P)	2,191,900	2,191,900	2,191,900
Return on Investment[3/]	3.3%	1.8%	7.8%

1/ 50% owners' equity and 50% loans.
2/ 50% owners' equity together with land owned and 50% loans.
3/ Computed for cash items only (i.e., without depreciation) with the assumption of profit being constant.

Table 6.27
Proforma Annual Income Statement – Novaliches Market Terminal

Item	% of Own Capital		
	100%	50%[1/]	50%[2/]
1. Revenue (P/year)	260,750	260,750	260,750
2. Expenditure (P/year)			
1) Depreciation	71,550	71,550	71,550
2) Operating Costs	100,000	100,000	100,000
3) Rent of Land	78,000	78,000	–
4) Interest on Loan	–	21,500	21,500
Sub-Total	243,550	271,050	193,050
3. Profit (P/year)	11,200	(10,300)	67,700
4. Investment (terminal construction cost) (P)	1,431,000	1,431,000	1,431,000
5. Return on Investment[3/]	0.8%	negative	4.7%

1/ 50% owners' equity and 50% loans.
2/ 50% owners' equity together with land owned and 50% loans.
3/ Computed for cash items only (i.e., without depreciation) with assumption of profit being constant.

6.5.7 Economic Aspect – Novaliches MIA

There are some difficulties in estimating the economic impact of the three proposed terminals. However, on the conservative expectation that at least five minutes of vehicle-time will be saved per day, the annual savings would amount to P5.4 million.

The greatest benefits can be derived from the secondary road bypass – even excluding its contribution to reshaping the urban pattern. Through a choice of alignment that uses as much of existing subdivision roads as possible, capital requirement is reduced greatly while benefits (reduced travel time, vehicle cost, and passenger time) would amount to ₱10.5 million/year.

6.5.9 Management Aspect – Novaliches MIA

A. Implementing Responsibilities

For the jeepney rerouting – in the short and medium-term, the responsibility for adopting and implementing the proposals falls squarely on the BOT. The franchises or CPCs may have to be modified (and some operators legalized) before the Police can enforce them. Installation of required traffic signs (at the turning points) and markings (loading/unloading zones) should be handled by the Quezon City government or MMC-TOC. Otherwise, because of the priorities of TEAM/TTC, the Novaliches area may remain unattended for quite some time.

The signals that are needed could be secured from TEAM/TCC which may have old stocks from other intersections which have been upgraded into the computerized system.

Construction of new roads will either be under MPWH or the Quezon City government. The primary roads (sections of C-5 and Quirino, for example are the responsibility of MPWH whose program at the moment precludes the early completion of these links in Novaliches. The bypass road proposed by JUMSUT should be pursued by the Quezon City government; to minimize cost, its alignment and rights-of-way should pre-empt existing private roads.

Almost all of the sites or lots in the Novaliches MIA are privately-owned. Hence, it would be difficult to expect the Quezon City local government to manage and operate the terminal, much less to develop it. And yet, only government can muster support among them for such a venture.

B. Managing the Novaliches MIA

JUMSUT II recommends that MMC organize a project office for land consolidation purposes. This office should induce the block development of the consolidated property north of the Novaliches market – with each lot-owner participant getting back a piece of the property equivalent to his original contribution. Through this process, the government can minimize the capital outlay from limited public funds, reshape the future growth of Novaliches, and give birth to an integrated public transport terminal. The latter two would then ensure that traffic congestion will be tolerable.

One such a block redevelopment occurs, the day-to-day operation of the MIA can be left to private sector management.

6.6 C-3/QUEZON AVENUE MODE INTERCHANGE AREA

6.6.1 The Present Situation

A. Land Use and Socio-economic Characteristics

A reconnaissance study of the area would suggest a residential neighborhood marked by the intrusions of commercial establishments along Quezon Avenue and some sections of C-3. A closer look (see Figure 6.56) at the land use map indicates creeping commercialization. Several factories have grown up along C-3 in between residences and vacant lots. The two landmarks of the area are the Sto. Domingo Church on Quezon Avenue and the funeral homes on C-3. Very few slums or squatter dwellings can be seen.

