C. Road Component

1) Confluence of vehicular trafic 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 Gen. Luis which functions as a primary road

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

4.2 INVESTMENT ON TRANSPORTATION FACILITIES

Development of the Novaliches Mode Interchange Area depends on two things, both requiring major investment.

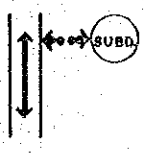
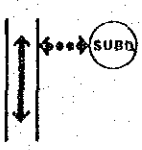
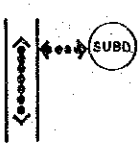
a) The provision of efficient public transportation services to the subdivisions

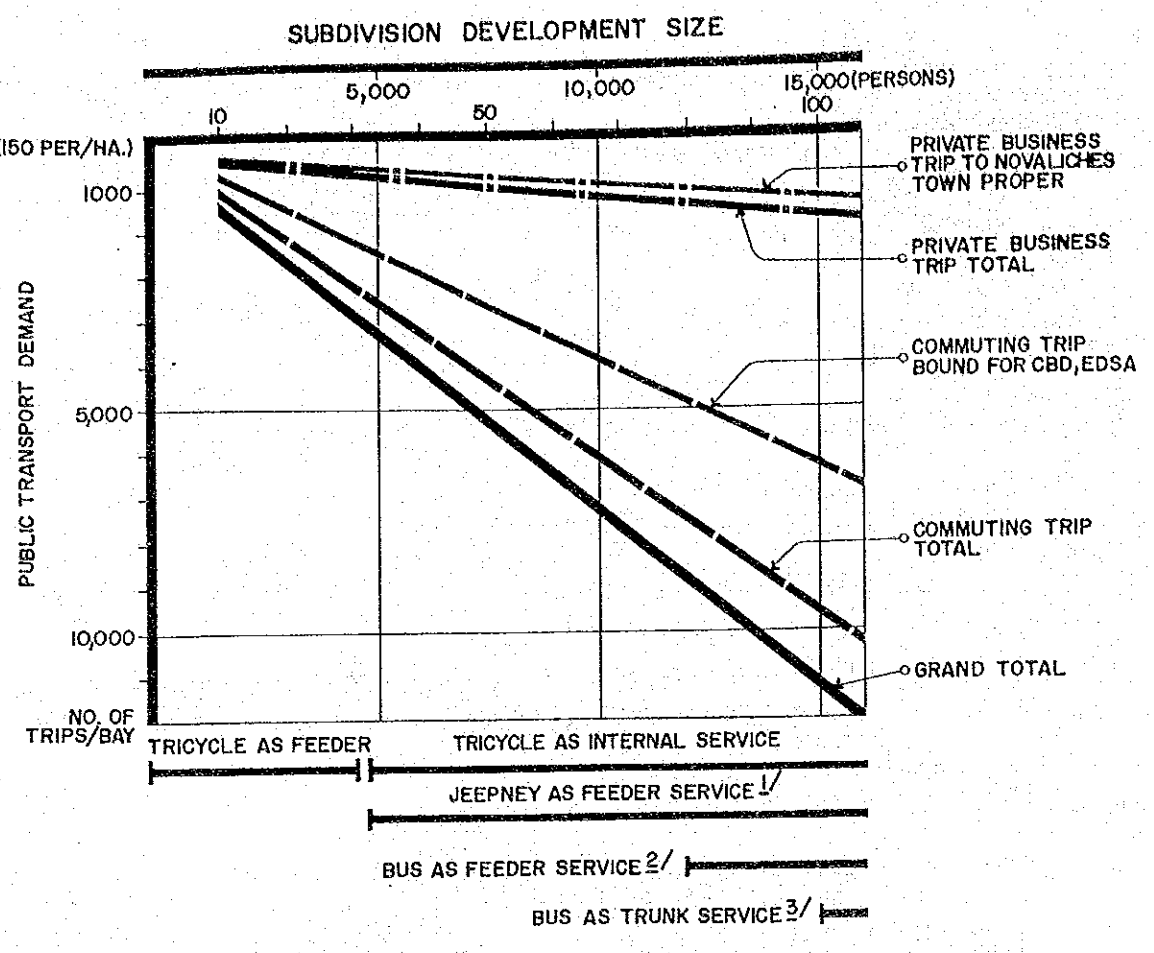
b) The construction of primary and secondary roads which would be in time with the rapidly increasing transportation demand.

4.2.1 Public Transport Services to Subdivisions

On the basis of the interview survey among subdivision residents, a diagram (see Figure 4.2) for use in assessing requirements for public transport services of subdivision residents was constructed. It is to be noted that "to work" and "to school" trips share a large percentage of total and are correlated with the CBD and EDSA area. "Private" and "business" trips relate more to Novaliches town proper. (Trips referred to are those for weekdays).

Some rules of thumb for determining reasonable levels of public transport services to subdivisions are as follows:

LEVEL/TYPE		REQUIRED DEMAND LEVEL
1 JEEPNEY FEEDER SERVICE		POCKET OF DEVELOPMENT GENERATING A TWO-WAY FREQUENCY OF 500/DAY, AND AN AVERAGE OCCUPANCY OF 7 PASSENGERS/VEHICLE (3,500 PASSENGERS/DAY)
2 BUS FEEDER SERVICE		HALF OF THE CBD-BOUND COMMUTER TRAFFIC REQUIRES MORE THAN A ONE-WAY FREQUENCY OF 72/DAY AND AN AVERAGE OCCUPANCY OF 20 PASSENGERS/VEHICLE (OR 12,000/DAY FOR TWO-WAYS, BOTH BUS AND JEEPNEY MODES)
3 BUS TRUNK SERVICE		COMMUTER TRIP DEMAND IN EXCESS OF 10,000 TRIPS/DAY WHERE COMMERCIAL CENTER IS DEVELOPED AT THE SAME TIME (APPROXIMATELY 100 HA. OF RESIDENTIAL AREAS)



1/ SUBDIVISION SIZE PREREQUISITE TO FEASIBLE FEEDER JEEPNEY ROUTE IS ESTIMATED AS FOLLOWS:

a) ASSUMED FREQUENCY REQUIRED OF JEEPNEY OPERATION (TWO-DAYS): MORE THAN 500 DAYS

b) REQUIRED LOAD FACTOR: 7 PASSENGERS/VEHICLE

c) REQUIRED NO. OF PASSENGER/DAY: 3500

• APPROXIMATE SUBDIVISION SIZE FOR THE ABOVE DEMAND: 30 HA. (4,500 RESIDENTS AT AN AVERAGE OF 150 PERSONS/HA. DENSITY*) OF 3375 TRIPS/DAY = 4,500 RESIDENTS x .0 0.75* TRIPS/DAY/RESIDENT

*BASED ON NOVALICHES SUBDIVISION INTERVIEW SURVEY (JUMSUT II)

2/ SUBDIVISION SIZE PREREQUISITE TO A FEASIBLE BUS FEEDER ROUTE IS ESTIMATED AS FOLLOWS:

a) ASSUMED FREQUENCY REQUIRED OF BUS OPERATION: 6/HOUR DURING PEAK HOURS AND 4/HOUR DURING OFF - PEAK HOURS (ONE WAY FREQUENCY)

b) REQUIRED LOAD FACTOR: 20 PASSENGERS/VEHICLE

c) DEMAND TO BE SHARED BY BUS: 50%

d) REQUIRED NO. OF PASSENGERS/DAY (FOR BOTH BUS AND JEEPNEY)
5,800 = (4 HOURS x 6 + 12 HOURS x 4) x 2 WAYS x 20 PASS./VEH. + 0.50 = 5,800

• APPROXIMATE SUBDIVISION SIZE FOR THE ABOVE DEMAND: 80 HA. (12,000 RESIDENTS)

3/ SUBDIVISION SIZE PREREQUISITE TO A FEASIBLE BUS TRUNK ROUTE IS ESTIMATED AS FOLLOWS:

COMMUTER DEMAND REQUIRED: MORE THAN 10,000 TRIPS/DAY

• APPROXIMATE SUBDIVISION SIZE TO FOR THE ABOVE DEMAND: 100 HA. (15,000 RESIDENTS)

Figure 4.2
Size of Subdivision Development Public Transportation Service Demand

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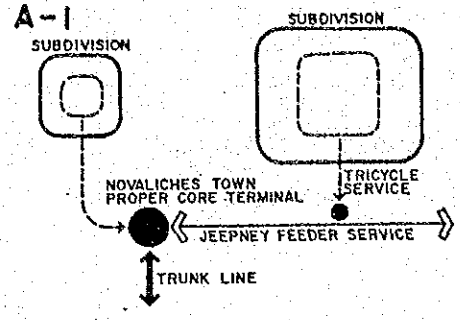
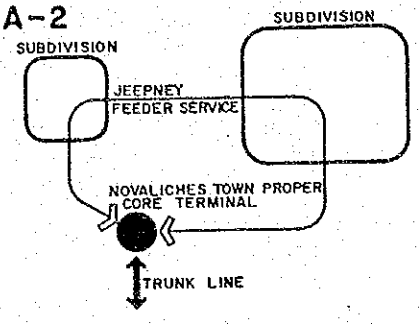
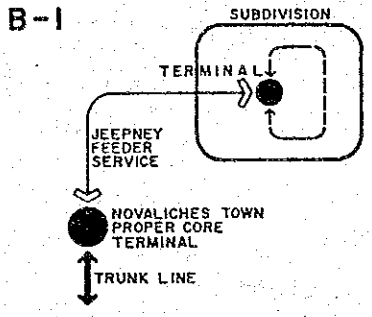
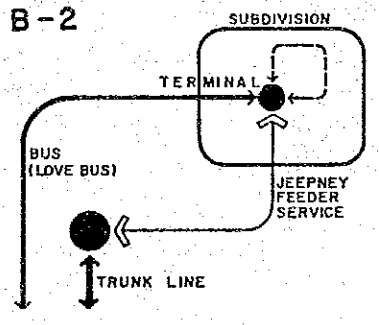
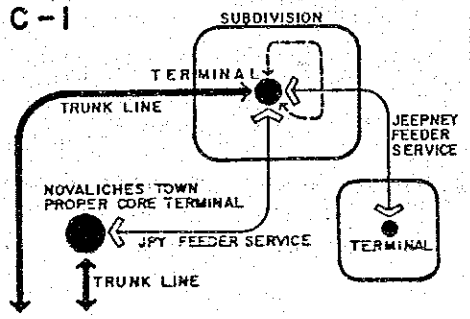
Traffic decongestion would be achieved if private transport users are encouraged to shift to public modes. Taking into account the demand characteristics and the distance to major destinations (CBD and EDSA area: 10 - 20 kilometers), it is anticipated that a large part of commuter trips would be diverted from private mode, especially, if more attractive services and coverage (e.g., Love bus, good coverage) are introduced.

Types of public transport services desirable for Novaliches are summarized in Table 4.2 and Figure 4.3.

Table 4.2
Types of Public Transportation Service
Required for Novaliches

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

Figure 4.3
Public Transportation Services to Subdivisions

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.

4.2.2 Bypass Road for Novaliches MIA

The trunk road network in the Novaliches and surrounding area is the subject of feasibility study under the northern roads package. This is currently under review in MMUTSTRAP B2. So far as can be determined, many of the roads crucial to the area under study are classified second priority. Their completion therefore, cannot be expected before 1990. Nonetheless, the trend towards increasing taffic volume is unlikely to decelerate nor reverse. Thus, deferment of the northern roads package would exacerbate existing conditions. Bottlenecks in the town proper already exist and traffic has reached capacity in many sections.

The most strategic bottleneck is at the town proper along Quirino Highway which is the only trunk road linking Novaliches with the downtown Manila. The obvious solution is to construct a new road link (approximately 3 kilometers) to bypass this congested section, as shown in Figure 4.4.

4.3 PLANNING DIRECTIONS

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.

4.3.1 Public Transport Route Management

Transport services in Novaliches can be improved by functional segregation of the following:

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.

Officially defined route structure, however, is no longer congruent with demand; colorum and irregular operations have grown as a consequence.

In view of the above, rationalization lie in the following schemes:

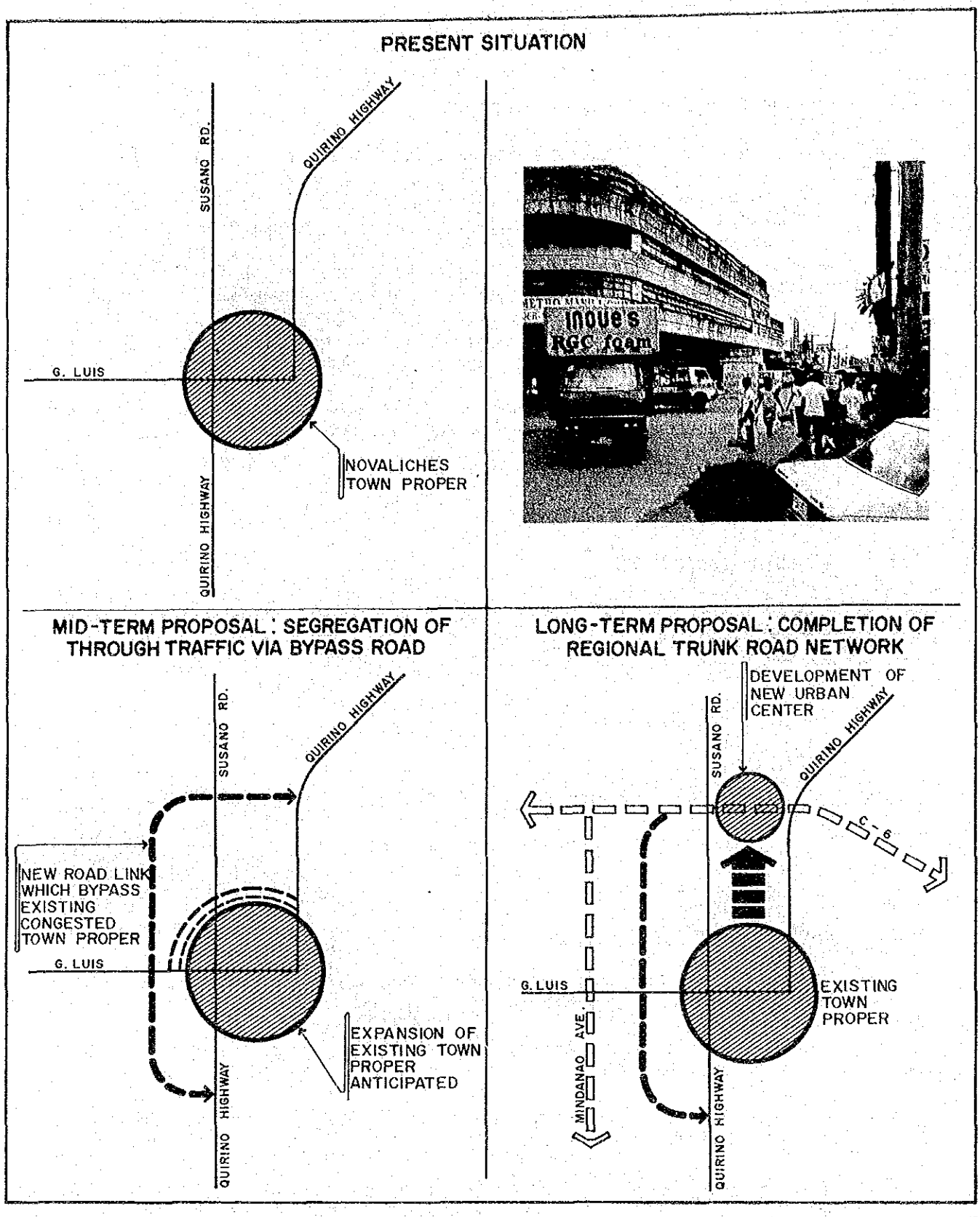


Figure 4.4
Proposed Development of
Road Network

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A1 : Route restructuring to cover areas with poor public transportation services

A2 : Control of colorum routes and operation

A3 : Provision of public transport routes associated with subdivision development

A4 : Local control of tricycle operations.

