

4.1.2 Problems

An analysis of Divisoria as mode interchange area brings up the following problems:

A. Traffic Management Component

- 1) Functional role of roads, (e.g., C. M. Recto) is not realized due to multiple usage of road space.
- 2) Pedestrians are exposed to unnecessary risks, due to lack of or misuse of pedestrian facilities.
- 3) On-street vendors dominate roads (e.g., Ylaya) as to displace through vehicular traffic.
- 4) Malfunctioning of traffic signals at congested intersections.
- 5) Negligent enforcement of elementary traffic rules.
- 6) Illegal parking which takes up valuable lanes for moving traffic.
- 7) Sidestreets blocked by pushcarts and delivery trucks, especially near the Divisoria and Asuncion markets.

B. Public Transport Component

- 1) Intermingled jeepney routes that complicates turning movements along C. M. Recto.
- 2) Disregard of median line with the occupancy of both lanes by opposing vehicles as a queue at C. M. Recto (in front of Tutuban Station).
- 3) Slow-moving calesas and pushcarts mixing with fast-moving vehicles.
- 4) Transfer passengers are dispersed over a wide area due to the scattered locations of various terminal functions. Off-street terminal space is inadequate.
- 5) The only available terminal space (Tutuban) is not efficiently used by the greater number of terminal users.

C. Road Component

- 1) Constricted opening of C. M. Recto to R-10 severely limits road capacity for through traffic.
- 2) Road pavements and drainage are in poor conditions.
- 3) Primary and secondary road network (which include C. M. Recto, Juan Luna, and Moriones) are inconsistent with the physical and logical distribution of traffic.

Table 4.1
Transport System: Problems and Solutions

	PROBLEM STATEMENT	DISCUSSIONS	POSSIBLE SOLUTIONS
TRAFFIC MANAGEMENT COMPONENT	<ul style="list-style-type: none"> • Recurring conflict between pedestrians and through traffic • Inadequate pedestrian facilities coupled with unruly behavior at street crossing • Street vendors rather than pedestrians use the sidewalks • Impassable road due to occupancy by vendors • Lack of traffic signals that control critical intersections, and a number of existing ones are not functioning • Weak traffic enforcement and, when available, adds to the confusion • Lack of off-road parking space • Passable road space usurped by on-road parking 	<ul style="list-style-type: none"> • Unrelenting congestion exist along C.M. Recto between J. Luna and Dagupan because of: <ul style="list-style-type: none"> • Mixture of pedestrians and vehicles • Through traffic lane is usurped by jeepneys loading/unloading • Pedestrians on the carriageway are exposed to peril • Vehicles can not pass along Ylaya • Not functioning properly are signals at 3 intersections: C.M. Recto/A. Rivera, C.M. Recto/Dagupan and C.M. Recto/J. Luna • 3 additional signals are needed along C.M. Recto and 2 more along Moriones • Traffic flow mixture transpires due to the illegal jeepney U-turn at the intersection of C.M. Recto/Dagupan and C.M. Recto/J. Luna • Traffic police and aides ignore the pedestrians • On-road parking along outer lanes of streets in the whole area is evident 	<ul style="list-style-type: none"> • Rerouting of jeepney • Installation of traffic signals and pedestrian crossings • Prohibition of on-road activities of vendors • TEAM II evaluation of the installation of new traffic signals and the improvement in the phasing of existing ones • Installation of pedestrian signal • Training of traffic enforcers on proper management of signalized intersections and congested streets. • Designation of exclusive through traffic roads and designation of prohibited on-road parking areas • Development of off-road parking • Institution of ordinances on specifications for provisions of parking space in newly constructed buildings

Table 4.1 cont'd

PUBLIC TRANSPORT COMPONENT	PROBLEM STATEMENT	DISCUSSIONS	POSSIBLE SOLUTIONS
	<ul style="list-style-type: none"> • Passing through traffic obstructed by push carts • Through traffic lanes misused for goods delivery • Traffic congestion due to the convergence of jeepney routes at C.M. Recto between Dagupan and J. Luna. • Mixture of traffic flow because of the influx of U-turning jeepneys at the intersection of C.M. Recto/Asuncion. • Jeepneys approaching terminal cut in to the opposite lanes against the flow of traffic with the intention of avoiding the long queue. • Interruption of vehicle traffic flow by calesas. • Scattered P.T. terminals. • Lack of off-road P.T. terminal space. • Inefficient space utilization of PNR Tutuban Station. • Inefficient road space utilization of C.M. Recto between Asuncion and J. Luna. • Impeded through traffic in the side streets of the Divisoria area due to the disordered utilization of road space. 	<ul style="list-style-type: none"> • Occurs near Divisoria and Asuncion Market, and San Nicolas Area • Jeepneys slow down along C.M. Recto between Dagupan and J. Luna due to this predicament. • Smooth west-east through traffic flow is interrupted and traffic capacity at intersection is reduced. • This problem is identified for east bound lanes of C.M. Recto between A. Rivera and Dagupan. • This is an issue especially along C.M. Recto. • Transfer passengers are inconvenienced. • Jeepney occupancy of road space renders the road impassable for private vehicles. • Utilization of paid parking at Tutuban Station Plaza is low despite considerable space. • Road space utility is unchartered combining street vendor activity, vehicle parking space and P.T. terminal/turning points with through traffic. • Road space is occupied by vendors and on-road parked vehicles near Divisoria and Asuncion Market. 	<ul style="list-style-type: none"> • Proper designation of push cart zone near Divisoria and Asuncion Market • Endorsement of effective road space utilization • Jeepney rerouting. • Effective traffic management/enforcement entails training of jeepney drivers. • Proposal for a calesa-prohibited zone along the primary and secondary roads. • Construction of new mode interchange facilities. • Redevelopment/endorsement of effective space utilization of Tutuban Station. • Effective road space utilization of C.M. Recto. • Systematic utilization of side street network near Divisoria and Asuncion Market.

Table 4.1 cont'd

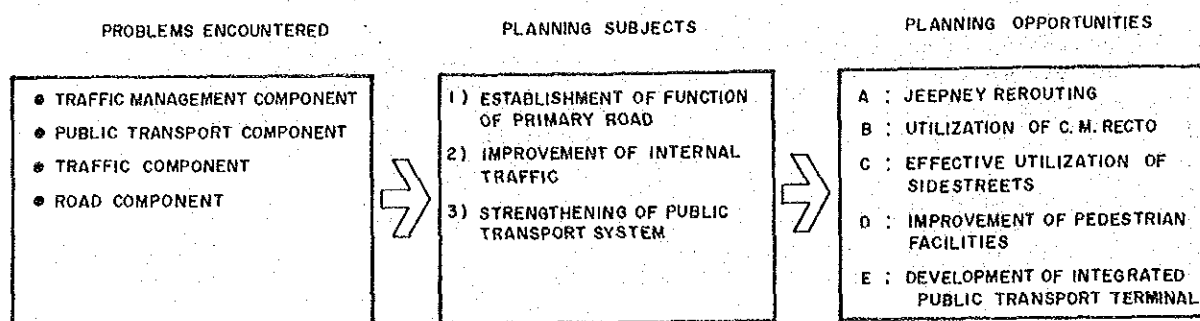
PROBLEM STATEMENT	DISCUSSIONS	POSSIBLE SOLUTIONS
<ul style="list-style-type: none"> ● Inconvenient access of freight. ● Reduction of passing through traffic due to the inadequate road section of C.M. Recto between R-10 and Asuncion. ● Deterioration of flooded road pavement/sections. ● Indistinct road hierarchy in the study area. 	<ul style="list-style-type: none"> ● Main access route of freight vehicles is Moriones and San Fernando in lieu of the inadequate road section of C.M. Recto. ● C.M. Recto between R-10 and Asuncion is not functioning properly as a circumferential road. ● Deterioration is caused by poor road maintenance and inadequate drainage, compounded by occasional flooding along Moriones. ● There is a need for secondary roads in the northern sector. ● J. Luna is not functioning properly as primary road due to the road congestion. 	<ul style="list-style-type: none"> ● Increase of road capacity by one-way couple of C.M. Recto and Asuncion-Zaragoza. ● Widening of C.M. Recto between R-10 and Asuncion to 4 lanes both ways. ● Rehabilitation of road surface ● Improvement of drainage system ● Upgrading of local roads, Asuncion, Lakandula, and Zamora to secondary roads. ● Improvement of road function of J. Luna by means of jeepney rerouting.

4.2 PLANNING OPPORTUNITIES

Planning opportunities are very few - without a policy decision on the urban role of Divisoria now and in the future. If the past is any gauge, then only some modest steps can be recommended:

- Jeepney rerouting
- Better utilization of C. M. Recto
- Redefinition of role and function of sidestreets
- Improvement of pedestrian facilities

Figure 4.1
Planning Direction for Divisoria MIA



Over the long-term, the development of an integrated public transport terminal must be addressed as the key to the resurgence of Divisoria.

4.2.1 Jeepney Rerouting

Predicated on the route structure of Divisoria-bound jeepneys, a basic rerouting scheme can be visualized as in Figure 4.2.

In the short-term period, patterns 1 and 2 are suitable, mainly as a relief to existing bottleneck. Over the long horizon, and in conjunction with the development of a mode-interchange facility, pattern 3 becomes attractive.

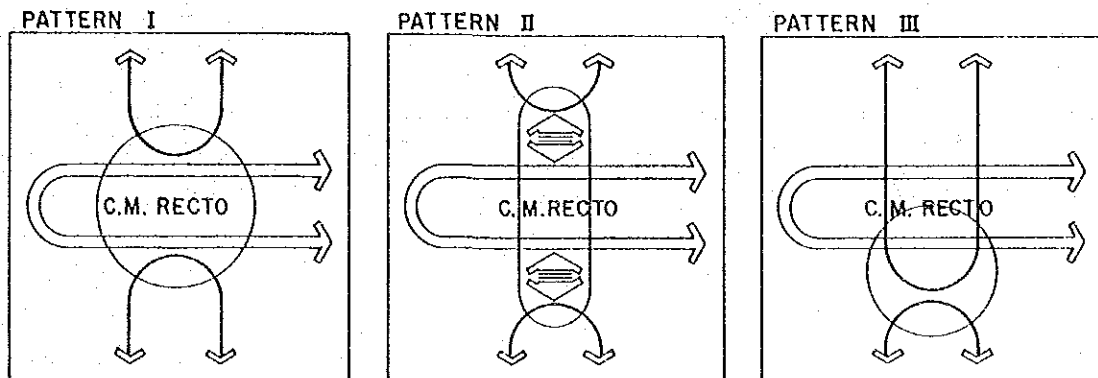
Simplification of routes lead to their classification into eight (8) types:

- A1 : Eastbound Terminating Jeepneys via C. M. Recto, A. Rivera
- A2 : Northbound Terminating Jeepney
- A3 : Southbound Terminating Jeepney via J. Luna

- A4 : Tayuman/North Harbor Terminating Jeepneys
- A5 : C.B.D. Bound Terminating Jeepneys
- A6 : Southbound Terminating Jeepneys via Del Pan
- A7 : Jeepney Running Counter to the On-coming Vehicles at C. M. Recto
- A8 : Creation of a New Route

Note that passing through jeepney routes were abolished by MOTC.