Requirements of transport analysis have divided the area into 5 zones. The middle-to-high income households coincide with the low-density residential blocks. Car-ownership rate (at 14.2% of all households) and number of private trips – ranging from 29% to 40% among the zones – are fairly high relative to metropolitan averages. The lopsided nighttime-to-daytime population supports the thesis that the area is not yet a major destination point.

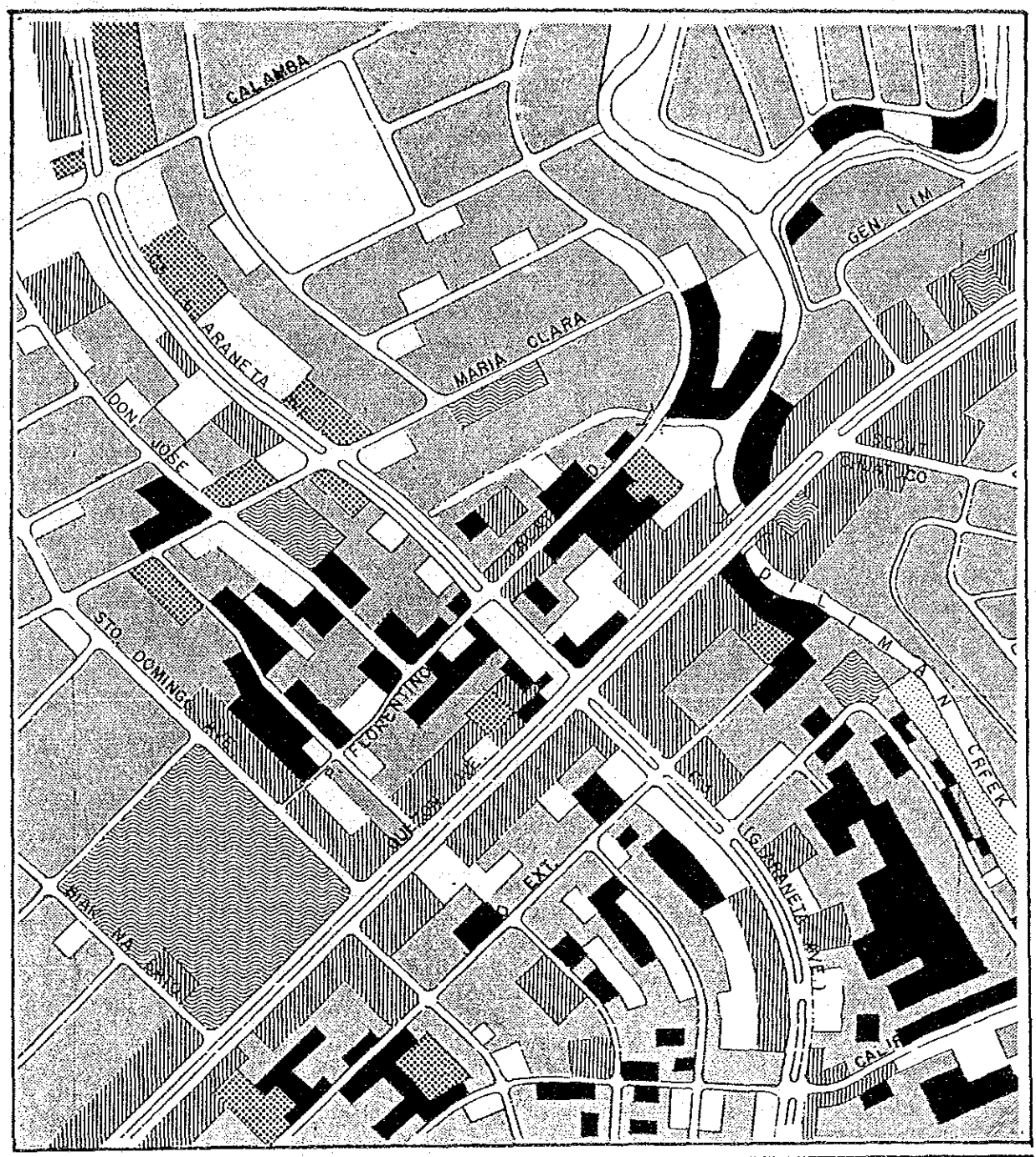
Strong potentials for rapid development can be detected from the waiting passengers on the wayside and the restaurants, retail shops, and other commercial houses that have sprouted around Timog Avenue/Quezon. Were it not for the non-completion of C-3, these types of developments would have become visible already at C-3/Quezon.