A1 : Restructuring of Routes to Cover Areas with Poor Transport Services

Planning concepts for the provision of a satisfactory public transportation system are shown in Figure 4.3. The areas for which these are wanting are shown in Table 4.3 and Figure 4.5.

A2 : Control of Colorum Routes and Operation

For the routes which link suburban area with the CBD (such as Lagro-Blumentritt), the restructuring proposal is as follows:

a) strengthening bus services between Lagro and CBD to encourage shift from lower capacity modes

b) retain jeepneys between Lagro and Novaliches as feeder service

c) strengthen bus services between Novaliches and Manila CBD to encourage diversion from jeepneys, while retaining or expanding jeepney feeder services around Novaliches. However, as this planned shift from jeepney to bus succeeds, the terminal at Blumentritt would have to be modified to meet the requirement of bus services.

JUMSUT II have identified five colorum routes with 164 units. Some units were without panel routes identification, where the direction would be set only after determining passenger destinations. This may be tolerated in view of the demand-responsive service given during this transition stage. Proposed schemes for the colorum routes are shown in Table 4.4.

A3 : Provision of Public Transport Routes Associated with Subdivision Development

Schemes/options presented in section 4.2 are applicable at the planning stage of subdivision development.

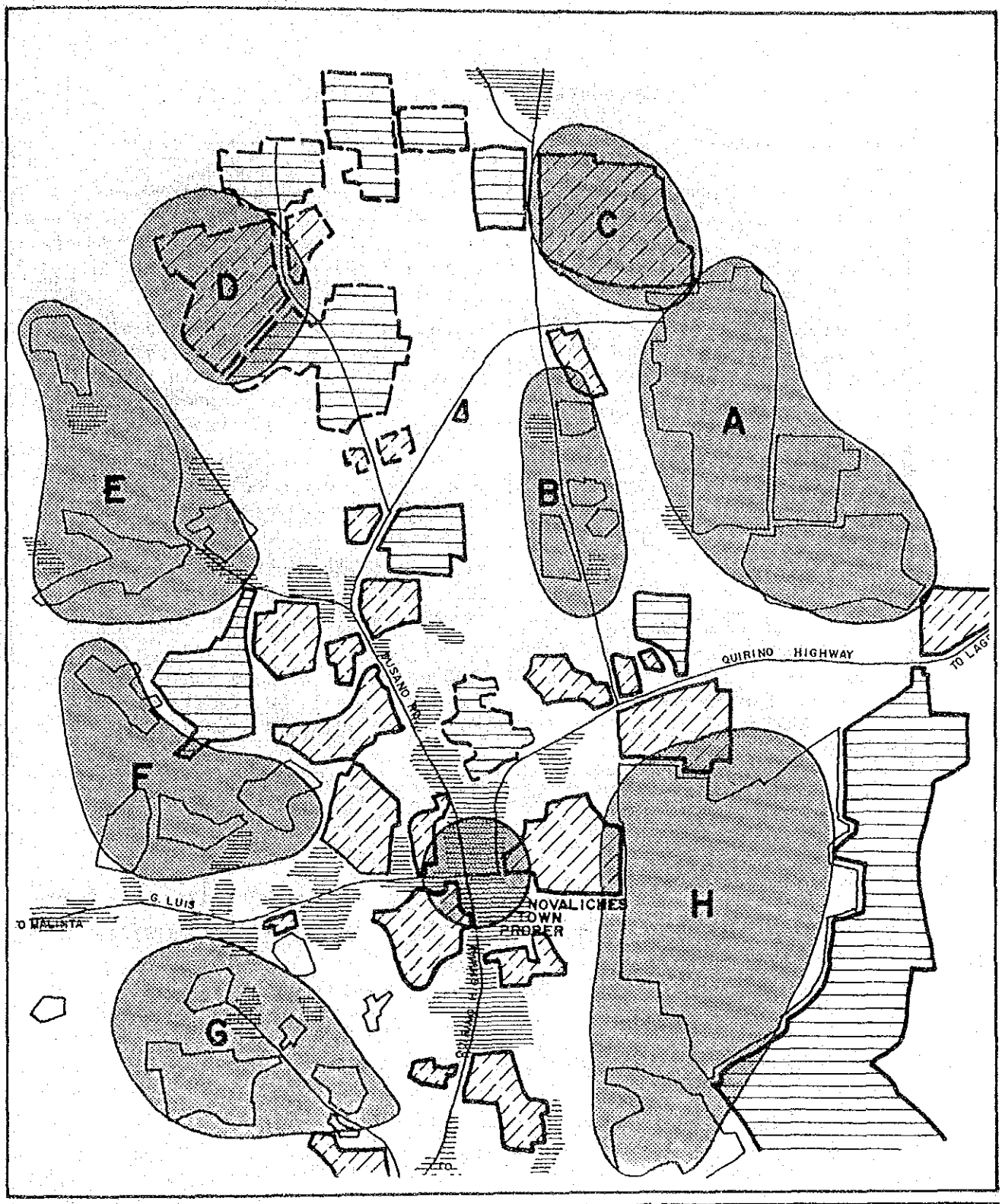
A4 : Control of Tricycle Operation

Tricycle operation in Novaliches is not well regulated. As a local transpocrt mode with a predefined service area, flexible route and elastic fare, it should be controlled at the local level - preferably by the subdivision associations, themselves in coordination with MMC-TOC.

Table 4.3
Areas with Poor Public Transportation System

Service Area 1/	Planning Solution/Consideration
A	• Although development size is extensive, rate of habitation is slow. • The following jeepney services are proposed: 1) Old Sabarte - Quirino Highway loop route 2) Shuttle route to/from Quirino Highway
B	• Extend existing route (e.g. Novaliches - Bagong Silang) to Old Sabarte from Quirino Highway.
C	• As demand is low for the time being, encourage tricycle service to feed the jeepney routes. • Provide new jeepney routes as developments proceed.
D	• As demand is low for the time being, encourage tricycle service to feed the jeepney routes. • Provide new jeepney routes as developments proceed.
E	• Extend existing BF Homes routes.
F	• Extend existing jeepney routes to cover the area.
G	• As demand is low for the time being, encourage tricycle service to feed the jeepney routes. • Provide a new loop route linking G. Luis and Quirino Highway.
H	• As demand is low for the time being, encourage tricycle service to feed the jeepney routes. • As development proceed, network service including Fairview area needs to be considered.

1/ Refer to Figure 4.5.



LEGEND:

- DEVELOPED SUBDIVISIONS
- DEVELOPING SUBDIVISIONS
- SUBDIVISIONS WITH DIRECT P.T. SERVICES
- SUBDIVISIONS WITH ACCESS TO P.T. SERVICES
- SUBDIVISIONS WITHOUT P.T. SERVICES
- A — AREAS WITH POOR P.T. SERVICES
- EXISTING ESTABLISHMENT

Figure 4.5
Areas with Poor Public Transportation Services

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Table 4.4
Recommendations for Controlling Colorum PUs

	Estimated Number of Units	Proposals
Novaliches - Bagong Silang	61	As the route serves communities in the north and considered important, it should be legalized.
Novaliches - Constellation	6	As the subdivision is located along Quirino Highway and can be served by other existing routes, this route should be abolished. Concurrently, encourage tricycles for feeder services.
Novaliches - Area BCD	30	As development proceeds and demand grows, the route should be legalized. However, RMC need no increase for the time being.
Novaliches - Brixton/Libis	49	As development proceed and demand grows, the route should be legalized. However, RMC need no increase for the time being.
Novaliches - Congress, Sampaguita Sarona Shelter Rainbow	18	As development proceed and demand grows, the route should be legalized. RMC need to be adjusted accordingly.

4.3.2 Route Modifications

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

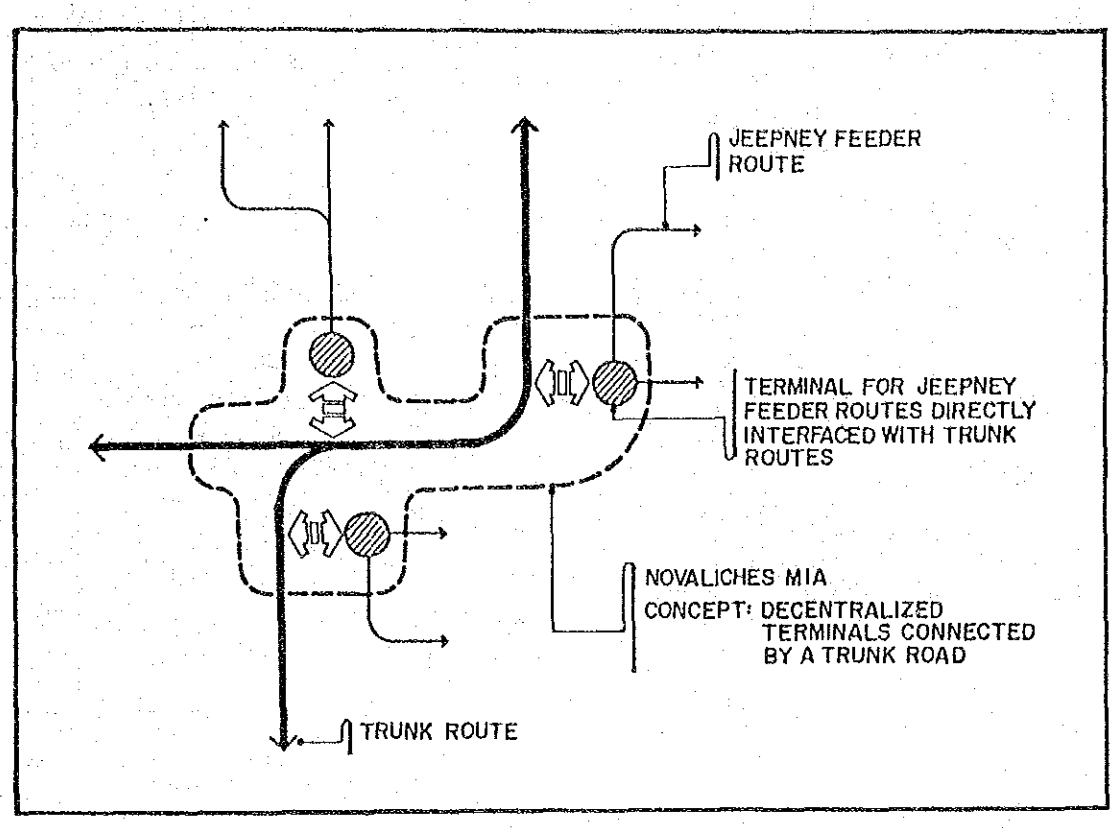
B4 : Susano Road based jeepney U-turn routes

B5 : Gen. Luis route

Figure 4.6 shows the schematics of the route restructuring which is constrained by the existing road network within the Novaliches town proper.

The various rerouting options are illustrated in more detail in Figure 4.7.

Figure 4.6
Concept of Route Restructuring



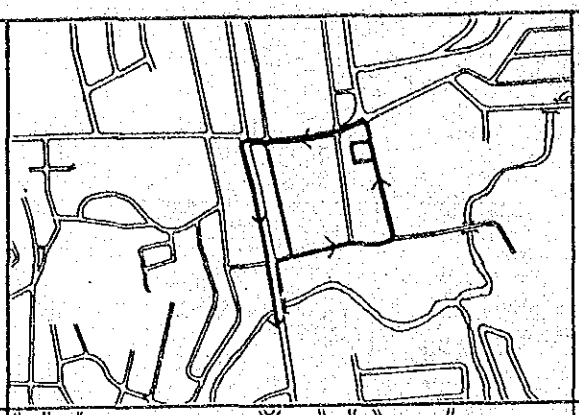
4.3.3 Traffic Management in Novaliches Town Proper

Maximum use of existing road facilities is the only logical step in the short-term, (i.e., before the realization of plans for primary roads). To achieve this, through-traffic flow must be smoothen, viz. (see Figure 4.8):

- 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.
- Transfer of bus stop.
- Transfer of mini-bus stop.
- Removal of on-street vending.
- Designation of road segments banned to tricycle.