Figure 4.2
Basic Concept of Jeepney Rerouting in Divisoria
Mode Interchange Area



4.2.2 Better Utilization of C. M. Recto

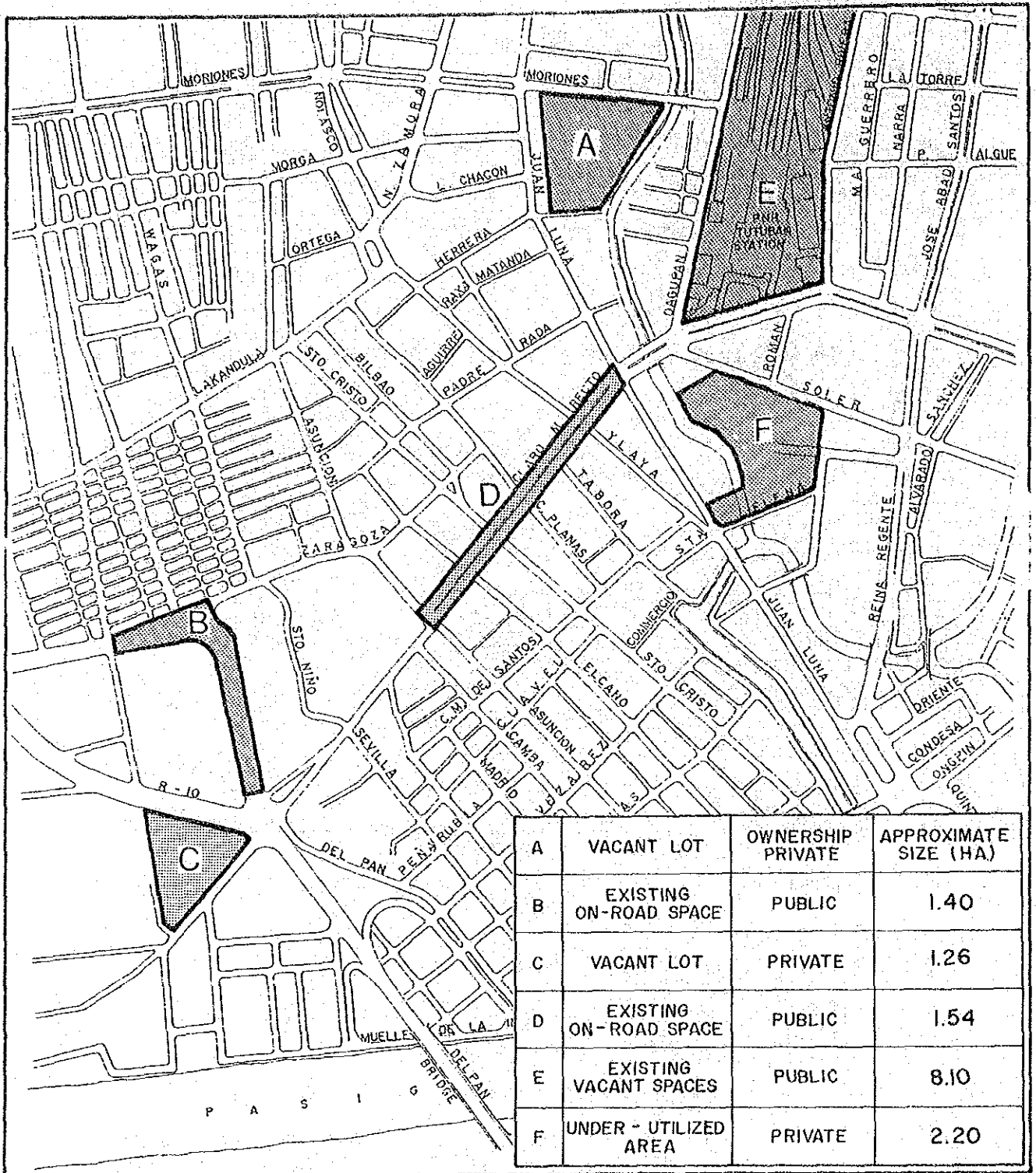
Proposals for relieving some of the problems in C. M. Recto fall into two categories:

- B1 : C. M. Recto from Asuncion to Juan Luna

Steps can be confined to the existing structure and requires management of public transportation, vending, and private car parking on the existing carriageway.

- B2 : C. M. Recto from Asuncion to R-10

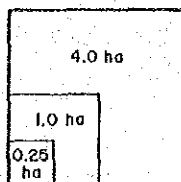
Existing facilities are adequate for 12,000 vehicles; however, traffic demand may go up to 56,000. This volume can only be handled through additional capacity via street widening and use of one-way couples.



LEGEND:



ALTERNATIVE AREAS FOR DEVELOPMENT OF MODE INTERCHANGE FACILITY



0 50 100 300 M

Figure 4.3
Alternative Areas for
Development of Mode
Interchange Facility

B3 : C. M. Recto from A. Rivera at R-10

From a long-term viewpoint, construction of flyover will directly benefit the large amount of potential through-traffic without affecting any terminal and commercial activities in Divisoria.

4.2.3 Redefinition of the Roles and Functions of the Sidestreets

Actual use should conform to road location, geometry, and economic needs. Every square inch of Divisoria is to be maximized but this requires difficult trade-offs between conflicting requirements.

To effect the preceding proposal, the following steps are considered essential:

- a) Construction of a secondary road in the northern area of C. M. Recto.
- b) Establishment of an access route from C. M. Recto to the southern sector of Divisoria. San Fernando is used as the only access from the south for commodity distribution because of impassable and inundated sidestreets.
- c) Satisfaction of parking demand (1,800 vehicles) elsewhere and restricting on-road parking.
- d) Mitigation of C. M. Recto's congestion by dispersing partly public transport to the sidestreets. This requires the strengthening of the south-north sidestreets network (perpendicular to C. M. Recto).

4.2.4 Improvement of Pedestrian Facilities

C. M. Recto also acts as a transport convergence point and transfer zone. As such, pedestrian activity is heavy. Deficient pedestrian facilities exacerbate traffic congestion.

Provision of pedestrian facilities to enhance safety and minimize conflicts with vehicles include the following steps:

- a) Repair of pedestrian signals
- b) Stricter enforcement
- c) Freeing the sidewalks from vendors
- d) Construction of overhead pedestrian walkways integrated with the commercial buildings

The spill-over of pedestrians into the main carriageway of C. M. Recto may not be dangerous owing to the marked slow-down in vehicle speed. Pavement of sidewalk, however, are in poor condition. Rehabilitation of pedestrian amenities is needed before they can be induced away from the carriageway. The possibility of a pedestrian mall appears worthy of exploring.

4.2.5 Development of Integrated Public Transport Terminals

Eventual resolution of the traffic and transport problems of Divisoria inevitably leads to a serious consideration of an integrated transport terminal. Integration of the various facets of mode interchange activities in one properly-designed location is imperative.

The latter will fill up the current shortage of off-street lay-over and parking areas for public transport vehicles. Vacant and less-efficiently used land areas, as shown in Figure 4.3, will be examined later to select the most feasible site for such a mode interchange facility.

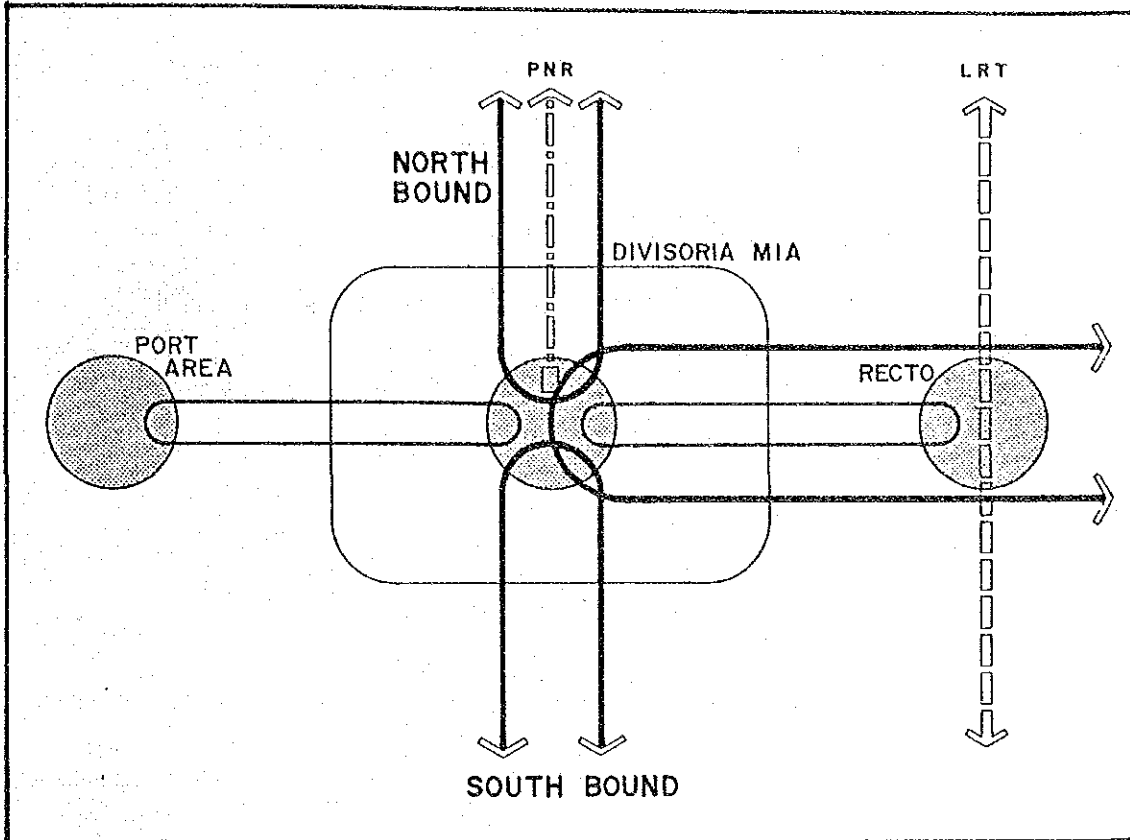
PNR Tutuban Station Compound eventually would provide a large potential area for further expansion of the Divisoria area as well as for strengthening of the urban transportation network and mode interchange function.

The existing CBD has been heavily developed, congested and getting to lose competitive power against other growth centers. Revival of the area will be difficult but an important aspect from the viewpoint of overall urban development of Metro Manila. The LRT would contribute considerably to the improvement of accessibility, while the OBA development would create additional attractiveness and activity opportunities. The existing vast underutilized PNR compound would be able to satisfy both urban development and transportation aspects as is conceptually shown in Figure 4.4. The plan includes the following tasks:

- a) To define specifically the area required for PNR operation to avail the remaining space for more efficient use.
- b) To provide a couple of good road links between C-2 C. M. Recto by widening the existing roads (Dagupan and Antonio Rivera, etc.) towards the PNR compound.
- c) To develop a new link within the PNR compound and improve/construct the roads in the adjoining areas to connect major radial roads (R10, J. Luna, J. A. Santos, Rizal Avenue, and Quezon Avenue).
- d) To develop integrated mode interchange facilities in the compound of which intermodal functions are conceptually shown in Figure 4.5.
- e) To improve necessary infrastructure to sell lots for private sectors, after defining specifically the use and function of vast area becoming available in PNR compound.

An alternative concept plan can be enumerated on the assumption that PNR commuter service would be extended towards Port Area via C. M. Recto which will form a part of loop route linking Tutuban, Port Area and Blumentritt. Otherwise, the same concept of the development for the PNR Compound can be applied.

Figure 4.4
Concept of Intermodal Relations at the Proposed
PNR Mode Interchange Facilities



