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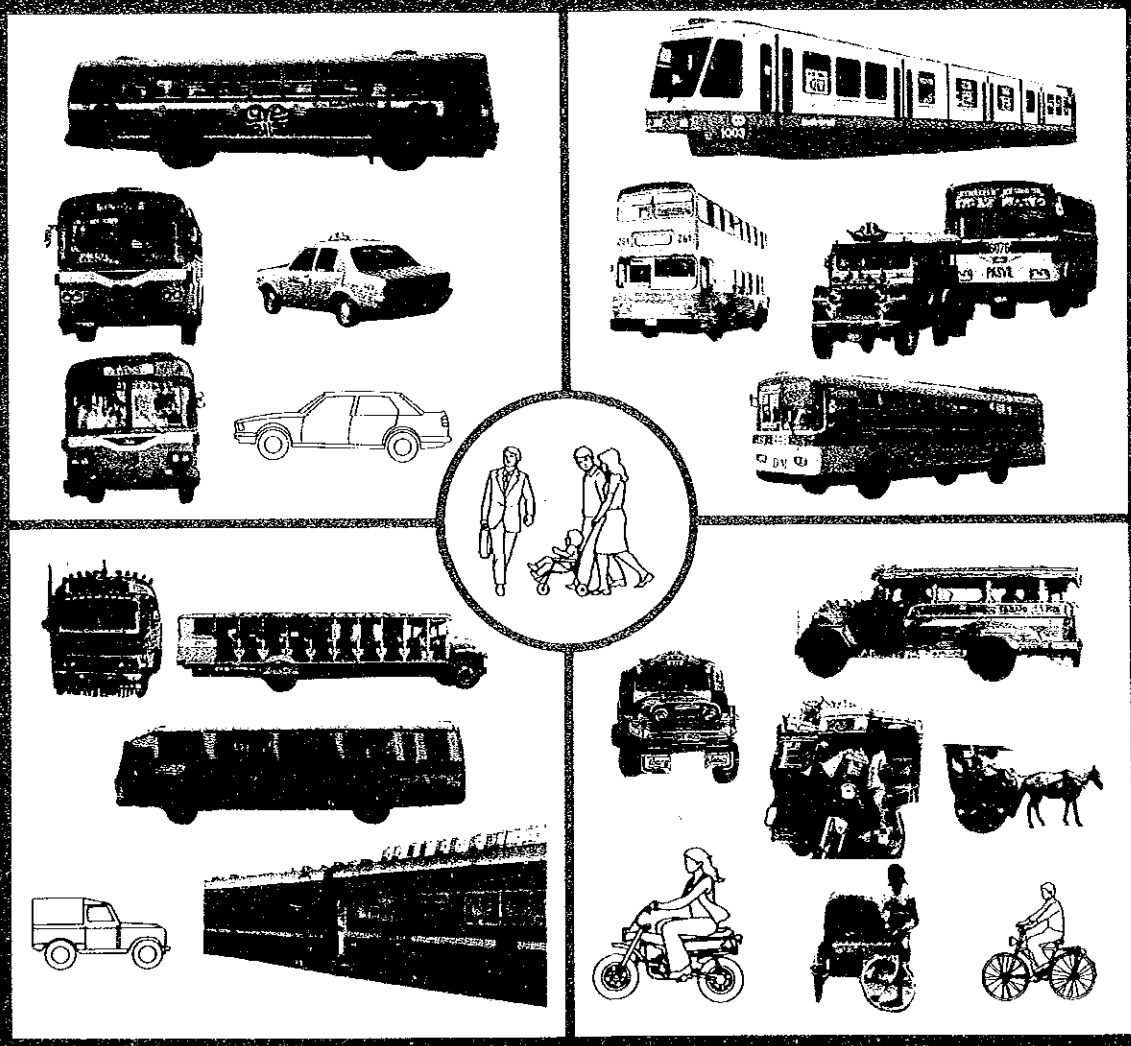
THE METRO MANILA TRANSPORTATION PLANNING STUDY (JUMSUT)

FINAL REPORT

MAIN TEXT

PART III : Planning (III-A)



March 1984

JAPAN INTERNATIONAL COOPERATION AGENCY

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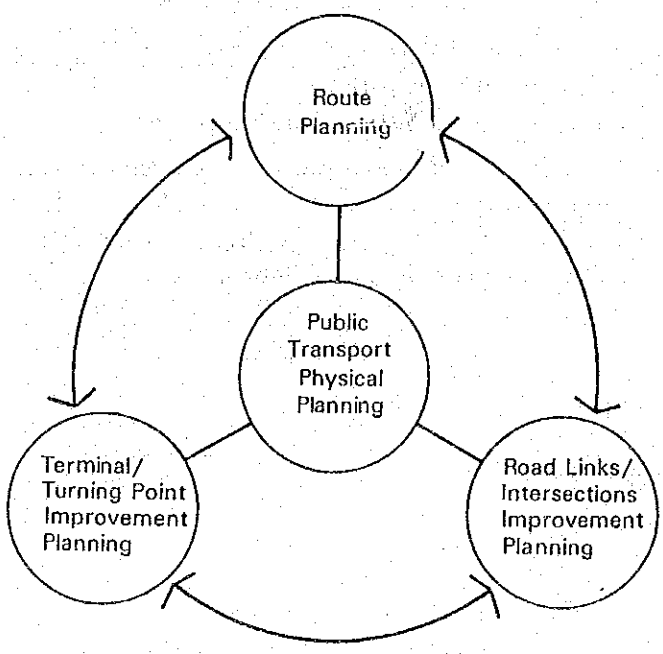
CHAPTER 7 OBJECTIVES AND FRAMEWORK OF THE SHORT-TERM PLAN

7.1 OBJECTIVES

- The primary objective of the short-term plan is to prepare a jeepney/bus rerouting plan and necessary public transport facility improvement plan to be associated with the proposed rerouting plan in anticipation of the scheduled completion of the LRT.
- The LRT is currently being constructed along the busiest transport corridor located within the intensively developed urban areas. It extends approximately 14 kilometers and will provide a grade- separated public transport link between the CBD on both ends of the C-4 (in the north and the south). About 2 million or 20 percent of Metro Manila's bus/jeepney routes are plying the corridor to link this area with its environs, including those outside Metro Manila. The LRT, when completed, will provide significant transport capacities along the corridor. It will be in such a way that it would either mainly compete or partly supplement the existing bus and jeepney transport in the affected areas.
- In view of the impact of the LRT construction, a strong socio-political need arose to restructure the existing bus/jeepney operation and to prepare a plan which will render a short-term solution to the public transport operation (bus and jeepney) along the LRT. The principal considerations for the rerouting plan are:
  1) The rerouting plan should be consistent with higher transport policies of the government.
  2) It should be financially acceptable to the LRT operation.
  3) The plan should be technically acceptable for BOT's implementation.
  4) It should be technically acceptable for police enforcement.
  5) The plan should be acceptable to existing transport operators (especially jeepney drivers/operators).
- However, in order for a plan to effectively function or properly meet the demand, it has to be prepared with regards to the necessary improvements in road links/intersections, as well as terminals/turning points. A balanced plan on the physical aspects of public transport improvement can only be worked out by coordinating the interactions among the factors relating to the route, terminals/turning points and road links/intersections as it is conceptually shown in the illustration below.



- In view of the need for immediate implementation upon completion of the LRT, the study intends to prepare a plan as practical and realistic as possible through the following measures:

  1) The conduct of a comprehensive field survey to collect accurate and on-the-spot information on the existing public transport operation.
  2) The conduct of an in-depth analysis on possible rerouting alternatives.
  3) The conduct of a joint planning work between the Ministry and Study Team together with intensive and frequent discussions on relevant planning policy guidelines and concepts among government agencies involved.

7.2 FRAMEWORK OF THE SHORT-TERM PLAN

- The short-term plan comprises a specific rerouting plan and associated facility improvement plan for the LRT corridor and a preliminary plan on the overall development directions on rerouting and mode interchange areas (terminals/terminal areas). The specific plan for the LRT corridor is as follows:

  1) Rerouting Plan:

     a) Rerouting structure plan: will indicate precisely which roads will be used for bus and jeepney operation.
     b) Route list: will give the information on integrated route basis, on the approximate capacities (how many number of units can be accommodated in a route) and other route characteristics (route name, length, roads via, turning points). This will be done in such a way that an existing route can be clearly related to the proposed route. The list will also give the information on the legal status of a route, whether the route is colorum or authorized by BOT, in order to facilitate implementation.

  2) Relevant Public Transport Facility Improvement Plan:

     a) Road improvement plan: will include the following:

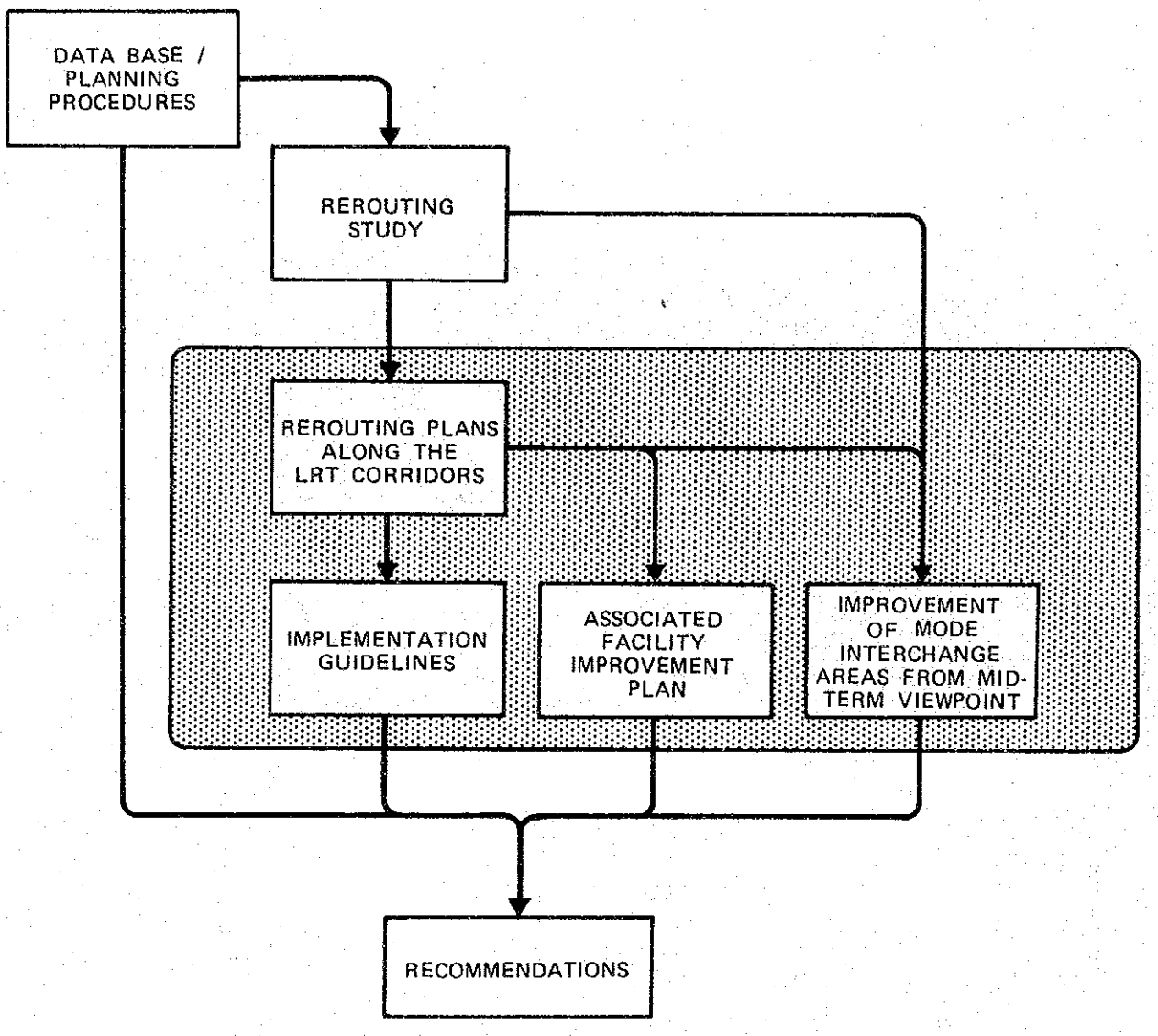
        i) road sections where maintenance/rehabilitation is required
        ii) intersections where installation of signals has to be considered
        iii) estimated level of improvement costs

     b) Traffic control plan: will include the following:

        i) road sections that are to be one-way
        ii) control of curbside parking
        iii) control of on-road market and street vendors

- In view of the importance to look into the improvement of terminals/terminal areas more from the mid-term and comprehensive points of view, this task is discussed separately from the above short-term plan. However, most of the short-term improvement measures in the terminal areas are covered in the improvement of road and traffic on road.

