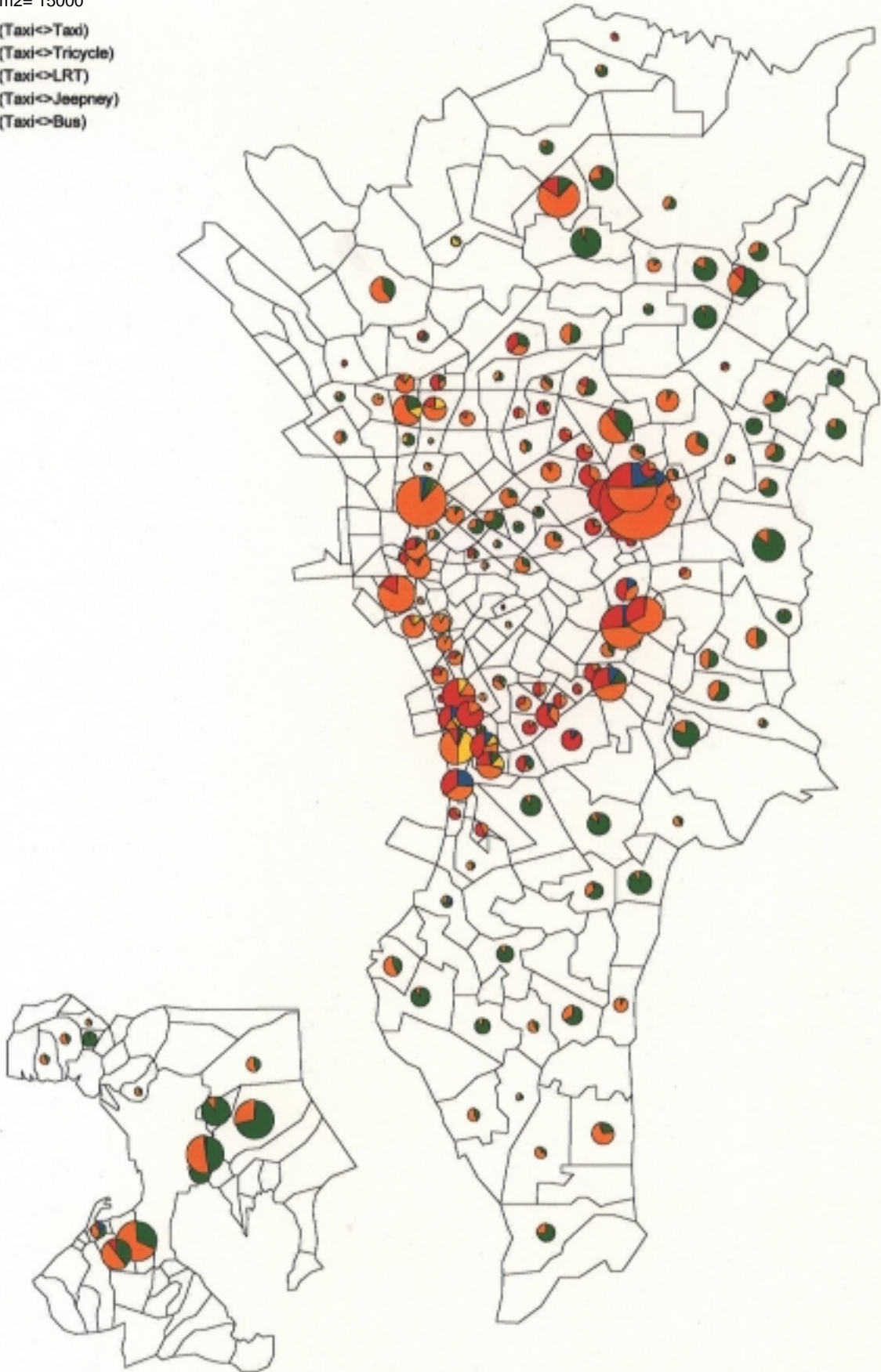


FIGURE 2.10
DISTRIBUTION OF TRANSFERS BETWEEN TAXI AND OTHER MODES

Legend:
Scale: 1cm²= 15000



2.3 Review of the JUMSUT and Terminal Conditions

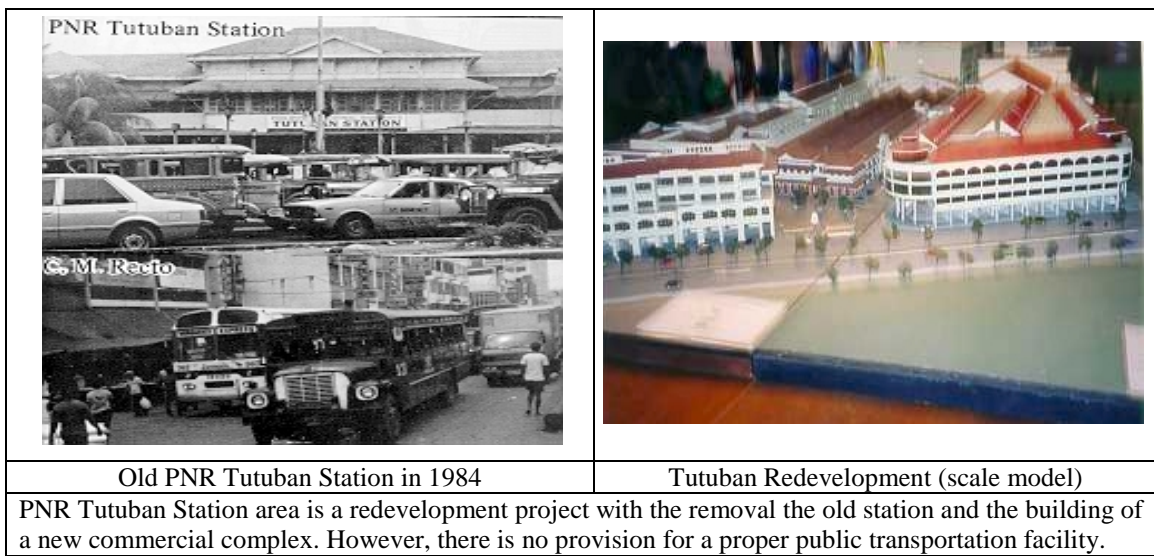
Among the major transportation planning studies conducted for Metro Manila in the past is the Metro Manila Transportation Planning Study (JUMSUT) in 1983-84. The study was undertaken by the Ministry of Transportation and Communications, Government of Philippines with technical assistance provided by the Government of Japan, through Japan International Cooperation Agency (JICA).

One of the objectives of the study is to prepare the public transport system development plans including the terminal facilities. Traffic surveys and investigations on the public transport systems were carried out carefully and several improvement plans were proposed. However, the implementation of said plans were not realized due to the lack funds. Figures 2.11 to 2.13 are comparative photo essays of the terminal conditions during the JUMSUT and MMUTIS periods.

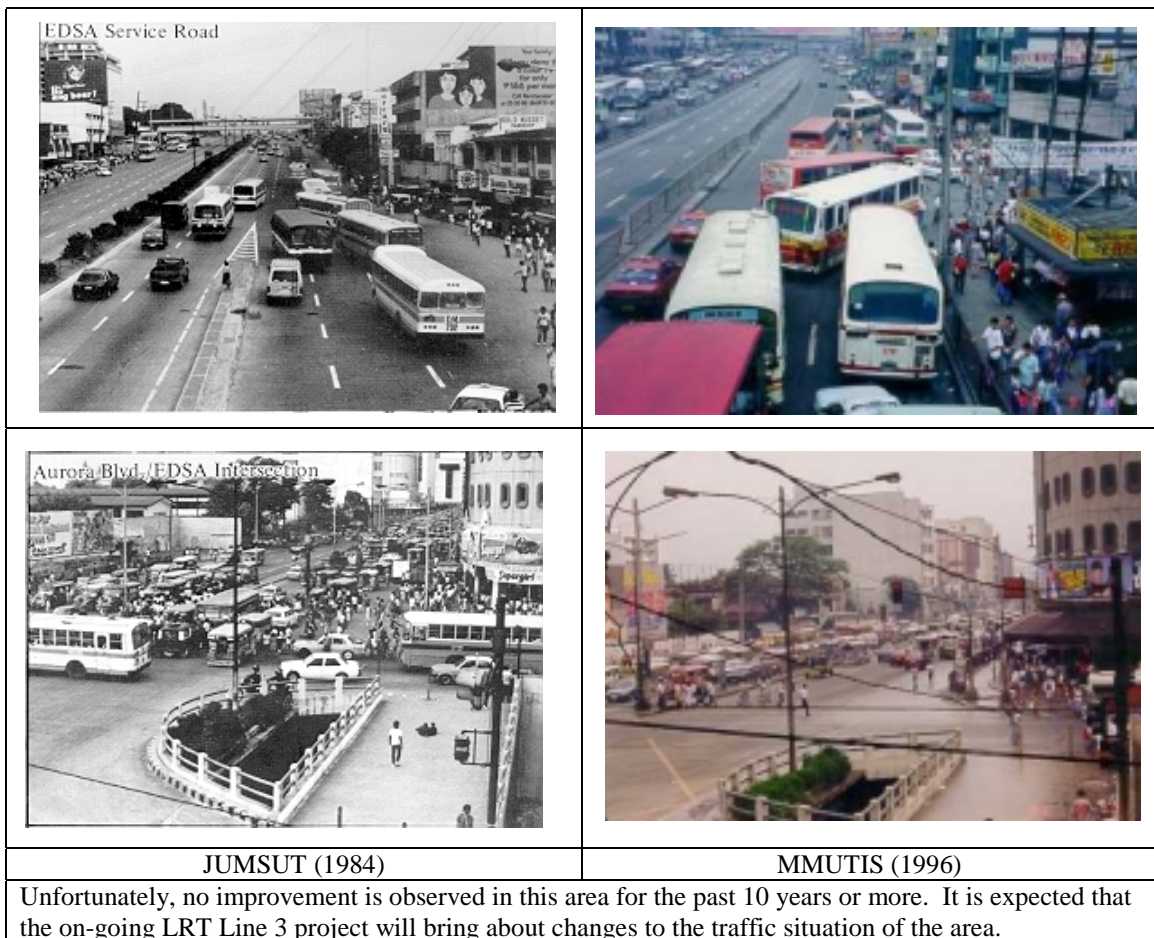
**FIGURE 2.11
 COMPARISON OF THE TRAFFIC CONGESTION AT TERMINAL AREAS, JUMSUT AND MMUTIS**

JUMSUT (1984)	MMUTIS (1996)
 <p data-bbox="276 1252 813 1301">Angle parking of vehicles on road forcing pedestrians to walk on the road where traffic flows.</p>	
 <p data-bbox="276 1641 778 1686">Sidewalk vendors are a sight at most LRT stations forcing pedestrians to encroach on the carriageway.</p>	
 <p data-bbox="276 2029 834 2072">Haphazard bus and jeepney maneuver coupled with disregard of traffic rules by pedestrians.</p>	