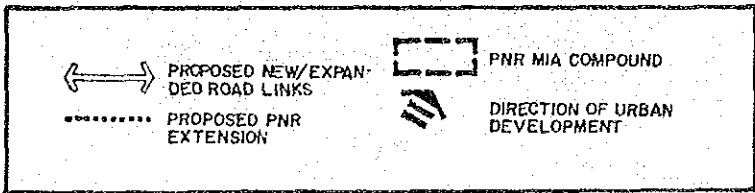
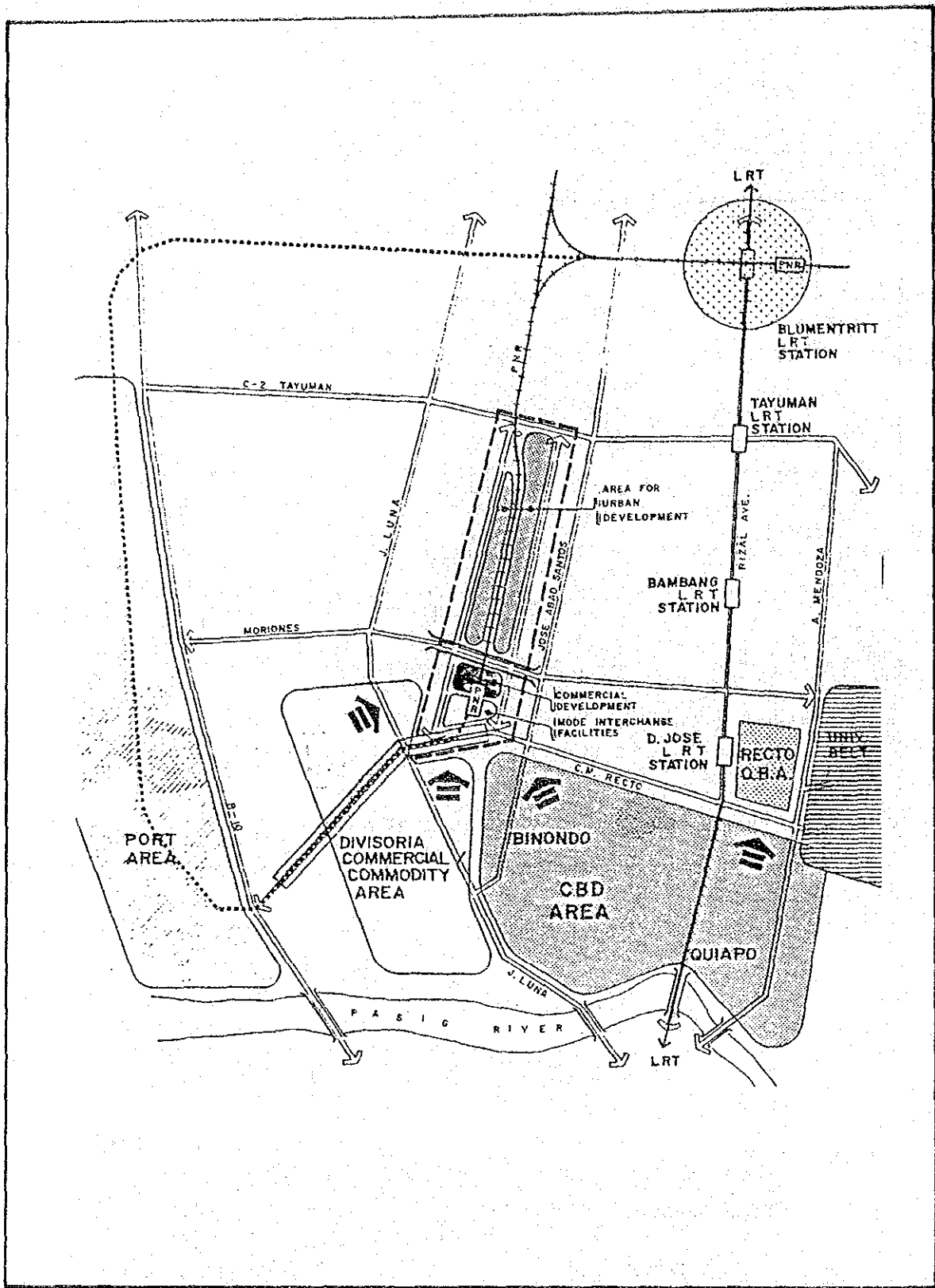


Figure 4.5
Development Concept
of PNR Compound
as New Urban Core

4.3 IMPLEMENTATION PACKAGE

4.3.1 Basic Considerations for the Short-term, Mid-term and Long-Term Actions

The planning parameters developed by JUMSUT II were delivered from a thorough review of existing plans and past studies, reinforced by additional topical surveys and investigations. Instead of defining solution alternatives on the assumption that the transportation sector is the most critical, the approach taken was to consider all proposals from various sectors as competing alternatives on the same footing initially. Thus, from a system analysis of the situation in Divisoria, a harmonious combination of seemingly separate but integrated solutions have been prescribed. It is from this perspective that the JUMSUT II specific recommendations on public transport improvements and mode interchange facilities should be viewed. They can not stand alone. Corollarily, the other proposals not inconsistent with the resultant overall plan can be endorsed or revised accordingly. For ease of implementation all these correlative measures have been grouped into short, mid- and long-term actions.

The basic consideration for the short, mid- and long term actions are as follows:

Short-term

- Some measure of improvement from minimum actions
- Action are not expected to affect current industrial activities in the area
- Rerouting and traffic management

Mid-term

- Larger measure of improvement expected
- Continuity of and consistency with short-term actions
- Actions will direct the industrial activities in the study area, e.g., widening of C. M. Recto.

Long-term

- Includes a more comprehensive and progressive approach
- Actions will initiate industrial activities in the study area, e.g., development of integrated mode interchange facility

4.3.2 Evaluation and Screening

The numerous options available for Divisoria have to be narrowed down systematically into a few viable alternatives. A set of criteria for evaluation and screening were adopted, viz.:

Screening Factors

- Technical viability and traffic engineering coherence
- Acceptability to the principal implementors or sponsors

Preference Factors

- Lease cost projects/options
- Public transport vehicles and users as the beneficiaries
- Least complicated solutions
- Minimum government intervention

The reasons for the above two categorization of evaluation factors is the fact that some of the alternatives are not mutually exclusive choices.

4.3.3 Agenda for Short-term, Mid-term and Long-term Actions

Table 4.2 summarizes JUMSUT II's Divisoria MIA package of recommendations under various categories and schedules. Each package is shown in Figures 4.6 to 4.10.

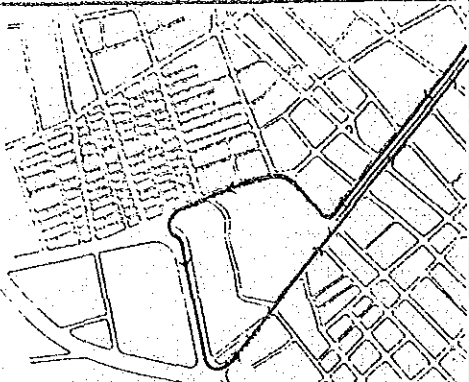
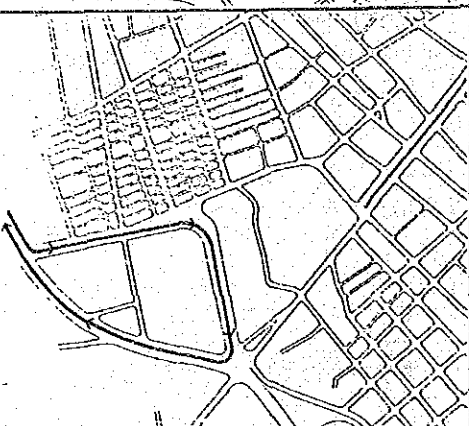
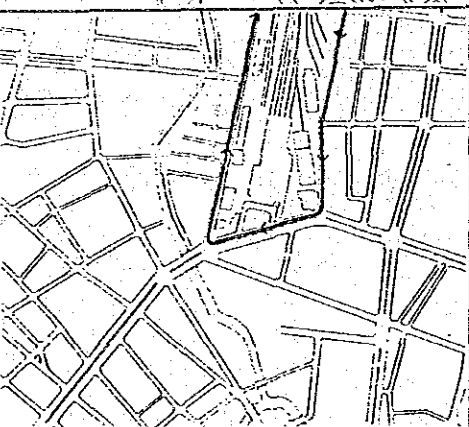
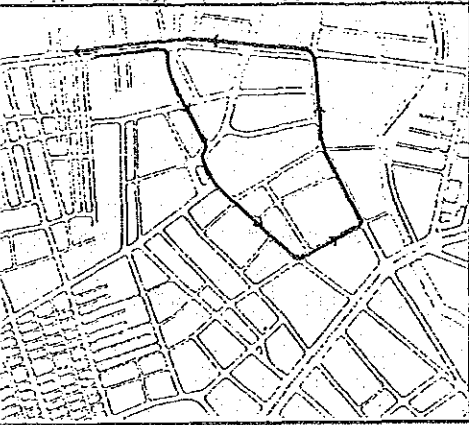
Table 4.2
Recommended Actions for the Divisoria
Mode Interchange Area

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	● A101	→	○ A. RIVERA ROUTE
A-2 NORTHBOUND TERMINATING JEEPNEYS	● A201	→	○
A-3 SOUTHBOUND TERMINATING JEEPNEYS	NA	● A301	○
A-4 TAYUMAN/NORTH HARBOR TERMINATING JEEPNEYS	● A401 A402	→ ●	○
A-5 CBD BOUND TERMINATING JEEPNEYS	A501	→	○
A-6 SOUTHBOUND TERMINATING JEEPNEYS VIA DEL PAN	A601	→	→
A-7 JEEPNEYS RUNNING COUNTER TO ONCOMING VEHICLE AT C. M. RECTO	● A701	→	→
A-3 CREATION OF NEW ROUTE	● A901	→	→
B. BETTER UTILIZATION OF C. M. RECTO	● B01 B02	→ ● B03 B04	● 1/ B05
C. EFFECTIVE USE OF SIDE STREETS	NA	●	→
D. IMPROVEMENT OF PEDESTRIAN FACILITIES	●	→ ●	→
E. DEVELOPMENT OF INTEGRATED PUBLIC TRANSPORT TERMINALS	● E01		● 1/ E03

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/ UTILIZATION SHOULD BE REVIEWED, THE REALIZATION OF WHICH IS BOY.
- 2/ WIDENING OF MORIONES BETWEEN J. LUNA AND DAGUPAN IMPERATIVE TO THE DEVELOPMENT OF AN INTEGRATED PUBLIC TRANSPORT TERMINAL AT TUTUBAN.

REROUTING OF JEEPNEYS : SHORT - TERM ACTIONS

SHORT - TERM	A101		<p>Rerouting of eastbound terminating jeepney via C.M. Recto</p> <ul style="list-style-type: none"> • Rerouting to one-way route of Asuncion, Zaragoza, Del Pan from U-turn at C.M. Recto/Asuncion. • Decrease in traffic flow mix at intersection. • Convenience of transfer from Asuncion market
	A201		<p>Decentralization of northbound terminating routes</p> <ul style="list-style-type: none"> • Existing frequency is 6,700/16 hr. Decentralization would relieve congestions at P. Rada and Ylaya. • Large capacity of R-10 will be utilized. • Terminal at Del Pan will be taken advantage of.
	A401		<p>Restructuring of Tayuman U-turn (at Dagupan) Route to Loop Route</p> <ul style="list-style-type: none"> • Smooth traffic flow along Dagupan and Dagupan/C.M. Recto intersection because of elimination of U-turning.
	A402		<p>Rerouting of North Harbor (via Moriones) Jeepneys</p> <ul style="list-style-type: none"> • Decrease in traffic volume along Dagupan. • Alleviated traffic congestion at C.M. Recto/Dagupan intersection.

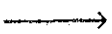
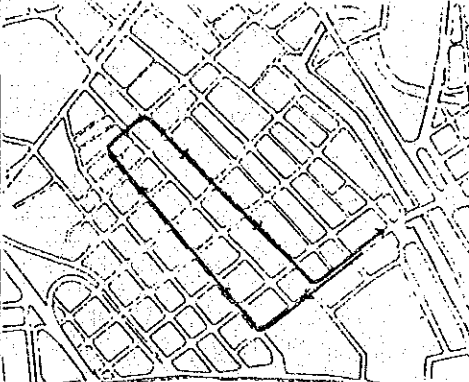

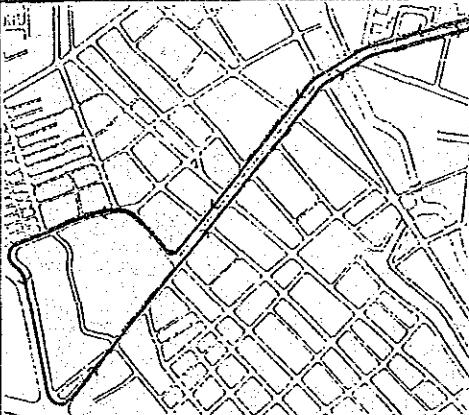
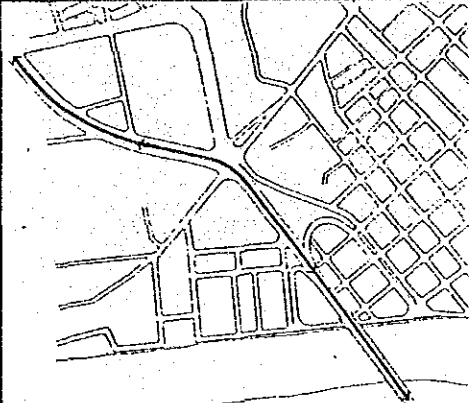
LEGEND:
 JEEPNEY ROUTE