SHORT - TERM

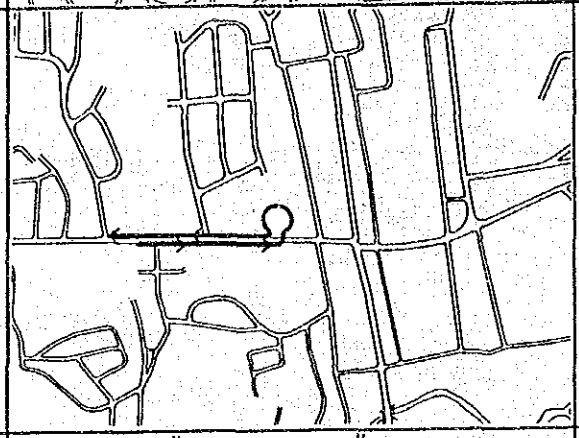
B101



Rerouting of Southbound Jeepney Routes

- Reduction in U-turn traffic on Quirino Highway (15,100 to 10,500/day)
- Discourage irregular vehicle movement and scattered waiting places
- Improvement of Quirino Highway/Geronimo intersection required

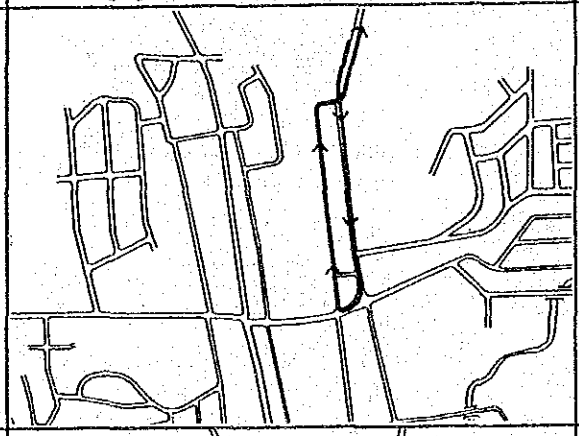
B301



Rerouting of Westbound Jeepney Routes

- Alleviate traffic conditions at Austria/ G. Luis intersection
- Disperse queueing on Austria
- Minor improvement of off-road terminal at the back of Novaliches Market

B201

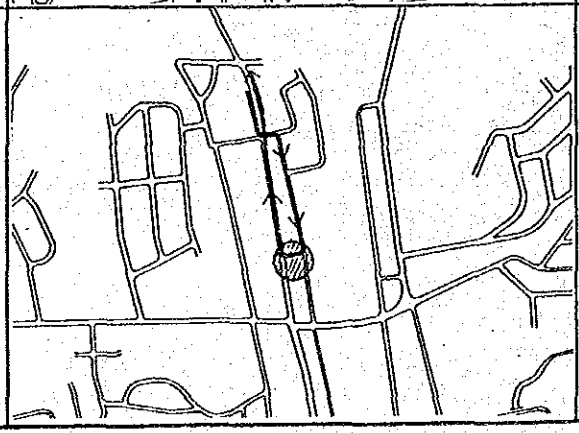


Rerouting of Northbound Jeepney Routes

- Dissolution of U-turn movement of northbound jeepneys on Quirino Highway
- Reduction of traffic volume on Quirino Highway section

LONG - TERM

B401



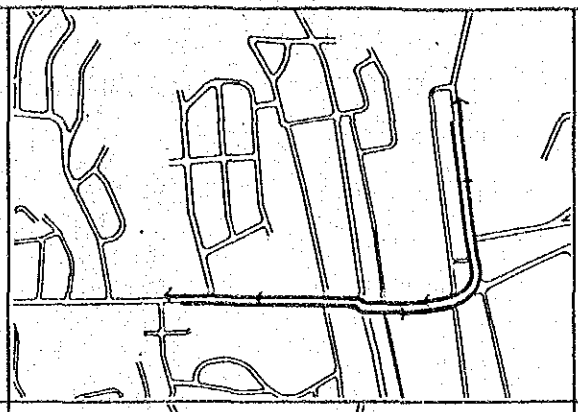
Rerouting of Susano Road U-turn Routes in Association with Terminal Development

- Reroute via Ramirez and Susano Road by improving off-road terminal north of Susano Market
- Improved access to Quirino Highway by integrating scattered terminals now serving the subdivisions
- Reduction in traffic conflict at the entrance of the jeepney terminal on Susano Road

Figure 4.7
Rerouting Proposals

LONG-TERM

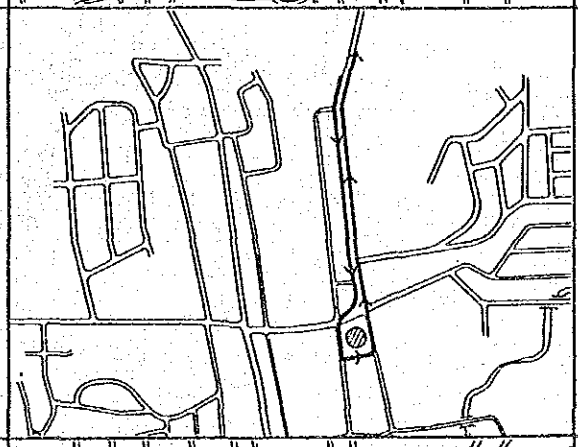
B501



Rerouting of G. Luis Bus Route

- Reduction in traffic congestion at the Quirino Highway/Sarmiento intersection caused by buses with a fre-
- Reduction of environmental disturbance in residential areas due to the diversion of through traffic
- Smoothen bus traffic flow line

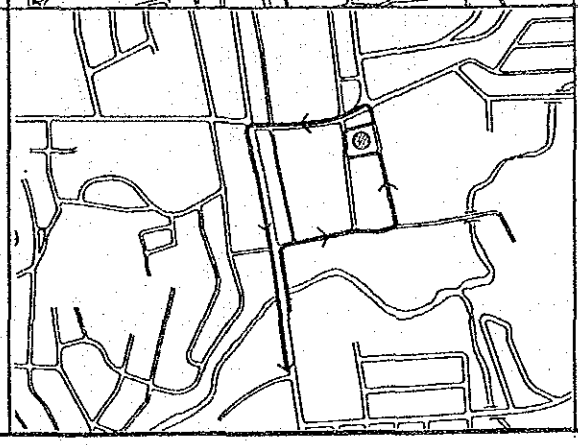
B202



Rerouting of Northbound Jeepney Routes in Association with Terminal Development

- Integration of northbound jeepney routes at the terminal
- Mitigation of traffic congestions due to parking of queueing jeepney

B102

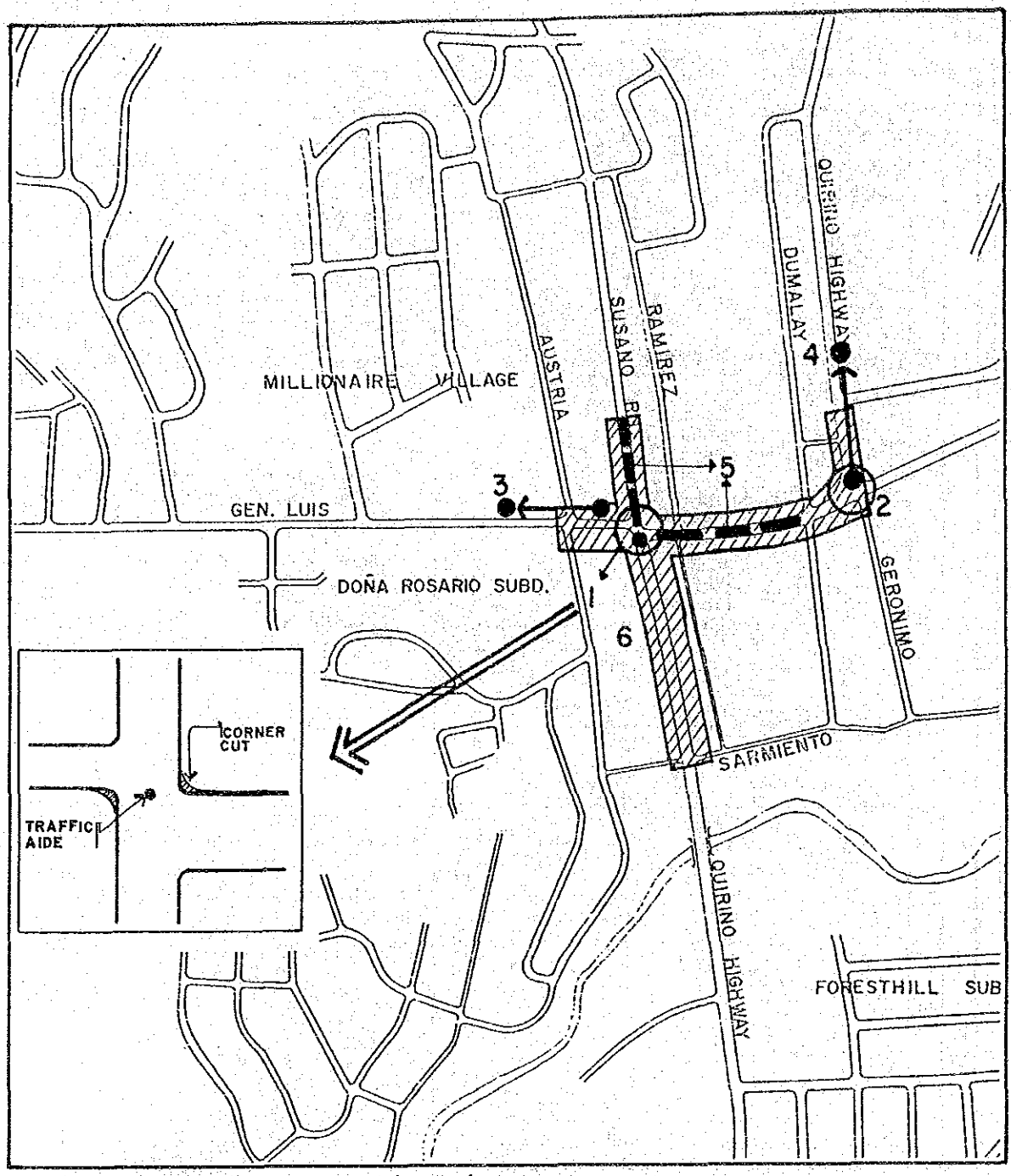


Rerouting of Southbound Jeepney Routes in Association with Terminal Development

- Rerouting associated with terminal development/road network improvement which involves definition of spinal network and road widening

Figure 4.7
Rerouting Proposals

JUMSUT II



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 4.8
Short-term Plan

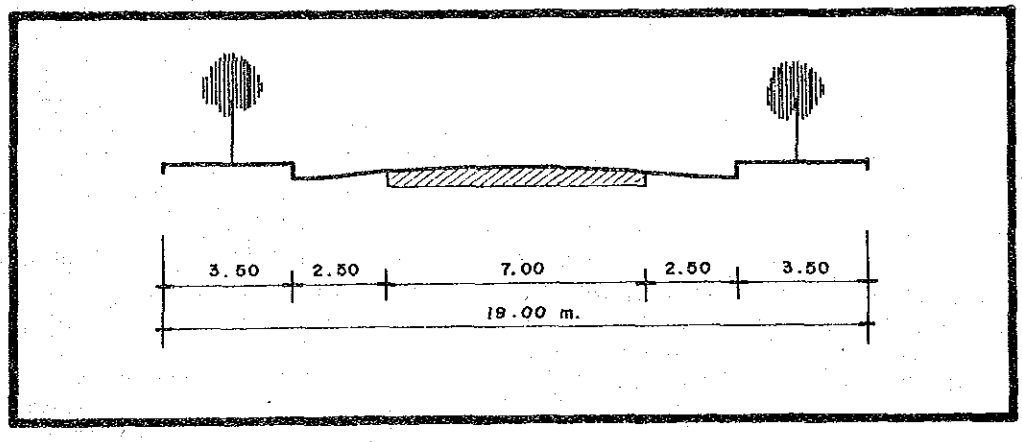
4.3.4 Trunk Road and Bypass Road Construction

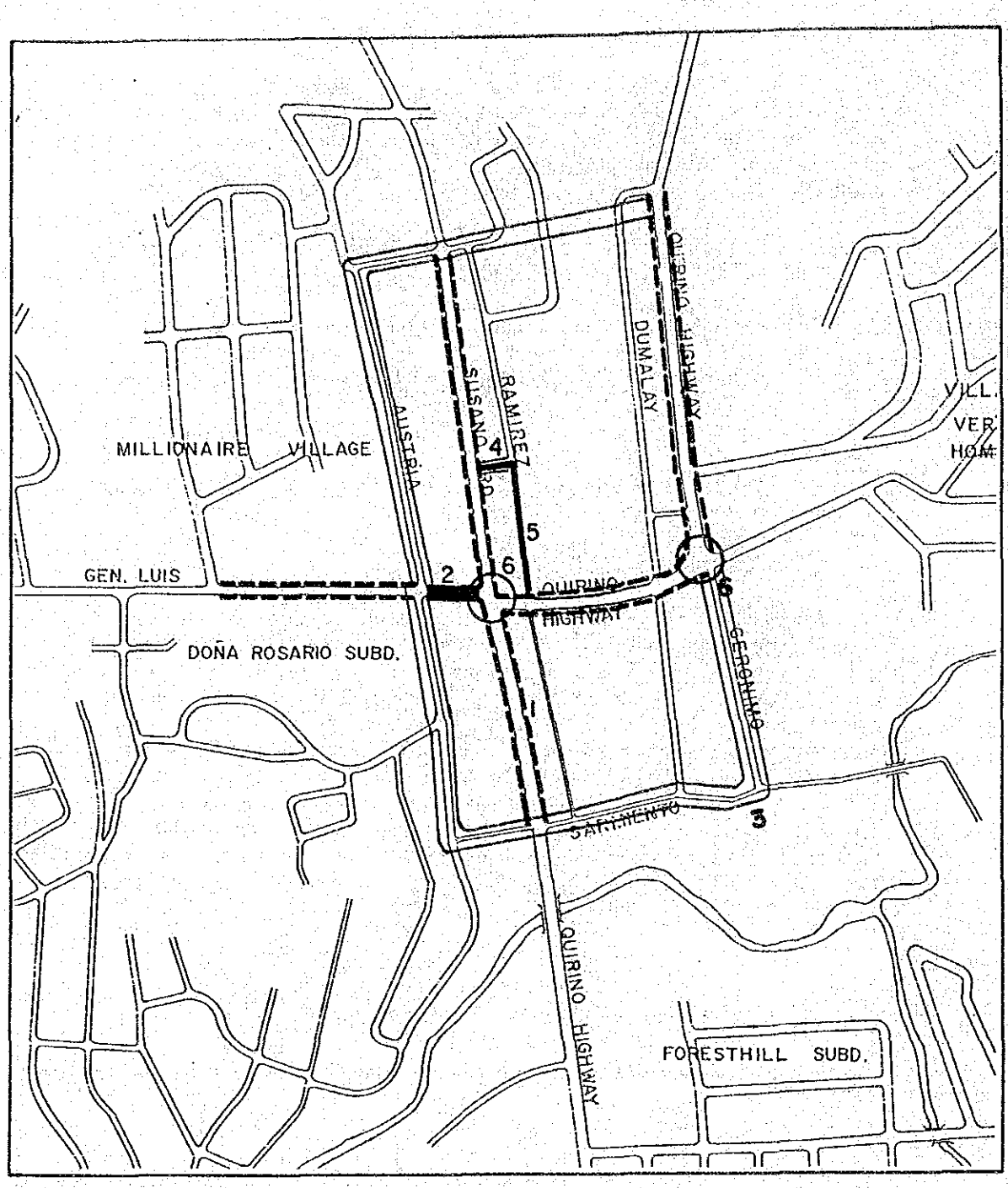
Mid- to long-term proposals includes all measures dependent on the completion of the planned trunk roads. These would limit existing road sections within the town proper to local traffic and internal circulation, while through traffic would be diverted to the new trunk roads. The details are as follows (see Figure 4.10).

- Segregation of vehicles and pedestrians by improving sidewalks along trunk roads.
- Widening of Gen. 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.
- Installation of traffic signals.

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 4.11, but Alternative 1 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. Since this bypass would function as an internal distributor when the primary road network is completed, two lanes with sidewalk and parking lanes would be sufficient as illustrated in Figure 4.9.