**FIGURE 2.12
 PNR TUTUBAN STATION**



**FIGURE 2.13
 AURORA BLVD/EDSA INTERSECTION AREA**

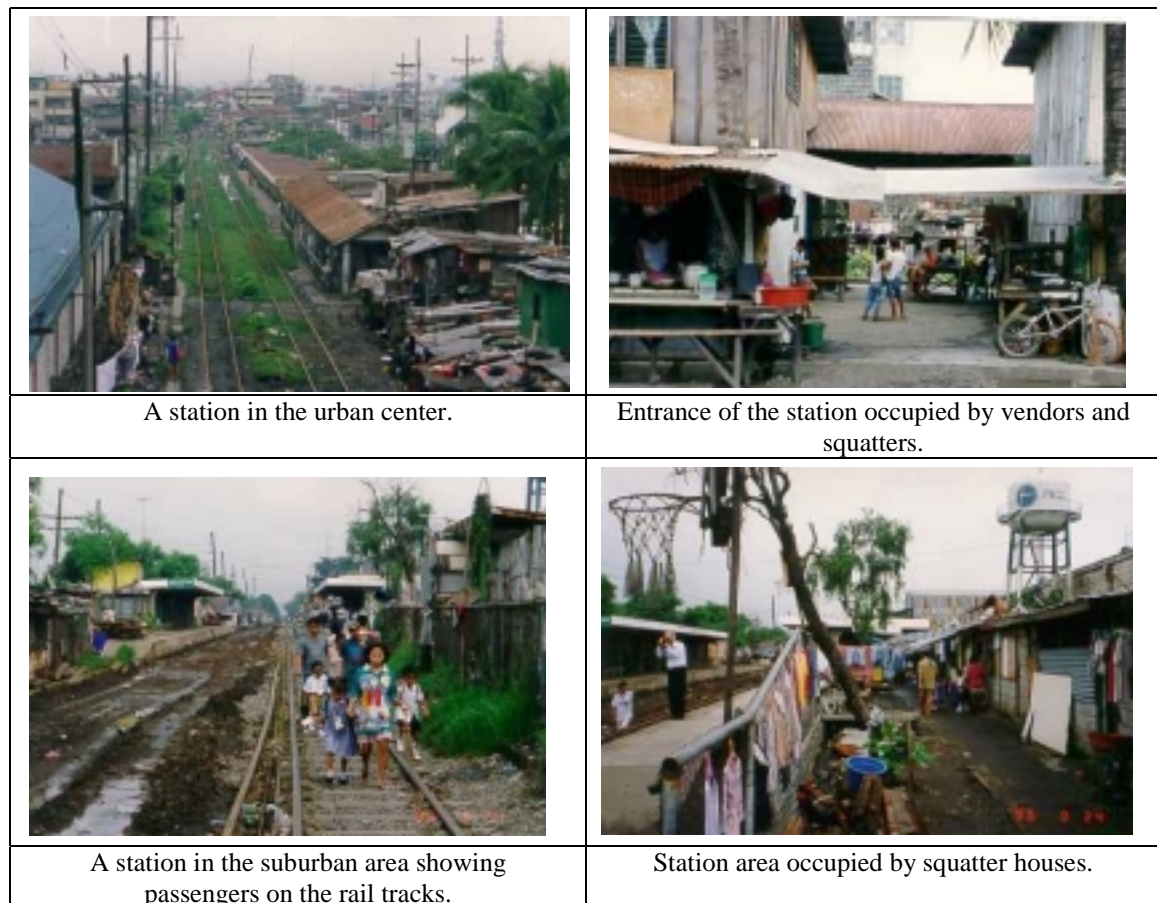


The general traffic conditions at terminal areas for 1984 and 1996 are shown in Figures 2.11 to 2.13. Additionally, succeeding photos depict the existing terminal conditions by major public transport modes. There are presently five (5) types of public transportation modes operating in Metro Manila. These are the PNR railway, LRT (Line 1), Bus, Jeepney and Tricycle. The transportation terminals are basically provided separately by type of mode.

(PNR Inter-urban Railway)

Presently, the Philippine National Railway (PNR) is the only inter-urban railway operated from north to south in Metro Manila. The PNR rehabilitation project has been recently carried out to provide efficient commuter rail service. However, reliability and efficiency of the service has not improved yet.

**FIGURE 2.14
 EXISTING PNR STATIONS**



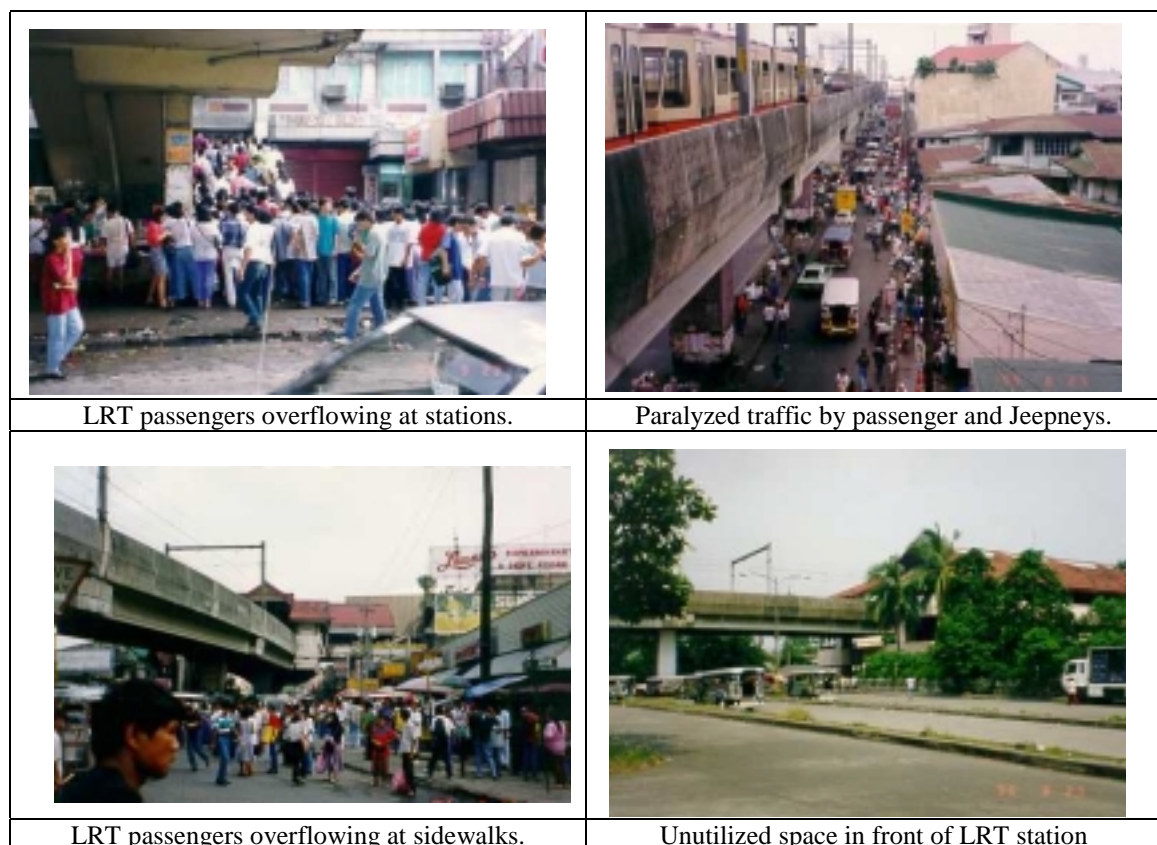
(LRT Line 1)

LRT Line 1 is operating from Monumento to Baclaran passing through the urban center of Metro Manila. The system was initially planned to carry 250 thousand passengers per day. However, almost 400 thousand passengers are presently using the system daily.

Due to this extremely large demand, major terminal areas are very congested with passengers overflowing from station and pedestrian walkways. Likewise, a lot of jeepneys and tricycles are competing for passengers on the frontage roads of the stations.

In order to meet the large demand, Line 1 expansion program is being undertaken. This will eventually place added burden on the operation and management at terminal areas.

FIGURE 2.15
EXISTING LRT LINE 1 STATION AREA



(BUS)

The bus transport system is the most important public transportation mode for the medium to long distance trip users in Metro Manila. This is due to the lack of efficient rail-based transport system. A large number of buses on the major arteries are generating serious traffic bottlenecks, particularly at bus stops and terminal areas as shown in Figure 2.16.

Presently there are more than 100 bus companies serving urban and inter-urban routes. Their terminals are provided individually, scattered along EDSA and along the LRT Line 1 corridor. The terminal conditions differ from one another. Only a few large bus companies can afford to build a comfortable terminal facility while most of the other companies have to manage within a limited space and facility. Furthermore, there is no appropriate coordination with other public transport modes to access the terminals.

FIGURE 2.16
EXISTING BUS STOPS AND TERMINALS









	
<p>Insufficient bus stop</p>	<p>Double parking disturbing general traffic flow</p>
	
<p>No facility for transfer in front of the bus terminal.</p>	<p>Inside of the bus terminal of a large bus company.</p>

FIGURE 2.17
EXISTING JEEPNEY TERMINALS

	
<p>Off-road terminal (improper maintenance)</p>	<p>Jeepney terminal utilizing local road</p>
	
<p>Off-road terminal (vacant land)</p>	<p>Road-side parking</p>

(Jeepney)

The highest share in the public transportation modes in Metro Manila is the jeepney. There is quite a large number of jeepneys existing basically for short and medium distance commuter trips. The jeepneys are operated by small private companies so that they can use only vacant spaces or road spaces for their terminals. Because of their serious impact on traffic, MMDA and LGU's in coordination with the jeepney associations are providing appropriate loading and unloading areas for the jeepneys to lessen or avoid their uncontrolled operations on the major arteries.

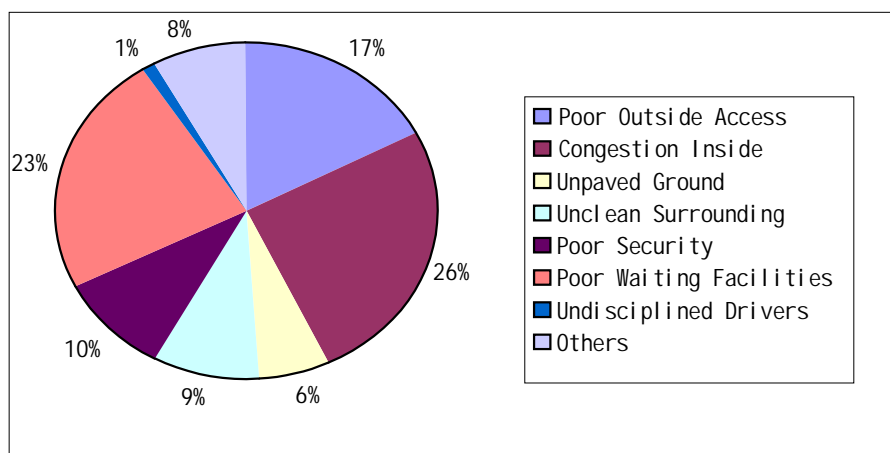
2.4 Results of the Passenger Interview Survey at Terminal

From the transportation planning point of view, the largest problem involving terminals is the traffic congestion around terminal areas. Terminal users are both the victims and the causes of the problem. To better understand the terminal problem, MMUTIS conducted a Passenger Interview Survey in 1996, the pertinent results of which are presented in Table 2.3.

**TABLE 2.3
 TERMINAL PROBLEMS NOTED BY PASSENGERS**

Problems	Jeepney		Bus		LRT		Total	
	No.	%	No.	%	No.	%	No.	%
Poor outside access	394	18.3	246	21.0	132	14.0	772	18.1
Congestion inside	186	8.6	94	8.0	193	20.4	473	11.1
Unpaved grounds	230	10.7	91	7.8	46	4.9	367	8.6
Unclean surroundings	398	18.5	106	9.0	68	7.2	572	13.4
Poor security	237	11.0	158	13.5	73	7.7	468	11.0
Poor waiting facilities	365	16.9	269	23.0	177	18.8	811	19.0
Undisciplined drivers	128	5.9	66	5.6	7	0.7	201	4.7
Others	63	2.9	3	0.3	62	6.6	128	3.0
No Answer	153	7.1	139	11.9	186	19.7	478	11.2
Total	2,154	100.0	1,172	100.0	944	100.0	4,270	100.0

Source: MMUTIS, 1996



The combined totals for all three transport modes showed “poor waiting facilities” as the terminal problem most frequently mentioned by the respondents (19%), followed by “poor outside access” (18%), and “unclean surroundings” (13%). Among the transport modes, bus terminals were considered to have more poor outside access (21%). The LRT terminals were viewed as congested (20%). The jeepney terminals, on the other hand, were assessed to have a problem of unpaved grounds (11%).

2.5 Identified Problems and Issues

Transportation terminal problems are summarized in Table 2.4. While the problems remain unchanged since 1983 (JUMSUT), the magnitude of these problems has increased.

TABLE 2.4
SUMMARY OF CURRENT PROBLEMS ENCOUNTERED IN PUBLIC TRANSPORT TERMINALS

		CBD's	Suburban Areas
Terminal Users	Public Transport Passengers	a) Increasing walking distance in access, transfer b) Increasing discomfort in waiting and access c) Increasing danger in waiting, loading/unloading d) Increasing difficulties in transfer	a) Accessibility to trunk PT routes b) Longer waiting time c) Lesser choice of destinations d) Safety of travel
	Operators/ Drivers	a) Lack of turn-around spaces b) Lack of waiting spaces c) Lack of loading/unloading places/facilities	a) Profitability
	Other Road Users	a) Traffic congestion in terminal areas b) Non-availability of parking spaces	
From Government/ Overall National Economic Viewpoint		a) Increasing overall traffic cost due to increasing bottleneck in terminal area b) Decreasing accessibility to economic growth centers c) Decreasing development potentials at growth centers d) Increasing difficulties in route control and management	a) Providing reasonable level of public transport service to isolated areas

2.6 Key Issues in Developing Terminals

2.6.1 Role of Public Sector

The Government has played a minimal role in developing transportation terminals in Metro Manila. However, as traffic congestion worsens everyday, both the public and private sectors are realizing the importance of terminal construction. At present, the following terminals have been proposed:

- a) FTI Bus-Jeepney Terminal (Private);
- b) Fort Bonifacio Multi-Modal Station (Private);
- c) Valenzuela Multi-Modal Station (Private); and
- d) Alabang Bus-Jeepney Terminal.