Figure 4.6
 Rerouting of Jeepneys:
 Short-term Actions

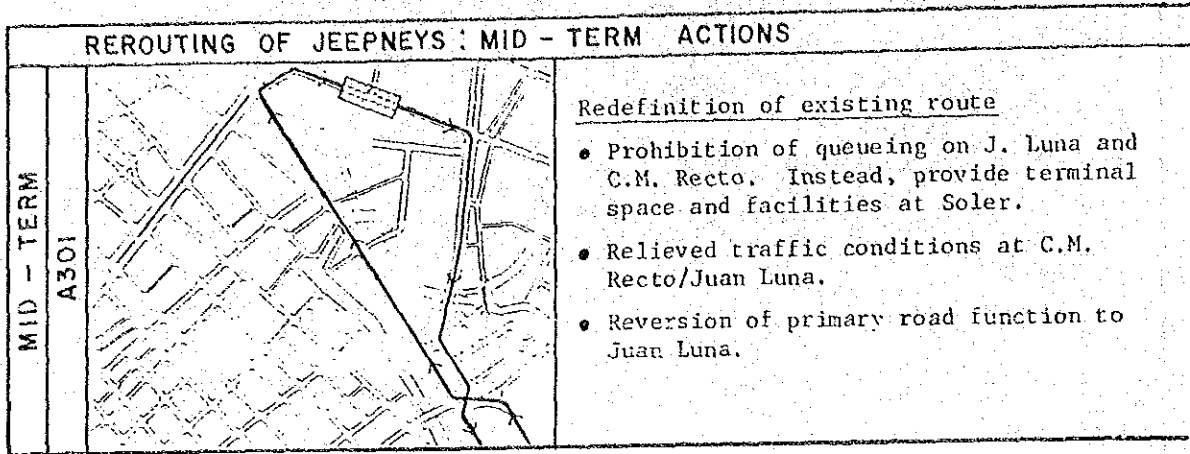
REROUTING OF JEEPNEYS : SHORT - TERM ACTIONS	
A501	 <p>Rerouting CBD bound jeepneys to avoid C.M. Recto</p> <ul style="list-style-type: none"> • Turning at C.M. de Santos. • Decrease in traffic volume at C.M. Recto/Asuncion intersection.
A601	 <p><u>Rerouting of Southbound Route</u></p> <ul style="list-style-type: none"> • Reroute southbound route via Del Pan to Asuncion and Zaragoza with one-way system. • Simple traffic flow at intersection.
A701	 <p><u>Back to the Original Route</u></p> <ul style="list-style-type: none"> • Decrease in traffic congestion due to elimination of U-turning at C.M. Recto/Soler. • Geometric restructuring of C.M. Recto median at A. Rivera for channelization and strict implementation necessary to eliminate risks of jeepneys going against the traffic flow.
A801	 <p><u>Creation of a new route</u></p> <ul style="list-style-type: none"> • Increased transfer passenger convenience. • Access to/from either sector of C.M. Recto.

LEGEND:

→ JEEPNEY ROUTE

Figure 4.6
Rerouting of Jeepneys:
Short-term Actions

Figure 4.6
Rerouting of Jeepneys
Mid-term Actions

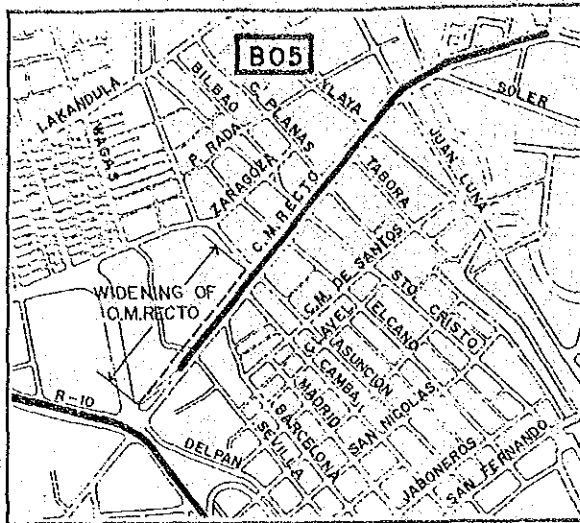


BETTER UTILIZATION OF C.M. RECTO: SHORT-TERM AND MID-TERM ACTIONS

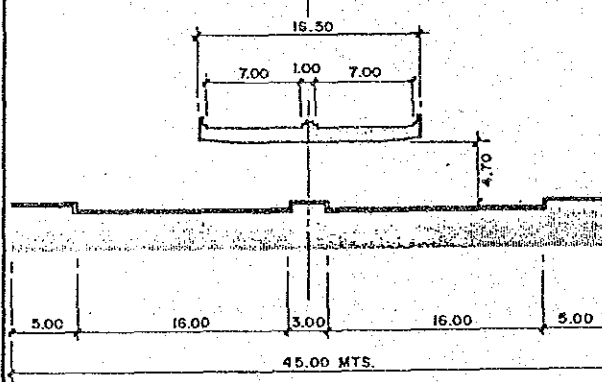
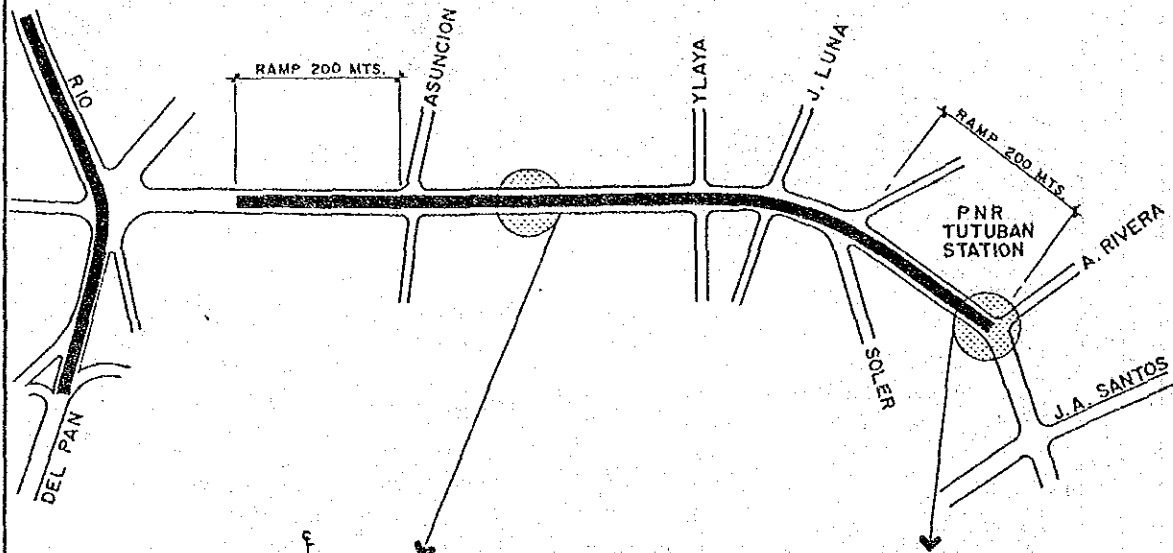
SHORT - TERM	B01		<p>Strict prohibition of jeepney loading/unloading and queuing between J. Luna and Dagupan</p> <ul style="list-style-type: none"> • Decrease in traffic congestion between Juan Luna and Dagupan. • Smooth through traffic along C.M. Recto. • Enhancement of pedestrian safety.
	B02		<p>One-way couple of C.M. Recto and Zaragoza - Asuncion</p> <ul style="list-style-type: none"> • Increase in access capacity of the east-west traffic from 12,000/day to 36,000/day. • Reduction of traffic load along San Fernando.
MID - TERM	B03	<p>LEGEND: _____ FENCE - - - - - JEEPNEY/BUS QUEUING LANE MARKING</p>	<p>Segregation of vehicle and pedestrian traffic by fence and markings</p> <ul style="list-style-type: none"> • Road markings for loading/unloading activities. • Provision of fences on sidewalk edge to regulate pedestrian and vending activities. • Maintenance of lanes for continuous flow, except for designated bus/jeepney loading/unloading area.
	B04		<p>Widening of C.M. Recto to 45 m. between R-10 and Asuncion (If not feasible, minimum widening to 4 lanes)</p> <ul style="list-style-type: none"> • Increase in road capacity of west-east traffic from 12,000/day to 36,000/day. <p align="right">- Recommendation of MMUTSTRAP -</p>

Figure 4.7
 Better Utilization of
 C. M. Recto:
 Short-term,
 and Mid-term Actions

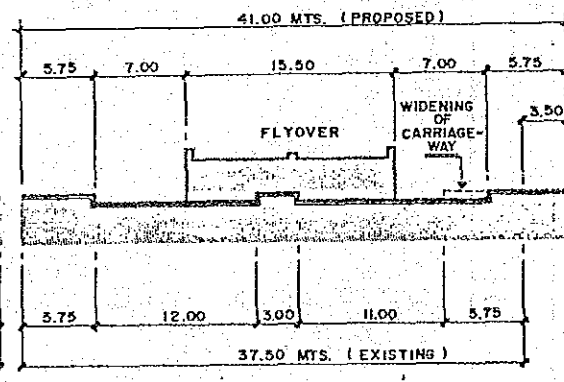
LONG TERM ACTION : PROPOSED FLYOVER ALONG C. M. RECTO



- Complete separation passing through traffic from access traffic to/from Divisoria
- Increase of road space utilization on C.M. Recto for on-road activities
- Increase in capacity of C.M. Recto from 12,000/day to 72,000/day



CROSS SECTION NEAR STO. CRISTO
SCALE 0 5 10 15 MTS.

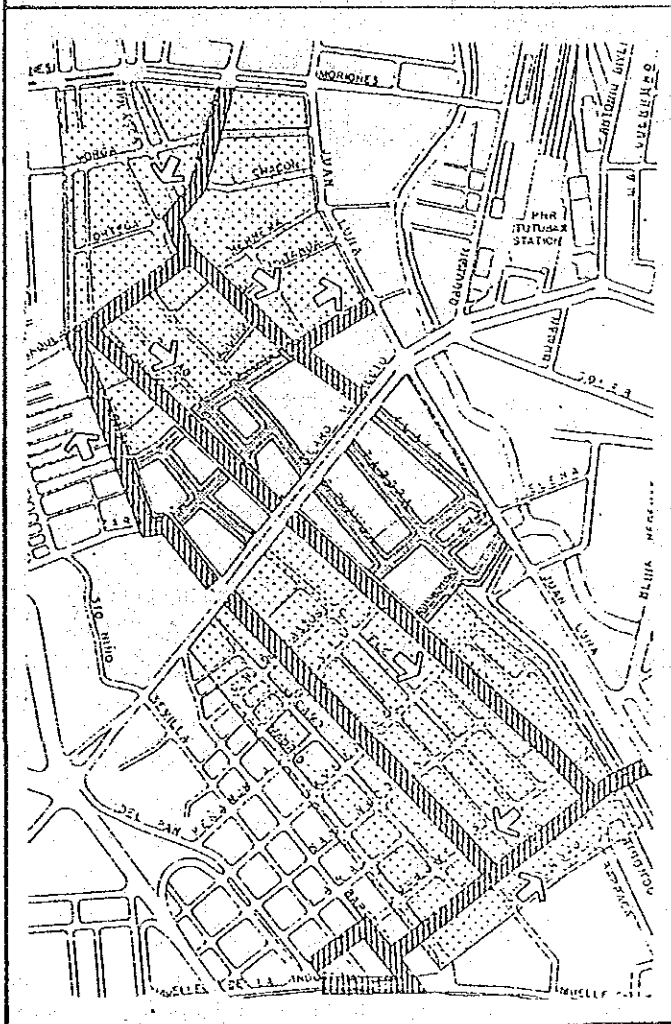


CROSS SECTION NEAR A. RIVERA
SCALE 0 5 10 15 MTS.

Figure 4.7
Better Utilization of
C.M. Recto: Long-Term
Actions

Ylaya St. Occupied by Vendors

Only One-way Traffic Allowed
due to Vendors and Pedestrians



- Increase of accessibility of commodity flow and other private vehicle
- Decrease of congestion along San Fernando.
- Reduce mixture between pedestrian and vehicle traffic.
- Smooth traffic flow inside the area.