Figure 4.9
Cross-section of Proposed Bypass

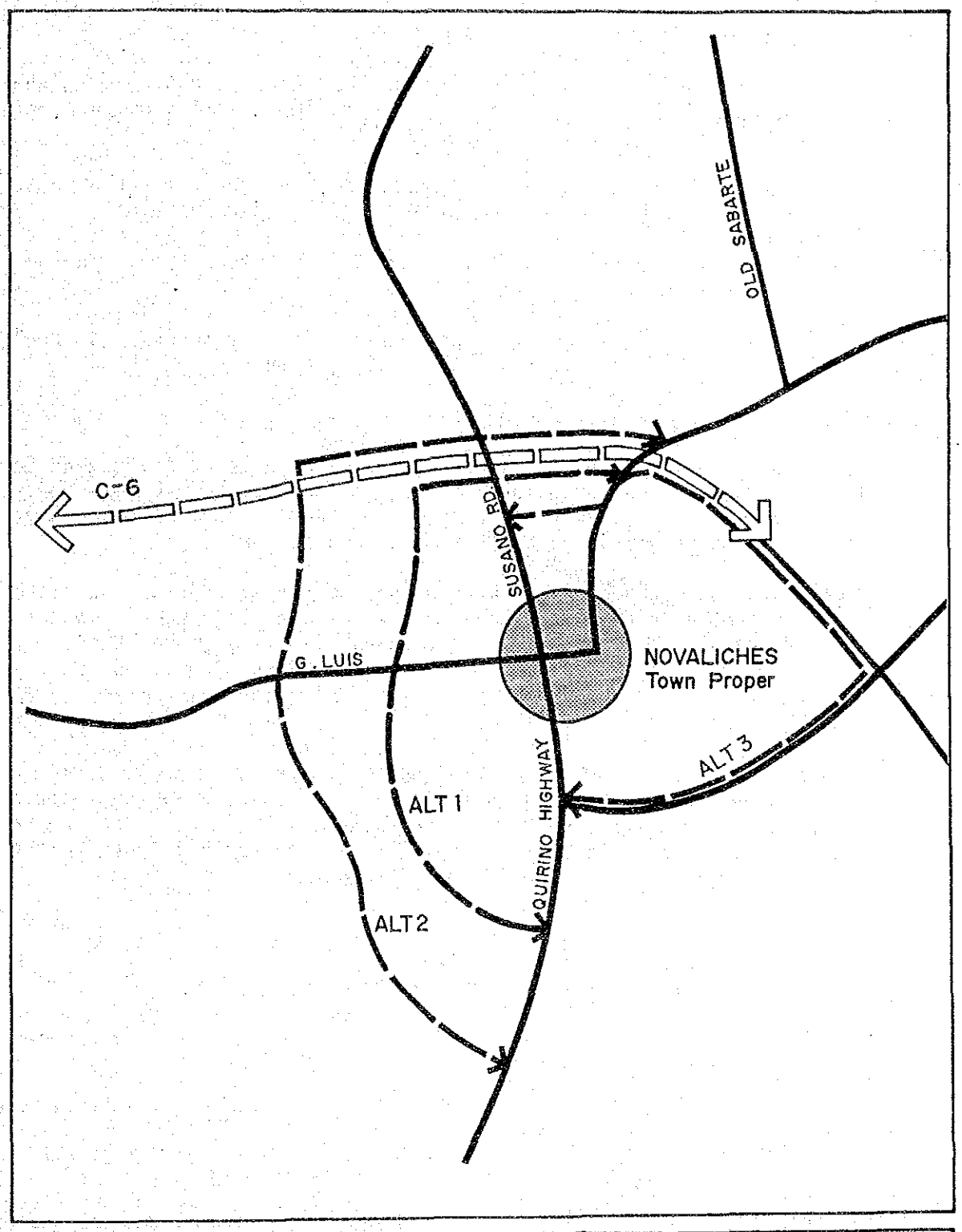




LEGEND

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 4.10
Mid-term Plan



LEGEND:

EXISTING ROADS

PLANNED ROADS

ALTERNATIVE 1 (3.2KM.) Recommended

ALTERNATIVE 2 (4.2 KM.)

ALTERNATIVE 3 (1.9 KM.)

Figure 4.11
Proposals for the Quirino Highway Bypass

4.3.5 Development of Mode Interchange Facilities

The key to the 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 4.12) appears viable:

   1) conversion of Old Pasvil Bus terminal 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.

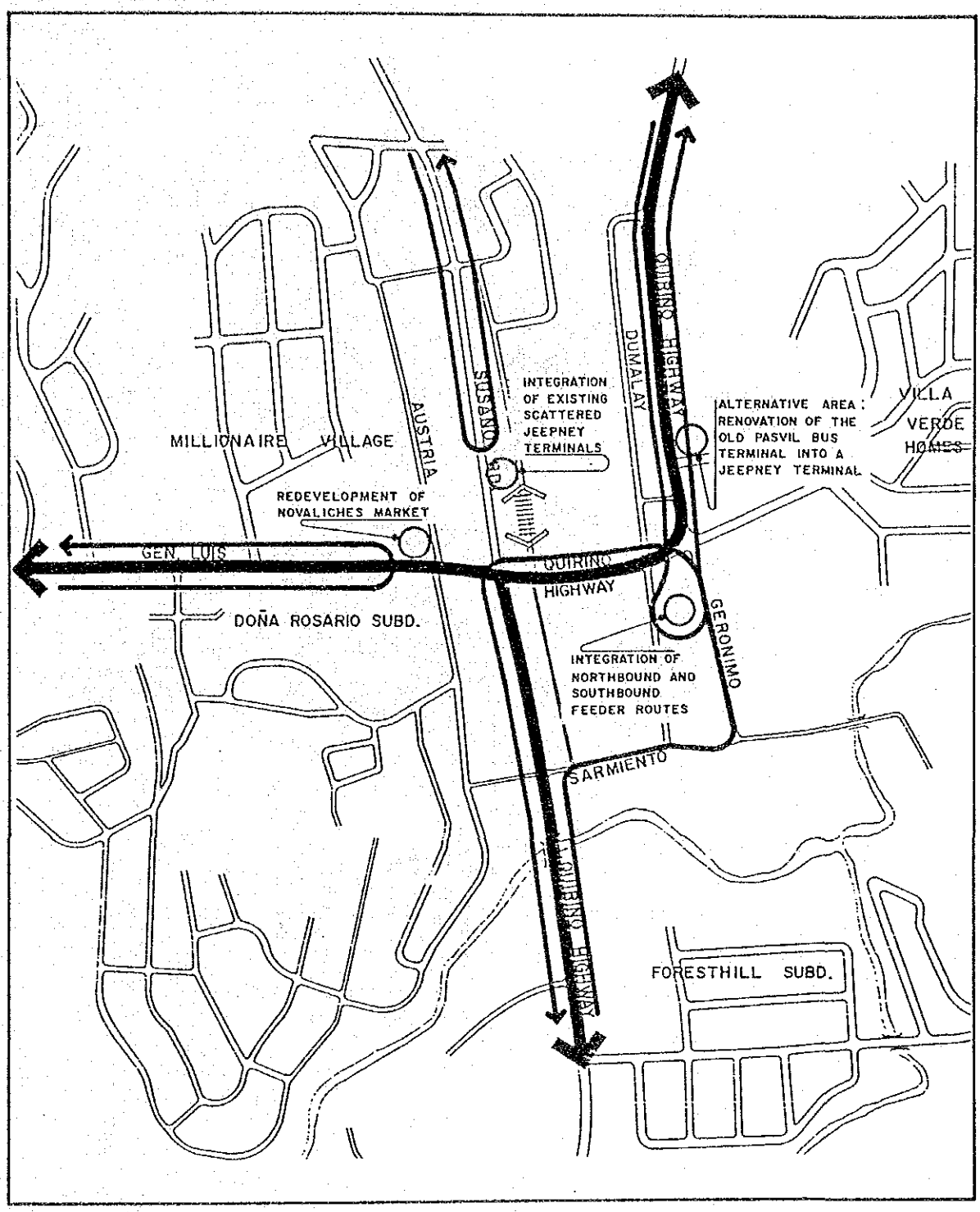
b) From a long-term viewpoint, however, major investment in new mode interchange facilities piggybacked to a commercial initiative is proposed for development in a new site north of but adjacent to the town proper.

The planned growth of the area hinges on the absorption of more comprehensive urban services in a new commercial/business center. A trigger for this is a mode interchange facility to be built as part of a comprehensive urban development (as shown in Figure 4.13). The scale and contents of this proposed development are given in Table 4.5.

Considering that such an area would involve the demolition or displacement of several houses, the detailed planning should consider integrating existing structures and uses into the above plan. In short, the plan should be incremental and designed for ease of implementation and minimum disruption.

Table 4.5
Outline of New Urban Area Development

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	



LEGEND:

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

0 50 100 300 m

Figure 4.12
Terminal Development
in Novaliches Town
Proper

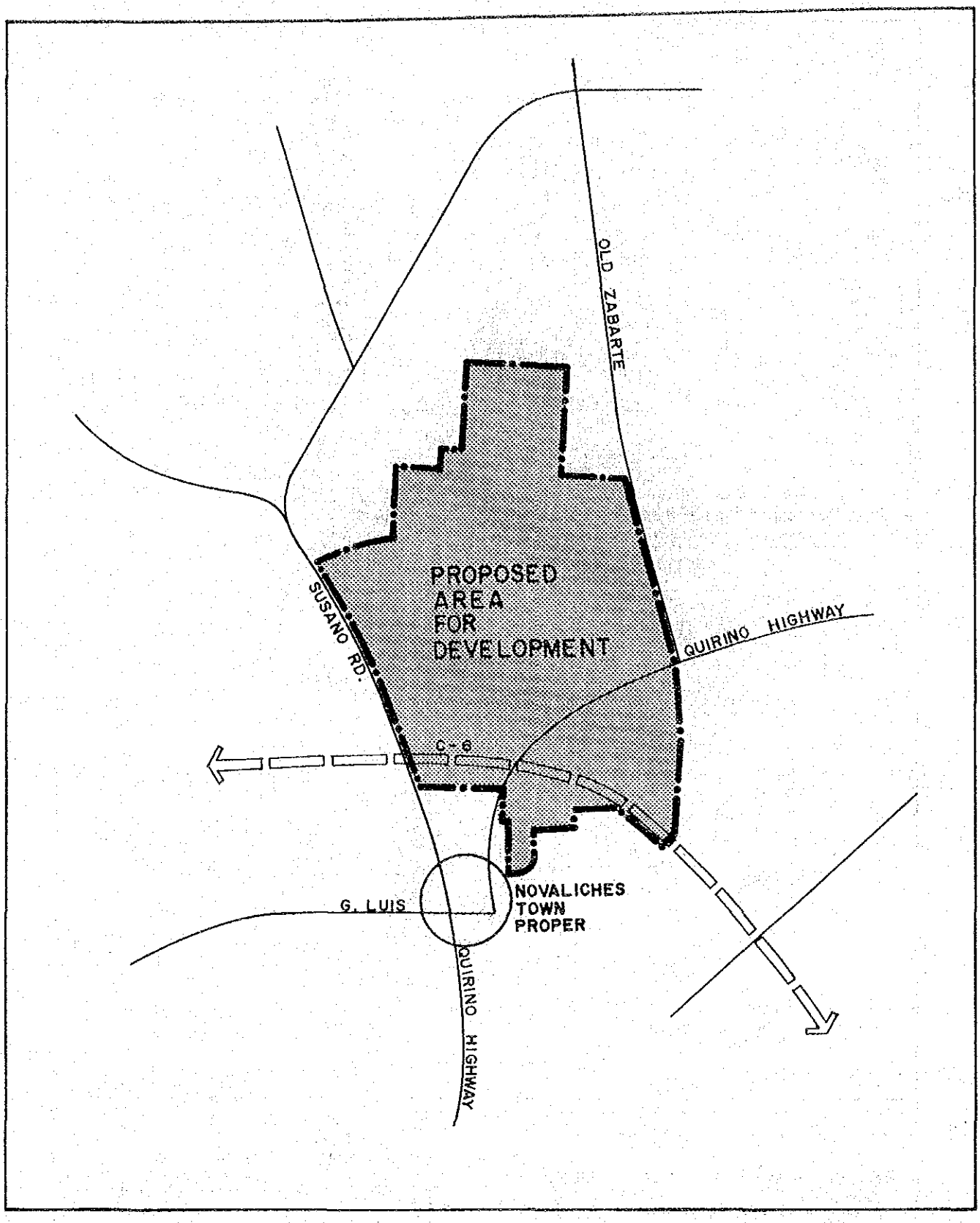


Figure 4.13
Concept of Mode
Interchange Area
Development

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4.4 IMPLEMENTATION PACKAGE

A series of implementing steps are required for the realization of the Novaliches MIA. The recommendation is to evolve the MIA through time and space rather than build it in one-short to look at it as a dynamic output rather than a static product.

Table 4.6
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	● B101	→	● B102
B-2 NORTHBOUND LOOP JEEPNEY ROUTES	● B201	→	● B202
B-3 WESTBOUND U-TURN JEEPNEY ROUTES	● B301	→	→
B-4 SUSANO RD. U-TURN JEEPNEY ROUTES	NA	NA	● B401
B-5 G. LUIS BUS ROUTES	NA	NA	● B501
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

5.0 DETAILED PLANNING

5.1 GENERAL

Associated works for each proposal recommended in the implemention package for the development of the Novaliches MIA are identified. Initial quantitative planning aspects are prepared and are primarily translated in terms of costs on a short, mid, and long-term periods.

5.2 REROUTING

5.2.1 Affected Routes

Current jeepney routes which will be affected by the proposals are identified in Table 5.1.

The general concept is route simplification for short-term and rerouting associated with terminal development for long-term.

5.2.2 Impact on Traffic

The existing volume/capacity ratio of north section Quirino Highway at 1.3 will be reduced because of the elimination of U-turning by the southbound and northbound routes with a frequency of 3,000/16 hours.

The short-term rerouting of westbound jeepney routes, with a frequency of 450/16 hours, to terminate at the back of the Novaliches Market would eliminate maneuvering at Austria and Gen. Luis.

The long-term rerouting associated with road widening and terminal development at three sites would integrate routes in a system of terminals and would simplify flow in the town proper.

Road widening of the critical section of Gen. Luis between Austria and Susano would accommodate the 900/16 hours passing through buses thus simplifying the route and avoiding their having to pass residential areas.