The FTI and Valenzuela projects involve restriction of provincial buses entering the city center of Metro Manila.

The role of Government in terminal development should not be small. It should be involved in the following areas:

- (i) Planning of terminal development for public convenience; and
- (ii) Coordinating with terminal developers to guide the implementation with regard to the following:
 - Establishing a legal basis to control the development (within the existing legal framework such as land use zoning by MMDA and CPC issuance by LFTRB); and
 - Providing the public sector's financial share if deemed necessary for construction of facilities.

2.6.2 Terminal Development in Built-up Areas

Development of terminals in built-up areas, as proposed in JUMSUT, involves development and management. At present, however, there is no agency responsible for terminal development and management. The organizational setup as well as adequate institutional arrangements must first be worked out.

2.6.3 Station Planning for LRT/MRT

Line 2 and Line 3 (EDSA MRT) are currently under construction. However, these projects are insufficiently coordinated with each other or with the existing LRT Line 1. This is particularly true in relation to the transfer stations and its related facilities where little planning has been done (e.g., pedestrian path, bus/jeepney loading/unloading space, etc.) For instance, passengers have to walk more than 300 meters to transfer between LRT Line 2 and Line 3 at Cubao, and no facility is planned for improving walking, waiting and boarding/alighting conditions. Considering the huge volume of boarding/alighting and transferring LRT passengers, this will surely create another traffic bottleneck in the area and cause great inconvenience and discomfort for passengers.

The situation is basically the same for other stations. Both Government and the private sector do not want to take the responsibility nor the initiative to improve the surrounding facilities of the stations.

Government should establish guidelines to control the LRT/MRT development projects. In doing so, it can properly assess and direct the implementation of the proposed projects.

3. FUNCTIONAL CLASSIFICATION OF TERMINALS

3.1 Classification

The classification of transportation terminals, or transportation nodes, will help clarify the objectives of the node development projects. Transportation nodes normally show many types of expressions according to the modes of transport and landuse of the adjacent areas, as well as the demands using the nodes. Sometimes designs of the transportation nodes are different based on the era they are constructed. In addition, some transportation nodes are symbolic facilities in urban areas.

An important consideration in the preparation of the node development plan is to not only examine the functions of the transportation network system, but also to recognize its role in the overall urban public facilities.

Table 3.1 presents the classification of the transportation nodes. From the urban development structure in the study area, five features of landuse pattern are identified. Metro Manila will be divided into three areas, namely the old CBD, new urban center development along EDSA, and housing development areas in the vicinity. The suburban areas may be classified as either a major urban center or a minor urban center. The table also shows the relationship between the urban structure and landuse of the study area.

3.2 Location of the Proposed Major Transport Node Development Projects

The major modes in the existing public transportation system in Metro Manila are jeepney and bus transport. In spite of the congestion on the LRT Line 1, the share of the rail-based transport is rather small due to the short distance of the operation. However, recent economic expansion and serious congestion in the road network has necessitated that rail-based transport be segregated from general road traffic. Already, there are many proposals for LRT and railway projects.

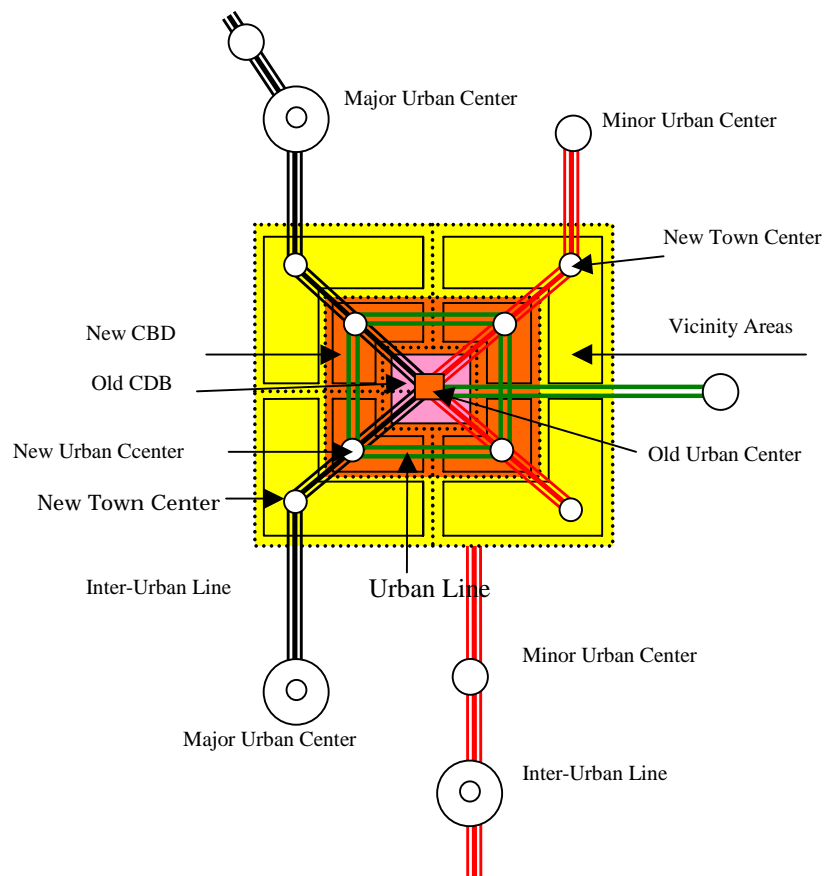
One of the objectives of the MMUTIS is also to develop the rail-based transport network system. Accordingly, this terminal node development plan will be prepared in line with the basic transport network development policies or strategies.

In order to identify the strategic locations for terminal node development, the following development strategies are examined:

- a) The coordination of future rail-based transport system, provision of smooth transfer and comfort for the passengers, and promotion of the use of the transport system; and
- b) The identification of strategic locations in line with the functions and hierarchy of the public transport network configuration. It is also important to take into account the urban structure and landuse features in the study area.

TABLE 3.1
CLASSIFICATION OF THE MAJOR TRANSPORTATION NODES AND
RELATIONSHIP BETWEEN URBAN STRUCTURE AND THE NODES

No.	Study Area	Develop-ment Area	Landuse	Mode Service Area	Mode	Feature of Landuse	Basic Considerations for the Development Plan
1	Metro Manila CBD and its Vicinity Area	Old CBD Area	Commercial Or Business	Inter-Urban	Multi-Modal Railway Bus LRT	Old development area High density, congested Mixed development Poor urban environment	Coordination with urban renewal/ redevelopment project Traffic management will be required.
2		New		Urban		Planned development High-rise Desirable urban environment	Priority will be given to Walk Trip from the node to the destination.
3		New Town Center				Large scale of residential developments in the suburban areas.	Secondary mode system from the node be considered such as Park and Ride, Kiss and Ride, etc. To provide community area, etc.
		Airport Terminal					Sufficient facilities for international passengers
4	Suburban Area	Major Urban Center				Gateway to/from the major urban center	
5		Minor Urban center				Gateway to/from the minor urban center	



The present system of bus and jeepney operations is the separation of inter-urban routes from urban routes and prohibiting inter-urban routes from entering the area inside EDSA.

Operation of the jeepneys along EDSA was also prohibited. In the future, this kind of efforts will have to be re-examined based on the new rail-based transport system, which will play a major role in the network system.

The main issue about the future transport network is where and how to intersect between inter-and intra-urban systems. There are five ideas that can be considered. Figure 3.1 shows the five conceptual functional public transport systems with strategic transportation nodes developments.

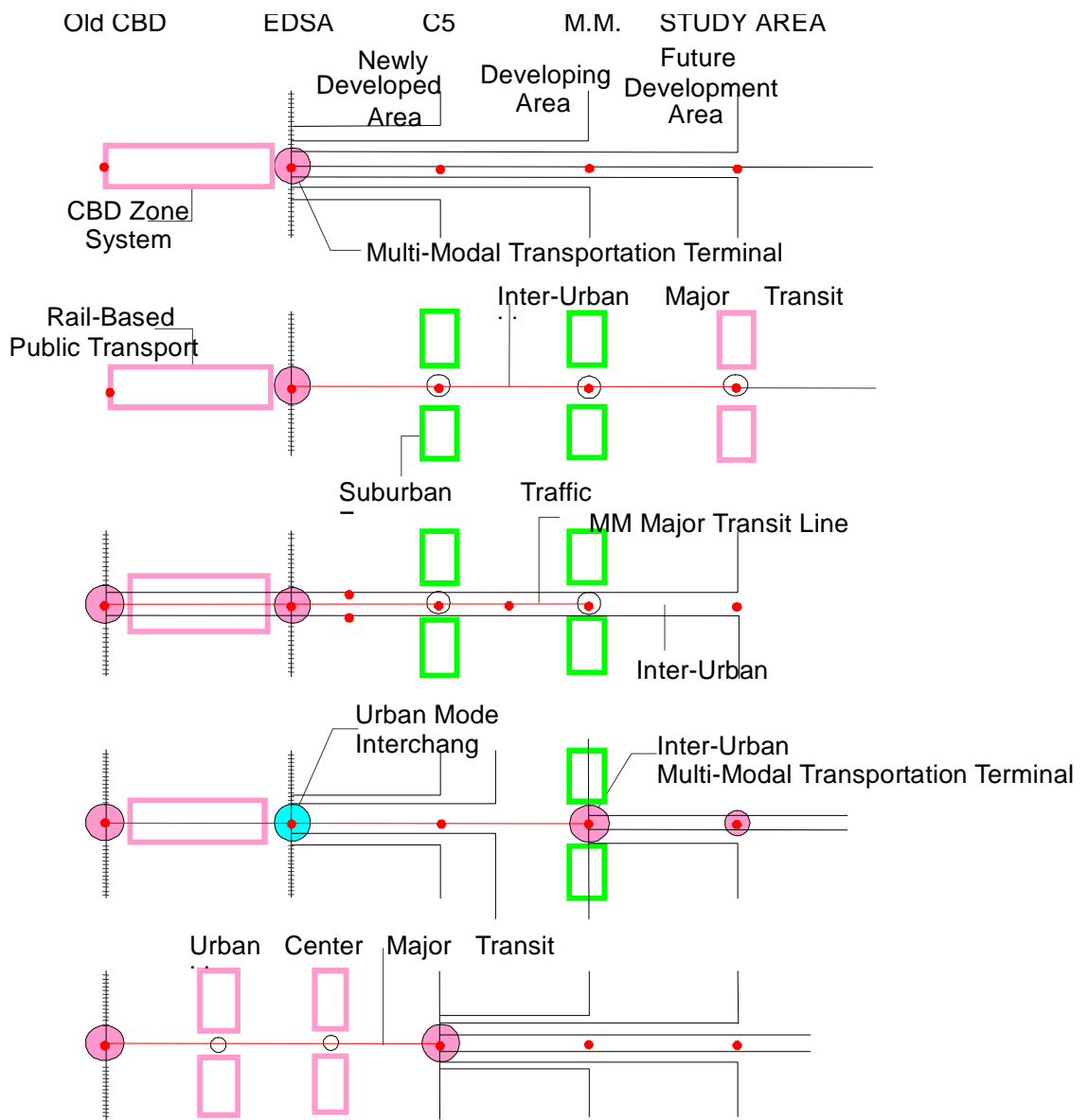
Plan A is an existing pattern intersecting on the EDSA corridor. However, going inside EDSA will be strictly prohibited. Plan B will reduce the number of inter-urban bus routes by replacing them with an inter-urban rail transport.

Plan C is a modification of Plan B. It will provide some inter-urban routes to the old CBD area in order to sustain and encourage economic activities in the area with improved accessibility, as well as provide accessibility to the institutional and recreational facilities located in the old CBD. In addition, those accesses will be provided in line with the future urban expressway network.

Plan D will provide another development corridor along the MM boundary in addition to the existing EDSA economic corridor. The transfer from the inter-to intra-urban system will be managed at the MM boundary. An advantage of this plan is that it will enable to reduce the development cost, as compared with the cost of the large transport facilities development in the EDSA corridor. The existing function in the EDSA will be minimized. Plan E will remove the major function of transportation focal points from the EDSA corridor and re-develop along MM boundary and the outskirts of the existing urbanized area.

Based on the examination of the five plans, Plan C will be more practical. The provision of the accessibility to the old CBD will be indispensable in revitalizing the commercial and business activities in the area. Although another economic corridor can be developed, the EDSA corridor will play the most significant role and generate higher traffic demand than other areas.