Figure 7.1
Framework of Short-term Public Transport
Improvement Plan



Chapter 8.
PUBLIC TRANSPORTATION ROUTE PLANNING

CHAPTER 8 PUBLIC TRANSPORTATION ROUTE PLANNING

8.1 PLANNING FRAMEWORK AND PROCEDURES

8.1.1 General

- The overall work flow of this task is shown in Figure 8.1. The whole process is composed of three major tasks, namely:

  Inventory Survey: intends to identify the existence, location, and inventory of the routes currently being operated. This is achieved by conducting extensive field surveys.

  Macro Level Analysis/Planning: intends to analyze the characteristics of the existing public transport routes, impact of the LRT operation, preparation and evaluation of alternatives to establish a basic route structure plan for the LRT-affected areas.

  Actual Level Analysis/Planning: intends to refine the basic route structure plans in preparation of a plan for eventual implementation wherein a proposed individual route list with required fleet capacity will be worked out.

8.1.2 Approach and Methodology

- The nature of this task is complex and complicated not only technically but also politically for the following reasons:

  1) The existing public transport route structure in Metro Manila is extremely complicated mainly due to the existence of jeepneys and the non-existence of comprehensive data on their inventory and operation. Jeepneys operate on more than 700 routes involving almost 40,000 units. Moreover, the corridor where the LRT is now under construction is the busiest transport corridor and more than half of the existing routes is directly affected.
  2) Some fundamental public transport policies of the government directly affecting the rerouting plan cannot necessarily be taken for granted by using presumptions. They need to be extensively assessed and tested in relation to this study.
  3) Due to the significant role of jeepneys in the Metro Manila public transport system, jeepney operators/drivers possess influential power. Unles plans are well coordinated, they will hardly be implemented.

- Accordingly, the study duly takes into account the following points:

  1) In order to analyze a considerable number of alternative policies and plans, the key is how to simplify the planning process in terms of data and methodology without reducing its required level of accuracy. Two basic measures were considered, namely:
     Integration of Routes: The existing 744 jeepney and 197 bus routes were simplified by consolidating/integrating homogeneous or similar routes and their route information. Although whole individual routes have to be dealt with during the actual implementation stage, in most cases, planning is primarily made based on the simplified input so that more alternative fundamental factors/policy directions can be tested and analyzed. As long as the process of simplification of actual/individual features is logical and realistic, it is always recommended that a simplified planning and data base be used for analysis. The process of route integration and disintegration is diagrammed in Figure 8.2.

     Application of Computer-aided Analysis Method: The size and nature of the task definitely requires the assistance of a good/practical computer-aided analysis method.

At various stages of analysis and planning, computer models and programs were made used of as much as possible not only on the large-scale computer at TTC but also on the micro computer. In the public transport network assignment, TRANSTEP was fully utilized.

2) In order to work out realistic plans, close coordination was continuously maintained within the team of JICA consultants and MOTC officials. Regular coordination with other relevant government agencies such as the BOT, MMC, CHPG, and police departments was also established.

Figure 8.1
Bus/Jeepney Rerouting Study Framework

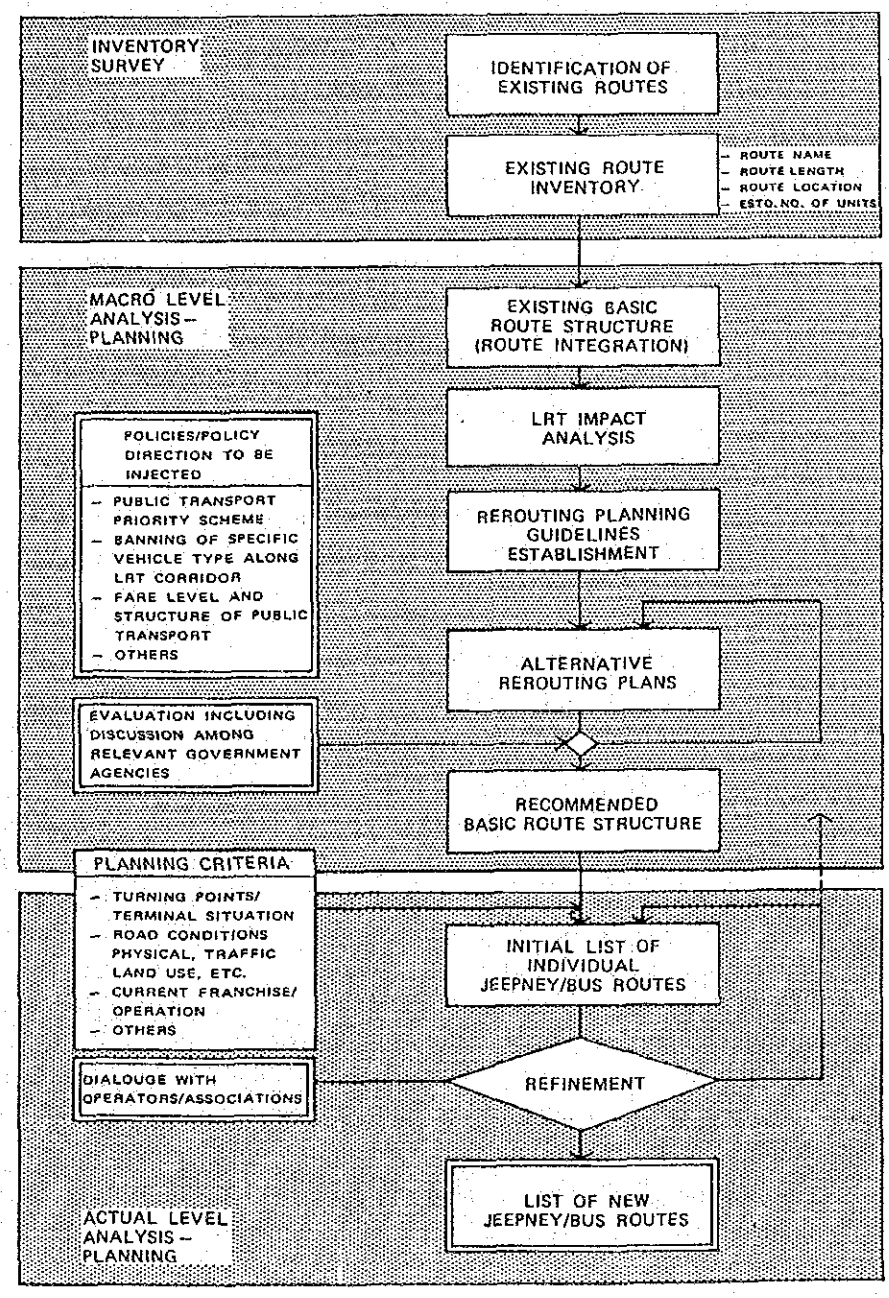
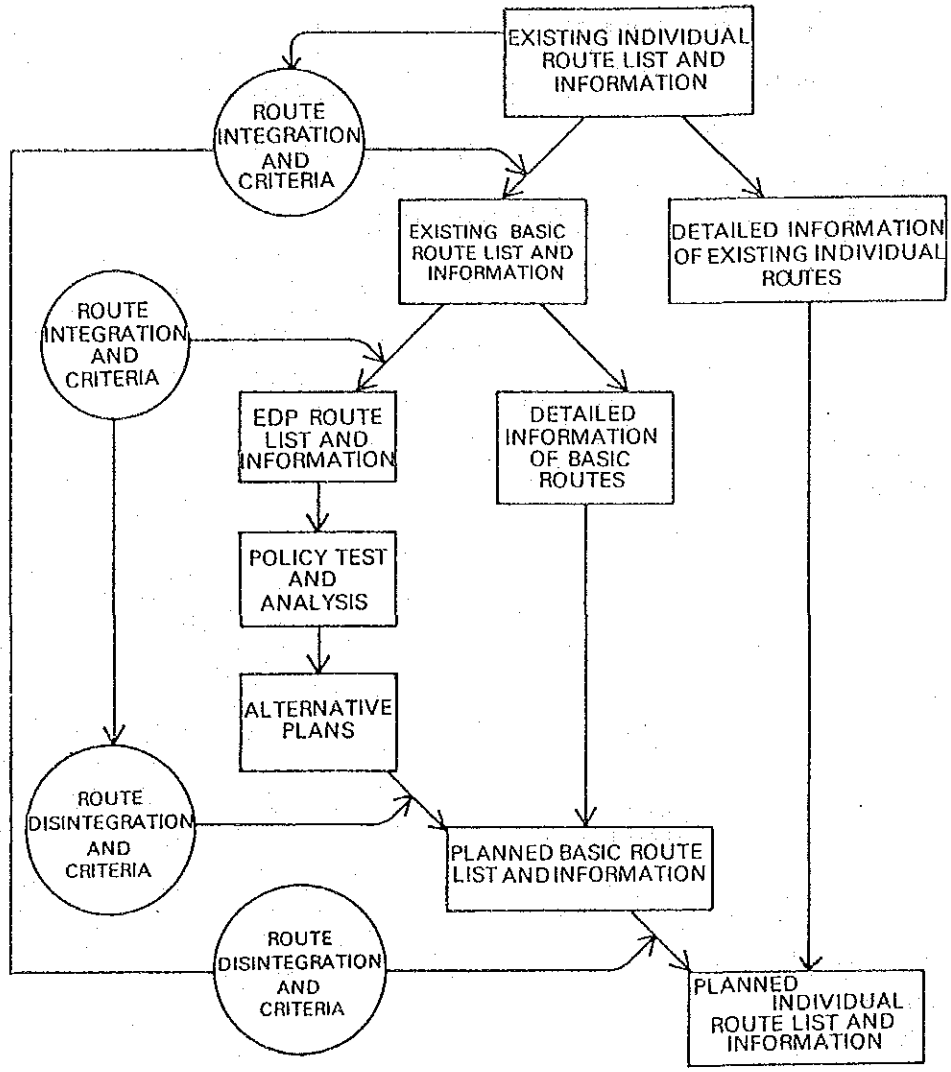