B. Road System and Traffic

The anticipated pressure of development emanates from the importance of the circumferential road C-3 and radial road R-7. With the desired northward thrust of urbanization, traffic volumes on both roads are predicted to become considerable.

G. Araneta Avenue is the most visible segment of C-3. Its southern portion extending R. Magsaysay to G. Puyat in Makati may never be realized due to rights-of-way problems. The northern arc is nearer to realization following the existing alignment of Emilio Rivera to Bonifacio Avenue, then 5th Avenue to Avenida Rizal and thence R-10.

Perhaps due to the disconnections posed by C-3, three secondary roads have developed at the periphery of the major traffic generators – school and the church. Banaue and Roosevelt have captured many of these trips, for example. A number of local distributor roads are in good condition but lightly used at the moment.



LEGEND:

- INSTITUTIONAL
- SQUATTERS
- RECLAIMED AREA
- PARKS & OPEN SPACES
- COMMERCIAL
- INDUSTRIAL
- RESIDENTIAL

0 50 100 200M

Figure 6.56
Existing Land Use of C-3/
Quezon Avenue Mode Interchange
Area

C. **Public Transportation Aspects**

At present, there is not much public transport movements that could provide the basis for a mode interchange facility in the C-3/Quezon junction. The bulk of bus and jeepney routes are passing the junction bound either for U.P. or Fairview (outbound) or Quiapo (inbound). A number of jeepneys already plies the G. Araneta Avenue, shuttling back and forth between Quezon Avenue and Sta. Mesa market.

D. **Pedestrian Aspects**

The early manifestations of passenger transfer are already apparent at the T-junction formed by G. Araneta with Quezon. Because of the absence of signal light or zebra markings, compounded by a high median barrier, this section has been the scene of numerous accidents despite the low volume of pedestrians.

A precursor of things to come is the heavy pedestrian traffic infront of the Sto. Domingo Chuch. It is signalized and cross-marked. On weekdays, the users are mainly grade-school students while on Sundays, the church-goers dominate and mix with a large volume of public and private vehicles and street vendors. Of particular note is the habit of jeepneys of waiting until fully-loaded in complete disregard of the signals, the lanes, and the time spent.

6.6.2 **Summary of the Problems**

If one were to judge from the present conditions, the conclusion inescapably leads to the one existence of a problem. But a comparison of the area with similarly-situated busy crossroads that are already in advanced stages of commercialization provides an early warning. It is anticipated that a future problem of congestion would arise unless arrested at the early stages.

Rather than react to a situation that has become problematic, the main objective for the C-3/Quezon MIA is to prevent their occurrence and to retain as much options as possible now before the constraints of lack of land sets in (as in the other 4 MIAs). In short, the government ought to seize the initiatives offered by the delay in the completion of C-3.

Based on present commitments of MPWH, the northern sections of C-3 will be completed by 1990. By then, the traffic volume would be around 65,000 to 70,000 vehicles per day – which is more than 50% of flows now observed in Cubao.
Figure 5.9 in the previous chapter illustrates the relative change from 1984 of traffic volumes in C-3 and Quezon Avenue.