FIGURE 3.1
ALTERNATIVES FOR THE INTER-URBAN TRANSPORT SYSTEM AND NODES DEVELOPMENT



Old CBD Quiapo Recto	Caloocan	(Caloocan)	Malanday	San Fernando
	Cubao	Marikina		
	Ortigas	Pasig	Cainta	Rizal
	Makati	FTI	Alabang	Laguna/Batangas
	Baclaran	(Baclaran)	Zapote	Cavite
Quezon City	Fairview	-	-	
	Novaliches	-	-	

The following objectives should be considered in the development and improvement of terminal nodes:

- i) To develop a more systematic and functional mode interchange in the EDSA corridor.

As mentioned above, the EDSA corridor will play a major role in the future transportation system. It is expected that the existing traffic congestion in the corridor will be eliminated with the completion of LRT Line 3 (MRT). However, the large future traffic demand is indicating another possible traffic congestion especially in the major transportation node areas. To minimize deterioration and provide smooth traffic flow in the EDSA corridor, the following strategies on the operation of transportation modes and their interchanges are proposed:

- 1) Only rail-based transport lines will be allowed to cross EDSA as well as major bus routes in the corridor where no rail-based line is provided;
- 2) Jeepney routes will not be allowed to cross EDSA;
- 3) Inter-urban bus routes will be disallowed from EDSA. All inter-urban bus routes will be directed to use the terminals developed along EDSA; and
- 4) Internal bus transport service in the EDSA corridor will be proposed to supplement the long interval of the LRT stations and to maintain accessibility to the areas along EDSA.

Based on these public transportation operational strategies, the transportation node development concept can be shown in Figure 3.2.

- ii) To develop transportation nodes for an efficient public transportation network in the CBD.

The aforementioned strategies aim to provide effective interchange function between inter- and intra-urban transportation systems. They also seek to improve the public transport system in the CBD. At present, the major transport modes utilized in the CBD are the so-called para-transit services such as jeepneys, FX taxis and tricycles due to the narrow and complicated street network in the area. Although the para-transit modes are able to provide almost door-to-door service, the large traffic demand and their uncontrolled operation are causing traffic congestion. In order to improve traffic conditions and provide a better urban environment, reorganization of the transport system is essential.

Figure 3.3 is shows a concept of traffic zone system and development of major interchanges. Identifying major interchanges and preparing a functional transport network will avoid traffic disturbances such as illegal parking and illegal boarding/alighting of jeepneys and tricycles, which are observed at most stations of the LRT Line 1.

- iii) To secure accessibility from major transportation nodes to major roads.

Major transportation nodes will generate heavy traffic demand. Therefore, the roads accessed to the major nodes should be provided with sufficient capacity and traffic management measures will be required to maintain smooth traffic flows.

FIGURE 3.2
OPERATIONAL MANAGEMENT OF THE PUBLIC TRANSPORT LINES AND NODES DEVELOPMENT

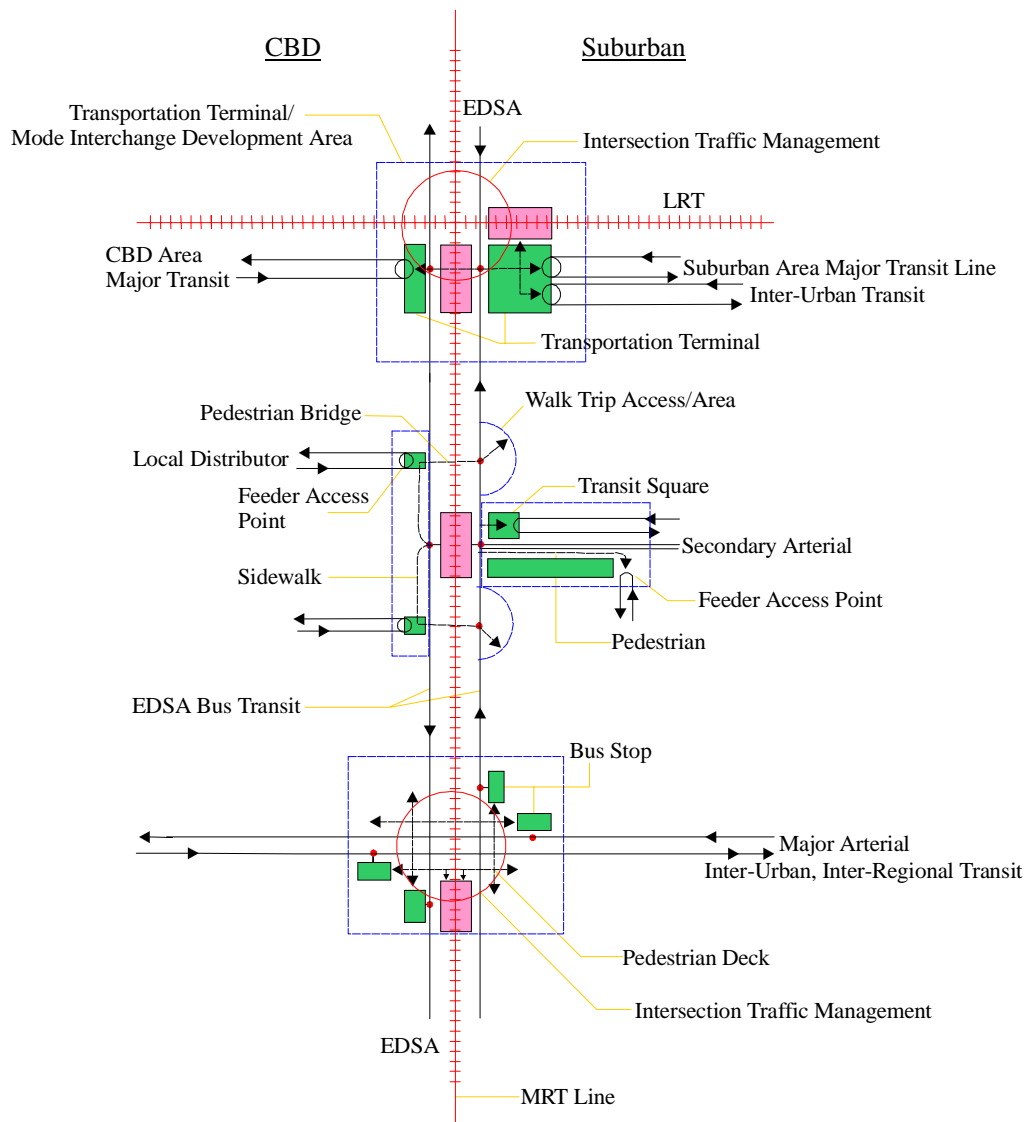
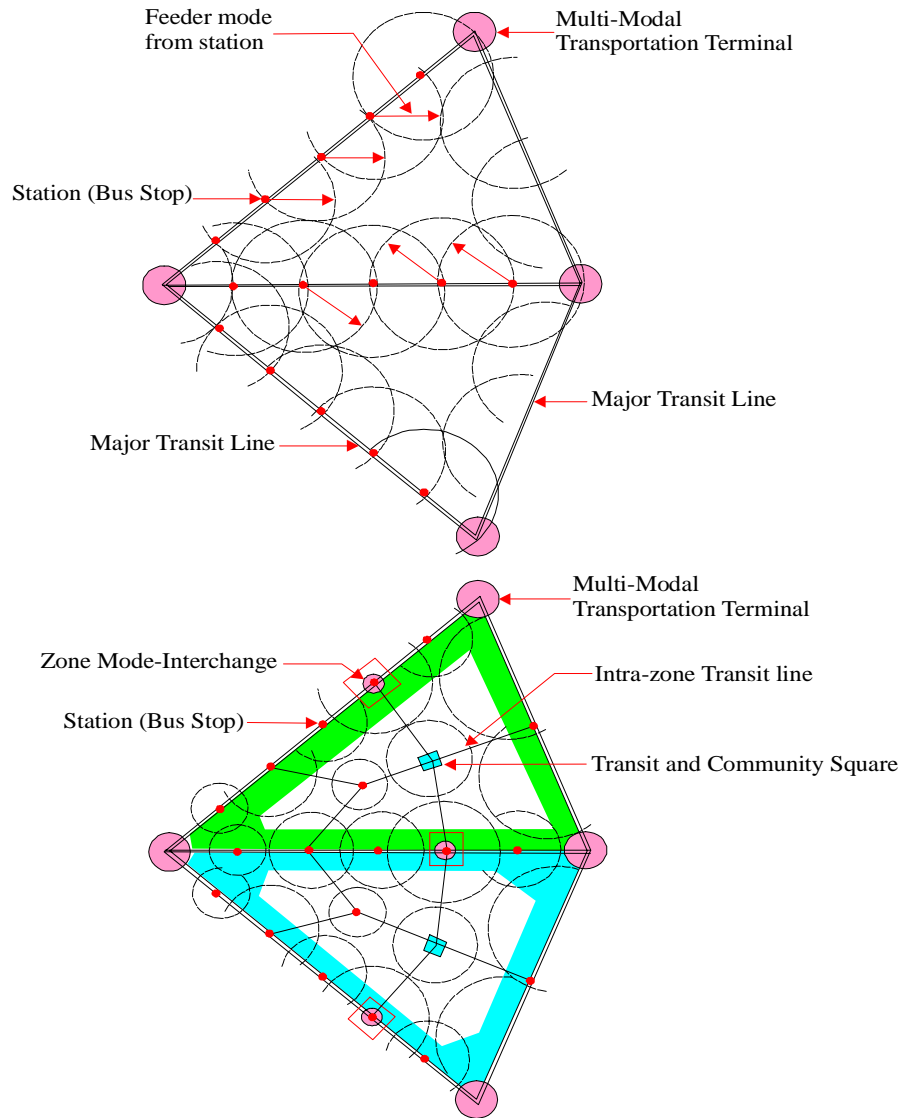


FIGURE 3.3
A CONCEPT FOR THE PUBLIC TRANSPORT SYSTEM AND
TERMINAL DEVELOPMENT IN THE METRO MANILA CBD



- iv) To lead the integration of the bus and jeepney terminals which are presently scattered along major roads.
- v) To provide safety and comfort for transfer passengers and pedestrians.

Transportation nodes should be planned and designed to be people-friendly and safe. The node areas should also be attractive not only to the passengers, but also for the people staying or working in these areas. The pedestrian deck/path is one such amenity square that usually addresses this requirement.

- vi) To prepare a preferable development plan in line with the functions and location of the nodes.

The components and structure of transportation nodes will differ according to their functions and landuse, as well as traffic demand and transportation modes intersecting them. Therefore, the plan and design for each node should be prepared carefully.

- vii) To prepare a preferable development plan and to negotiate land availability.

The public transportation system generally faces financial difficulties due to low fares. Even so, the development of node areas will be very costly, especially in urbanized areas. It will be impossible to make this development project viable by itself. Integration with urban development will be an effective measure to reduce the financial burden. This integrated development does not benefit the transportation facilities alone, but also induces a large impact on urban economic development. Negotiation of available land for node development, such as the PNR land, will be another measure to reduce costs.

4. TERMINAL DEVELOPMENT PLAN OR THE “DO MAXIMUM” CASE

4.1 Development Concept Plans (Case Study)

Based on the strategies, a total of 47 major transportation nodes have been identified in line with the integration of urban development, as shown in Table 4.1 and Figure 4.1. Out of these, 21 nodes are in the CBD and 9 nodes are in the vicinity area of the CBD. In the suburban areas, 9 nodes are in the major urban centers and 8 nodes in the minor urban centers. In addition, the project to improve the existing LRT Line 1 corridor is proposed.

For the nodes in the CBD, all the projects should be coordinated with urban development because of the high construction and land costs, as well as the adverse impact on the urban economy. In the old CBD area, it is expected that node development will encourage an urban redevelopment project or urban environmental improvement project. In the new urban centers, it will accelerate their commercial and business development.

For the Master Plan of the transportation node development projects, the major components and types of construction method of all the proposed projects are examined (refer to Table 4.2).

In addition, several major transportation nodes are discussed further, identifying the existing problems and issues and preparing concept plans, especially for the nodes which may introduce an integration with urban development. These are the following:

- a) Metro Manila Old CBD Integrated Transportation Node Area Development;
- b) Metro Manila North Integrated Transportation Node Area Development;
- c) Metro Manila South Integrated Transportation Node Area Development;
- d) Metro Manila East Integrated Transportation Node Area Development;
- e) Metro Manila Ortigas New Urban Center Transportation Node Area Development;
- f) Metro Manila New Urban Center Transportation Node Area Development; and
- g) Metro Manila Major Public Transport Corridor Nodes Area Improvement (LRT I).