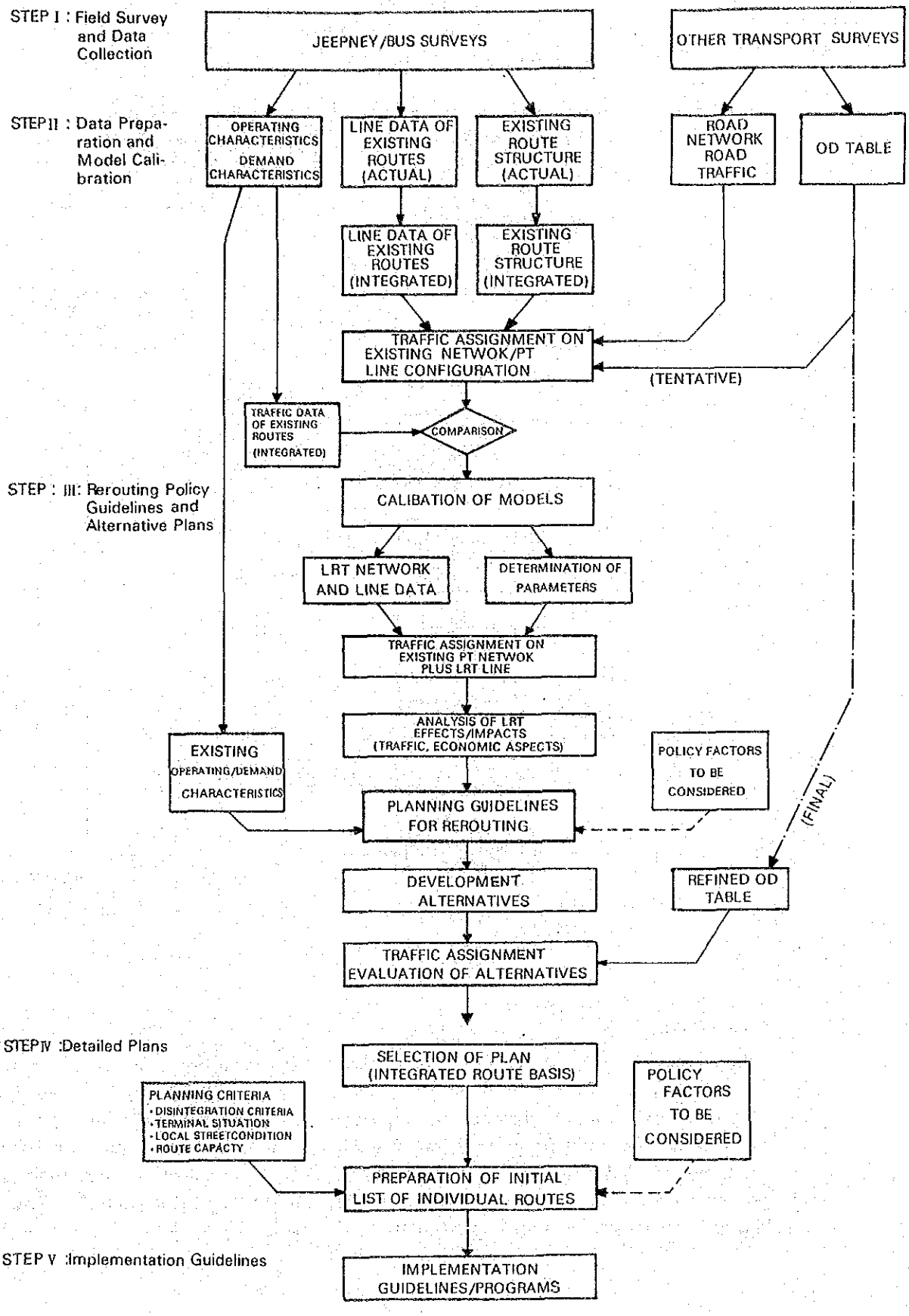
Figure 8.2
Conceptual Framework of Route
Integration and Disintegration



8.1.3 Planning Procedures

- The whole route planning process may be further brokendown into five steps, as shown in Figure 8.3. In Steps I and II, all necessary data were collected and prepared. Based on these data, the model was calibrated. In Step III, planning guidelines were determined on the basis of the government policies/policy guidelines and alternative plans were then prepared and assessed. In Step IV (a reiterating process of Step III), a more thorough analysis was made for those alternatives which were narrowed down in Step III. Step V aimed at preparing guidelines for implementation.

Figure 8,3
General Work Flow of Rerouting Plan



8.1.4 Preparation of Planning Base and Data

1) General

- The planning base and data required for the study consists of those which express the existing situation and characteristics of the Metro Manila bus and jeepney transport in relation to its system, demand and operation. They are as follows:
  a) system : route and route characteristics
  b) demand : public transport passenger demand level, distribution and characteristics
  c) operations : supply level, distribution and operating characteristics of units
- Due to the complexity and existence of a large number of public transport routes (744 jeepney and 197 bus routes), the planning procedure required computerization of a set of planning and data base which includes:
  a) Zoning of study area
  b) Road network and link data
  c) Public transport line configuration and line data
  d) Public transport passenger OD table
  e) TRANSTEP
  f) Planning/Policy guidelines
- Two sets of EDP data were prepared from the following viewpoints:
  a) 64 zoning system and associated data base: to analyze the whole Metro Manila area in a more balanced way.
  b) zoning system and associated data base: to analyze the LRT affected area with particular attention to:
     i) LRT passenger loading/unloading by individual station
     ii) Split in traffic between Taft Avenue and Mabini/M. H. del Pilar
     iii) Accessibility to LRT stations
- This section presents a discussion of the planning base and data mainly for the 64-zoning system, while that for the 74-zoning system is presented in Appendix 8.4.

2) Zoning of Study Area

- The first step was to work out a reasonable zoning system which would meet the specific planning objectives of this study. With jeepney rerouting as one major objective, a new zoning system that took into account the location of jeepney terminals/turning points was developed. The principle behind is that terminals which are similar in terms of location and function will be included in the same traffic zone. The importance of this zoning system is that it will affect route integration. Routes in separate zones cannot be integrated although they have similar terminals and pass the same roads.
- As shown in Appendix 8.1, the zoning system comprises 64 zones: 58 zones are within Metro Manila and six in external areas. This zoning system corresponds to the MMUTIP 202-zoning system (see Appendix 8.2). The 74-zoning system is shown in Figure A of Appendix 8.4.

3) Road Network and Link Data

- For the new zoning system, the EDP road network was built based on the network developed in MMUTIP covering major roads and major public routes.

- The EDP road network is illustrated in Appendix 8.3. The following information were prepared for each network link:
  a) length of link
  b) number of lanes
  c) link speed
  d) delay function (relationship between velocity and capacity)

  The EDP road network for 74-zoning system was prepared in a similar way and is presented in Figure B of Appendix 8.4.

4) **Public Transport Route Configuration and Line Data**

- Existing jeepney and bus routes were further integrated from 196 and 96 basic routes to 98 and 41 EDP routes, respectively. This was done so that the total number of routes would fit the capacity of TRANSTEP. The basic priniciples applied in this integration process are shown in Table 8.1 (for both bus and jeepney). These do not comply with the route integration method discussed in the previous section and, therefore, were applied to those routes outside the LRT corridor.
- EDP route structures and the list of buses and jeepneys prepared for the 64-zone system are shown in Appendix 8.5.

Table 8.1
Type of Routes Integrated for EDP

Type of Routes Combined in Further Integration	Conditions	Frequency of Combined Routes
A B C	route length is not very much different	FA + FB + FC
A B	frequencies of A and B routes are similar	FA or FB
A B C	frequencies of A and B route are similar	FA + FC or FB + FC

5) OD Table

- The 1980 HIS OD table was developed for this particular exercise based on the 1980 and 1983 HIS analysis. The methodology and characteristics of the 1980 HIS OD table are described in detail in Chapter 16.
- The OD tables used in this exercise are:
  a) public transport passenger OD for morning peak hour (all purpose)
  b) private transport vehicle OD for morning peak hour (all purpose)

6) TRANSTEP

- Normally, a comprehensive transport planning work for a large city like Metro Manila requires a computer model that can deal with a sizeable amount of varied data and simulate various alternative scenarios. TRANSTEP is one of these readily available models. In fact, it has already been used in several transport studies for Metro Manila. such as MMUTIP, LRT Extension Study, LRT Line No. 1 Study and PNR Commuter Study.
- Although the whole TRANSTEP is a comprehensive transport planning package, only some modules of the public transport assignment were used. In order to meet the particular planning objectives of JUMSUT, inprovements were made on several areas such as an increase in capacity in terms of the number of public transport lines to be inputted and an output format. Details on TRANSTEP and the improvements made in this study are presented in Chapter 15.
- Prior to the actual application, TRANSTEP needed to be calibrated. This process is explained in detail in Appendix 8.6.

8.2 REROUTING PLAN FOR LRT CORRIDOR

8.2.1 Assessment and Formulation of Policy/Planning Guidelines

1) General

- Rerouting of bus and jeepney is affected by certain government policies such as:
  a) Intermodal relations along LRT corridor
  b) Fare system
     i) LRT fare level and sytem in relation to bus and jeepney fare
     ii) introduction of differential fare for bus and jeepney.
  c) Implementation capabilities

2) Modal Relations along the LRT Corridor

- It is clear that the entire public transport demand along the LRT corridors will not be accomodated by the LRT alone. Judging from the analysis results of the LRT Line No. 1 study and other available information, LRT will roughly meet 0.5 million passengers/day out of the total public transport demand of 2.0 million passengers/day (initial LRT capacity is 18,000 passengers/direction/hour only). Therefore, there is a need for LRT to be supplemented by bus and jeepney.
- LRT will mainly attract passengers with longer trip lengths. Therefore, the impact of LRT in terms of passenger traffic flow will be much larger than other modes of public transport. (According to further analysis of the results of the LRT Study, reduction in bus/jeepney passenger traffic flow at various road sections is approximately between 25 to 50 percent).
- In order to accommodate the remaining public transport passengers, alternative solutions are:

Case A : by bus only
Case B : by jeepney only
Case C : by bus and jeepney

Case A will lead to the following:

a) purchase of a sizeable number of new buses
b) operation of a large number of existing jeepneys will be discontinued
e) decrease in service level of public transport
d) easier regulation and control

Case B will lead to the following:

a) traffic situation along the corridor will possibly become worse
b) possible threat to LRT operation
c) difficult regulation and control

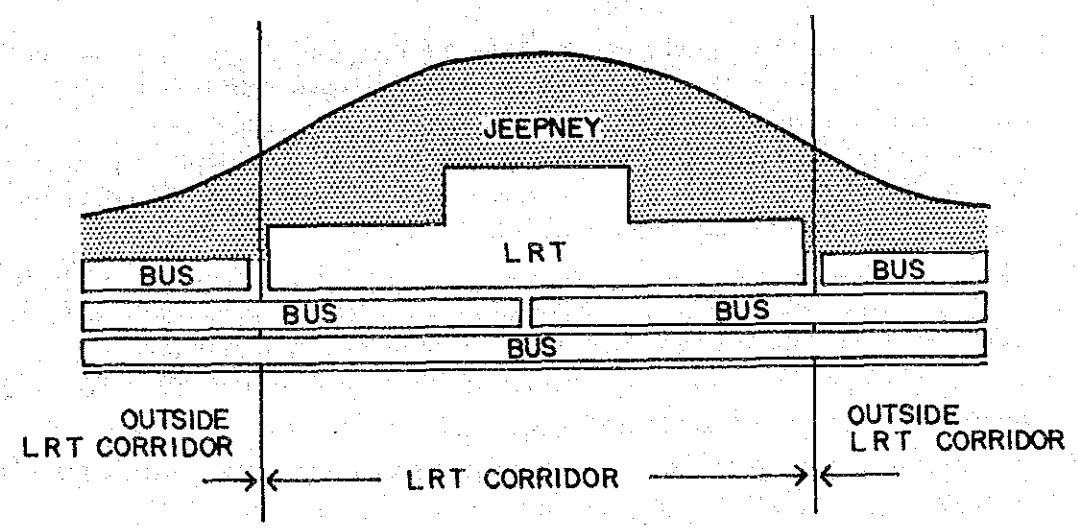
Case C will lead to the following:

a) no large change from the current situation
b) difficult to clearly determine the roles of bus and jeepney
c) difficult to implement and regulate whatever policy is introduced

Case C seems to be the only realistic and adequate solution so far considering the severe limitation and problems of other cases.