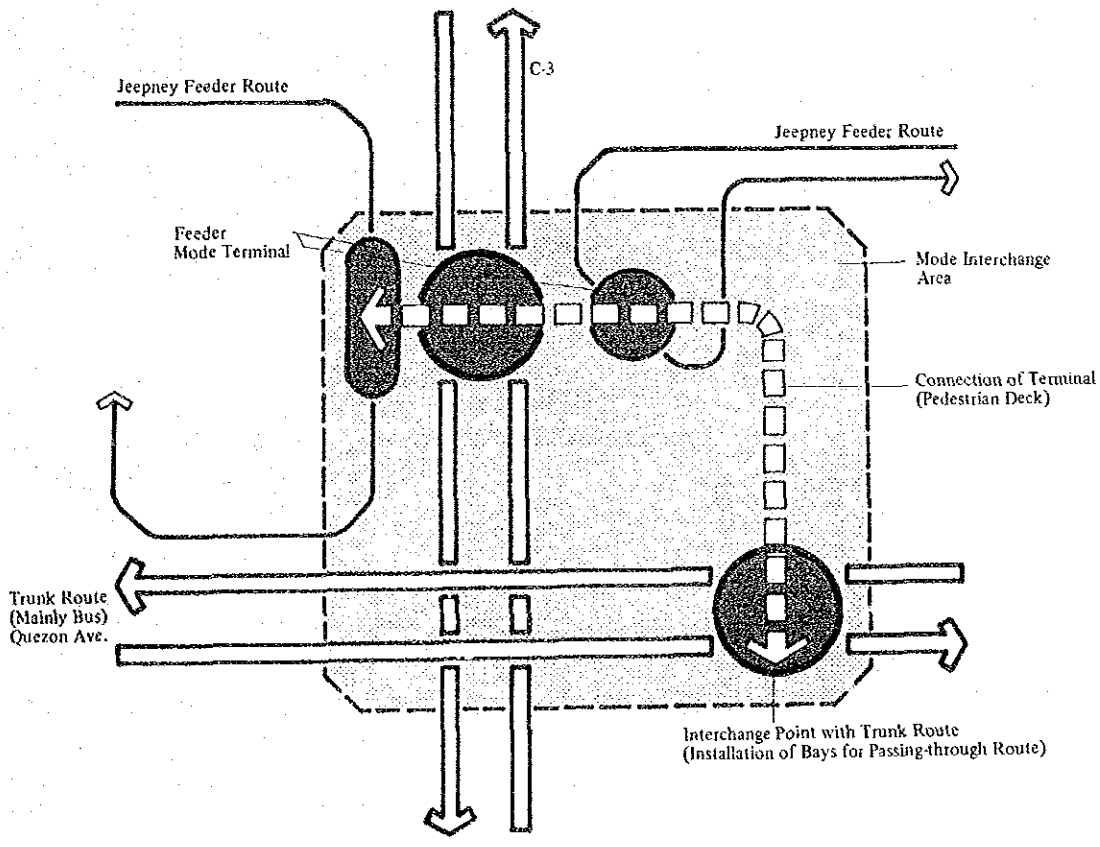
6.6.3 Concept Plan of a Mode Interchange Facility for C-3/Quezon MIA

Figure 6.57 gives a sketch of the proposed mode interchange facility at C-3/Quezon. While the indicated location is not absolute, the availability of vacant land falls on the northwest quadrant formed by the intersection. It is less expensive and easier to develop into a commercial center with corollary terminal facilities. Because of the envisioned grade-separation (with Quezon Avenue depressed and C-3 elevated), a situation similar to A. Mendoza and Recto could emerge with adverse effects to pedestrians. Proposed development plan is shown in Figure 6.58.

The series of road constructions programmed by MPWH from 1985 to 1990 leading to the completion of C-3 provides a long window of opportunity for the development of a mode interchange area. The acquisition of the land can therefore be piggy-backed with the road implementation and the grade-separation designed to meet the requirements of public transport terminal and pedestrian movements.

It is also advisable to limit C-3 for bus routes – especially the passing-through routes. This is to ensure as much throughput as possible from what is anticipated to be a high-speed but heavily-used primary road akin to EDSA.