4.2 Evaluation of the Proposed Projects

The proposed projects will be evaluated from the following viewpoints:

- a) Project cost;
- b) Socioeconomic effectiveness;
- c) Financial viability;
- d) Land use impacts; and
- e) Construction difficulties.

Based on the evaluation results, a priority ranking for the projects will be undertaken. Basically, the evaluation will be carried out according to the program type in order to enhance balanced development in the study area.

TABLE 4.1
TERMINAL AND MODE INTERCHANGE PROJECTS BY DEVELOPMENT PROGRAM

Program	Sub-Program	Terminal and Mode Interchange
(I) Metro Manila Integrated Transportation Node Area Development Program	(A) Metro Manila Old CBD	(1) Divisoria (2) Recto (3) Blumentritt (4) Central Station
	(B) Metro Manila North	(1) Kalayaan (2) Monumento
	(C) Metro Manila South	(1) EDSA/Taft Ave. (2) Baclaran (3) Libertad
	(D) Metro Manila East	(1) Cubao
	(E) Metro Manila Middle Area	(1) C3/Quezon (2) Magsaysay
(II) Metro Manila New Urban Center Transportation Node Area Development	(A) Quezon	(1) Quezon/EDSA (2) North Avenue (3) Congressional
	(B) Ortigas	(1) Ortigas
	(C) Fort Bonifacio	(1) Fort Bonifacio (2) MCX (NAIA)
	(D) Makati	(1) MCX/ (Libertad) (2) MCX (EDSA) (3) EDSA (LRT2)
(III) Metro Manila New Town Center Transportation Node Development	(1) Quirino Highway (2) San Mateo (3) UP Diliman (4) Marikina (5) Taytay	(6) Sun Valley (7) San Isidro (8) Sucat (9) Zapote
(IV) Metro Manila Major Public Transport Corridor Nodes Area Improvement Program	LRT Line 1	Monumento Baclaran
(V) Major Urban Center Public Transport Terminal Development Program	(1) Malolos (2) Meycauayan (3) San Jose Del Monte (4) Antipolo (5) Bacoor	(6) Alabang (7) Biñan (8) Calamba (9) Dasmariñas
(VI) Minor Urban Center Public Transport Terminal Development Program	(1) Santa Maria (2) Bulacan (3) Angono (4) Muntinlupa	(5) San Pedro (6) East Imus (7) West Imus (8) Noveleta
(VII) Institutional Development Program		

FIGURE 4.1
 PROPOSED TRANSPORTATION NODE DEVELOPMENT PROJECTS

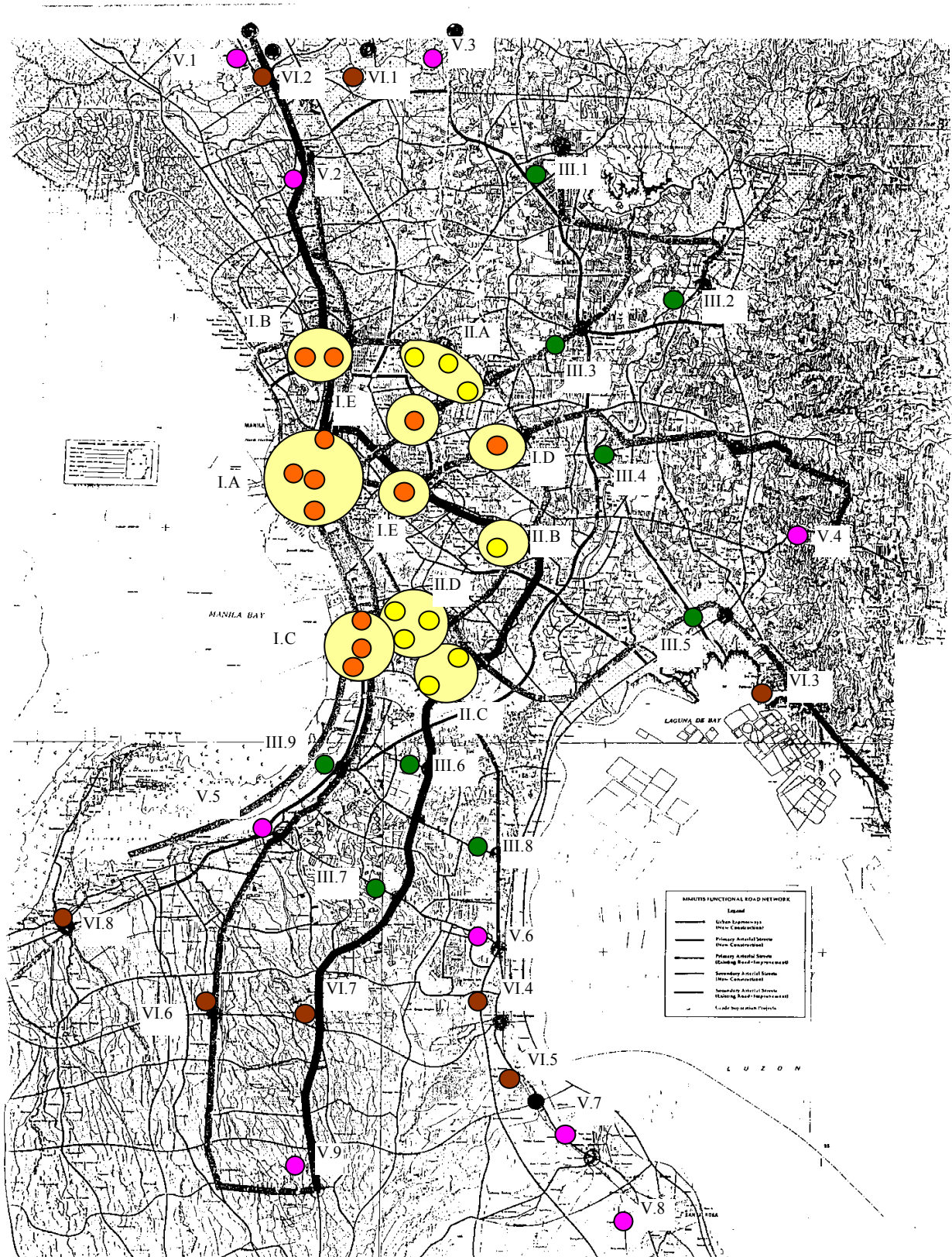


TABLE 4.2
COMPONENTS OF THE TRANSPORTATION NODES DEVELOPMENT PLAN

Program	Sub-Program	Terminal and Mode Interchange	Const- ruction		Type of Transport Modes					Struc- ture		Other Facilities			Traffic Management	Integration with Urban Development
			Improvement of Existing facilities	New Construction	Railway	MRT/LRT	Inter-Urban Bus	Metro Bus	Jeepney	Terminal Building	On Ground	Pedestrian Path/Deck	Park and Ride Parking	Amenity or Community Area		
(I)	(A)	(1) Divisoria (2) Recto (3) Blumentritt (4) Central Station	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	(B)	(1) Kalayaan (2) Monumento	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	(C)	(1) EDSA/Taft Ave. (2) Baclaran (3) Libertad	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	(D)	(1) Cubao	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	(E)	(1) C3/Quezon (2) Magsaysay	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(II)	(A)	(1) Quezon/EDSA (2) North Avenue (3) Congressional	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	(B)	(1) Ortigas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	(C)	(1) Fort Bonifacio (2) MCX(NAIA)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	(D)	(1) MCX(Libertad) (2) MCX(EDSA) (3) EDSA(LRT2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(III)		(1) Quirino H'way (2) San Meteo (3) UP Diliman (4) Marikina (5) Taytay (6) San Valley (7) San Isidoro (8) Sucat (9) Zapote	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(IV)	LRT L 1	Monumento to Baclaran	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(V)		(1) Malolos (2) Meycauayam (3) S. J. Del Monte (4) Antipolo (5) Bacoor (6) Alaban (7) Binan (8) Calamba (9) Dasmaringas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(VI)		(1) Santa Marie (2) Bulacan (3) Angono (4) Muntenlupa (5) San pedoro (6) East Iamus (7) West Iamus (8) Noveleta	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

FIGURE 4.2
TRANSPORTATION NODE DEVELOPMENT CONCEPT PLAN

PROGRAM	Metro Manila Old CBD Integrated Transportation Node Area Development
PROJECT	(1) Divisoria Inter-Urban Multi Modal Transport Terminal (2) Recto Urban Center Multi Modal Interchange Area (3) Blumentritt Sub-Center Public Transport Terminal (4) Central Station improvement for the LRT line 4
DEVELOPMENT DIRECTION	- To provide a desirable linkage between public transport modes leading to the old CBD area so as to assure an accessibility and comfort on the public modes as a system/network. - To provide public open spaces and improve urban environment in the old CBD - To stimulate urban economic activities through the area development of the integrated mode interchange.

PLANNING ISSUES

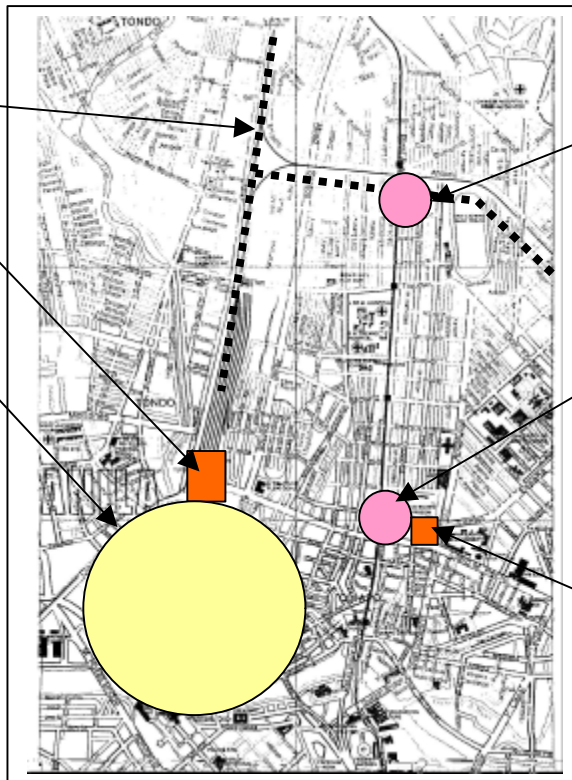
Proposed Inter-Urban Railway TerminDevelopment

Tutuban Commercial Development

Traditional development of the old Manila
 Traffic congestion on the narrow streets

Insufficient capacity on the major arterial network

Poor urban living environment in the old Manila



Blumentritt (LRT 1) Proposed new underground railway station
 Heavy mixture of vendors, pedestrian and Jeepney

D.Jose (LRT 1)
 Large pedestrian and transfer demand to Bus and Jeepney
 Poor Bus and Jeepney terminal facilities and congested

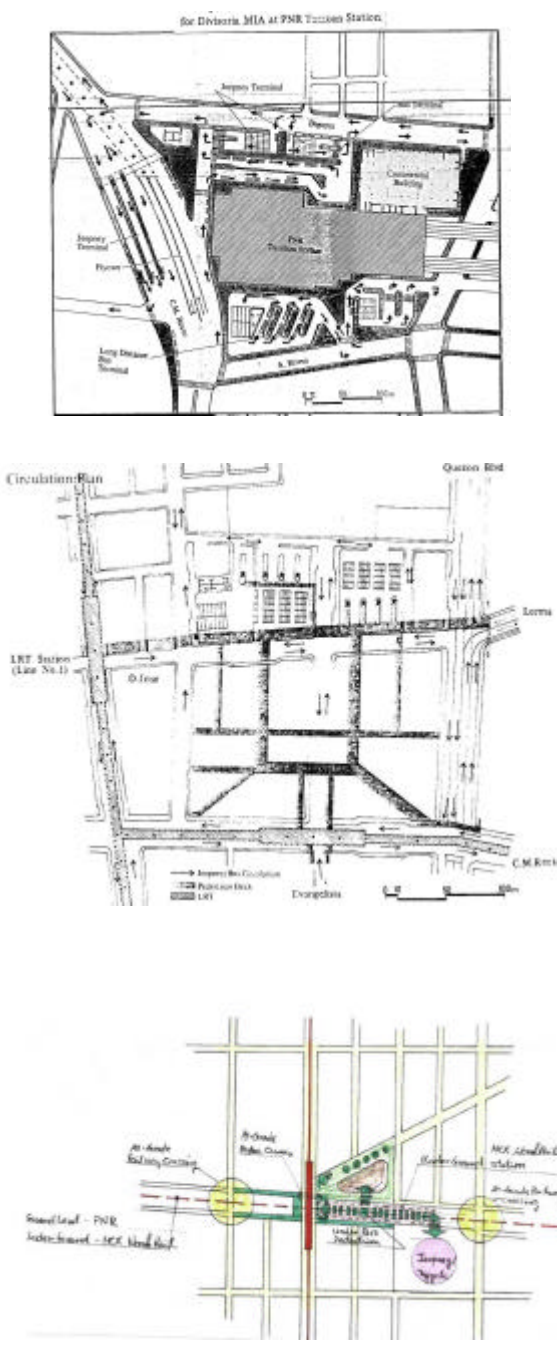
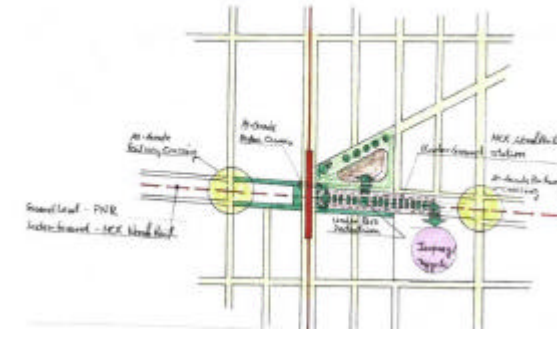
Pedestrian path between LRT stations
 Old prison land indispensable for the terminal development