- An analysis of the public transport passenger demand related to the LRT corridor also indicates that the type of demand along the LRT corridor is so complex that it requires a combination of different modes and route structures. This is largely due to the fact that the LRT corridor is directly related to almost all other important transport corridors. Therefore, though the modal relations along the LRT corridor require careful study with regards to the public transport demand characteristics of the other corridors, its basic modal shares can be conceptually illustrated as shown in Figure 8.4.

Figure 8.4
Concept of Modal Share along the LRT Corridor



3) **LRT Fare Level and Structure**

- An extensive exercise on how and to what extent the LRT fare level and structure will affect the ridership of LRT passengers was made and explained in detail in Chapter 11. Based on the discussions made in this chapter, the LRT fare was set at a flat fare of ₱1.0, while the existing fare for bus and jeepney used was: ₱0.65 for first five kilometers and ₱0.13 for every subsequent kilometer thereafter. The LRT flat fare of ₱1.0 has been considered to give the maximum LRT revenue with a minimum increase in total generalized cost.

4) **Bus and Jeepney Fare:**

- This exercise intends to find a way to regulate bus and jeepney modal shares by changing the current fare structures of bus and jeepney.

- The average trip length for bus and jeepney is 7.8 and 3.8 kilometers, respectively. The distribution is shown in Figure 8.5. Under the same fare level and structure, passengers tend to use the bus for longer trips and the jeepney for shorter trips, as shown in Table 8.2. It is also notable that the trip length range between 2.6 and 7.5 kilometers, which forms the largest public transport market, is common to both bus and jeepney. This indicates that the bus and jeepney have a more significant competitive relationship or that their functional split is not clear for this particular trip length range.

Figure 8.5
Trip Length Distribution of Bus and Jeepney Passengers

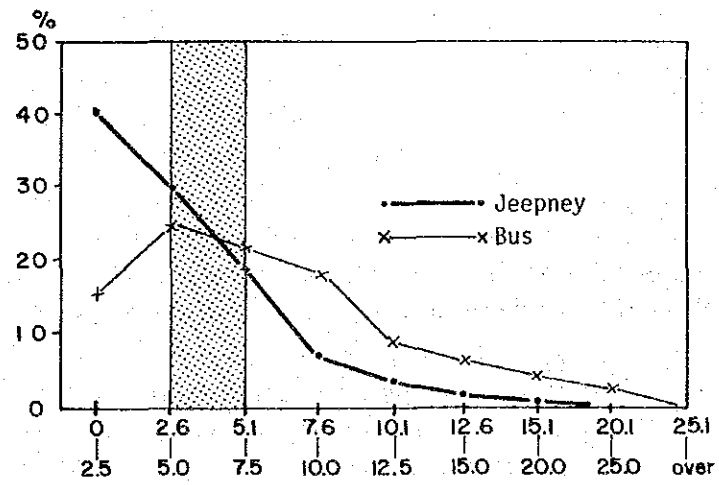
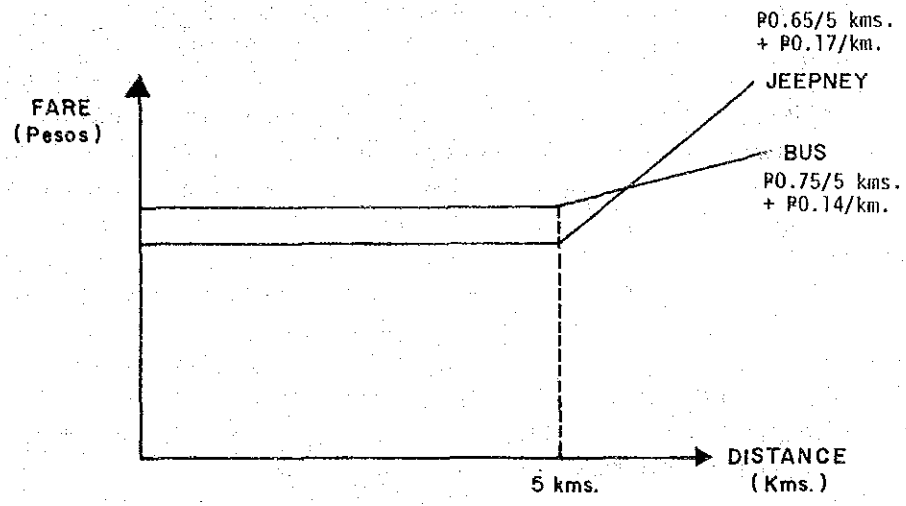


Table 8.2
Trip Length Distribution of Bus and Jeepney Passengers (%)

Mode	Trip Length (Km.)			
	0 – 2.5	2.6 – 5.0	5.1 – 7.5	7.6 – over
Jeepney	40	30	18	12
Bus	15	25	22	38

- The current bus and jeepney fare structure needs to be assessed with the following in mind:
  a) to meet the passengers demand characteristics more properly (passenger preference is basically longer trip for bus and shorter trip for jeepney).
  b) to segment the market for bus and jeepney more clearly (this is one way of protecting the bus industry).

  In consideration of the above factors, a possible direction for adjusting the existing fare for bus and jeepney is to introduce a relatively cheaper farefor jeepney passengers for a distance shorter than five kilometers and similarly for bus passengers for a distance longer than five kilometers.
- Differential fare between bus and jeepney was tested. The basic principle adopted in this exercise is to apply a higher minimum fare for bus short distances and less rate of increase in additional fare for any further distance. The concept is illustrated below:



- The analysis on TRANSTEP application indicates that the introduction of differential fare between bus and jeepney will result in:
  a) a clearer split of passengers between the bus and the jeepney wherein the bus atracts longer trips and the jeepney, shorter ones.
  b) a considerable increase in LRT passenger traffic due to the discouragement of long trip jeepney passengers.
- Although more alternatives need to be tested and carefully evaluated, it can be said that the introduction of a differential fare between bus and jeepney will distinguish the bus and jeepney transport market more clearly, work positively for the LRT and promote bus transport without possibly increasing the total economic cost.

- Although more alternatives need to be tested and carefully evaluated, it can be said that the introduction of a differential fare between bus and jeepney will distinguish the bus and jeepney transport market more clearly, work positively for the LRT and promote bus transport without possibly increasing the total economic cost.

5) **Implementation and Enforcement Capabilities:**

- Jeepney operations in Metro Manila are so extensive and complicated that possible and realistic implementation and enforcement methods take into account both institutional aspects as well as traffic enforcement and control. On the basis of discussions with relevant government agencies, it was agreed that this study stands on the following basis:

  a) In order to assure a certain required level of patronage for LRT, the longer jeepney routes which run parallel to it should be detoured at certain sections of the LRT corridor so that they will not compete with the LRT on long distances. The bus routes can be maintained as they are, considering the relatively low share and difficulties in operation along the narrow side streets.
  b) As much as possible, no drastic rerouting will be done for the jeepneys.
  c) When jeepneys are deviated from the LRT corridor, it is proper that all jeepneys be banned from some common sections of the corridor to facilitate the implementation. Consequently, there will be some routes running the corridor for a long distance to be cut at certain points.
  d) Possible types of new routes, including feeder services to LRT stations and in other potential demand areas, will be created to accommodate the expected surplus of jeepneys due to the LRT operation and subsequent rerouting.
  e) The new route list should correspond clearly to the existing route list in order to facilitate relocation of jeepneys.

8.2.2 Alternative Concepts of Rerouting

1) **Preparation of Alternative Rerouting Structure Plans**

- Alternative rerouting plans were prepared to meet the following objectives:

  a) to maximize the economic benefits due to LRT operations
  b) to maximize the LRT patronage and revenue
  c) to minimize the impact of LRT on bus and jeepney operation

  However, these appear contradictory to each other, For example, satisfying LRT requirements will not necessarily be an optimum solution to bus and jeepney transport or to total public transport. Since the bus, jeepney and LRT share the same transport market and operate in the same area, a plan which favors one mode is always detrimental to the other.

- Although a set of rerouting plans was prepared and assessed, the main purpose of this exercise is not to determine the final plan but to assess various alternatives and to narrow down possible directions for further analysis.

- More specifically, the principles in developing alternative rerouting plans are as follows:

  a) split the functions of the LRT, bus and jeepney more clearly in meeting different passenger demand: basically longer trips for LRT and bus, while shorter trips for jeepney.
  b) maximize use of LRT capacity as long as it will not bring about considerable adverse consequences.
  c) rerouting plan will not be very complicated nor impractical to facilitate the implementation.

- Alternatives prepared on the basis of different possible rerouting concepts are classified into the following groups:

  PLAN A: is to adjust only those bus/jeepney routes which might be affected by the LRT. Depending upon the degree of influence by the LRT, these routes are either eliminated or shortened if the number of units are reduced. The EDP route configurations for PLAN A are shown in Figures 8.8 and 8.13 for jeepney and bus, respectively.

  PLAN B: is to restructure the bus/jeepney routes according to the principles shown in Figure 8.6. Although jeepney routes will remain along the whole corridor, the length of the portion of routes which run parallel to the LRT will not exceed 1/3 of the LRT corridor. On the other hand, no bus routes using Monumento and Baclaran as terminals will be operated unless they serve the area outside of the LRT corridor. EDP route configurations for PLAN B are shown in Figures 8.9 and 8.13.

  PLAN C: aims to divert jeepney passengers with longer trips to the LRT according to the plan shown in Figure 8.7 wherein it is assumed that all jeepney routes will be cut at Jones, McArthur, and Quezon Bridges. No jeepney will cross the Pasig river via these bridges, otherwise, the jeepney routes will remain as is. On the other hand, bus routes will remain onthose bridges. EDP route configurations are shown in Figures 8.10 and 8.13.

  PLAN D: also aims to discourage longer trip jeepney passengers who travel particularly across Jones, McArthur, and Quezon bridges by diverting those routes to other bridges such as Del Pan, Ayala or Nagtahan, instead of cutting the routes. This concept is shown in Figure 8.7. Bus routes remain as is. EDP route configurations are shown in Figures 8.11 and 8.13.