LEGEND:




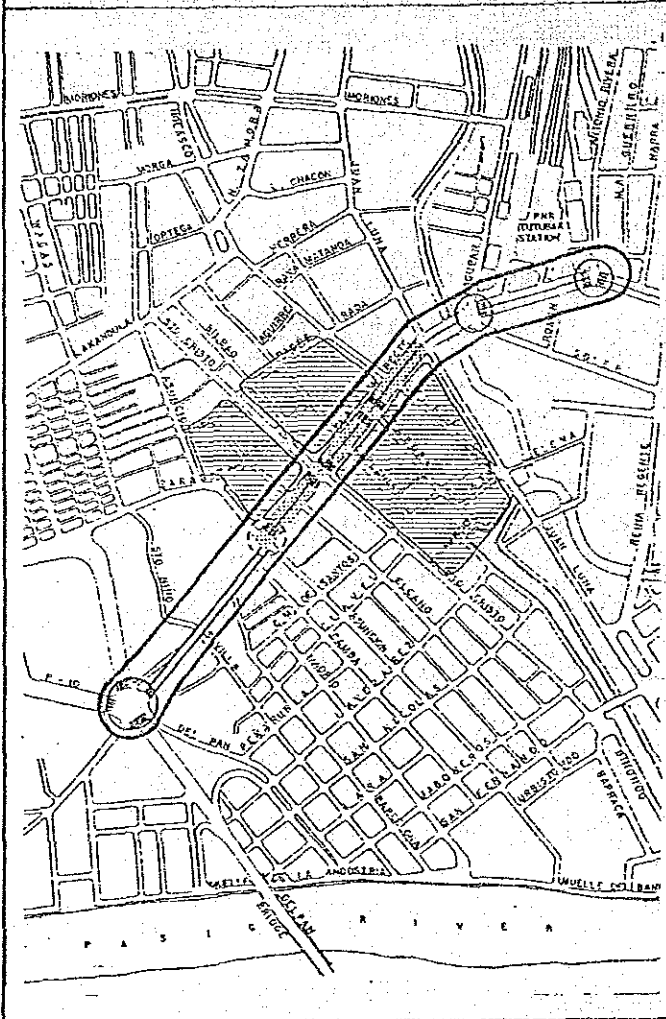
-  STRICTLY PROHIBITED OF ON-ROAD PARKING
-  DESIGNATION OF THE PEDESTRIANS/VENDORS PRODOMINANT ZONE
-  ON-ROAD PARKING IS ALLOWED ONLY ONE SIDE OF CARRIAGEWAY

Figure 4.8
Effective Use of
Sidestreets
Mid-term Actions

Vehicle/Pedestrian Mix on Intersection Disregard for Barrier Fence by Pedestrian



- Provide pedestrians precinct with a larger area clearly segregated from vehicle traffic.
- Repair of sidewalks.
- Improve the convenience and safety of pedestrians and public transport passengers along C.M. Recto by provision of facilities and by management.
- Regulate and segregate pedestrian traffic crossing of C.M. Recto from vehicle traffic.
- Define and limit pedestrian activity on carriageway by closing off median on Juan Luna and Sto. Cristo, and by providing fence, markings and signals along C.M. Recto.

LEGEND:







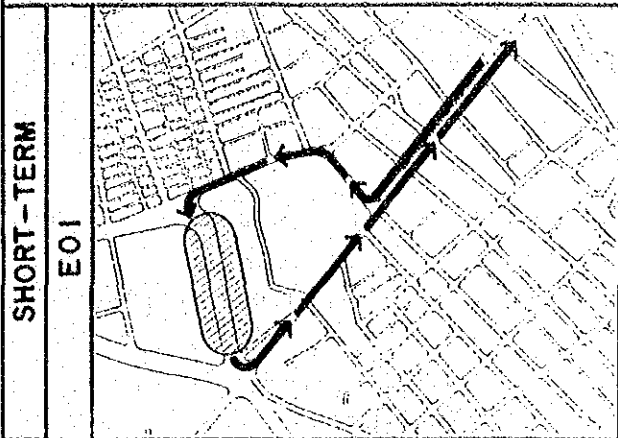
-  TRAFFIC SIGNAL (MID TERM, CONDITION TO THE EXPANSION OF C.M. RECTO BETWEEN R-10 AND ASUNCION)
-  PEDESTRIAN CROSSING
-  TRANSFER OF STREET VENDORS FROM SIDEWALK
-  DESIGNATION OF PEDESTRIANS/VENDOR ZONE
-  WIDENING OF SIDEWALK
-  TRAFFIC SIGNAL

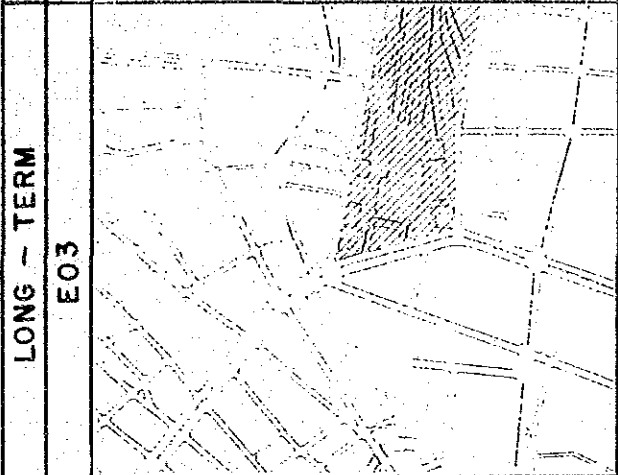
Figure 4.9
Improvement of
Pedestrian Facilities:
Short-term to Long-term
Actions



Efficient use of Del Pan as on-road terminal

- Potential capacity of C.M. Recto U-turn route for 45 jeepneys.

- MMUTSTRAP Recommendation -



Redevelopment of Tutuban Station

- Integrated development of MIF.
- Route structure of pattern III.
- Increase in convenience of transfer passengers.
- Decrease in traffic congestion near the on-road terminal.



Figure 4.10
Development of
Integrated Public
Transport Terminals:
Short-term to
Mid-term Actions
JUMSU I II

5.0 DETAILED PLANNING

5.1 GENERAL

Pursuant to the recommended implementation package (section 4.2) for the improvement and development of Divisoria MIA, JUMSUT II identified associated works for each proposal and further went into the initial quantitative planning aspects of each plan. These plans are primarily translated in terms of costs on a short, mid and long-term bases.

5.2 JEEPNEY REROUTING

5.2.1 Affected Routes

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

The general concept is the maximum utilization of the primary road, C. M. Recto, for vehicles and the optimum utilization of side-streets by defined application; and for long-term, rerouting to conform with the development of integrated public transport terminals.

5.2.2 Impact on Traffic

Extreme congestion exists between Dagupan and Juan Luna because of jeepney loading/unloading, pedestrian and vendor activities. With the implementation package, these activities will be avoided in this section, where added to the large traffic volume is the factor of curvature, and transferred to specific designated sections. Rerouting of the northbound routes eliminates U-turning at Dagupan and moves flow to less critical sections. Traffic volume of Dagupan and C. M. Recto/Dagupan intersection will be reduced by 900/16 hours.

The large volume of passengers originally alighting at C. M. Recto mostly for transfer will be dispersed away from the C. M. Recto section between Dagupan and Juan Luna, either at P. Rada or moved in front of the PNR station. Other rerouting schemes would conveniently transfer boarding/alighting points away from C. M. Recto to the Del Pan area, and Soler (for mid-term), where conditions are less critical. Besides, the mid-term implementation plan of designated boarding/alighting points would limit these activities.

C. M. Recto will be relieved of 9,500/16 hours U-turning at C. M. Recto and instead will be taken along the whole stretch and will utilize the one way couple of Zaragoza and C. M. Recto parallel section. Although there will be no actual traffic reduction along C. M. Recto - on the contrary, an additional traffic volume of 800 between Del Pan and Asuncion - the smoother traffic flow brought on by the elimination of U-turning at C. M. Recto and at perpendicular

Table 5.1
Affected Routes in the Implementation
Package of the Divisoria Mode Interchange Area

	Affected Routes	Frequency ^{1/}			
		MP	EP	OP	16hrs.
A. Short-term jeepney route restructuring					
A.1 <u>Eastward terminating jeepneys via (C.M. Recto - A. Rivera) (A101)</u>	1. Divisoria - Meycauayan	2	1	3	43
	2. Divisoria - Sta. Maria	2	1	2	20
	3. Divisoria - Blumentritt	22	20	21	357
	4. Divisoria - Malanday	23	22	14	288
	5. Divisoria - Monumento	10	15	14	216
	6. Divisoria - M.C.U.	33	4	11	294
	7. Divisoria - Tullahan BBB	7	4	5	87
	8. Divisoria - Karubatan	2	2	1	27
	9. Divisoria - Malinta	9	8	5	100
	10. Divisoria - Retiro	29	25	19	351
	11. Divisoria - La Loma	34	36	37	476
	12. Divisoria - Frisco	1	3	1	24
	Sub-Total		174	141	133
A.2 <u>Northbound Terminating jeepney (A201)</u>	1. Divisoria - Gasak	91	79	101	1,181
	2. Divisoria - Navotas	70	32	58	814
	Sub-Total	161	111	159	1,995
A.3 <u>Tayuman/North Harbor terminating jeepneys (A401, A402)</u>	1. Divisoria - North Harbor (via Moriones)	27	44	33	483
	2. Divisoria - Tayuman	7	83	18	431
	Sub-Total	34	127	51	914
A.4 <u>CBD bound terminating jeepneys (A501)</u>	1. Divisoria - Sta. Cruz	100	102	78	1,325
	2. San Nicolas - Sta. Cruz	115	117	60	1,356
	Sub-Total	215	219	138	2,681
A.5 <u>Southbound Terminating jeepneys via Del Pan (A601)</u>	1. Divisoria - Pier South	73	75	47	781
A.6 <u>Jeepney running counter to on-coming vehicles at C.M. Recto</u>	1. Divisoria - Proj. 4	2	0	0	6
	2. Divisoria - Murphy	18	14	12	231
	3. Divisoria - Cubao	145	85	102	1,725
	4. Divisoria - San Juan	132	81	79	1,677
	5. Divisoria - Sta. Mesa	93	51	70	1,033
	6. Divisoria - Meycauayan	2	1	3	43
	7. Divisoria - Sta. Maria	2	1	1	20
	8. Divisoria - Blumentritt	22	20	21	357
	9. Divisoria - Malanday	23	22	14	288
	10. Divisoria - Monumento	10	15	14	216
	11. Divisoria - Bacoed	2	2	1	16
	12. Divisoria - Morayta	97	90	95	1,115
	13. Divisoria - Proj. 2 & 3	0	0	1	7
	14. Divisoria - Punta	6	5	5	97
	15. Divisoria - Quiapo	100	83	83	1,213
	16. Divisoria - Santol	0	1	1	13
	17. Divisoria - M.C.U.	33	4	11	294
	18. Divisoria - Tullahan BBB	7	4	5	87
	19. Divisoria - Karubatan	2	2	1	27
	20. Divisoria - Malinta	9	8	5	100
	21. Divisoria - Retiro	29	25	19	351
	22. Divisoria - La Loma	34	36	37	476
	23. Divisoria - Frisco	1	3	1	24
Sub-Total		769	553	582	9,416
A.7 <u>Creation of new route</u>					
B. Medium Term route restructuring					
B.1 <u>Southbound terminating jeepney (A301)</u>	1. Divisoria - Baclaran	120	75	54	1,163
	2. Divisoria - Pasay Rtda.	17	7	9	183
	3. Divisoria - Imus	3	0	1	11
	4. Divisoria - Jones	0	2	2	12
	5. Divisoria - City Hall	46	16	28	468
	6. Divisoria - Libertad	99	61	62	1,058
	7. Divisoria - Nichols	19	15	19	243
	8. Divisoria - Las Piñas	4	2	1	16
	9. Divisoria - Pedro Gil	18	17	10	173
	10. Binondo - Pier	2	10	5	66
Sub-Total		325	205	191	3,393

^{1/}MP - morning peak
EP - evening peak
OP - off-peak

sections, and the one-way couple would make it possible to accommodate the additional load on the west side and relieve congestions along the rest of the section. U-turning at sections perpendicular to C. M. Recto, i.e., Dagupan, Asuncion, will be reduced by 3,600/16 hours. Reduction in traffic volume due to rerouting implementable in the short-term is shown in Table 5.2. The general alleviated traffic resolved from rerouting (short-term), the designated jeepney loading/unloading areas and planned road utilization (mid-term), U-turning, backing up of 9,500/16 hours, ultimately resulting from aversion of existing congestions, will be reduced significantly.

For long-term, geometric design and structural measures such as channelization, road widening, flyover, terminal development, will physically impose improved conditions.

Table 5.2
Traffic Reduction due to Jeepney Rerouting

	Section	Frequency	
		Peak Hour	16-Hour
SHORT TERM PLAN			
1. Decentralization of Northbound Routes	P. Rada & Ylaya	161	1,995
2. Rerouting of Tayuman/North Harbor Terminating Jeepney	Dagupan	34	914
3. Route Restructuring of CBD Bound Terminating Jeepneys	C.M. Recto between Camba and Asuncion	215	2,681
4. Rerouting of South-bound Terminating Jeepneys	C.M. Recto between Del Pan and Asuncion	73	781

5.2.3 Required Inputs

Simultaneous to the rerouting scheme, physical upliftment of some streets have to be undertaken. The required associated works are enumerated in Table 5.3.