Figure 6.57
Concept of C-3/Quezon Mode
Interchange Area Development



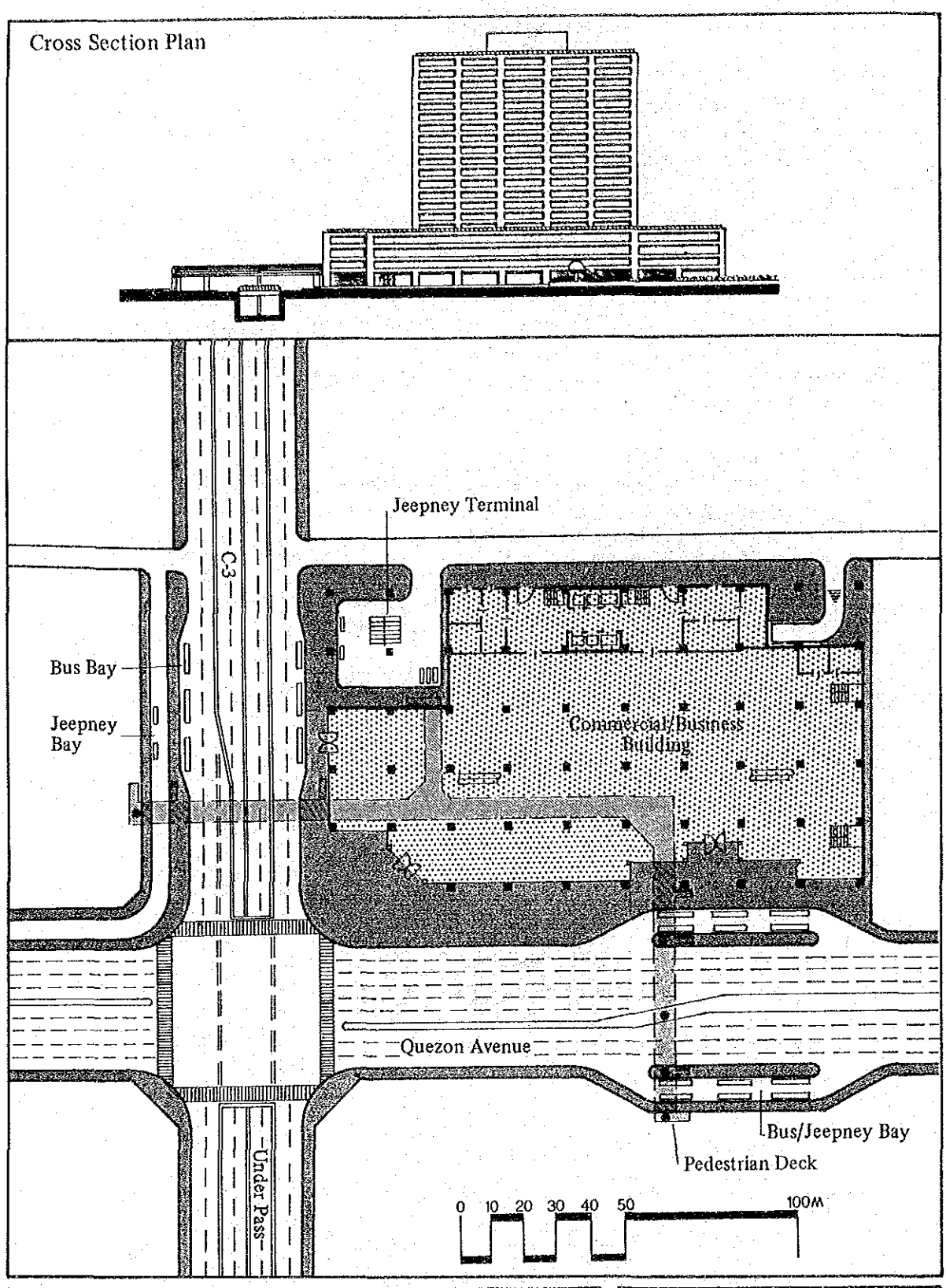


Figure 6.58
Proposed Development Plan
for C-3/Quezon MIA

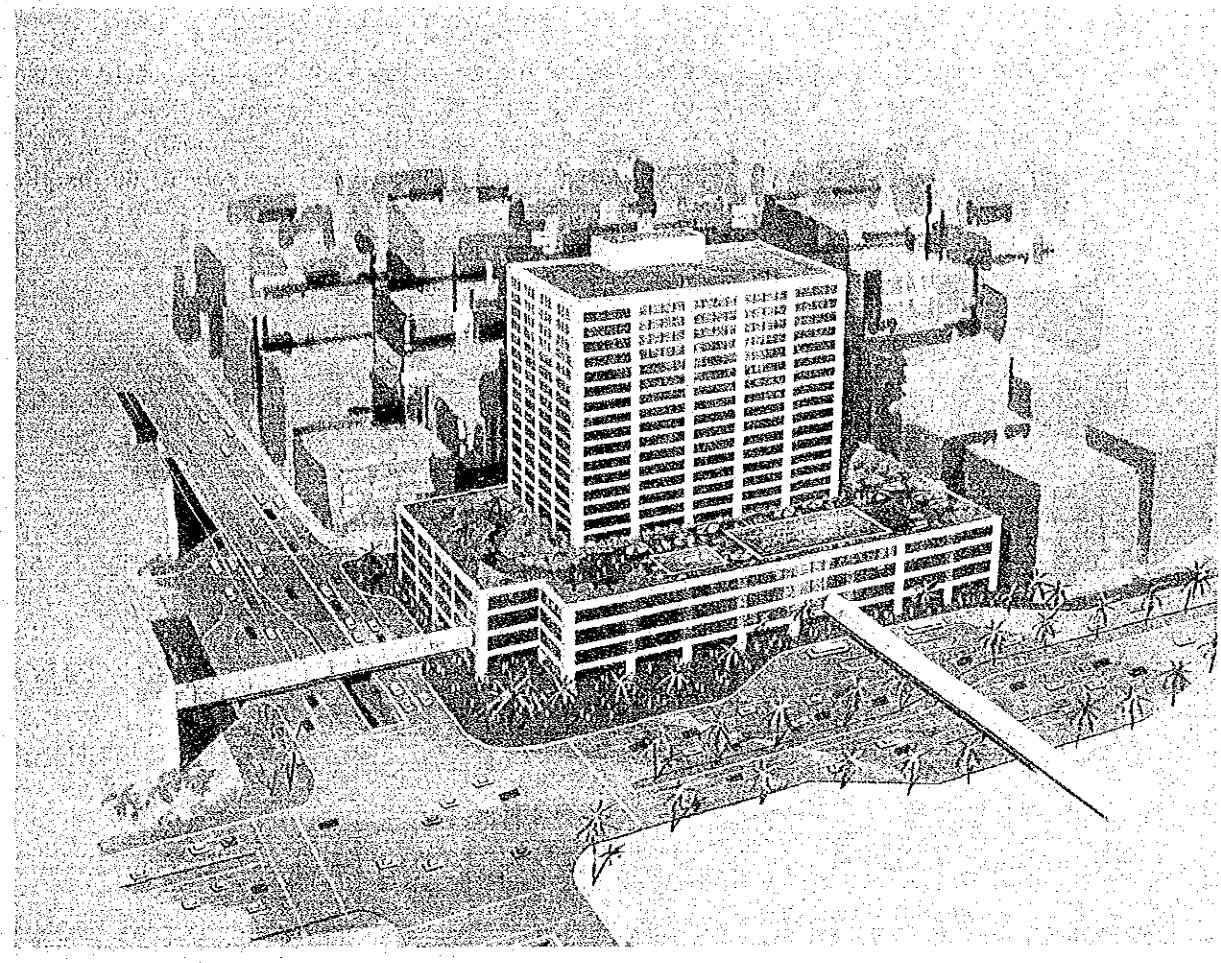


Figure 6.59
Bird's Eye View of Proposed
Mode Interchange Facility
for C-3/Quezon Ave. MIA

6.6.4 Financial Aspect

While a detailed plan could not be produced, preliminary cost of the MIA project was nevertheless estimated to provide a basis for future planning actions. As shown in Table 6.29, the mode interchange would cost P10.3 million. No analysis has been made about the viability of such a terminal at C-3, but it is likely to be marginal without the associated commercial space.

Table 6.28
Summary of Project Costs Required
for the Improvement/Development of C-3/Quezon Avenue MIA

Item	Short-Term (P000)	Mid-Term (P000)	Long-Term (P000)	TOTAL
A. Pedestrian Overpasses			5,400	5,400
B. Development of Mode interchange Facility			4,308	4,308
1) Land Acquisition and Compensation			2,982	2,982
2) Road Improvement			1,202	1,202
3) Administration Building and Waiting Shed			54	54
4) Other Facilities			70	70
C. Provision of Bus Bays			619	619
TOTAL			10,327	10,327

6.6.5 Economic Consequence

Aside from the usual methodological difficulties involved in the economic evaluation of off-set transport terminals, the analysis of C-3/Quezon MIA suffers from the highly-tentative nature of the traffic data. The resulting economic benefits would be extremely speculative at this stage that a qualitative assessment would suffice.

The main benefits would arise from the early and planned development of the area, inducing a rise in land values. Urban amenities would be brought nearer to its service/catchment area, not to mention the avoided costs from inefficiencies of un-controlled growths.