  PLAN E: to cut all the jeepney routes at Jones, McArthur and Quezon bridges which have one end within C-2, and to divert those that have both ends outside C-2. This is basically the combination of Plans C and D. Bus routes remain as is. EDP route configurations are shown in Figures 8.12 and 8.13.

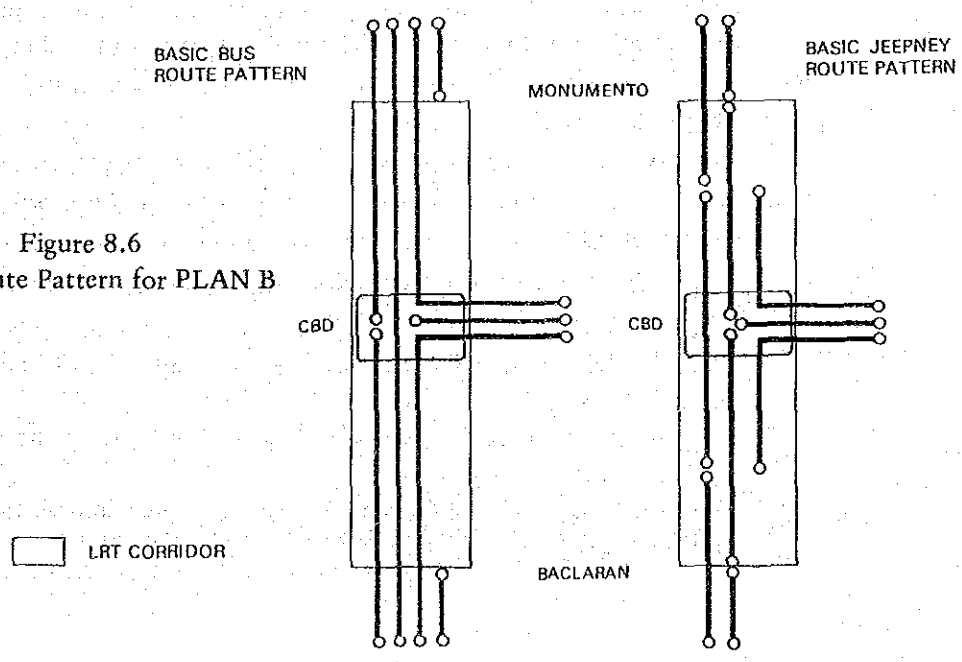
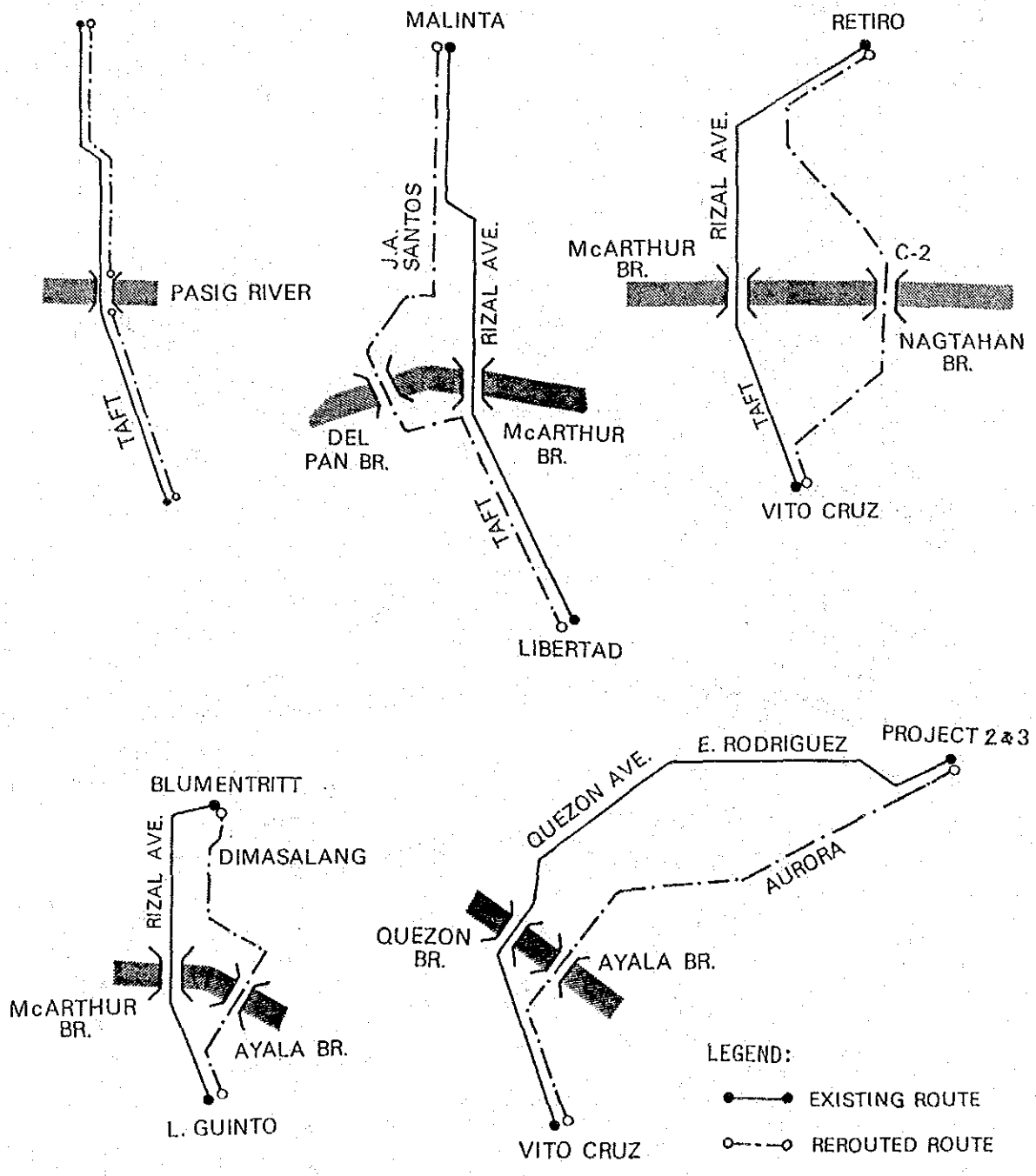


Figure 8.6
Basic Route Pattern for PLAN B

Figure 8.7
Concept of Deviating Jeepney Routes
from Jones, McArthur, and Quezon Bridges