5.3 UTILIZATION OF C. M. RECTO

Efficient utilization of C. M. Recto entails both the physical and administrative betterment of the area. Table 5.4 presents the tasks to be undertaken and their estimated costs while Figure 5.1 shows the envisioned improvements.

Table 5.3
Associated Improvements Required
for Jeepney Rerouting

Item	Quantity	Unit Cost	Estimated Cost (P000)	Remarks
A. SHORT TERM PLAN				
A.1 Improvement Required for Eastbound U-turn Routes				
1) Improvement of Zaragoza				
a) Pavement of Carriageway	270m(L)x14m(W)	544.00/m ²	2,056.32	
b) Improvement of Sidewalks	270m(L)x3.5m(W)	985.50/m	266.09	
c) Removal of Vendors	-	-	-	
		Sub-Total	2,322.41	
A.2 Improvement Required for Tayuman, N. Harbor Routes				
1) Improvement of Zaragoza				
	100m(L)x14m(W)	544.00/m ²	761.60	
2) Pavement of Moriones/ Nolasco Intersestion				
	40m(L)x20m(W)	544.00/m ²	435.20	
		Sub-Total	1,196.80	
A.3 Improvement Required for Sta. Cruz bound jeepneys				
1) Improvement of CM De Santos				
a) Pavement of Carriageway	100m(L)x11m(W)	544.00/m ²	598.40	
b) Pavement of Sidewalks	100m(L)x4m(W)	1,084.00/m	108.40	
2) Pavement of Madrid				
	120m(L)x7m(W)	544.00/m ²	456.96	
		Sub-Total	1,163.76	
Short Term Plan Total			4,682.97	
B. MID-TERM PLAN				
B.1 Improvement Required for South-bound Routes				
1) Designation of Terminal Area by Road Markings				
	100m	36.00/m	3.60	
2) Traffic Signs				
	6 pcs.	1,077.00	6.46	
Mid Term Plan Total			10.06	

Table 5.4
Associated Improvements Required
for Better Use of C. M. Recto

Item	Quantity	Unit Cost	Estimated Cost (#000)	Remarks
A. SHORT TERM PLAN				
A.1 Prohibition of Boarding/Alighting along C.M. Recto between Dagupan and J. Luna				
1) Installation of Traffic Signal at C.M. Recto/Dagupan	1 unit	832,000.00	832.00	TEAM PLAN
2) Construction of Central Median at C.M. Recto/J. Luna	34m(L)x2.5m(W)	935.00/m	31.79	
3) Rehabilitation of Central Median at C.M. Recto/St. Cristo	10m(L)x2.5m(W)	862.50/m	8.63	
		Sub-Total	872.42	
A.2 One way Couple of C.M. Recto and Zaragoza				
1) Improvement of Zaragoza	100m(L)x14m(W)	544.00/m ²	761.60	
2) Traffic Signs	17 pcs	1,077.00	18.31	
		Sub-Total	779.91	
Short Term Plan Total			1,652.33	
B. MID-TERM PLAN				
B.1 Improved Use of C.M. Recto between J. Luna and Asuncion				
1) Lane Markings for Jeepney Queueing Space	300m x 2	36.00/m	21.60	
2) Pedestrian Fence	260m	725.00/m	188.50	
3) Loading/Unloading Signs	22 pcs	1,077.00/pc	23.69	
		Sub-Total	233.79	
B.2 Widening of C.M. Recto between Asuncion and R10				
1) Land Acquisition	9,800	7,800/m ²	76,440.00	
2) Compensation	-	-	-	
3) Improvement of Road				
a) Earthwork	2,940 cu.m.	47.00/m ³	138.18	
b) Pavement of Carriageway	350m(L)x26m(W)	511.00/m ²	4,650.10	
c) Pavement of Sidewalks	350m(L)x2m(W)	989.00/m	692.30	
		Sub-Total	81,920.58	
Mid-Term Plan Total			82,154.37	
C. LONG TERM PLAN				
C.1 Construction of Fly-over				
1) Removal of PNR Tracks	710m	530.00	376.30	
2) Removal of Medians	710m(L)x3m(W)	1,751.00/m ²	1,243.21	
3) Construction of Fly-over	810m(L)x16.5m(W)	7,384.00/m	98,687.16	
		Long-Term Plan Total	100,306.67	

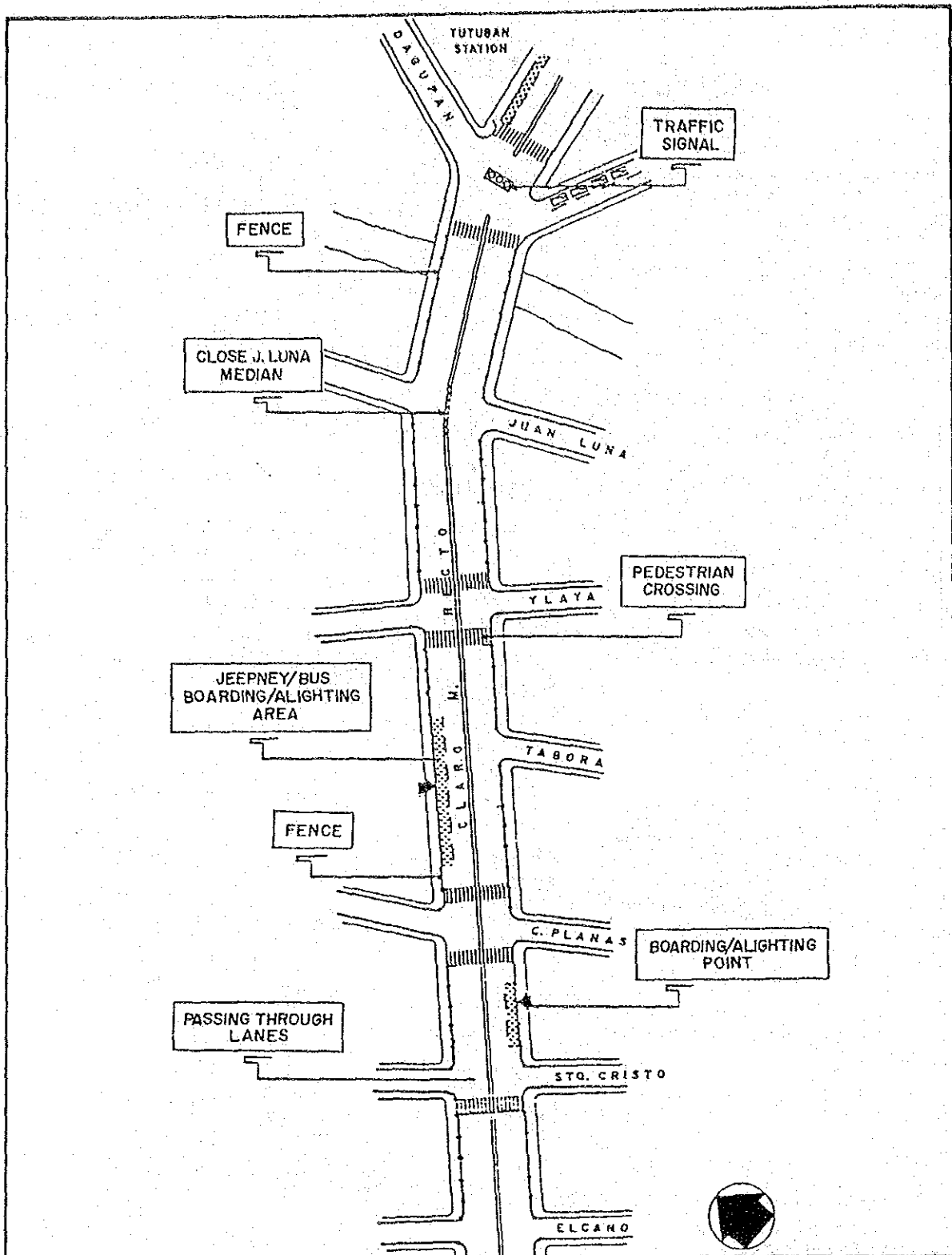


Figure 5.1
 Better Utilization
 of C. M. Recto
 (from Asuncion
 to J. Luna)

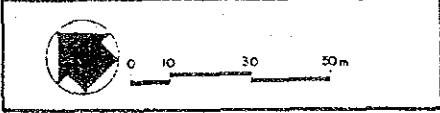
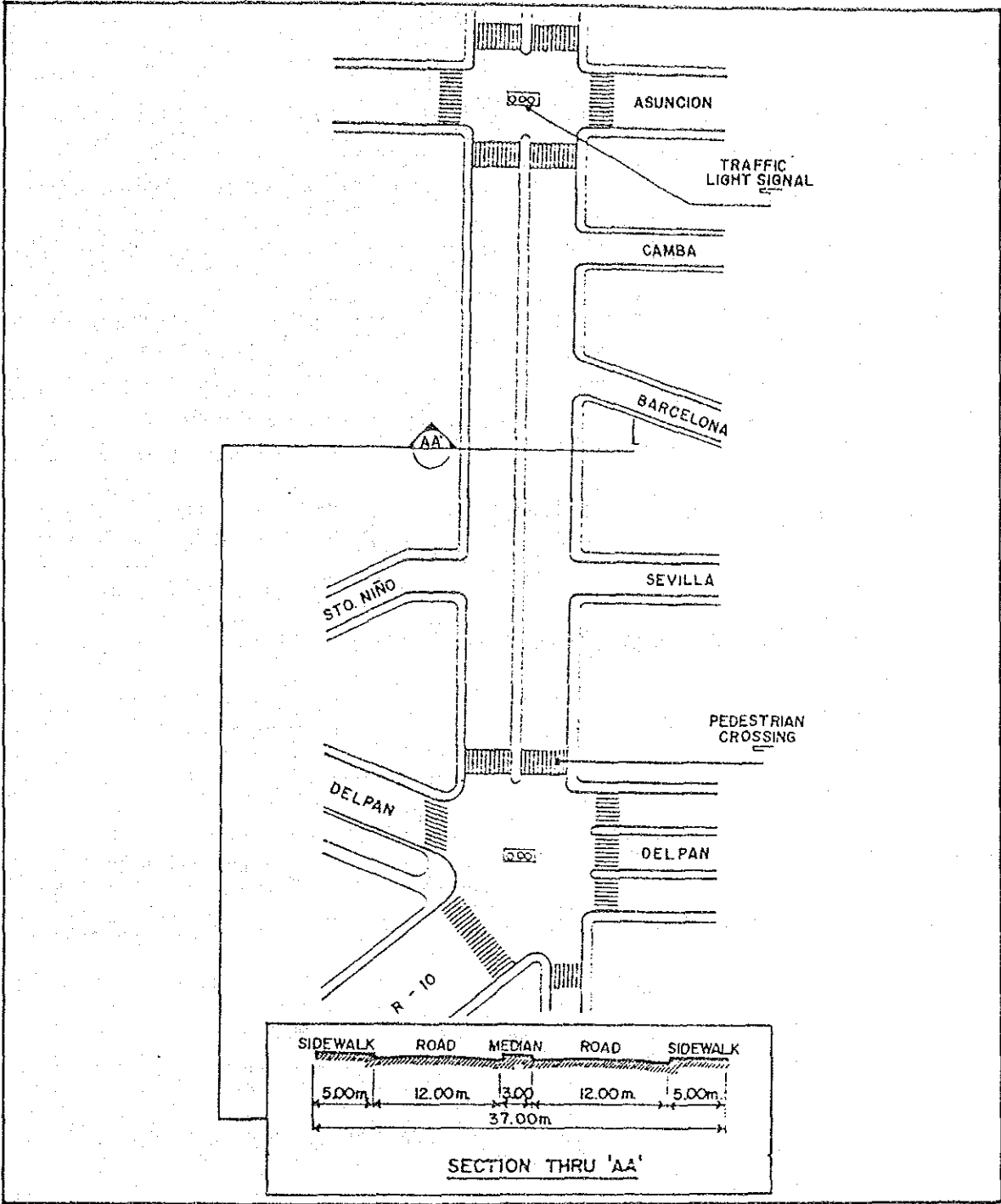
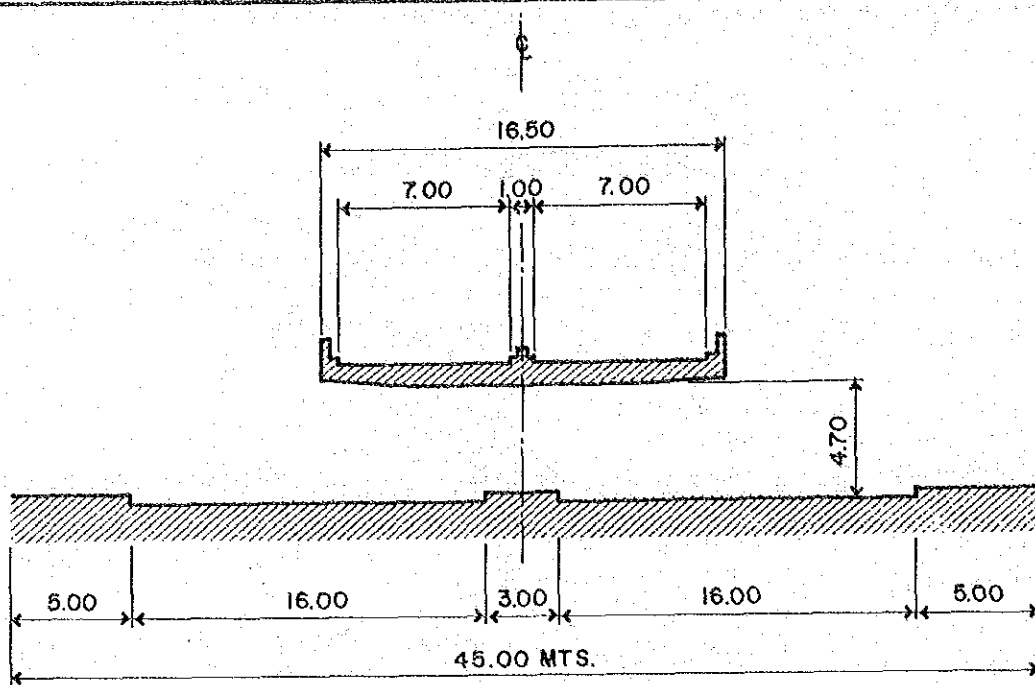
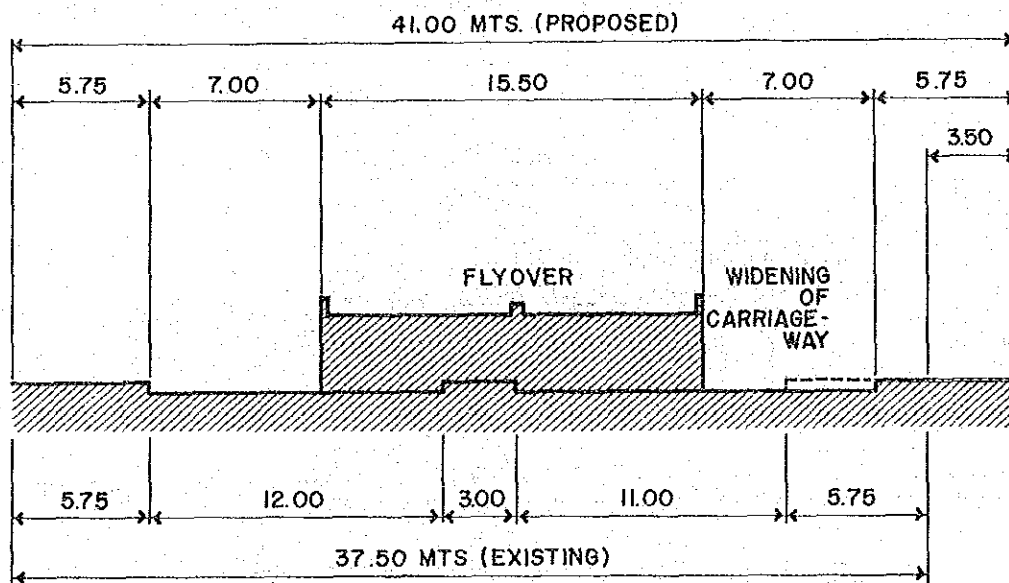