Conceptual Transport Network and Terminal Configuration and Related Projects Proposals



MMUTIS

**FIGURE 4.2 (CONT'D.)
 TRANSPORTATION NODE DEVELOPMENT CONCEPT PLAN**

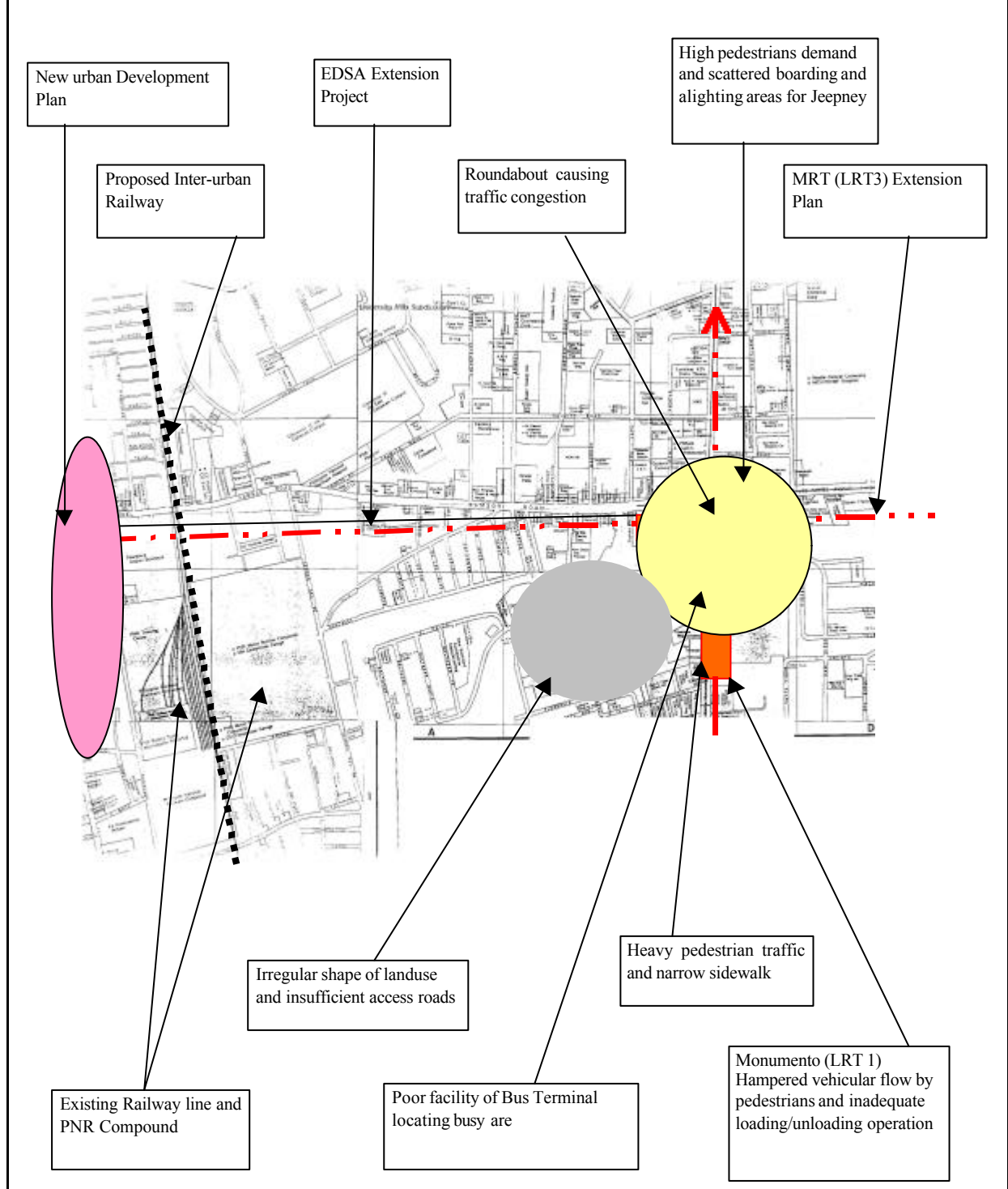
PROGRAM	Metro Manila Old CBD Integrated Transportation Node Area Development	
PROJECT	(1) Divisoria Inter-Urban Multi Modal Transport Terminal (2) Recto Urban Center Multi Modal Interchange Area (3) Blumentritt Sub-Center Public Transport Terminal (4) Central Station improvement for the LRT line 4	
<p>PROJECT COMPONENTS</p> <p>(Divisoria)</p> <ul style="list-style-type: none"> - Inter-urban Railway Terminal - Inter-urban Bus Terminal - Jeepney Terminal - Parking Space - Pedestrian Path to LRT 2 Station <p>(Recto)</p> <ul style="list-style-type: none"> - Bus/Jeepney Terminal - Pedestrian Between LRT 1 and LRT 2 - Integration of the existing terminals scattered <p>(Blumentritt)</p> <ul style="list-style-type: none"> - Underground Railway Station for Northrail and MCX line - Closure of Blumentritt Avenue and Station Plaza development - Railway crossings for local arterials - At-grade intersection improvement - Landscaping 	<p>A CONCEPTUAL PLAN</p> 	
<p>RELATED PROJECTS</p> <ul style="list-style-type: none"> - Tayuman Avenue widening project - Aurora Avenue improvement - People mover system between the mode interchange areas - Traffic Management in Blumentritt and Quiapo areas - Commercial and Business zone developments - Public plaza (park) development 		

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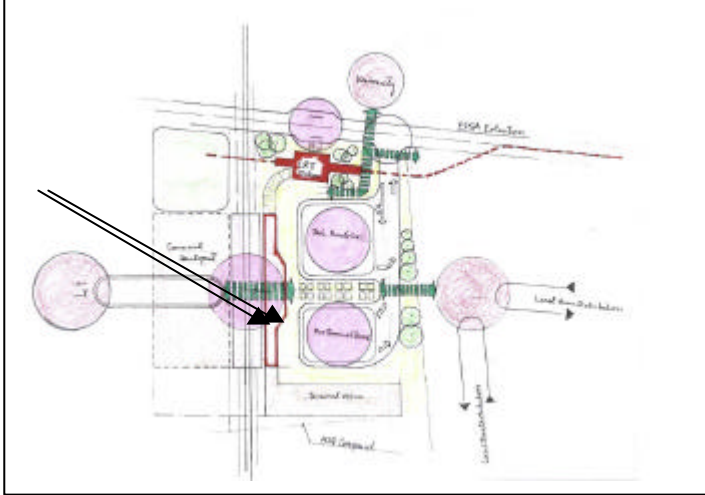
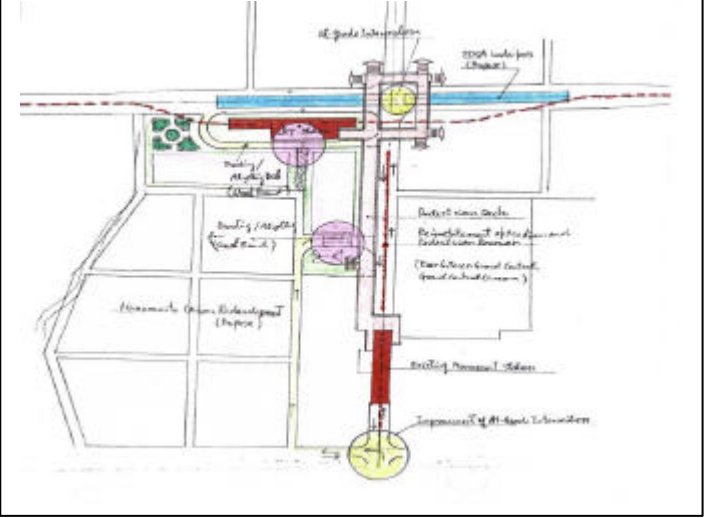
**FIGURE 4.2 (CONT'D.)
 TRANSPORTATION NODE DEVELOPMENT CONCEPT PLAN**

PROGRAM	Metro Manila North Integrated Mode Interchange Area Development
PROJECT	(1) Kalayaan Inter-Urban Multi Modal Transport Terminal (2) Monumento Urban Center Multi Modal Interchange Area
DEVELOPMENT DIRECTION	- To develop public transport terminals to provide desirable transfer from inter-urban and suburban modes to intra-urban mode as a North Gate of the CBD - To stimulate the economic development potential of the CBD fringe area and encourage sub-center developments

PLANNING ISSUES



**FIGURE 4.2 (CONT'D.)
 TRANSPORTATION NODE DEVELOPMENT CONCEPT PLAN**

PROGRAM	Metro Manila North Integrated Mode Interchange Area Development	
PROJECT	(1) Kalayaan Inter-Urban Multi Modal Transport Terminal (2) Monumento Urban Center Multi Modal Interchange Area	
<p>PROJECT COMPONENTS</p> <p>(Kalayaan)</p> <ul style="list-style-type: none"> - Railway Station plaza - Mode interchange facilities - Landscaping - Pedestrian deck - LRT station and pedestrian space - Bus and Jeepney bay on frontage road - At-grade signal intersection <p>(Monumento)</p> <ul style="list-style-type: none"> - LRT 3 (extension) Station Plaza - Bus/Jeepney boarding and alighting bay - Pedestrian Deck - At-grade intersection improvement - Median and pedestrian barrier on Rizal Ave. 	<p>A CONCEPTUAL PLAN</p> 	
<p>RELATED PROJECTS</p> <ul style="list-style-type: none"> - EDSA extension and grade separation at the intersection between EDSA and Rizal Ave. - Monument urban redevelopment 	 <p style="text-align: right;"><i>MMUTIS</i></p>	

**FIGURE 4.2 (CONT'D.)
 TRANSPORTATION NODE DEVELOPMENT CONCEPT PLAN**

PROGRAM	Metro Manila South Integrated Transportation Node Area Development
PROJECT	(1) Baclaran Multi Modal Interchange Area Development
DEVELOPMENT DIRECTION	- To develop public transport terminals to provide desirable transfer from inter-urban and suburban modes to intra-urban mode as a South Gate of the CBD - To stimulate the economic development potential of the CBD fringe area and encourage urban redevelopment projects as a urban sub-center

PLANNING ISSUES

Dangerous pedestrian crossing in the at-grade intersection on EDSA

EDSA station (LRT 1)
 Conflicting traffic flow between pedestrians and vehicles at the entrance/exit area of the station

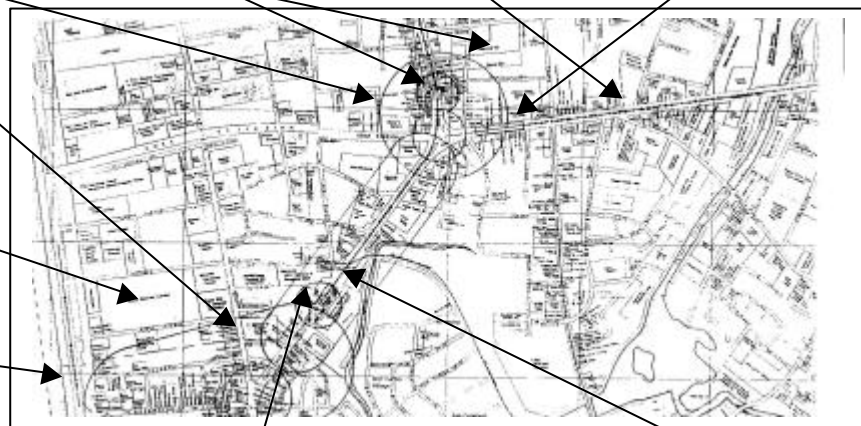
Existing Inter-urban Bus Terminals located far from LRT station

Taft Ave. Station (MRT)
 Require an adequate access to LRT 1 station

Hampered vehicular flow due to the mixture with pedestrians and inadequate loading/unloading operation of Jeepney

Traffic function of Taft avenue is destroyed by the pedestrians and street vendors.