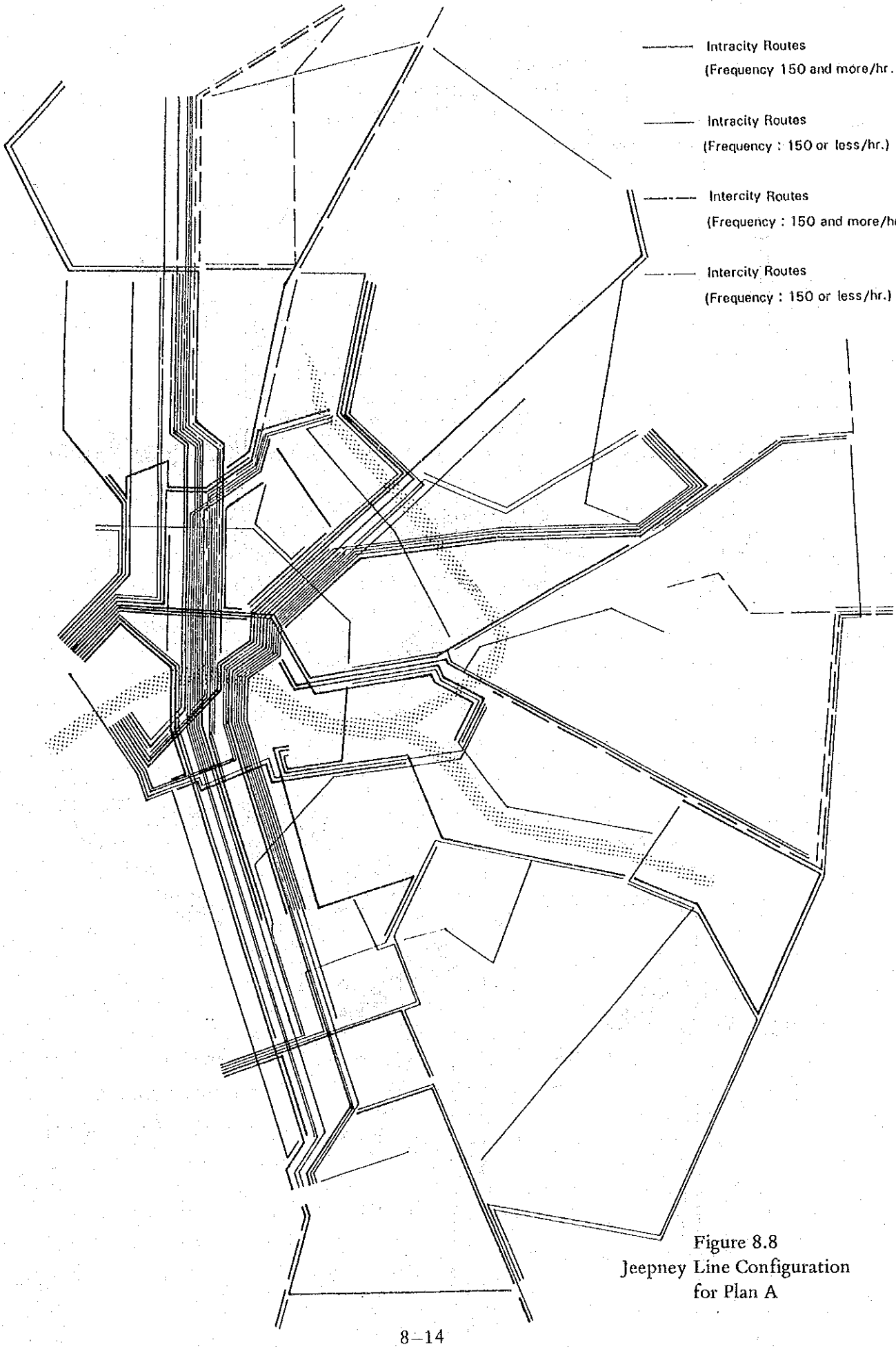


Figure 8.8
Jeepney Line Configuration
for Plan A

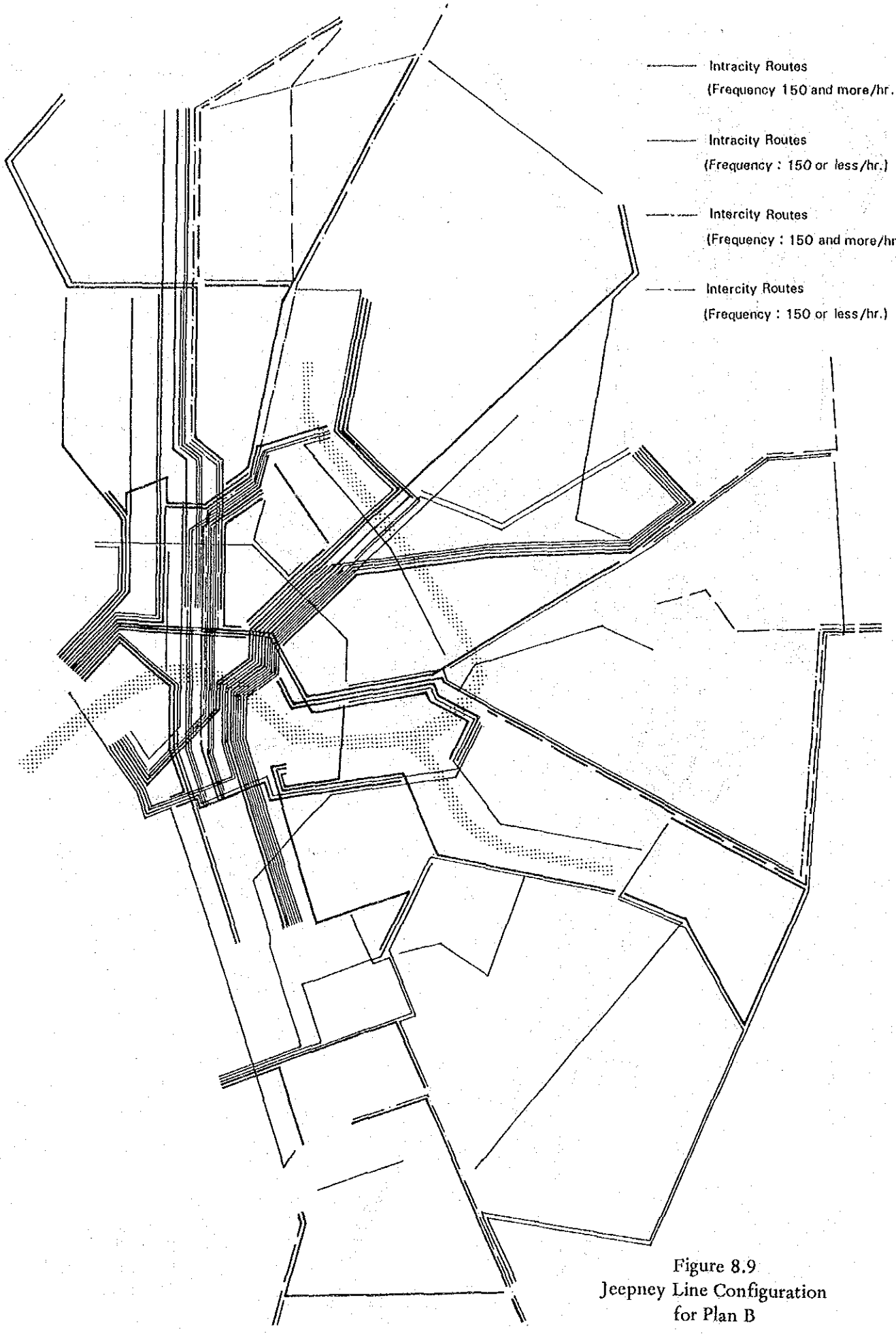


Figure 8.9
Jeepney Line Configuration
for Plan B

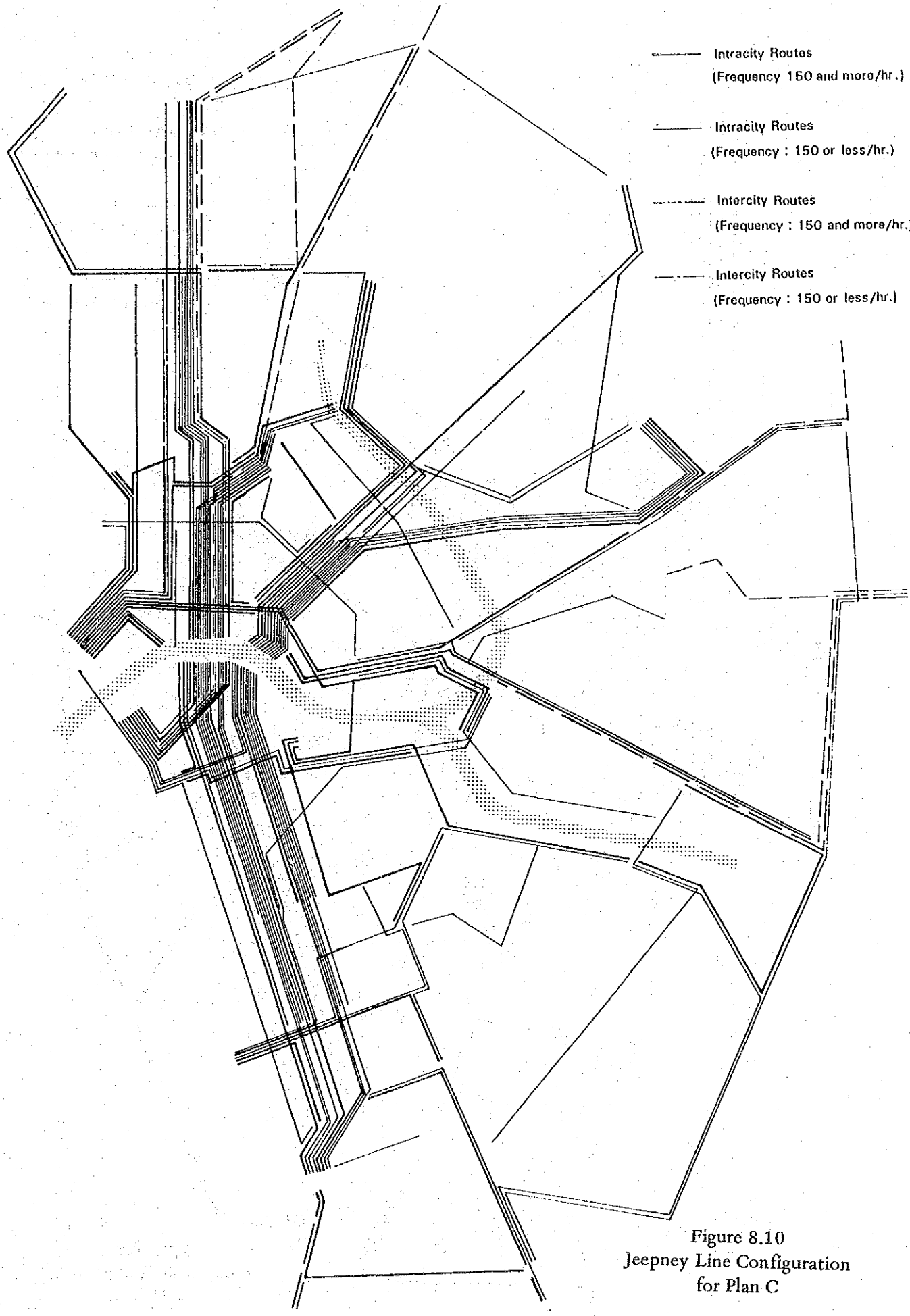


Figure 8.10
Jeepney Line Configuration
for Plan C

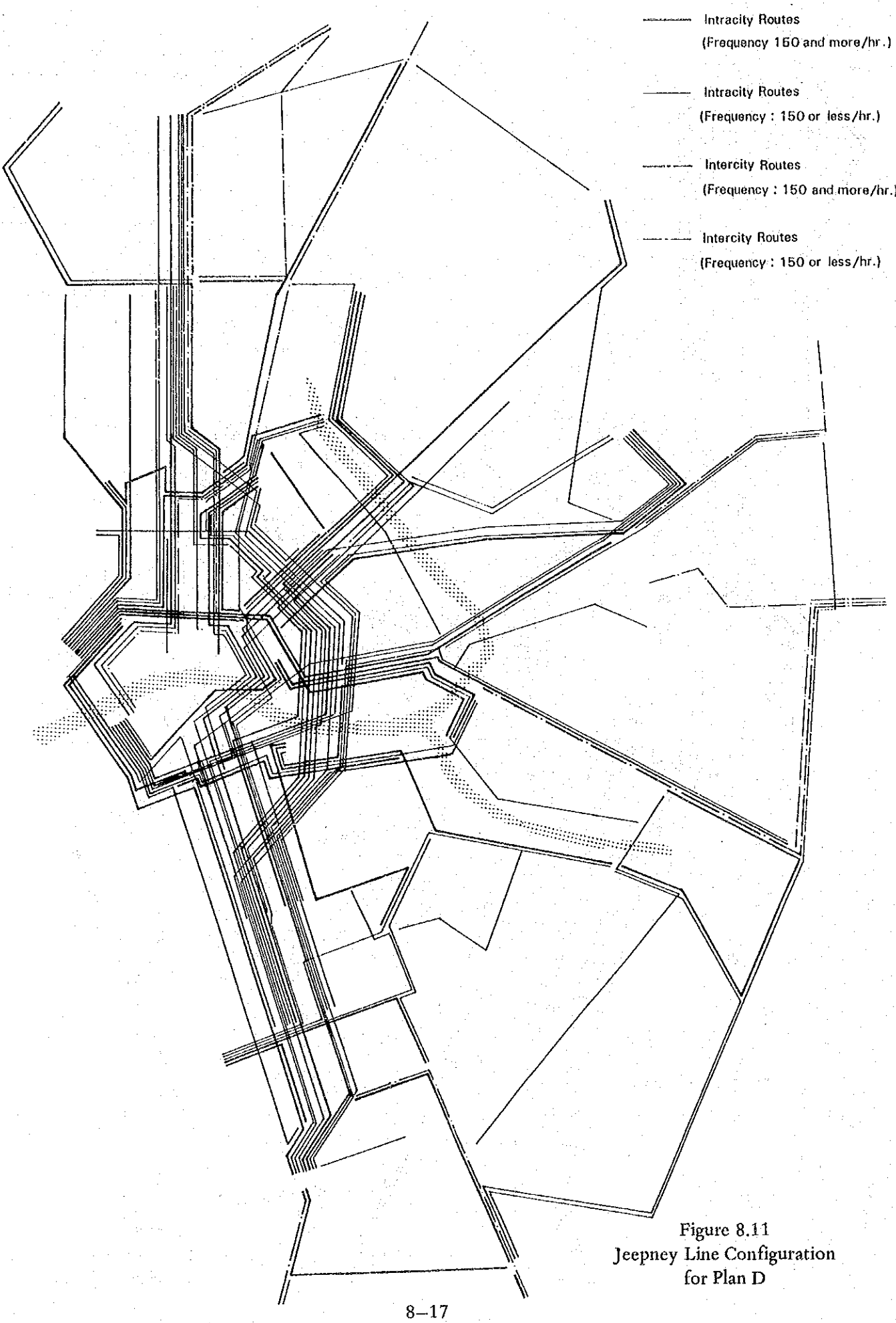


Figure 8.11
Jeepney Line Configuration
for Plan D

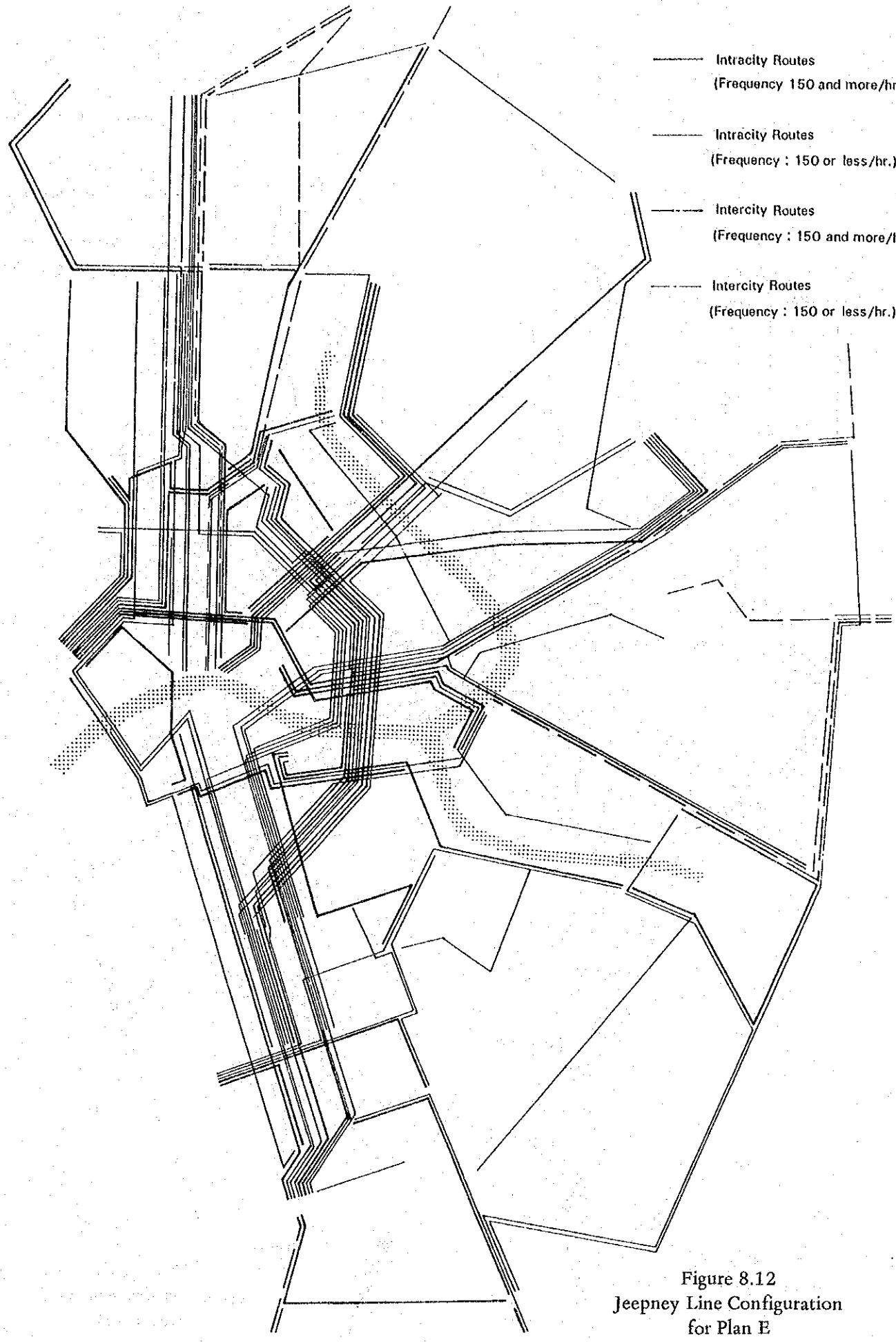


Figure 8.12
Jeepney Line Configuration
for Plan E

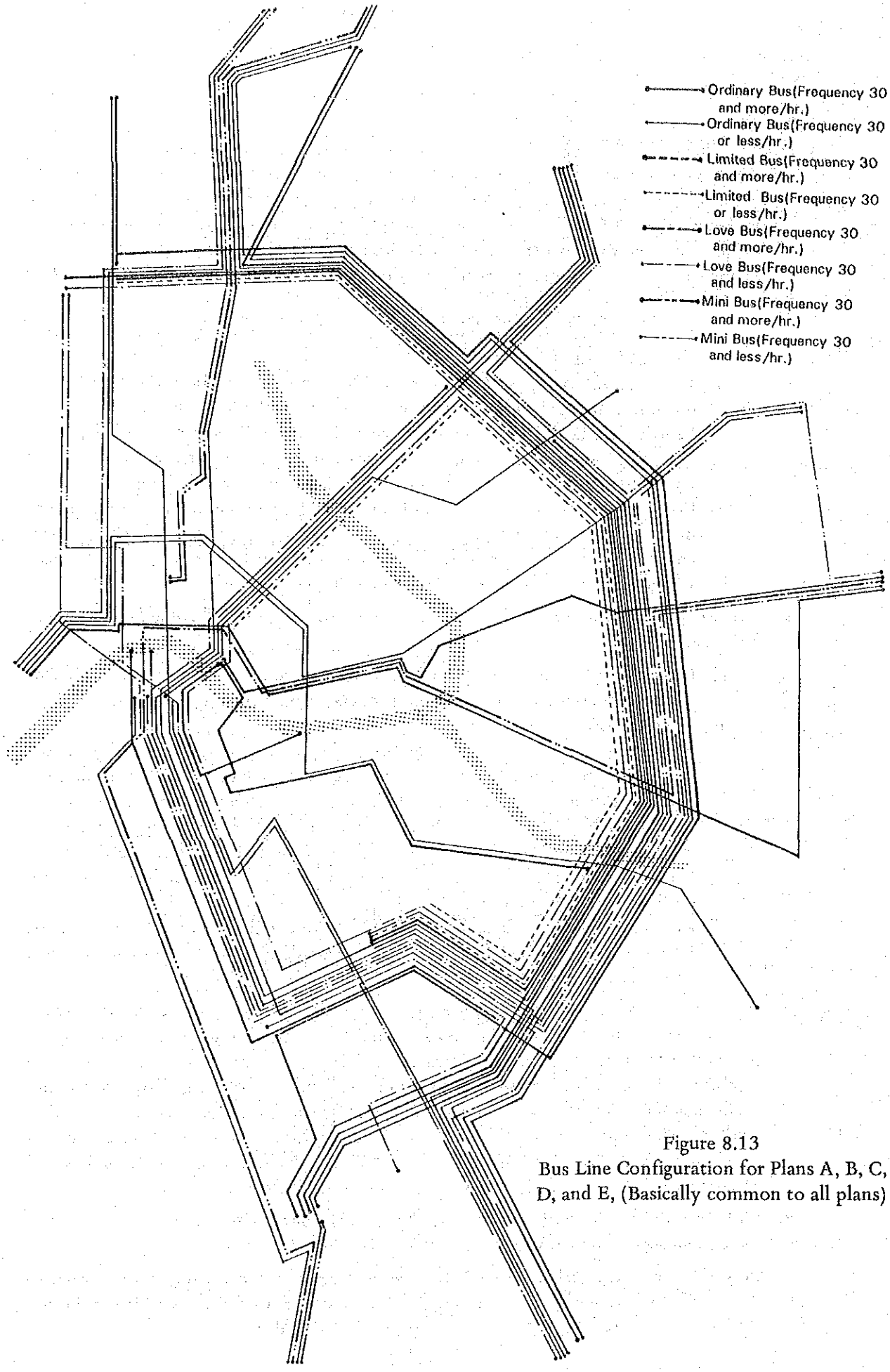


Figure 8.13
Bus Line Configuration for Plans A, B, C, D, and E, (Basically common to all plans)

2) **Assessment of Alternative Plans**

- These plans are based on the assumption of LRT single fare of ₱1.5 flat and Time Value of ₱1.0/hour. The summary of the results are shown in Table A of Appendix 8.7. Although the LRT fare and passenger time value are different from those mentioned earlier, relative differences among the alternative rerouting plans can be assessed as long as the alternatives are based on the same assumptions. The findings are as follows:

  a) Refinement of affected route only (Plan A) shows a slight increase in LRT passenger traffic.
  b) Plan B shows the greatest increase in LRT passenger traffic but has an adverse economic impact largely due to the increase in number of transfers.
  c) Plans C and D also show considerable increase in LRT passenger traffic. However, the former has an adverse economic impact, while the latter a favorable one. Bus transport is favorable under Plan C, but not so under Plan D.
  d) Plan E, which is a combination of Plans C and D, shows a slightly better picture in terms of overall economic impact, an increase patronage of bus transport and minimum adverse effects to jeepney transport. However, the LRT passenger traffic will increase only by about 20 percent.

- Regarding the directions for further analysis on rerouting, the following factors should be considered:

  a) Rerouting of jeepney along the LRT corridor would not bring any significant adverse economic consequences as long as jeepney routes are allowed to exist along the LRT corridor.