The longer term development of terminals at Geronimo (Old Pasvil is an alternative site) for south and northbound routes and between Susano and Ramirez for the routes servicing subdivision demands would complete the integrated system of three terminals including the other at the Novaliches Market. This rerouting and associated system of terminals would allow relieved traffic conditions from Susano/Quirino/Gen. Luis intersection to Quirino/Geronimo intersection by 3,500/16 hours for short-term and 4,300/16 hours for long-term thus making possible the two-way frequency of the bus route along Gen. Luis.

5.2.3 Required Inputs

Associated improvements required for the rerouting schemes are shown in Table 5.3.

Table 5.1
Affected Routes for the Novaliches Mode Interchange Area

	Name[1/]	Frequency[2/] MP	EP	OP	16 hrs.
A. SHORT TERM REROUTING					
A.1 Southbound jeepney routes (B101)	1. Balintawak - Novaliches	22	10	7	176
	2. Novaliches - Blumentritt	261	224	181	2,093
	3. Sabarte - Blumentritt	1	0	1	5
	4. Tala - Blumentritt	2	1	2	26
	5. La Mesa Dam - Blumentritt	2	3	2	26
	Sub-Total	288	238	193	2,326
A.2 Westbound jeepney routes (B301)	1. Novaliches - Malinta	39	39	24	431
A.3 Northbound jeepney routes (B201)	1. Novaliches - Constellation (colorum)	6			42
	2. Novaliches - Tala	3	7	6	106
	3. Amparo - Balintawak	4	1	2	19
	4. Blumentritt - Lagro	2	2	2	25
	5. Balintawak - Lagro	0	1	3	43
	6. Amparo - Blumentritt	0	2	0	15
	7. Amparo - Novaliches	2	4	4	51
	8. Novaliches - Lagro	13	27	25	405
	Sub-Total	30	(44)	(42)	706
B. LONG-TERM REROUTING					
B.1 Susano Road Jeepney U-turn routes	1. Novaliches - B.F. Homes	21	8	14	142
	2. Novaliches - Camarin	23	34	35	345
	3. Novaliches - Urduja	17	5	4	121
	4. Novaliches - Bagumbong	2	12	3	120
	5. Blumentritt - Urduja	1	1	1	18
	6. Novaliches - Brixtone (colorum)				
	Novaliches - Libis (colorum)				157
	7. Novaliches - Area BCD (colorum)				120
	8. Novaliches - Congress				54
	Novaliches - Sampaguita				
	Novaliches - Saranay (colorum)				
	Novaliches - Shelter				
	Novaliches - Rainbow				
	9. Novaliches - Bagong Silang (under OTC)				183
	Sub-Total	(64)	(60)	(57)	1,260
B.2 Gen. Luis Bus Route	1. Ayala - Lagro	2	3	1	33
	2. Novaliches - FTI	4	1	2	48
	3. Novaliches - Ayala	4	2	3	61
	4. Novaliches - Alabang	27	18	20	243
	5. Sapang Palay - Sta. Cruz (bus)	5	3	1	25
	6. Sapang Palay - Sta. Cruz (minibus)	43	22	13	330

Table 5.1 cont'd

		Name[1]	Frequency[2] MP	EP	OP	16 hrs.
		7. Ayala - Francisco Homes	2	2	3	31
		8. Ayala - Sapang Palay	5	9	3	55
		9. Cubao - Sapang Palay	5	3	2	37
		10. FTI - Sapang Palay	2	0	0	6
		Sub-Total	99	63	48	869
B.3	Rerouting of Northbound Jeepney Routes (B202)	1. Novaliches - Constellation (colorum)	6			42
		2. Novaliches - Tala	3	7	6	106
		3. Amparo - Balintawak	4	1	2	19
		4. Blumentritt - Lagro	2	2	2	25
		5. Balintawak - Lagro	0	1	3	43
		6. Amparo - Blumentritt	0	2	0	15
		7. Amparo - Novaliches	2	4	4	51
		8. Novaliches - Lagro	13	27	25	405
		Sub-Total	30	(44)	(42)	706
B.4	Rerouting of Southbound Jeepney Routes (B102)	1. Balintawak - Novaliches	22	10	7	176
		2. Novaliches - Blumentritt	261	224	181	2,093
		3. Sabarte - Blumentritt	1	0	1	5
		4. Tala - Blumentritt	2	1	2	26
		5. La Mesa Dam - Blumentritt	2	3	2	26
		Sub-Total	288	238	193	2,326

1/ Route names are that which are existing as of this report. Panel routes may change retrospect to the MOTC modification on CBD bound routes.

2/ MP - morning peak
EP - evening peak
OP - off-peak
( ) - sub-total for available data only

Table 5.2
Estimated Reduction in Traffic between Austria and Geronimo

Route	Frequency Peak Hr.	16 Hrs.
A. SHORT TERM PLAN		
A.1 Southbound Jeepney Routes	228	2,326
A.2 Westbound Jeepney Routes	39	431
A.3 Northbound Jeepney Routes	30	664
B. LONG-TERM PLAN		
B.1 Susano Road Jeepney U-turn Routes	(64)[1]	1,260
B.2 Gen. Luis Bus Route	-99 [2]	- 869
B.3 Northbound Jeepney Routes	30	706
B.4 Southbound Jeepney Routes	288	2,326

1/ ( ) due to colorum operation, total for available data only.

2/ -99 additional load on the section.

Table 5.3
Associated Improvements Required for Jeepney/Bus Rerouting (Novaliches)

Item	Quantity	Unit Costs	Amount (₱000)	Remarks
A. SHORT TERM PLAN				
A.1 Improvement Required for Southbound Jeepney				
1) Improvement of Geronimo				
a. Pavement of Carriageway	40m(L)x5m(W)	544	108.800	
2) Improvement of Quirino/ Geronimo Intersection	lump sum		4.309	refer to Table 5.4,A.1
		Sub-Total	113.109	
A.2 Improvement Required for Westbound Jeepney Routes				
1) Improvement of G. Luis				
a. Pavement of Carriageway	30m(L)x6m(W)	256	46.080	
A.3 Improvement Required for G. Luis Bus Route				
1) Improvement of Quirino/ G.Luis Intersection				
a. Widening of Carriageway	230m(L)x6m(W)	511	705.180	
b. Pavement of Sidewalks	230m(L)x3m(W) 2 sides	687	150.010	
2) Improvement of Shoulder of Quirino Highway	890m(L)x3m(W) 2 sides	256	683.520	refer to Table 5.4,B.2
		Sub-Total	1,538.71	
	Short-term Plan Total		1,697.899	
B. MID-TERM PLAN				
B.1 Improvement Required for Southbound Jeepney Routes	lump sum		5,044.850	refer to Table 5.6,B
B.2 Improvement Required for Northbound Jeepney Routes	lump sum		2,991.044	refer to Table 5.6,C.2
B.3 Improvement Required for Susano Road Routes				
1) Improvement of Terminal	lump sump	4,824.404	4,824.404	refer to Table 5.6,C.1
2) Improvement of Road Between Susano-Ramirez	40m(L)x6m(W)	256/m^2	61.440	
3) Pavement of Carriage-way of Ramirez	50m(L)x6m(W)	256	76.800	
		Sub-Total	4,962.644	
	Mid-term Plan Total		12,998.638	

5.3 TRAFFIC IMPROVEMENT

Short-term plans launch on immediate improvements by considering existing conditions that complicate traffic flow. Medium-term plans require minor civil works of road improvement and traffic light installation. Detailed works associated with improvement of traffic flow are shown in Table 5.4, while plan is shown in Figure 5.1.

Table 5.4
Associated Inputs required for Traffic Improvements (Novaliches)

Item	Quantity	Unit Cost	Amount (₱000)	Remarks
A. SHORT TERM PLAN				
A.1 Improvement of Quirino/ Geronimo Intersection				
1) Removal of Police Post and Pavement	2 sq.	1,616	3.232	
2) Traffic Sign	1 pc.	1,077	1.077	
		Sub-Total	4.309	
A.2 Relocation of Bus and Minibus Stops				
1) G. Luis: Ordinary Bus				
a. Traffic Sign	1 pc.	1,077	1.077	
b. Allocation of Dispatcher				
2) Quirino Hwy: Minibus				
a. Traffic Sign	1 pc.	1,077	1.077	
b. Allocation of Dispatcher	1 pc.	-	-	
		Sub-Total	2.154	
A.3 Prohibition of On-Road Vendors				
1) Along Quirino Hwy.	200 m	-	-	
2) Along Susano Road	100 m	-	-	
		Sub-Total		
A.4 Prohibition of Tricycle Operation				
1) Traffic Signs	21 pcs.	1,077	22.617	
2) Transfer of Two Tricycle Terminals		-	-	
		Sub-Total	22.617	
A.5 Designation of Bus Terminal Area				
a. Markings	200m x 2	36	15.840	
b. Traffic Signs	4 pcs.	1,077	4.308	
		Sub-Total	20.148	
	Short-term Plan Total		49.228	
B. MID-TERM PLAN				
B.1 Improvement of Quirino and G. Luis				
1) Quirino/G. Luis Intersection				
a. Channelization including Removal of Sidewalk and Pavement of Carriageway	lump sum		354.420	
b. Traffic Sign	2 pcs.	1,077	2.154	
c. Allocation of Traffic Aides		-	-	

Table 5.4 cont'd

Item	Quantity	Unit Cost	Amount (₱000)	Remarks
2) G. Luis/Austria Intersection				
a. Allocation of Traffic Aides		-	-	
3) Transfer of Electric Poles		-	-	
		Sub-Total	356.574	
B.2 Improvement of Sidewalk Along Major Roads				
1) Quirino Highway				
a. Improvement of Shoulders	890m(L)x3m(W)	256	633.520	
b. Pavement of Carriageway	890m(L)x1m(W)	544	484.160	
c. Pavement of Sidewalk	890m(L)x3m(W)	887	789.430	
2) G. Luis				
a. Pavement of Carriageway	210m(L)x1m(W) x 2	544	228.480	
3) Susano Road				
a. Pavement of Sidewalk	290m(L)x1m(W) x 2	493	384.540	
		Sub-Total	2,520.130	
B.3 Widening of G. Luis				
1) Land Acquisition	70m(L)x4m(W)	975	273.000	
2) Compensation for Buildings	8 house	100,000	800.000	
3) Road Improvement				
a. Pavement of Carriageway	70m(L)x6m(W)	511	214.620	
b. Pavement of Sidewalk	60m(L)x3m(W)	687	41.220	
		Sub-Total	1,328.840	
B.4 Improvement of Road Between Susano Road and Ramirez	40m(L)x6m(W)	256	61.440	
B.5 Exclusive Use of Ramirez for Pedestrians				
a. Pavement of Roads	170m(L)x6m(W)	256	261.120	
		Sub-Total	322.560	
B.6 Installation of Traffic Signals Signals				
1) Quirino/G. Luis	1 unit	832,000	832.000	
2) Quirino/Geronimo	1 unit	832,000	832.000	
		Sub-Total	1,664.000	
	Mid Term Plan Total		6,192.000	

5.4 STRENGTHENING OF THE TRUNK ROAD SYSTEM

A bypass of the Novaliches town proper is proposed for the through traffic and will greatly alleviate Novaliches town proper traffic. The use of planned roads (i.e., C-6), and existing subdivision roads, if possible, is advocated. Associated inputs required for the development of the chosen bypass road (from three alternatives presented) is shown in Table 5.5.

Table 5.5
Associated Inputs Required for
Strengthening of the Trunk Road System

Item	Quantity	Unit Cost	Amount (₱000)
B. MID TERM PLAN			
B.1 Construction of Bypass Road			
1) Land Acquisition	25,200	660/m^2	16,632.000
2) Compensation			
3) Road Construction	900	1,000/m^2	900.000
a. Earthwork	32,000	47/m^2	1,604.000
b. Pavement of Carriage-way	32,000(L)x10m(W)	511/m^2	16,352.000
c. Pavement of Sidewalks	32,000(L)x2m(W)	536/m	3,430.400
	Mid-Term Plan Total		38,918.400

5.5 DEVELOPMENT OF INTEGRATED SYSTEM OF TERMINAL

The scheme is the development of separate terminals but integrated in function to form the Novaliches MIA. Three sites were chosen for terminal development (see Figures 5.2 to 5.4).

a) along Geronimo for north and southbound routes; a second alternative site for these routes is the Old Pasvil terminal.

b) at the back of Novaliches Market for westbound routes

c) north of Susano Market for Susano U-turn routes.

The estimated space needed for the improvement of each of the above terminals is given in Table 5.6.

Associated inputs required for the development of mode interchange facilities are shown in Table 5.7.

Associated with this scheme of integrated terminal development is the provision of pedestrian facilities. This scheme would, besides alleviate traffic congestion in the critical portion of the town proper, also make possible the designation of pedestrian precinct at Ramirez.

Table 5.6
Estimated Space Required for Novaliches
Mode Interchange Area

	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	570
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.