Jeepney terminal located far from LRT station and dangerous crossing of Roxas Boulevard



Baclaran Station (LRT 1)
 Large number of passenger transfer to other mode of transport without any information/signboard

Poor facilities of the Jeepney and Bus terminals located at the vacant land adjacent to the LRT station

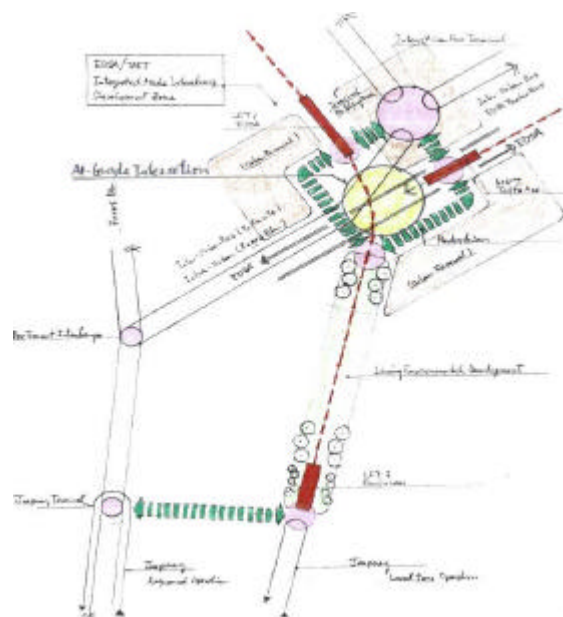
PROJECT COMPONENTS

- (1) Inter-urban bus terminal
- (2) Jeepney Terminal
- (3) Bus and Jeepney loading/unloading bay/berth
- (4) Pedestrian deck between EDSA station and Taft Ave. station including for the crossing EDSA
- (5) Improvement of the at-grade intersection between EDSA and Taft avenue.
- (6) Jeepney and Tricycle terminal at Baclaran Station
- (7) Provision of sufficient sidewalk from Baclaran Station to Roxaz Boulevard

RELATED PROJECTS

- (1) Traffic management in the Baclaran area including one-way system and junction improvement
- (2) Urban redevelopment
- (3) Urban environmental improvement project including Mexico road pedestrianization

A CONCEPTUAL PLAN

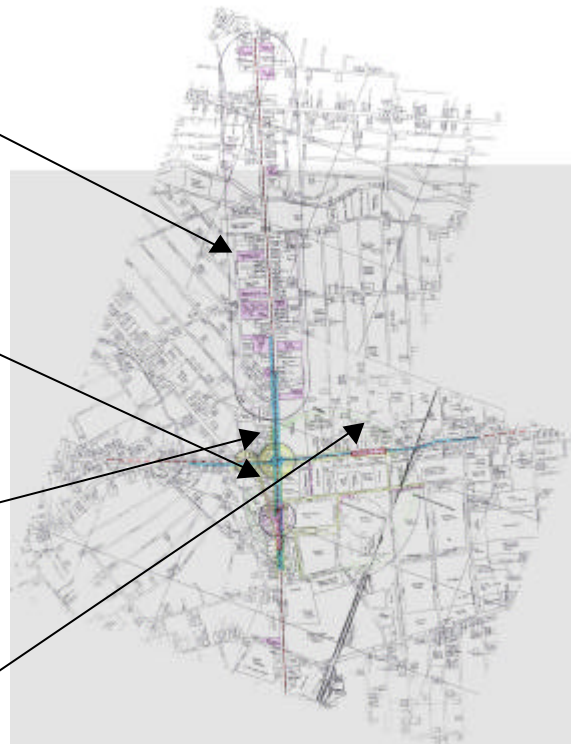


**FIGURE 4.2 (CONT'D.)
 TRANSPORTATION NODE DEVELOPMENT CONCEPT PLAN**

PROGRAM	Metro Manila East Integrated Transportation Node Area Development
PROJECT	(1) Cubao Multi Modal Interchange Area Development
DEVELOPMENT DIRECTION	<ul style="list-style-type: none"> - Reorganization and integration of the exiting bus terminals so as to develop an effective public transportation system as a whole - To stimulate the economic development potential of the EDSA new economic growth corridor, and enhance the improvement of urban environment in the old commercial and business district

PLANNING ISSUES

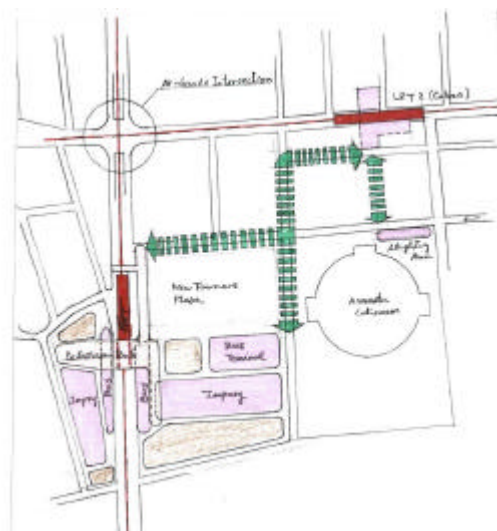
- Bus terminals scattered along EDSA, obstructing smooth traffic flows with inadequate loading /unloading operation, illegal parking, as well as buses entering and exiting to the terminals
- MRT Cubao Station area
 - Heavy pedestrian traffic of boarding and alighting buses, Jeepneys and tricycles, without adequate facilities such as bus bay/berth and waiting space
 - Conflicting traffic flow between buses and
- Traffic congestion on the at-grade intersection between EDSA and Aurora Boulevard due to the illegal loading/unloading operation of Buses and Jeepneys, and heavy pedestrian traffic flow
- LRT 2 Cubao Station (Plan)
 - Sufficient access to the EDSA transport corridor and transfer space to the local mode (Jeepney/ tricycle) be required



PROJECT COMPONENTS

- Inter-urban bus terminal
- CBD public transport terminal
- Bus bay on EDSA
- Pedestrian deck
- Bus, Jeepney and Tricycle loading/unloading area for LRT 2 station
- Pedestrian network development

A CONCEPTUAL PLAN



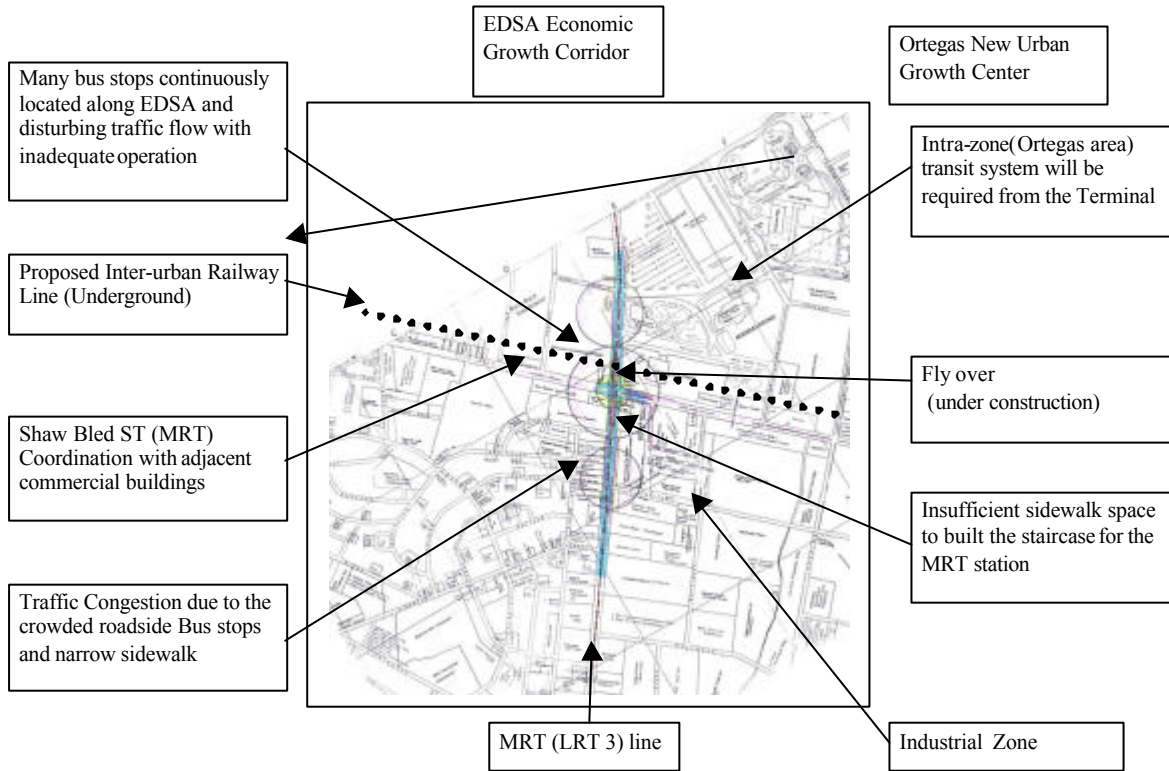
RELATED PROJECTS

- Intersection improvement (EDSA and Aurora Boulevard) including pedestrian bridge
- Urban redevelopment (Commercial and Business area)
- Traffic management system including one-way system and bus/jeepney road.

**FIGURE 4.2 (CONT'D.)
 TRANSPORTATION NODE DEVELOPMENT CONCEPT PLAN**

PROGRAM	Metro Manila New Urban Center Mode Interchange Development
PROJECT	Ortigas Urban Center Multi-Modal Interchange Area Development
DEVELOPMENT DIRECTION	- To provide a better and successive accessibility of public transportation network system to the New Urban Center in the EDSA Growth Corridor - To encourage New Urban Center development

PLANNING ISSUES



PROJECT COMPONENTS

- Inter-urban Railway terminal
- Inter-urban Bus terminal
- Intra-zone transit terminal
- Bus bay on EDSA
- Pedestrian deck between terminal and commercial buildings
- Pedestrian Plaza/Park

RELATED PROJECTS

- Intersection improvement (EDSA and Shaw Blvd) including pedestrian bridge
- Urban development (Commercial and Business area)
- Traffic management system including one-way system and bus/jeepey road.

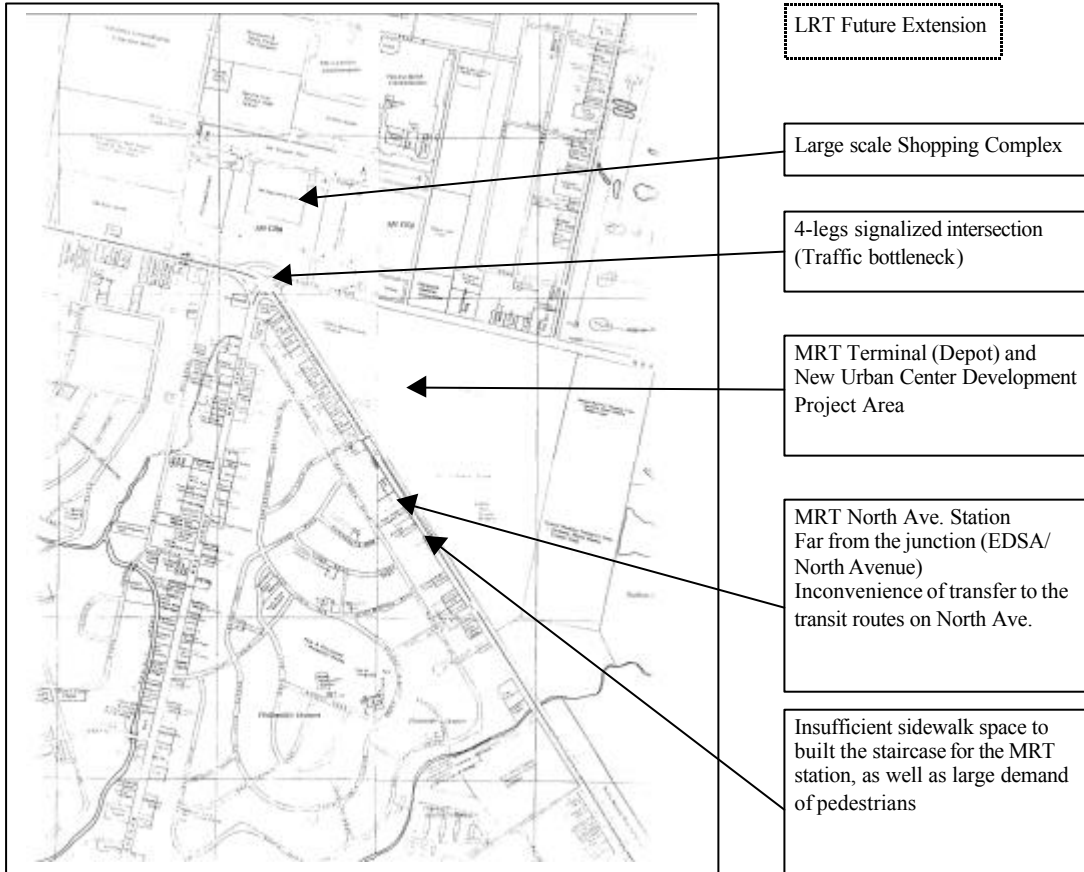
A CONCEPTUAL PLAN



**FIGURE 4.2 (CONT'D.)
 TRANSPORTATION NODE DEVELOPMENT CONCEPT PLAN**

PROGRAM	Metro Manila New Urban Center Transportation Node Development
PROJECT	North Avenue Urban Center Multi Modal Interchange
DEVELOPMENT DIRECTION	- To provide a better and successive accessibility of public transportation network system to the New Urban Center in the EDSA Growth Corridor - To encourage New Urban Center development