  b) The rerouting policy that would bring about an increased patronage of the LRT is not to allow any jeepney routes run longer than 1/4 to 1/3 of the LRT corridor distance at any section of the corridor. This is considered to be the most fundamental policy which will effectively meet the planning requirements without bringing about any adverse effects on overall public transport. Since the basic route structure does not change much, no complicated measures are needed for implementation.
  c) Rerouting policy could also be effectively directed at diverting more routes from the LRT corridor to other routes particularly to C-2. Positive economic impacts can be expected.

- It should be noted that effective rerouting always takes into consideration the physical and traffic conditions along the routes, particularly conditions of terminal/turning points if new locations need to be created or existing ones are to be expanded due to rerouting. Local conditions such as location, road and traffic conditions, land use and socio-economic activities and characteristics of particular areas need to be further studied. The important point for regulating jeepney routes and operation is improvement and controlled development of existing terminals/turning points which will benefit both public transport passengers as well as operators.

- With regards to alternative rerouting, the possible directions for improving the terminals/turning points are as follows:

  PLAN B: A considerable number of existing terminals and turning circuits need to be restructured considering the LRT stations, interface with LRT and other existing physical constraints in the LRT corridor.

PLAN C: The functions of jeepney terminals around Jones, McArthur, and Quezon Bridges need to be strengthened.

This includes a considerably wide range of physical improvements particularly in and around Quiapo, Binondo/Sta. Cruz, Divisoria and Lawton area.

PLAN D: This plan assumes the improvement of jeepney terminals/turning circuits and roads near Del Pan, Ayala, and Nagtahan bridge.

Particularly, the improvement of Divisoria and Quiapo is indispensable for this plan.

PLAN E: Since this plan is a combination of Plans C and D, the above-mentioned improvements are also necessary.

- The passenger loading/unloading patterns of Plans A to E are also shown in Appendix 8.7.

8.2.3 Assessment of Possible Public Transport Roads in the LRT Corridor

This section aims to identify and assess the availability of alternative public transport roads in the LRT corridor.