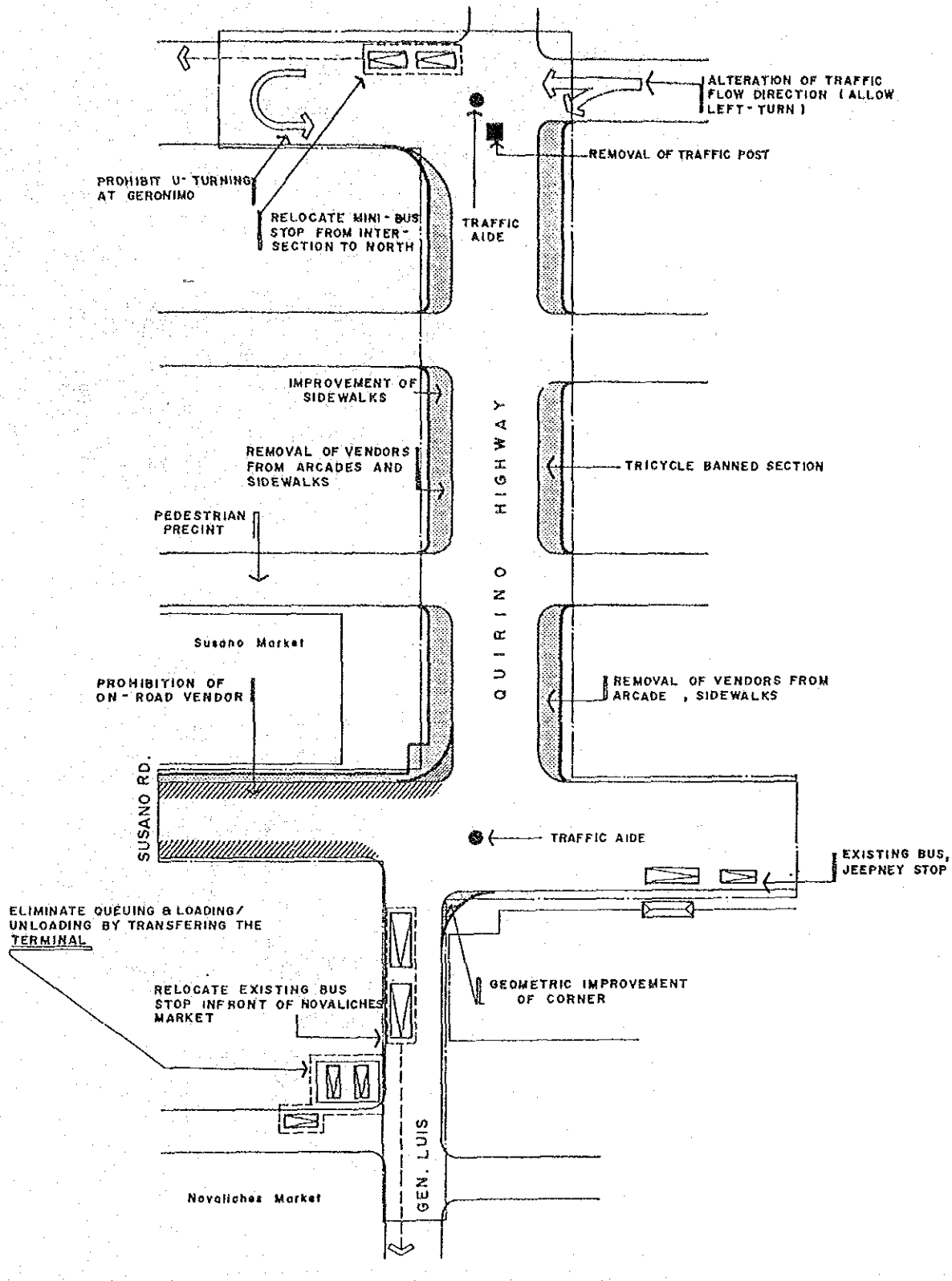

Figure 5.1
Quirino Highway
Improvement Plan

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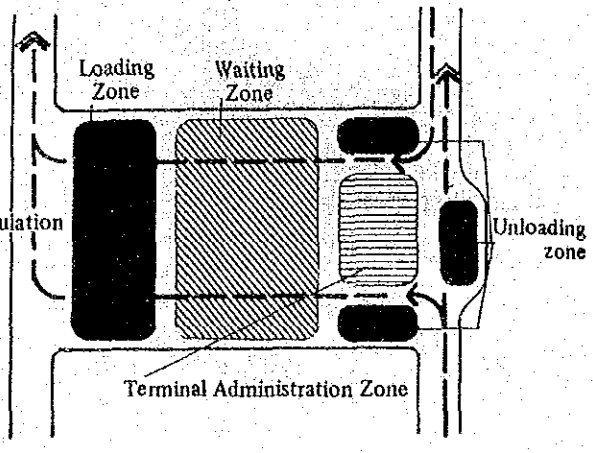


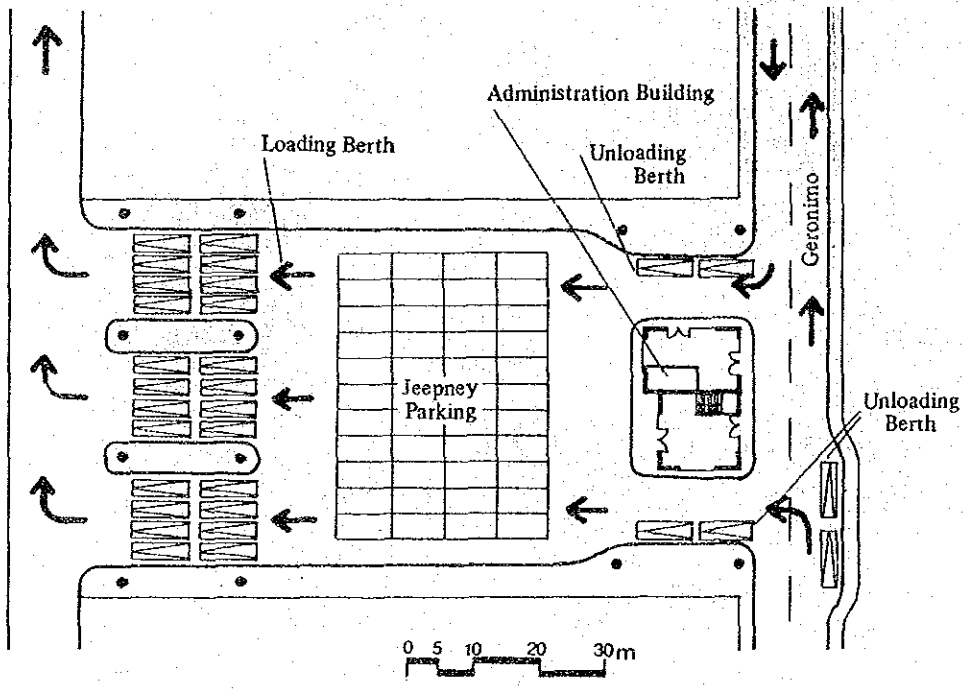
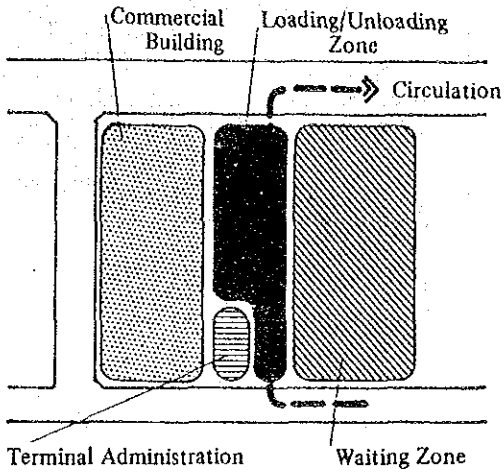


Figure 5.2
Proposed Plan for
Terminal at Geronimo



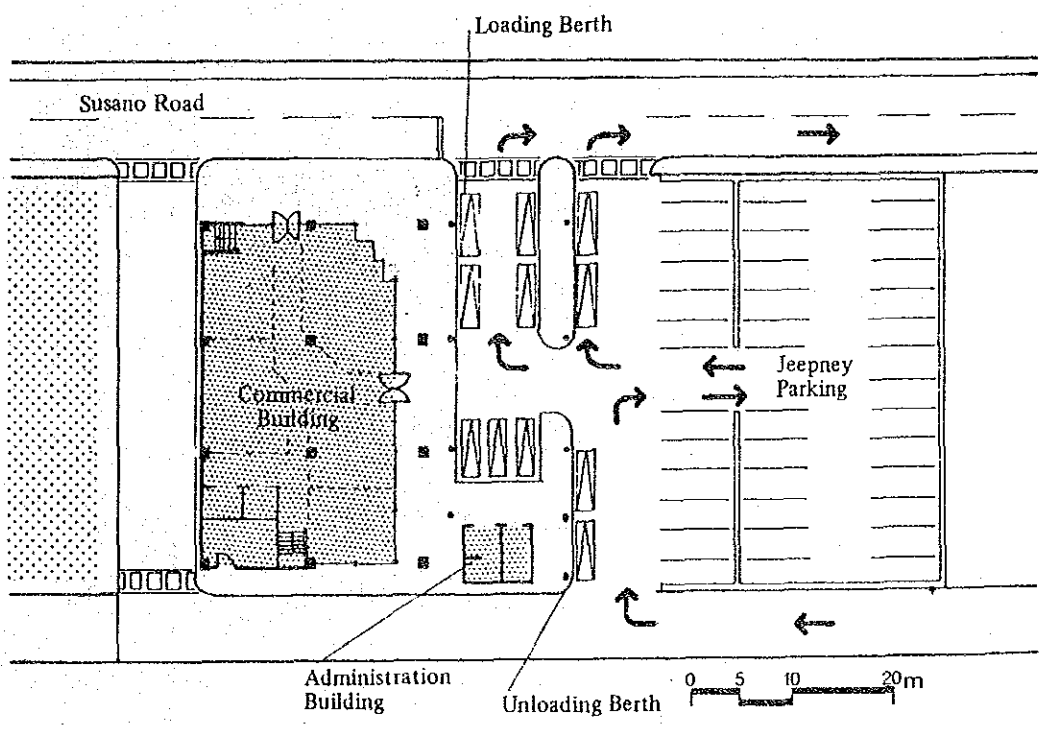


Figure 5.3
Proposed Plan for
Susano Market Terminal

Figure 5.4
Proposed Plan for
Novaliches Market
Terminal

Table 5.7
Associated Inputs required for the Development of Mode Interchange Facilities

Item	Quantity	Unit Cost	Amount (P000)
B. MID-TERM PLAN			
B.1 Improvement of Terminal at Geronimo			
1) Land Acquisition	2,390/m^2	975/m^2	2,330.250
2) Compensation	150 m^2	1,000/m^2	150.000
3) Construction of Terminal Facilities			
a. Removal of building	150 m^2	110/m^2	16.000
b. Earthwork	2,390 m^2	47/m^2	112.300
c. Pavement of Carriageway	1,730 m^2	511/m^2	884.030
d. Pavement of Sidewalk	275m(L)x2m(W)	536/m	147.400
e. Markings	530 m	36/m	19.080
f. Lights	10 pcs.	4,306/pc.	43.060
g. Fence	-	-	-
4) Construction of Adm. Office and Waiting Sheds	620 m^2	2,165/m^2	1,342.300
		Sub-Total	5,044.920
	Mid-term Plan Total		5,044.920
C. LONG TERM PLAN			
C.1 Development of Susano Market North Terminal			
1) Land Acquisition	2,700 m^2	975/m^2	2,632.500
2) Compensation	200 m^2	1,000/m^2	200.000
3) Construction of Terminal Facilities			
a. Removal of building	200 m^2	110/m^2	22.000
b. Earthwork	2,700 m^2	47/m^2	126.900
c. Pavement of Carriageway	1,700 m^2	511/m	868.700
d. Pavement of Sidewalk	150m(L)x2m(W)	536/m	80.400
e. Markings	300 m	36/m	10.800
f. Lights	9 pcs.	4,306/pc.	38.754
g. Fence	-	-	
4) Construction of Adm. Office and Waiting Shed	390 m^2	2,165/m^2	844.350
		Sub-Total	4,824.404
C.2 Development of Novaliches Market Terminal			
1) Land Acquisition	1,600 m^2	975/m^2	1,560.000
2) Compensation	500 m^2	1,000/m^2	500.000
3) Construction of Terminal Facilities			
a. Removal of building	500 m^2	110/m^2	55.000
b. Earthwork	1,400 m^2	47/m^2	65.800
c. Pavement of Carriageway	580 m^2	511/m	296.380
d. Pavement of Sidewalk	110m(L)x2m(W)	536/m	58.960
e. Markings	130 m	36/m	4.680
f. Lights	4 pcs.	4,306/pc.	17.224
g. Fence	-	-	
4) Construction of Adm. Office and Waiting Sheds	200 m^2	2,165/m^2	433.000
		Sub-Total	2,991.044
C.3 Development of Integrated Terminal as a Part of New Urban Center (Conceptual Proposal only)	-	-	-
	Mid-term Plan Total		7,815.448

5.6 ECONOMIC EVALUATION

Expected impact due to the improvement of the Novaliches mode interchange area as a whole will be great. Benefits are both tangible and non-tangible. Inasmuch as there are some difficulties in deriving the economic impact of the three proposed terminals for the area, a conservative estimate of at least five minutes saving on vehicle time can be expected. In terms of annual monetary savings, this would amount to approximately ₱5.4 million.

Jeepney route restructuring will improve traffic conditions in the area and thus decrease travel cost and travel time which is beneficial to operators because of fuel and vehicle operating costs and to passengers because of savings in time.

Improvement of pedestrian facilities obviously favor pedestrians in terms of safety and comfort. The prevented spill-over of pedestrians onto the carriageway also avoid accident occurence.

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

The redefinition of the road network by road construction and widening will directly benefit residents because of increased access but may also have negative effects due to the larger traffic to be accommodated in these residential areas. Improved access to the area will also benefit local business in the area.

The development of the integrated terminals will directly benefit parties concerned or utilizing public transportation. Such a development will bring about improved utilization of the area not only in terms of mode interchange functions but also in commercial aspects.

5.7 FINANCIAL ASSESSMENT OF THE TERMINAL

An exercise was made to examine the financial viability of terminal operation.

Novaliches Market Terminal

A. Revenue

1) Revenue from Jeepney

a) Terminal fee : ₱5.00/unit/day

b) Number of jeepneys using the terminal : 65

c) Dispatcher fee : ₱0.25/trip

d) Frequency advocating dispatching service : 560 trips per day (80% of total frequency)

Revenue from jeepney = (terminal fee x number of jeepney using the terminal) + (dispatcher fee x frequency advocating service)

= (₱5.00 x 65) + (₱0.25 x 560)

= ₱465/day

2) Revenue from Bus : (from bus stop)

a) Dispatcher fee : ₱0.50/trip

b) Frequency using the terminal : 560 trips/day

Revenue from bus = (dispatcher fee x frequency using the terminal)

= (₱5.00 x 65) + (₱0.25 + 560)

= ₱280/day

3) Total Revenue

Total Daily Revenue = Revenue from bus and Revenue from jeep

= ₱465 + ₱280

= ₱745/day

Total yearly revenue = Total daily revenue x 350

= ₱745 x 350

= ₱260,750/year

B. Expenditure

1) Terminal Construction Cost : ₱1,431,000

2) Rent of Land (5% of market Value) : ₱78,000/year

3) Operating Cost of terminal : ₱100,000/year

C. Assumptions

1) Depreciation : 20 years, fixed amount

2) Repayment conditions on loan : uniform payment of principal and interest for 20 year repayment period at 5% interest rate

3) Taxes : exempted

D. Results

Table 5.8
Proforma Annual Income Statement -
Novaliches Market Terminal

Item	% of Own Capital		
	100%	50%[1/]	50%[2/]
1. Revenue (₱/year)	260,750	260,750	260,750
2. Expenditure (₱/year)			
a) Depreciation	71,550	71,550	71,550
b) Operating Costs	100,000	100,000	100,000
c) Rent of Land	78,000	78,000	-
d) Interest on Loan	-	21,500	21,500
Sub-Total	249,550	271,050	193,050
3. Profit	11,200	(10,300)	67,700
4. Investment (terminal construction cost) (₱)	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 with assumption of profit being constant

Susano Market Terminal

A. Revenue

1) Revenue from Jeepney

a) Terminal fee : ₱5.00/unit/day

b) Number of jeepneys using the terminal : 220

c) Dispatcher fee : ₱0.25/trip

d) Frequency advocating dispatching service : 1,260 trips per day (80% of total frequency)

Revenue from jeepney = (terminal fee x number of jeepney using the terminal) + (dispatcher fee x frequency advocating service)

= (₱5.00 x 220) + (₱0.25 x 1,260)