Figure 5.2
 Proposed Widening
 of C. M. Recto
 (from Asuncion to R-10)



TYPICAL CROSS-SECTION NEAR STO. CRISTO



TYPICAL CROSS-SECTION NEAR A. RIVERA

Figure 5.3
Proposed Flyover
at C. M. Recto

The general idea is to utilize C. M. Recto for passing through along with attracted traffic. Smooth vehicular flow is important thus measures to limit pedestrian and vendor on-road activities and jeepney and bus loading/unloading activities are undertaken for the short to mid-term period.

Long-term viewpoint foresees the necessity of widening the C. M. Recto section from Asuncion to R-10 Figure 5.2 shows this proposed widening. A further measure to separate passing through traffic is the construction of a flyover. Proposed cross-sections for this is shown in Figure 5.3. This will leave more freedom in the Divisoria for on-road activities.

5.4 REDEFINITION OF SIDESTREETS

The alleviation of traffic congestion in Divisoria is partly seen with the effective use of the available sidestreets. However, upgrading of some portions of these alternative sidestreets are deemed necessary on a mid-term viewpoint. The street sections for improvement are given in Table 5.5 together with their estimated costs.

The sidestreets are redefined such that pedestrian and vendor activity is predominant proximate to the existing markets. Other are assigned for passing through traffic. On-road car parking on one side is allowed for definite areas (refer to Implementation Package). Such redefinition of sidestreets would allow the continued activity of the retail/wholesale trade of Divisoria and better external access by PT to the area. At the same time, passing through traffic along C. M. Recto is made convenient because of relocation of vendor activities from the said road.

Table 5.5
Effective use of Sidestreets

Item	Quantity	Unit Cost	Amount (P000)	Remarks
A. Short-term Plan	none			
B. Medium-term Plan				
B.1 <u>Improvement of Roads for Vehicular Traffic</u>				
1) Asuncion between Zaragoza and P. Rada				
a. Pavement of Carriageway	90m(L)x7m(W)	256./m ²	161.280	asph. minor
b. Pavement of Sidewalks	90m(L)x4m(W)	1,084./m ²	97.560	replacement
2) Asuncion between Lakandula and Mariapayo				
a. Pavement of Carriageway	80m(L)x7m(W)	256./m ²	143.360	asph. minor
b. Pavement of Sidewalks	80m(L)x4m(W)	1,084./m	346.880	replacement
3) Sto. Cristo between Lakandula and P. Rada				
a. Pavement of Carriageway	200m(L)x7m(W)	256./m ²	358.400	asph. minor
b. Pavement of Sidewalks	200m(L)x4m(W)	1,084./m	216.800	replacement
4) Sto. Cristo/Zaragoza Intersection				
a. Pavement of Carriageway	140 sqm.	256./m ²	35.840	asph. minor
5) Sto. Cristo Between C.M. De Santos and San Fernamo				
a. Pavement of Carriageway	490m(L)x7m(W)	256./m ²	878.080	asph. minor
b. Pavement of Sidewalks	490m(L)x4m(W)	1,084./m	531.160	replacement
6) Around Lakandula/ C. Planas Intersection				
a. Pavement of Carriageway	40m(L)x10m(W)	256./m ²	102.400	asph. minor
7) Around N. Zamora/ Ortega Intersection				
a. Pavement of Carriageway	200 sqm.	544./m ²	108.800	conc. minor
		Sub-Total	2,980.56	

Table 5.5 cont'd

Item	Quantity	Unit Cost	Amount	Remarks
B.2 Improvement of Roads for Pedestrian/Vendor Zones				
1) Ylaya between C.M. Recto and J. Luna				
a) Pavement of Carriageway	230m(L)x10m(W)	256./m ²	588.800	asph. minor
2) Around Tabora/ C.M. de Santos Intersection				
a) Pavement of Carriageway	200m(L)x10m(W)	256./m ²	512.000	asph. minor
3) P. Rada Between Asuncion and C. Planca				
a. Pavement of Carriageway	220m(L)x8m(W)	256./m ²	450.560	asph. minor
b. Pavement of Sidewalks	400m(L)x2m(W)	690./m	276.000	replacement
4) Zaragoza Between Sto. Cristo and C. Planca				
a. Pavement of Carriageway	100m(L)x10m(W)	256./m ²	256.000	asph. minor
b. Pavement of Sidewalks	200m(L)x2m(W)	690./m ²	138.000	replacement
5) Bilbao Between P. Rada and Zaragoza				
a. Pavement of Carriageway	100m(L)x10m(W)	256./m ²	256.000	asph. minor
b. Pavement of Sidewalks	200m(L)x2m(W)	690./m ²	138.00	replacement
		Sub-Total	2,615.36	
	Mid-Term Plan Total		5,595.92	

5.5 IMPROVEMENT OF PEDESTRIAN FACILITIES

Improvements of pedestrian facilities as shown in Table 5.6 inevitably requires pedestrian crossing-marking on a short-term viewpoint. On the other hand, the mid-term plan entails the installation of traffic signals, widening of sidewalks and improvement of pedestrian/vendor zones.

Table 5.6
Associated Inputs Required for the Improvement
of Pedestrian Facilities

Item	Quantity	Unit Cost	Estimated Cost (₱000)	Remarks
A. SHORT TERM PLAN				
<u>A.1 Pedestrian Crossing Markings</u>				
1) CM Recto/A. Rivera	46m	864/m	39.74	
2) CM Recto/Dagupan	23m	864/m	19.87	
3) CM Recto/ Tabora	72m	864/m	62.21	
4) CM Recto/Sto. Cristo	72m	864/m	62.21	
5) CM Recto/Asuncion	36m	864/m	31.10	
6) CM Recto/R-10	98m	864/m	84.67	
Short Term Plan Total			299.80	
B. MID-TERM PLANS				
<u>B.1 Installation of Traffic Signals</u>				
1) CM Recto/A. Rivera	1 unit	832,000	832.00	
2) CM Recto/Dagupan	1 unit	832,000	832.00	
3) CM Recto/Asuncion	1 unit	832,000	832.00	
4) CM Recto/R-10	1 unit	832,000	832.00	
Sub-Total			3,328.00	
<u>B.2 Widening of Sidewalk of CM Recto between Asuncion and R-10</u>				
	700m(L)x3m(W)	687/m	480.90	
<u>B.3 Improvement of Pedestrian/ Vendor Zones</u>				
1) Traffic Signs	L. S.	300,000	300.00	
Mid Term Plan Total			4,108.90	

5.6 DEVELOPMENT OF INTEGRATED PUBLIC TRANSPORT TERMINALS (SHORT-TERM PLAN)

The short-term action suiting the implementation package is basically the utilization of Del Pan as a terminal. Consequently, the following works are involved:

- a) improvement of a road sections; and
- b) improvement of two intersections.

Table 5.7
Associated Improvements Required for
the Development of Mode Interchange Facilities

Item	Quantity	Unit Cost	Estimated Cost (P000)	Remarks
A. SHORT-TERM PLAN				
A.1 Utilization of Del Pan as Terminal				
1) Improvement of Del Pan/Zaragoza Intersection				
a) Construction of Central Median Along Zaragoza	320m(L)x1m(W)	475./m	152.000	new const. on asph. road
b) Construction of Traffic Island	80 sqm	lump sum	25.860	new const. on asph. road
c) Pedestrian Crossing Markings	45m(L)x5m(W)	864/m	38.880	
2) Improvement of Del Pan Between Zaragoza and CM Recto				
a) Improvement of Sidewalks	150m(L)x4m(W)	1,084/m	162.400	replacement
b) Removal of Median	200m(L)x2m(W)	764/m	152.800	replacement
c) Provision of Median	190m(L)x2m(W)	764/m	152.800	replacement
d) Lane Markings	750m	36/m ₂	27.000	
e) Pavement of Carriageway	780 sqm	544/m ²	424.320	conc. minor
f) Provision of Street Lights	50 pcs	5,317/pcs	265.850	
3) Improvement of Del Pan/CM Recto Intersection				
a) Improvement of Traffic Island	180 sqm	lump sum	58.185	
b) Installation of Traffic Signals	1 unit	832.000/unit	832.000	
c) Pedestrian Crossing Markings	50(W)	864.000/m	43.200	
Short-Term Plan Total			2,335.295	