PLANNING ISSUES



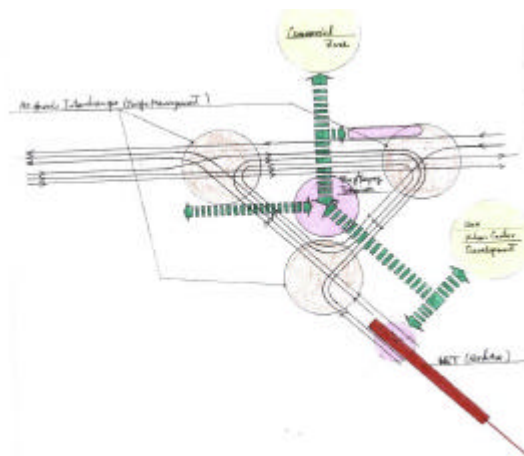
PROJECT COMPONENTS

- Inter-urban Bus terminal
- Intra-zone transit terminal
- Bus bay on EDSA and North Ave.
- Pedestrian deck connecting terminal and Station and Shopping complex
- Pedestrian Plaza/Park

RELATED PROJECTS

- Intersection improvement (EDSA and North Ave.) including pedestrian bridge
- Urban development (Commercial and Business)

A CONCEPTUAL PLAN



At this master plan stage, it is difficult to make a quantitative evaluation for all the proposed projects. Therefore, the evaluation criteria and considerations on the abovementioned items are further elaborated hereunder.

4.2.1 Project Cost

The major components of the project cost include construction cost, and land acquisition and compensation. The construction cost will be roughly estimated based on the model project plans in the expected development areas. However, land cost and compensation can not be confirmed due to the uncertainty on the exact location of the project sites. Moreover, the transportation nodes will be located in prime areas, which command higher land prices. It is clear that the self-financing implementation option will be impossible for node development projects.

The construction cost only for the transportation facilities, including the transfer passenger and pedestrian supports, can be explained in the features of the projects.

4.2.2 Socioeconomic Effectiveness

Socioeconomic effectiveness is measured in terms of savings in the time cost for the transfer passengers, savings in vehicle operation cost derived from the improvement of traffic congestion, reduction of traffic accidents between vehicles and pedestrians, increased comfort both for passengers and transport, and so on.

The total degree of the socioeconomic impact for each project depends on the number of passengers. As such, the projects located in the CBD and urban centers will have higher impacts than the projects located outside these areas. In order to promote a balanced development and provide equal service level in the different land use patterns or urban structures, the socioeconomic evaluation will be done by type of program.

4.2.3 Function and Roles in the Public Transport Network Configuration

The function and roles of the proposed projects will be evaluated with the number of transit lines connecting the nodes and the higher function of the transit lines.

4.2.4 Land Use Impacts

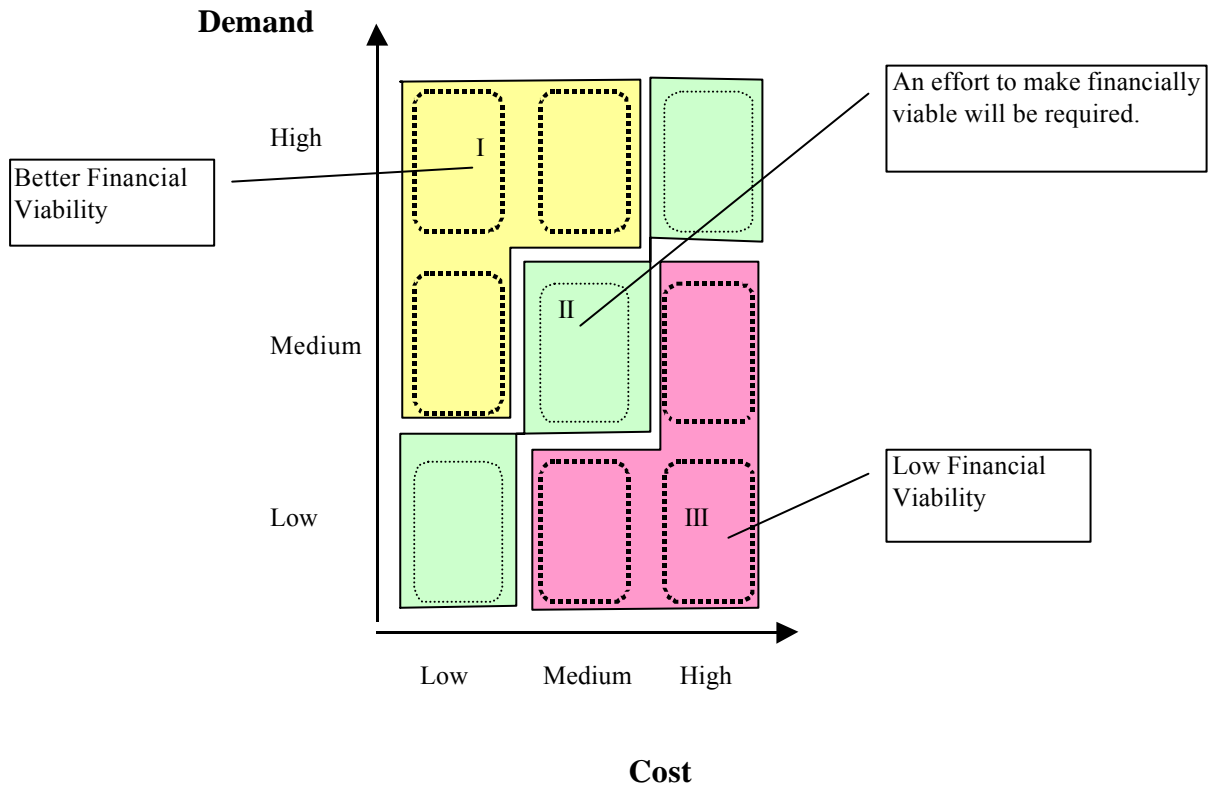
The land use impact tries to measure the extent the provision of the transportation node will encourage urban development or urban re-development. In the CBD, higher commercial and business activity areas will indicate higher impacts while the old CBD may have a higher impact than new urban centers in terms of serious urban environmental deterioration and economic subsidence in the areas. In the vicinity areas of the urban center, the higher impact will be shown in areas with potential for large residential development. More over, in the suburban areas, the impact on areas having large demand to the Metro Manila CBD will be higher.

4.2.5 Financial Viability

As mentioned earlier, it will be difficult to make the transportation development projects financially viable because of the lack of beneficiaries who can pay for their development and maintenance. Considering this, it is indispensable to promote a private-initiated project as much as possible, in order to reduce the financial burden on the national and local governments.

The financial evaluation will try to identify the projects where there is a possibility of private initiative. This evaluation can be expressed in the figure below.

FIGURE 4.3
BASIC IDEA ON THE EVALUATION FOR FINANCIAL VIABILITY



4.2.6 Construction Difficulties

Construction difficulties will be evaluated basically from the standpoint of land availability for development, including land use pattern and its density. The cost and type of construction of either building or groundwork are also factors affecting these difficulties. In this evaluation, however, such factors are already considered in the cost evaluation.

4.2.7 Priority Ranking

Based on the evaluation, a priority ranking for each project will be made. The ranking will be divided into three levels, namely High, Medium and Low. This priority ranking for the transportation node development is made without taking into account the public transport system development program. In other words, this evaluation is an indication of the required degree of node development in the areas. Of course, coordination with the development of the public transport lines should be made as a next step.

The results of the evaluation are shown in Table 4.4

TABLE 4.3
EVALUATION OF THE PROPOSED TRANSPORTATION NODES DEVELOPMENT PROJECTS

Program	Sub-Program	Transportation Nodes	Project Cost	Socio-Economic Effectiveness	Function on the Public transport net Landuse Impact	Financial Viability	Construction Difficulties	Priority Ranking	
(I)	(A)	(1) Divisoria	45	H	H	H	M	L*	I
		(2) Recto	160	H	H	H	L	L*	I
		(3) Blumentritt	12	H	M	H	H	L*	II
		(4) Central Station	12	L	L	L	M	L	III
	(B)	(1) Kalayaan	24	M	H	L	M	L*	I
		(2) Monumento	12	M	M	M	H	M**	I
	(C)	(1) EDSA/Taft Ave.	250	M	H	M	L	M	I
		(2) Baclaran	12	M	M	H	H	H	I
		(3) Libertad	12	L	M	M	M	H	II
	(D)	(1) Cubao	250	H	H	H	L	H	I
(E)	(1) C3/Quezon	160	M	H	M	L	H	II	
	(2) Magsaysay	160	H	H	M	L	H	II	
(II)	(A)	(1) Quezon/EDSA	12	L	M	L	H	M	II
		(2) North Avenue	24	M	M	L	L	L	II
		(3) Congressional	12	M	M	L	M	M	III
	(B)	(1) Ortigas	250	H	H	L	L	H	I
	(C)	(1) Fort Bonifacio	45	H	H	L	L	L	II
		(2) MCX(NAIA)	12	L	L	L	M	M	III
	(D)	(1) MCX(Libertad)	24	M	H	M	M	H	II
		(2) MCX(EDSA)	12	L	M	L	M	H	III
(3) EDSA(LRT2)		24	M	L	L	M	H	II	
(III)		(1) Quirino H'way	34	H	H	H	H	M	I
		(2) San Meteo	17	L	L	M	M	L	III
		(3) UP Diliman	17	M	M	M	L	L	II
		(4) Marikina	34	H	M	H	H	M	I
		(5) Taytay	34	M	M	M	L	M	II
		(6) San Valley	17	L	M	H	M	L	II
		(7) San Isidoro	17	L	M	H	M	L	II
		(8) Sucat	17	L	L	L	M	L	III
		(9) Zapote	34	M	M	L	L	M	II
(IV)	LRT Line 1	Monumento to Baclaran	N.A	H	H	M	L	H	I
(V)		(1) Malolos	12	L	L	L	M	L	III
		(2) Meycauayam	12	L	M	L	M	L	III
		(3) S. J. Del Monte	12	L	M	L	M	L	III
		(4) Antipolo	12	L	M	L	M	M	II
		(5) Bacoar	12	L	M	L	M	M	III
		(6) Alaban	24	H	H	H	H	H	I
		(7) Binan	24	H	H	H	H	H	I
		(8) Calamba	12	L	M	L	M	M	II
		(9) Dasmaringas	24	H	H	H	H	L	I
(VI)		(1) Santa Marie	8	L	L	L	L	L	III
		(2) Bulacan	8	L	M	L	M	L	II
		(3) Angono	8	L	M	L	M	M	II
		(4) Muntenlupa	12	H	M	H	H	M	I
		(5) San pederro	8	L	M	L	M	M	II
		(6) East Iamus	8	H	M	H	H	L	I
		(7) West Iamus	12	H	M	H	H	L	I
		(8) Noveleta	8	L	L	L	L	L	III

NOTE: 1) H: high, M: medium, L: low
 2) Comparative evaluation in each development program respectively done.
 3) Priority Ranking I: short term II: mid term and III: long term plan.
 4) Project costs do not include the land acquisition and compensation cost.