= ₱1,415/day

2) Revenue from Bus : none (terminal for jeepneys only)

3) Total Revenue

Total daily revenue = Revenue from bus and revenue from jeep

= 0 + ₱1,415

Total daily revenue = ₱1,415/day

Total yearly revenue = Total daily revenue x 350

= ₱1,415 + 350

= ₱495,250/year

B. Expenditure

1) Terminal Construction Cost : ₱2,191,900

2) Rent of Land (5% of market value) : ₱131,600

3) Operating Cost of terminal : ₱81,000/year

C. Assumptions

1) Depreciation : 20 years, fixed amount

2) Repayment conditions on loan : uniform payment of principal and interest for 20 year repayment period at 5% interest rate

3) Taxes : exempted

D. Results

Table 5.9
Proforma Annual Income Statement -
Susano Market Terminal

Item	% of Own Capital		
	100%	50%[1/]	50%[2/]
1. Revenue (₱/year)	495,250	495,250	495,250
2. Expenditure (₱/year)			
a) Depreciation	109,600	109,600	109,600
b) Operating Costs	181,000	181,000	181,000
c) Rent of Land	131,600	131,600	-
d) Interest on Loan	0	32,900	32,900
Sub-Total	422,220	455,100	323,500
3. Profit (₱/year)	73,030	40,150	171,750
4. Investment (terminal construction cost) (₱)	2,191,900	2,191,900	2,191,900
5. 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 with assumption of profit being constant

Geronimo Terminal

A. Revenue

1) Revenue from Jeepney

a) Terminal fee : ₱5.00/unit/day

b) Number of jeepneys using the terminal : 1,070

c) Dispatcher fee : ₱0.25/trip

d) Frequency advocating dispatching service : 4,360 trips per day (80% of total frequency)

Revenue from jeepney = (terminal fee x number of jeepney using the terminal) + (dispatcher fee x frequency advocating service)

= (₱5.00 x 1,070) + (₱0.25 x 4,360)

= ₱6,445/day

2) Revenue from Bus : none (terminal for jeepneys only)

3) Total Revenue

Total daily revenue = Revenue from bus and Revenue from jeep

= 0 + ₱6,445

= ₱6,445/day

Total yearly revenue = Total daily revenue x 350

= ₱6,445 x 350

= ₱2,255,750/year

B. Expenditure

1) Terminal Construction Cost : ₱ 2,714,670

2) Rent of Land (5% of market value) : ₱ 116,500

3) Operating Cost of terminal : ₱628,000/year

C. Assumptions

1) Depreciation : 20 years, fixed amount

2) Repayment conditions on loan : uniform payment of principal and interest for 20 year repayment period at 5% interest rate

3) Taxes : exempted

D. Results

Table 5.10
Proforma Annual Income Statement -
Geronimo Terminal

Item	% of Own Capital		
	100%	50%[1/]	50%[2/]
1. Revenue (₱/year)	2,255,750	2,255,750	2,255,750
2. Expenditure (₱/year)			
a) Depreciation	135,700	135,700	135,700
b) Operating Costs	628,000	628,000	628,000
c) Rent of Land	116,500	116,500	-
d) Interest on Loan	-	40,700	40,700
Sub-Total	880,230	920,930	804,430
3. Profit (₱/year)	1,375,520	1,334,820	1,451,320
4. Investment (terminal construction cost) (₱)	2,714,670	2,714,670	2,714,670
5. 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 on cash items only with the assumption of profit being constant

5.8 MANAGEMENT ASPECTS - NOVALICHES

The foregoing proposed improvements would render beneficial effects for the area if placed under proper implementing bodies. As such, identification of the various agencies to forge each aspect of the development task is crucial. The responsibility may be shared by both the private and government sector. Since the area has not yet measured up to attracting sizeable development by the private sector, the government sector should make pioneering efforts to lay down foundations for the influx of investments and regulation of the future growth of Novaliches.

For each of the areas of recommendation, the delegation of responsibilities is discussed in succeeding topics.

5.8.1 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/TCC, 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 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 the government can muster support among them for such a venture. Given this paradoxical situation, it would seem that the most feasible approach is for MMC to take the lead and include Novaliches among its land consolidation project sites.

5.8.2 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.

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

APPENDICES

Appendix A.1
Novaliches Household Survey

1.0 INTRODUCTION

1.1 OBJECTIVE

The purpose of the survey was to secure primary data on the different characteristics of the households in the Novaliches area.

1.2 SURVEY DESCRIPTION

A survey was conducted in four (4) subdivisions in Novaliches, namely: Urduja, BF Homes, Villa Verde, and Jordan Plains. The first two subdivisions were quite distant from the Novaliches town proper while the latter two were located along the periphery of this town.

The procedure of the survey was relatively simple and relied heavily on the cooperation of the barangay captains of said subdivision. The questionnaire forms were given to these barangay captains who in turn took charge of the distribution and collection from sample households.

The survey lasted for two weeks (November 17 to December 3, 1984) covering a total of 260 sample households brokendown as follows:

	Collected Samples	
Subdivisions	No. of Households	No. of Household Members
Urduja	101	648
BF Homes	62	350
Villa Verde	50	262
Jordan	47	277
Total	260	1,537

2.0 SURVEY RESULTS AND MAJOR FINDINGS

2.1 HOUSEHOLD CHARACTERISTICS

The typical size of households residing far from the Novaliches town proper is slightly higher than those residing within the periphery of the same town; reflecting average household sizes of 6.2 and 5.6, respectively (see Table 1).

The Urduja subdivision shows the highest average number of 6.5 persons per household while Villa Verde, indicative of its urban environment, averages the lowest with 5.2 persons per household.

Table 1
Distribution of Sample Households
According Household Size

Subdivision	Household Size[1]									Average H.H. Size[2]
	2	3	4	5	6	7	8	9	10	
Urduja	4	5	14	18	19	15	7	6	13	6.5
B.F. Homes	2	9	11	10	10	9	6	1	4	5.7
Sub-Total[3]	6	14	25	28	29	24	13	7	17	6.2
Villa Verde	0	4	10	18	11	4	2	0	1	5.2
Jordan	1	6	9	8	7	5	4	2	5	6.0
Sub-Total[4]	1	10	19	26	18	9	6	2	6	5.6
TOTAL	7	24	44	54	47	33	19	9	23	5.9

1/ Number of persons per household excluding 176 household helpers.
2/ Average number of persons per household.
3/ Total household size for households away from town proper.
4/ Total household size for households near town proper.

On the whole, the income of households in the sample subdivisions is fairly well distributed with high average incomes ranging from ₱3,700 to ₱4,900 per month (see Table 2). This information is based on the responses of 175 households (representing 67.3% of the total sample) who indicated their income. The rest abstained from answering this particular item.

Table 2
Household Income Distribution (%)

Income Range	Sample Subdivisions[1]				Total
	Urduja	B.F. Homes	Villa Verde	Jordan	
1000 - below	7.0	0.0	0.0	4.3	3.5
1001 - 2000	12.9	21.0	10.0	4.3	12.7
2001 - 3000	10.9	21.0	6.0	17.1	13.5
3001 - 4000	5.0	1.7	10.0	4.3	5.0
4001 - 5000	5.0	4.9	32.0	14.9	12.0
5001 - 6000	8.0	4.9	12.0	10.7	8.5
6001 - 7000	1.0	3.3	2.0	0.0	1.6
7001 - above	11.9	9.7	16.0	4.3	10.8
Unknown	38.7	33.9	12.0	40.5	32.7
Ave. Income	₱4,000	₱3,700	₱4,900	₱3,800	₱4,100

2.2 VEHICLE OWNERSHIP

The car-ownership data from the survey indicate that majority (55.4%) of the total sample households own at least a car. The sample households own an average of 1.28 cars per household (see Table 3).

The subdivision of Villa Verde has the highest car-ownership share of 72%, while Urduja has the lowest share of 45.6%.

Corollary to vehicle ownership, motorcycle and bicycle ownership were noted to be quite high for all subdivision households, respectively (see Table 4). This is indicative of the reliance or preference of the residents in these areas for these types of transport modes especially for moving within the subdivisions.

Table 3
Car-Ownership

Subdivisions	Car-Owning Households (%)[1/]				Non-Car-Owning Households (%)	Average No. owned per Household
	1	2	3	Total		
Urduja	34.7	9.9	1.0	45.6	54.5	1.26
B.F. Homes	43.5	14.5	3.2	61.2	38.7	1.34
Villa Verde	48.0	24.0	0.0	72.0	28.0	1.33
Jordan	42.6	8.5	0.0	51.1	48.9	1.17
TOTAL	40.8	13.5	1.1	55.4	44.6	1.28

1/ in terms of number of cars owned per households.

Table 4
Motorcycle and Bicycle Ownership (%)

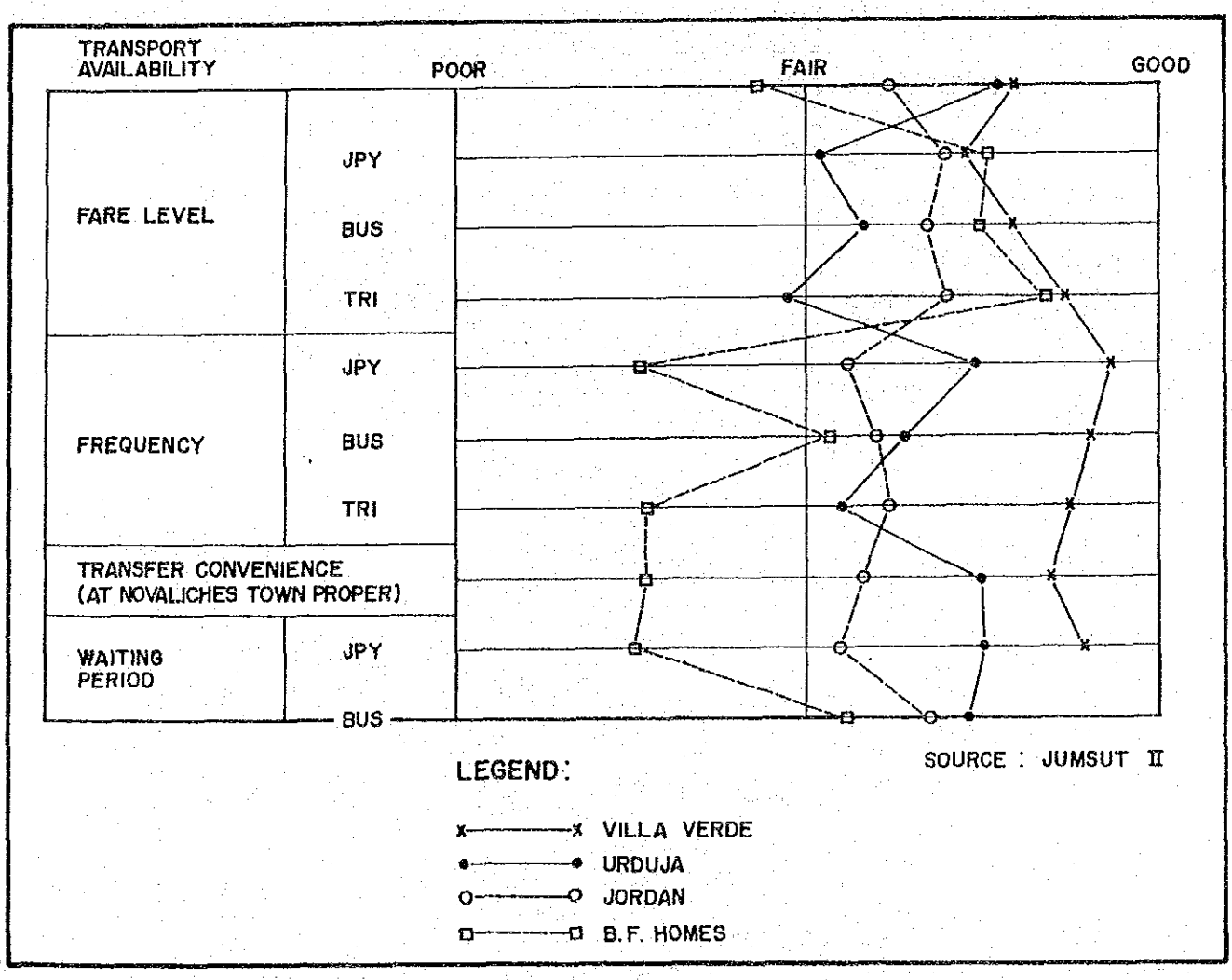
Subdivision	Sample Households	
	With Motorcycle	With Bicycle
Urduja	95.0	65.3
B.F. Homes	90.3	56.5
Villa Verde	60.0	78.0
Jordan	93.6	74.5
Total	86.9	67.3

2.3 PUBLIC TRANSPORT SERVICE

Opinions of present conditions of the Novaliches public transport service were also solicited from the sample households. Rating of this service is based on five criteria, namely: 1) availability of public transportation, 2) fare levels of the different types of transport modes, 3) frequency of transport modes, 4) transfer convenience at Novaliches town proper, and 5) waiting period.

The results of the above rating per subdivision is illustrated in Figure 1. In terms of the above set of criteria, only BF Homes residents gave a low rating of their public transport service while those in the rest of the selected subdivisions rated it between good and fair. Moreover, Villa Verde seems to be enjoying a more efficient service.

Figure 1
Perceived Convenience of Public Transportation



2.4 TRIP CHARACTERISTICS

2.4.1 Trip Makers

The number of persons who actually made trips from/to their respective subdivisions is 901 persons (see Table 5). This means that out of the 260 sample households, at least 3.51 persons per household have travelled outside of their subdivisions.

Data on the number of trip makers per subdivision show that Urduja has the highest share (38.5%) followed by Villa Verde (22.9%), BF Homes (22.9%), and Jordan (16.1%).

Table 5
Trip Makers

Subdivision	Trip Makers		Ave. No. of Trip Makers/household
	No.	%	
Urduja	347	38.5	3.54
B.F. Homes	206	22.9	3.32
Villa Verde	206	22.9	4.12
Jordan	142	15.8	3.02
Total	901	100.0	3.51

2.4.2 Trip Rate

The total number of trips captured in the survey for all four subdivisions is 1,859 (see Table 6). This would mean that a person made an average of 1.21 trips based on the total number of sample household members or an average of 2.07 trips based on the number of trip makers.

Average trip rate is highest in Villa Verde subdivision (1.57 trips per person) but BF Homes' trip makers had more trips with an average net trip rate of 2.14 per person.

Table 6
Trip Rates

Subdivision	No. of H.H. Members	No. of Trips	Average Trip Rate	No. of Trip Makers	Net Trip Rate 1/
Urduja	648	713	1.10	347	2.05
B.F. Homes	350	440	1.26	206	2.14
Villa Verde	262	411	1.57	206	2.00
Jordan	277	295	1.07	142	2.08
TOTAL	1,537	1,859	1.21	901	2.07

1/ Net trip rate is calculated against the total number of person who actually made the trips.