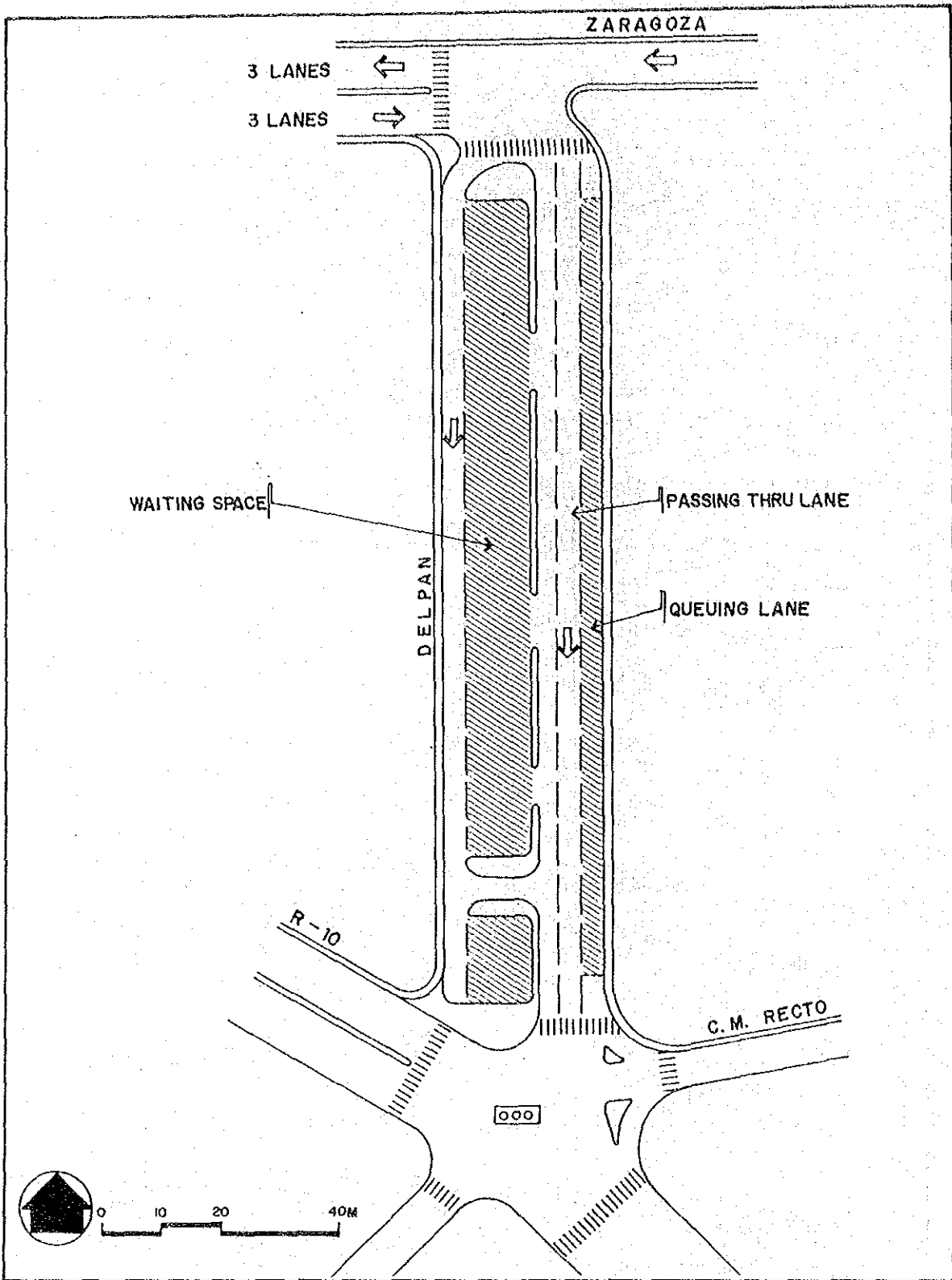


Figure 5.4
Proposed Terminal
at Del Pan

5.7 DEVELOPMENT OF PNR TUTUBAN COMPOUND AS INTEGRATED TRANSPORT TERMINAL

Due to the high volume of public transport modes converging in Divisoria, a huge space requirement is deemed necessary for the rationalization of the public transport movement of the area. The PNR Tutuban Compound can easily accommodate the needed space for an integrated transport terminal. Approximately 55,000 square meters is estimated for the Divisoria MIA (see Table 5.8). Aside from the space for the already existing PNR Tutuban Station, 18,100 square meters is reserved for the public transport modes - jeepney, city bus and provincial bus. The sizeable road space of 15,000 square meters, which includes the existing outside-the-terminal road spaces, will add to the ease of flow in the terminal area.

Table 5.8
Estimated Terminal Space Required
for Divisoria Mode Interchange Area

Use	Area (m)
A. Terminal Space	
1) Jeepney Terminal ^{1/}	8,100
2) City Bus Terminal ^{2/}	5,200
3) Provincial Bus Terminal ^{3/}	4,800
4) Tutuban Station ^{4/}	12,600
5) Administration/Service Facility	1,000
Sub-total	31,700
B. Road Space	15,500
C. Building Space	5,200
D. Others ^{5/}	2,600
Total	55,000

1/ Comprising 17 unloading berth, 32 loading berth and 92 waiting space and each direction of berths for passing through jeepneys along C.M. Recto.

2/ Comprising 3 unloading berths, 12 loading berths and 41 waiting space.

3/ Comprising 10 berths.

4/ Space occupied by existing Tutuban Station.

5/ Medians, open space etc.

The concept plan for the integrated terminal compound of Tutuban is designed with a building to house the commercial/business sector which would complement the area. A flyover is also envisioned for the area so that the activities of the terminal area will not hamper the through-traffic or vice versa. Part of the road space below the flyover could be utilized as a possible terminal for the bus and jeepney (Figure 5.5). The planned flow of vehicles for the transport terminal is mapped out in Figure 5.6, while a sectional plan of the improvements conceived for the PNR Tutuban Compound is shown in Figure 5.7.

To bring the plan to realization, the estimated project cost would amount to ₱91 million (see Table 5.9). Cost for the repair of the existing Tutuban station has been imputed in the estimates as well but the cost of the commercial building is left to the plans and designs of the developer.

Table 5.9
Estimated Project Cost of Terminal at PNR Tutuban Complex
for Divisoria Mode Interchange Area

	Quantity	Unit Cost (₱)	Amount (₱000)	Remarks
C. Long Term Plan				
C.1 Development of Transport Terminal at Tutuban Station Compound				
1) Clearance of Existing Building	10,200 m ²	110	1,122	
2) Repair of Tutuban Station	300 m ²	1,000	300	
3) Earthwork of the Site	16,500 m ²	50	825	
4) Pavement of Carriageway	12,000 m ²	544	6,528	
5) Pavement of Sidewalks	6,000 m ²	250	1,500	
6) Markings/Sign Posts	Lump Sum	-	168	
7) Traffic Signals	2 pcs.	832,000	1,664	
8) Street Lights	30 pcs.	10,000	300	
9) Waiting Sheds	3,800 m ²	1,300	4,940	
10) Utilities	Lump Sum	-	600	
11) Administration Building	1,000 m ²	2,500	2,500	
12) Road Improvement				
- North side	150 m	13,000	1,950	W = 26 m
- East side	180 m	10,500	1,890	W = 22 m
- West side	320 m	10,500	3,360	W = 22 m
- C.M. Recto	240 m	22,000	5,280	W = 40 m
13) Pedestrian Underpass	60 m	50,000	3,000	W = 5 m
		Sub-total	35,927	
C.2 Construction of New Road Links	Lump Sum		54,800	
TOTAL			90,727	

Table 5.10
Consequences of MIA Development

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

LEGEND:

- SIGNIFICANTLY BENEFITED
- △ BENEFITED TO LESSER EXTENT
- NEUTRAL

5.8 ECONOMIC EVALUATION

Expected impact due to the improvement of the Divisoria mode interchange area as a whole will be great. Benefits are both tangible non-tangible. Economic evaluation is on the macro-level.

Jeepney route restructuring will increase accessibility of the area and reduced traffic congestions which lead to lesser travel cost, travel time and accidents. Pedestrians, vehicles and its passengers, public transport drivers/operators will benefit from this.

The defined utilization of C. M. Recto will benefit passing through traffic by allocating a greater portion of the road capacity for this purpose. Savings in time, fuel and operating costs, are great. In this connection, on road activities which include vending and pedestrian movement will be limited.

The defined application sidestreets is the counterbalance for the previous action. The arrangement of allocating C. M. Recto for passing through traffic and the sidestreets for various activities which include parking, on-road market, pedestrian precinct, and the passing through is optimum in that it maintains the commercial status of Divisoria while increasing vehicular capacity besides increasing access to the area. This will benefit business operators in the area as well as trading between the harbors to other parts of the Metro. The segregation of vehicle and pedestrian activities also put forth safety.

Improvement of pedestrian facilities obviously favor pedestrians in terms of safety and comfort. The prevention of their using the carriageway also avoid accident occurrence, and indirectly decrease travel cost and time for vehicles and operators.

The development of integrated public transport terminals will directly benefit public transportation concerned parties and government. The heightened commercial attraction will also benefit the local people who run business.

5.9 FINANCIAL ASSESSMENT OF THE TERMINAL

An exercise was made to examine the financial viability of terminal operation. The inputs and assumptions for the profitability assessment of the terminal are given below and the proforma annual income statement was computed based on three different capital structures (Table 5.11).

A. Revenue

- 1) Revenue from Jeepney
 - a) Terminal fee at P5.00/unit/day
 - b) Dispatcher fee at P0.25/trip

- d) Number of jeepneys = 760
- e) Frequency advocating dispatching service: 12,700 trips/day (80% of total frequency)

$$\begin{aligned} \text{Revenue from jeepney} &= (\text{terminal fee} \times \text{number of jeepney using the terminal}) + (\text{dispatcher fee} \times \text{frequency advocating service}) \\ &= (\text{₱}5.00 \times 760) + (\text{₱}0.25 \times 12,700) \\ &= \text{₱}6,975/\text{day} \end{aligned}$$

2) Revenue from Bus

- a) Terminal fee at ₱2.00/trip
- b) Frequency of using the terminal : 1,300 trips/day

$$\begin{aligned} \text{Revenue from bus} &= (\text{terminal fee} \times \text{frequency using the terminal}) \\ &= \text{₱}2.00 \times 1,300 \\ &= \text{₱}2,600/\text{day} \end{aligned}$$

3) Revenue from Bus (long distance)

- a) Terminal fee : ₱5.00/trip
- b) Frequency using the terminal : 750 trip/day

$$\begin{aligned} \text{Revenue from bus} &= (\text{terminal fee} \times \text{frequency using the terminal}) \\ &= \text{₱}5.00 \times 750 \\ &= \text{₱}3,750/\text{day} \end{aligned}$$

4) Total Revenue

$$\begin{aligned} \text{Total daily revenue} &= \text{Revenue from bus and revenue from jeep} \\ &= \text{₱}6,975 + \text{₱}2,600 + \text{₱}3,750 \\ &= \text{₱}13,325/\text{day} \end{aligned}$$

$$\begin{aligned} \text{Total yearly revenue} &= \text{Total daily revenue} \times 350 \text{ days} \\ &= \text{₱}13,325 \times 350 \\ &= \text{₱}4,663,750/\text{year} \end{aligned}$$

B. Expenditure

- 1) Terminal construction cost : ₱35,927,000
- 2) Rent on Land : ₱825,000/year
(5% of market value)
- 3) Operating and maintenance cost: ₱1,800,000/year

C. Assumptions

- 1) Depreciation : 20 years, fixed amount
- 2) Repayment conditions on loan : uniform repayment of principal and interest for 20 year repayment period at 5% interest rate
- 3) Taxes : exempted

D. Results

Table 5.11
Proforma Annual Income Statement

Item	% of Own Capital		
	100%	50% ^{1/}	50% ^{2/}
1. Revenue	₱4,663,750	4,663,750	4,663,750
2. Expenditure (₱/year)			
a) Depreciation	1,796,350	1,796,350	1,796,350
b) Operating Costs	1,200,000	1,200,000	1,200,000
c) Rent of Land	825,000	825,000	-
d) Interest on Loan	0	538,900	538,900
Total	3,821,350	4,360,250	3,535,250
3. Profit (₱/year)	842,400	303,500	1,128,500
4. Investment (terminal construction cost) (₱)	35,927,000	35,927,000	35,927,000
5. 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 cash items only with assumption of profit being constant.

5.10 MANAGEMENT ASPECTS

5.10.1 Implementing Responsibilities

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.

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.

The most important responsibility identification has yet to be carefully evaluated for the integrated public transport terminal in Tutuban. Since the proposed site for this type of terminal is within the PNR compound, it is only natural that its redevelopment should fall under the PNR Management. 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 suggests 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 preferred to give as much leeway as possible to the "risk-takers".

5.10.2 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 "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.

The Tutuban MIA may appear to be a public facility to government planners. To a private developer, it is a business proposition. The opportunities are in the lease-able space for commercial uses whose marketability improves with accessibility.

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