2.4.3 Trip Mode and Purpose

Total trips were further classified by mode and purpose for the study areas. Trips by mode indicate that the jeepney is the most preferred transport mode by all subdivisions except Villa Verde (see Table 7). The latter reflects high usage of private car/jeep owing to its high car-ownership rate of upper household income bracket. The standard bus is the next and most preferred mode among the public transport modes.

A substantial number of trips from the subdivisions are usually "To Work" and "To School" trips (see Table 8). A comparison of private purpose, trips (includes medical, social, shopping, recreation, eating, church, etc.) across the surveyed subdivisions show that Villa Verde generated a considerable number of trips for this purpose, accounting for 17.0% of its total trips. On the whole, "To Home" trips have the largest percentage shares ranging from 48.6% to 49.9% of total trips made.

Table 7
Trips by Mode (%)

Mode	Subdivision			
	Urduja	B.F. Homes	Villa Verde	Jordan
Walk/Motorcycle	5.3	1.1	11.4	9.8
Tricycle	0.1	0.9	15.3	6.4
Jeepney	61.9	50.2	17.8	42.4
Mini-Bus	1.1	0.0	0.0	0.0
Standard Bus	15.0	22.5	13.9	13.9
Taxi	0.0	0.2	0.0	0.7
Car/Jeep	11.4	18.9	38.7	13.9
Van/Truck	0.4	0.0	0.0	2.0
Others	4.8	6.1	2.9	10.9
Total 1/	713	440	411	295

1/ Figures are in absolute number of trips by mode.

Table 8
Trips by Purpose (%)

Trip Purpose	Subdivision			
	Urduja	B.F. Homes	Villa Verde	Jordan
To Home	49.9	48.6	49.4	49.8
To Work	23.9	24.1	21.7	19.3
To School	22.4	19.8	11.9	23.4
Private	3.7	5.2	17.0	6.8
Business	0.3	2.3	0.0	0.7
Others	0.1	0.0	0.0	0.0
Total 1/	713	440	411	295

1/ Figures are in absolute number of trips by purpose.

2.4.4 Trip Flow

Both trips generated and attracted to/by the study areas by trip types indicate that a considerable number of trips are made between the subdivisions and Metro Manila with modal transfer at Novaliches town proper (see Tables 9 and 10). The percentage shares of these trips to total are 56.8% and 57.6%, respectively.

2.4.5 Modal Transfer

The number of modal transfers encountered by the trip makers was also captured in the survey. The efficiency of present public transport routes by area can be deduced from the results presented in Table 11. As supported by previous findings, most of the households of Villa Verde are enjoying the convenience of a non-transfer ride (86.9% of total trip makers). This can be attributed to the subdivision's proximity to the Novaliches town proper where many routes converge and to its high car-ownership rate. It seems that the farther the households are from the town proper, the more transfers they are likely to make.

The trips with and without any transfer were further dissected by mode (see Tables 12 and 13). On the whole, non-transfer trips are naturally highest by cars (35.7%), while trips with transfers are highest by jeepneys (74.5%).

Table 9
Trip Generation by Trip Type (%)

Subdivision	Trip Type[1/]				
	1	2	3	4	5
Urduja	16.9	14.3	65.3	1.5	2.0
B.F. Homes	15.1	16.9	64.3	0.0	4.0
Villa Verde	25.7	39.0	35.2	0.0	0.0
Jordan	19.4	18.8	59.7	0.0	2.1
Total[2/]	171	193	509	5	18
(%)	(19.1)	(21.5)	(56.8)	(0.6)	(2.0)

1/ Trip types are: 1 - trips between subdivision and Novaliches town proper (NTP); 2 - NTP through trips from subdivision to Metro Manila; 3 - trips between subdivision and Metro Manila with modal transfer at NTP; 4 - trips between subdivision and Metro Manila but with other activity at NTP; 5 - trips between subdivision and other places without passing through NTP.

2/ Figures are in absolute number of persons who travelled.

Table 10
Trip Attraction of Trip Type (%)

Subdivision	Trip Type[1/]				
	1	2	3	4	5
Urduja	17.2	12.5	66.5	0.3	3.5
B.F. Homes	15.1	16.6	64.3	0.0	4.0
Villa Verde	25.7	39.0	35.2	0.0	0.0
Urduja	19.4	18.8	59.7	0.0	2.1
Total[2/]	171	185	516	1	23
(%)	(19.1)	(20.6)	(57.6	(0.1)	(2.6)

1/ Trip types are : 1 - trips between subdivision and Novaliches town proper (NTP); 2 - NTP through trips from Subdivision to Metro Manila; 3 - trips between subdivision and Metro Manila with modal transfer at NTP ; 4 - trips between subdivision and Metro Manila but with other activity at NTP ; 5 - trips between subdivision and other places without passing through NTP.

2/ Figures are in absolute number of persons who travelled!

Table 11
Rate of Transfers (%)

Subdivision	Number of Transfers							
	Trip Attraction				Trip Generation			
	0	1	2	3	0	1	2	3
Urduja	35.2	24.5	37.5	2.9	34.9	24.7	37.5	2.9
B.F. Homes	34.0	36.4	24.8	4.9	35.5	35.5	25.3	3.9
Villa Verde	86.9	11.7	1.5	0.0	86.9	11.7	1.5	0.0
Jordan	46.5	40.9	12.0	0.7	49.3	37.4	12.7	0.7
Total	48.6	26.9	22.3	2.4	49.3	26.2	22.5	2.2

Table 12
Rate of Non-Tranfser Trips by Mode (%)

Subdivision	MODE							
	Walk	Motor-cycle	Bicycle	Car	Tri-cycle	Jeep-ney	Bus	Others
Urduja	14.3	1.6	0.0	30.2	0.0	38.9	0.0	15.1
B.F. Homes	2.8	0.0	1.4	41.1	2.8	32.9	0.0	19.2
Villa Verde	13.3	1.2	0.0	44.9	14.4	6.4	17.3	2.9
Jordan	17.0	0.0	0.0	11.4	13.2	24.6	22.7	11.4
Total	12.2	1.0	0.3	35.7	8.0	22.8	9.9	10.4

Table 13
Rate of Transfer Trips by Mode (%)

Subdivision	MODE				
	Jeep-ney	Bus	Mini Bus	Tri-cycle	Others
Urduja	80.8	14.1	2.0	2.6	0.5
B.F. Homes	79.6	19.4	0.3	0.7	0.0
Villa Verde	60.5	10.5	0.0	29.0	0.0
Jordan	47.2	18.3	0.0	34.5	0.0
Total	74.5	15.8	1.1	8.2	0.4

Appendix A.2
Bus and Jeepney Characteristics of Novaliches Mode Interchange Area

Route Name	Route No. 1/	No. of Units	Frequency		Route Confirmation 2/		Remarks
			16 Hours	A.M. Peak Hour	JUMSUT I	JUMSUT II	
A. INTRA-CITY JEEPNEY							
Terminating Routes							
1. via Quirino Highway							
(a) Southbound							
- Balintawak-Novaliches	153	29	176	22	0	0	
- Blumentritt-Novaliches	152	435	2,093	261	0	0	
- Katipunan-Novaliches	462	4	17	2	0	not existing	They cut their route up to Tandang Sora only
- Novaliches-Pier	603	4	7	2	0	not existing	They cut their route: Blumentritt-Pier
- Morayta-Novaliches	591	7	31	7	0	not existing	They cut their route: Blumentritt-Morayta
(b) Northbound							
- Amparo-Novaliches	41	5	51	2	0	0	
- Novaliches-Lagro	512	43	405	13	0	0	
- Novaliches-Constellation		6	42		0	0	Illegal route
- Novaliches-Tala	597	12	106	3	0	0	
- Blumentritt-Zabarte	196	31	2	0	0	cutting trip	Novaliches-Blumentritt
- Blumentritt-Tala	194	12	26	2	0	cutting trip	Novaliches-Blumentritt
- Blumentritt-La Mesa Dam	193	7	26	2	0	cutting trip	Novaliches-Blumentritt
- Amparo-Balintawak	38	60	19	4	0	MP only	Amparo-Novaliches
- Blumentritt-Lagro	154	8	25	2	0	cutting trip	Novaliches-Lagro
- Balintawak-Lagro	198	81	43	0	0	cutting trip	Novaliches-Lagro
- Amparo-Blumentritt	39	7	15	0	0	cutting trip	Novaliches-Amparo
2. via Susano Road							
(a) North							
- Bagumbong-Novaliches	61	10	120	2	0	0	
- Urduja-Novaliches	595	7	121	17	0	0	
- B.F. Homes-Novaliches	145	9	145	21	0	0	
- Novaliches-Camarin	234	33	345	23	0	0	
- Novaliches-Bagong Silang		61	183			0	new route under OTC
- Novaliches-Brixton Libis		49	157			0	Illegal route
- Novaliches-Area B C D		30	120			0	Illegal route
- Novaliches-Congress Sampaguita Saranay Shelter Rainbow		18	54			0	Illegal route
- Novaliches-Urduja	191	4	18		0	cutting trip	Novaliches-Urduja

Appendix 2.2 cont'd

Route Name	Route No. 1/	No. of Units	Frequency		Route Confirmation 2/		Remarks
			16 Hours	A.M. Peak Hour	JUMSUT I	JUMSUT II	
B. INTER-CITY JEEPNEY							
Terminating Routes 3/							
1. via Gen. Luis							
(a) Northbound							
- Francisco-Novaliches		10	50			0	Illegal route
- Novaliches-San Jose del Monte	596	18	181	12	0	0	
- Blumentritt-San Jose del Monte	208	18	48	5	0	MP only	Off-peak & PM Peak: Novaliches-San Jose
- Blumentritt-Grotto	192	8	16	2	0	MP only	Off-peak & PM Peak Novaliches-Grotto
- Balintawak-San Jose del Monte	195	17	35	3	0	MP only	Off-peak & PM Peak Novaliches-San Jose
- Balintawak-Grotto	186	9	10	2	0	MP only	Off-peak & PM Peak Novaliches-Grotto
C. INTRA-CITY BUS							
Terminating Routes							
1. via Quirino Highway							
- Novaliches-Philtrade	119	29		4	0	0	
- Novaliches-Baclaran	120	88		23	0	0	
- Baclaran-Novaliches		60				Additional	Old Pasvil
- Novaliches-Alabang	64	76		8	0	0	
- Novaliches-Alabang	65	161			0	0	
Passing Through Routes							
1. via Quirino Highway							
- Bagong Silang-Baclaran		10				0	Pasvil MMTC
2. via Expressway							
D. INTER-CITY BUS							
Passing Through Routes							
1. via Expressway							
- Sapang Palay-Ayala	11	22	33	2	0	0	
- Sapang Palay-Sta. Cruz	12	22	25	5	0	0	
- Ayala-Francisco Home	15	9	17	1	0	0	
- FTI-Sapang Palay	16	8	6	2	0	0	
- Ayala-Francisco Home	21	16	14	1	0	0	
- Sapang Palay-Cubao	25	33	37	5	0	0	
- Sapang Palay-Ayala	41	28	22	3	0	0	
- Sapang Palay-Sta. Cruz	81	184	330	43	0	0	Mini-bus

0 route exists
MP morning peak
1/ for reference to JUMSUT I
2/ route confirmation as to status from JUMSUT I
3/ terminating at Novaliches

Appendix A.3
Characteristics of Jeepney Operation in the Novaliches Study Area

	Northbound		Northbound Subdivision	Malinta	Average
	Intra	Inter			
No. of Round Trips/Day	7.0	3.1	4.3	3.0	4.4
Working Hours/Day	14.6	14.6	14.7	14.5	14.6
No. of Working days/week (by driver)	5.0	5.9	4.5	5.0	5.1
No. of Drivers Assigned to this vehichle	1.6	1.1	1.7	1.8	1.6
No. of operating days of this vehicle for the last week	4.4	4.9	4.3	2.8	4.1
Average Daily Revenue (Pesos) *Weekdays	280.50	295.00	203.60	209.80	247.20
*Holidays	315.70	345.70	218.90	217.10	274.40
Average Expenses/ Day (Pesos)	206.30	224.0	182.80	203.0	204.50
• Boundary	90.80	104.30	81.80	103.30	95.10
• Fuel & Oil	104.60	112.60	93.10	95.80	101.50
• Association	2.10	2.00	1.00	1.00	1.50
• Dispatcher	6.20	6.00	2.80	1.50	4.10
• Others	2.60	-	4.10	2.30	2.30
Net Income/Day	99.80	70.70	46.50	35.00	63.00
Net Income/Day (Calculated) *Weekdays	74.20	70.10	20.80	5.96	42.90
*Holidays	109.40	120.80	36.00	13.2	69.90

Source: JUMSUT II

Appendix A.4
Chracteristics of Tricycle Opeation in Novaliches Study Area

	Tricycle Terminal							
	Quirino	G. Luis	Susano Road	Jordan	Villa Verde	Millioner	Rosario	Average
No. of Round Trips/Day	3.3	18.0	18.7	6.3	6.3	9.8	20.0	11.8
Working Hours/Day	7.9	14.0	13.0	15.0	15.8	13.3	14.2	13.3
No. of Working Days/Week (by driver)	6.9	6.0	5.7	6.7	6.0	5.2	5.2	6.0
No. of Drivers assigned to this tricycle	1.0	1.2	1.7	1.0	1.3	1.3	1.2	1.2
No. of Operational Days/Week (by vehicle)	6.9	3.5	5.7	5.7	6.0	5.5	6.2	5.6
Average Daily Revenue (Pesos) *Weekdays	119.20	72.00	106.00	129.80	114.80	98.00	94.60	105.00
*Holidays	112.40	83.00	137.00	129.80	116.50	121.80	88.00	114.10
Average Expenses/Day	90.70	65.00	72.70	104.30	76.50	73.20	66.30	78.40
• Boundary	25.00	25.00	20.70	25.00	16.70	20.00	23.30	22.20
• Fuel & Oil	64.20	34.00	48.00	78.30	58.30	49.20	40.00	53.10
• Association	-	3.00	-	1.00	1.50	1.30	1.00	1.60
• Others	1.50	3.00	4.00	-	-	2.70	2.00	2.60
Net Income/Day	35.00	37.00	33.30	41.70	38.30	25.80	29.20	34.30
Net Income/Day (Calculated) *Weekday	29.00	7.00	33.30	25.50	28.30	24.80	28.30	26.60
*Holiday	31.70	18.00	64.30		40.00	48.00	21.70	35.70
Remarks	Town Proper Service	Town Proper Service	Town Proper/ Sub-division Service	Sub-division Service	Sub-division Service	Sub-division Service	Sub-division Service	

Source: JUMSUT II