1) **Roads used during the LRT construction**

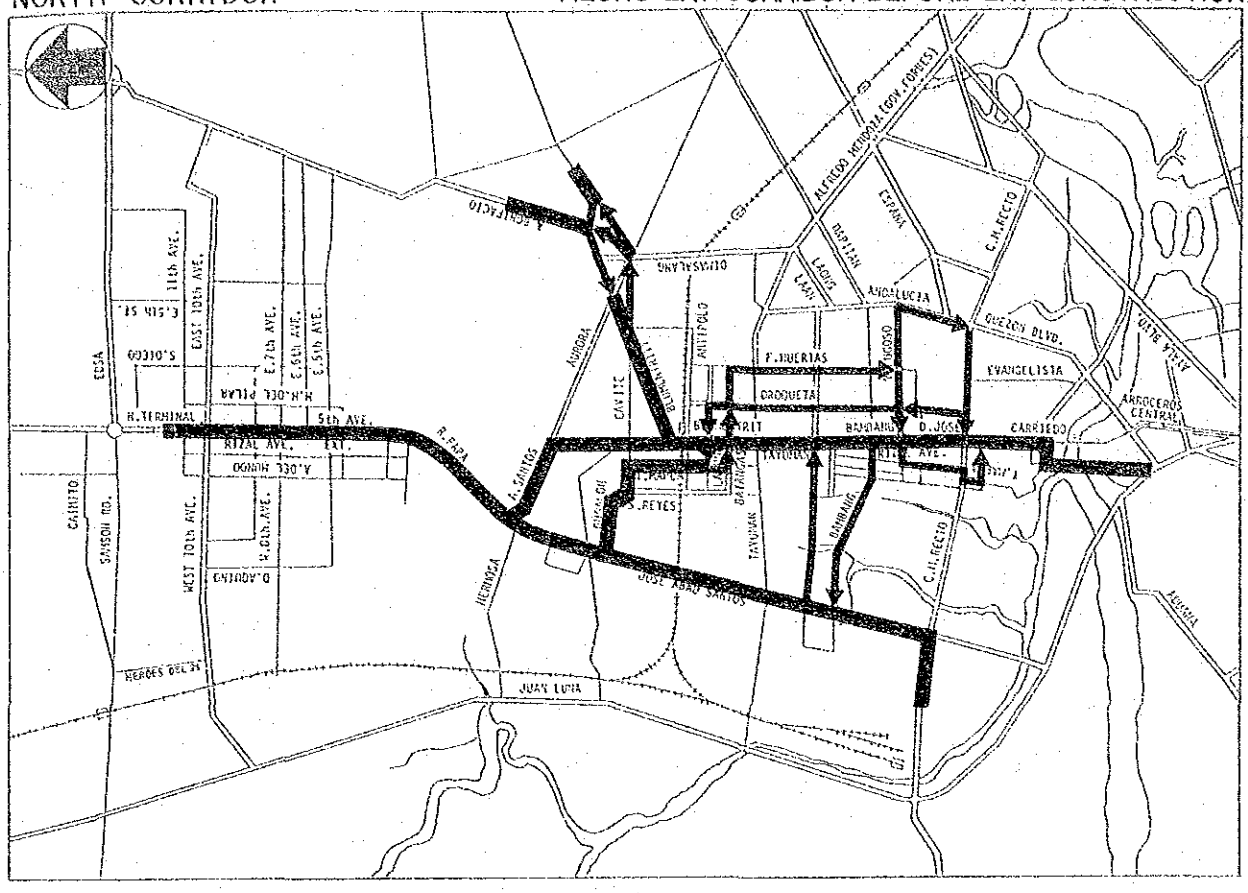
- Due to the on-going LRT construction, the LRT corridor was closed at various sections from time to time depending on its construction schedule. All the jeepney and bus routes with the heaviest traffic flow in the Metro Manila road network then had to be rerouted temporarily to the best available side streets.
- During this period, JUMSUT conducted public transport/traffic surveys along the corridor (between December 1982 and February 1983). It revealed that the total traffic level at any of the cross sections of the LRT corridor and its side streets remained at more or less the same level with that of "before" LRT construction. Apparently, passenger travel demand is being met by the rerouted buses and jeepneys. This implies that although the service level was considerably reduced due to traffic congestions caused by such factors as lack of road traffic capacity, lack of traffic signals and traffic control measures, poor and deteriorated surface conditions of side streets, it is still considered that many of the side streets could have provided and are able to provide considerable space and routes for traffic along this corridor.
- Figures 8.14 and 8.15 present the outline of this temporary rerouting around the period of April and May 1983. Many of these secondary roads can be considered as possible permanent main public transport roads rather than temporary ones. The characteristics of the temporary rerouting are as follows:

  North Corridor:

  a) Existing routes were basically maintained and rerouting was made by maximizing use of available side streets which run parallel to Rizal Avenue/ Rizal Avenue Extension.
  b) Standard of the side streets vary from narrow two-lane roads to undivided three to four-lane roads. An attempt to reduce traffic congestions was

FIGURE 8.14 JEEPNEY ROUTE STRUCTURE
ALONG LRT CORRIDOR BEFORE LRT CONSTRUCTION

NORTH CORRIDOR



SOUTH CORRIDOR

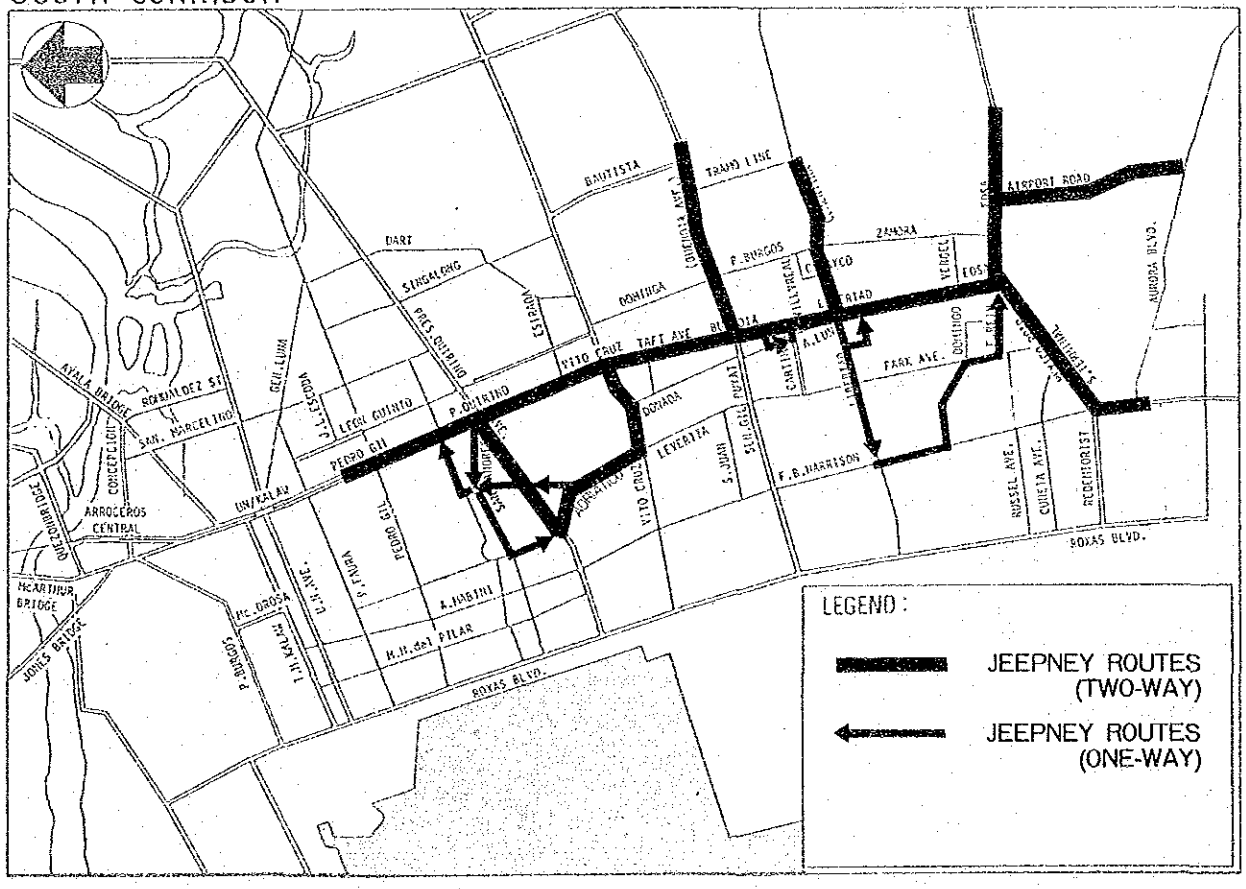
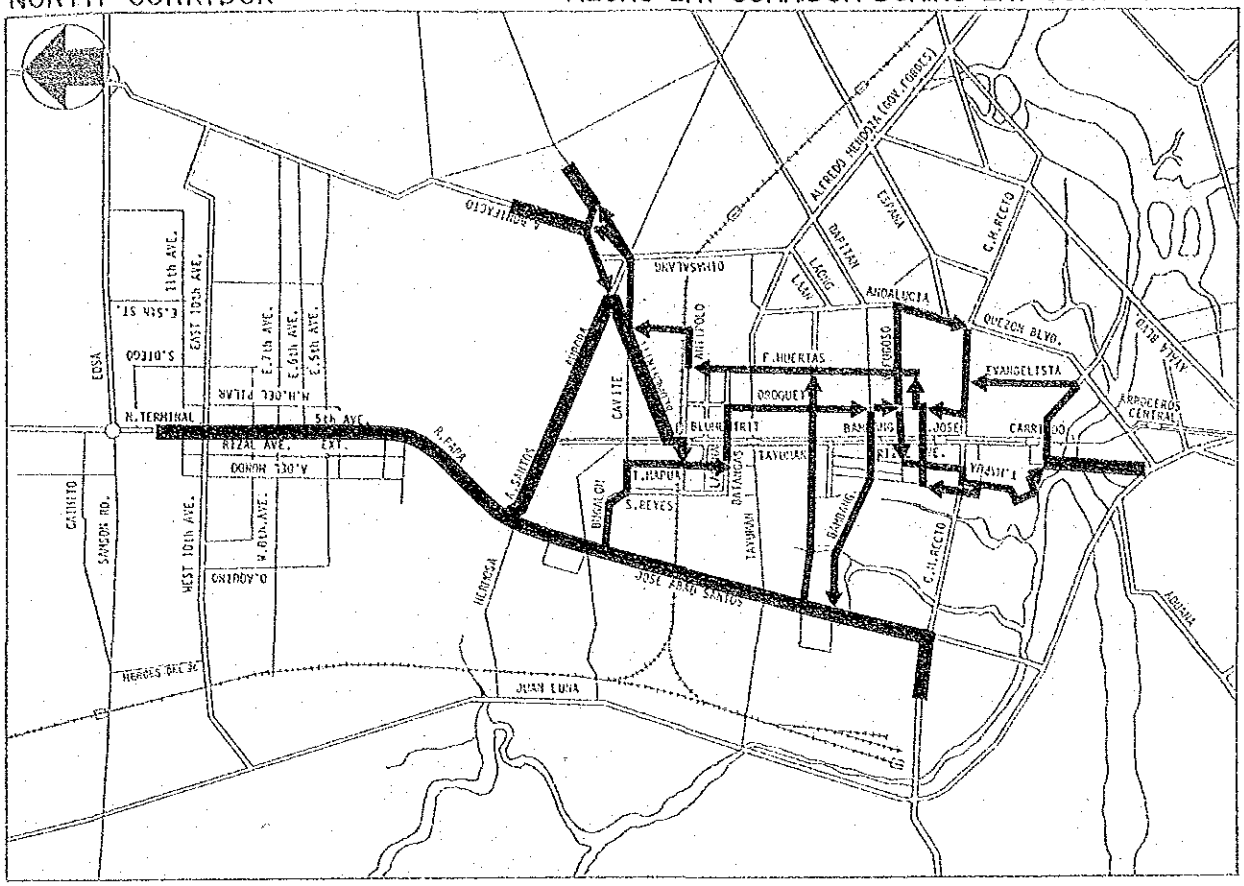
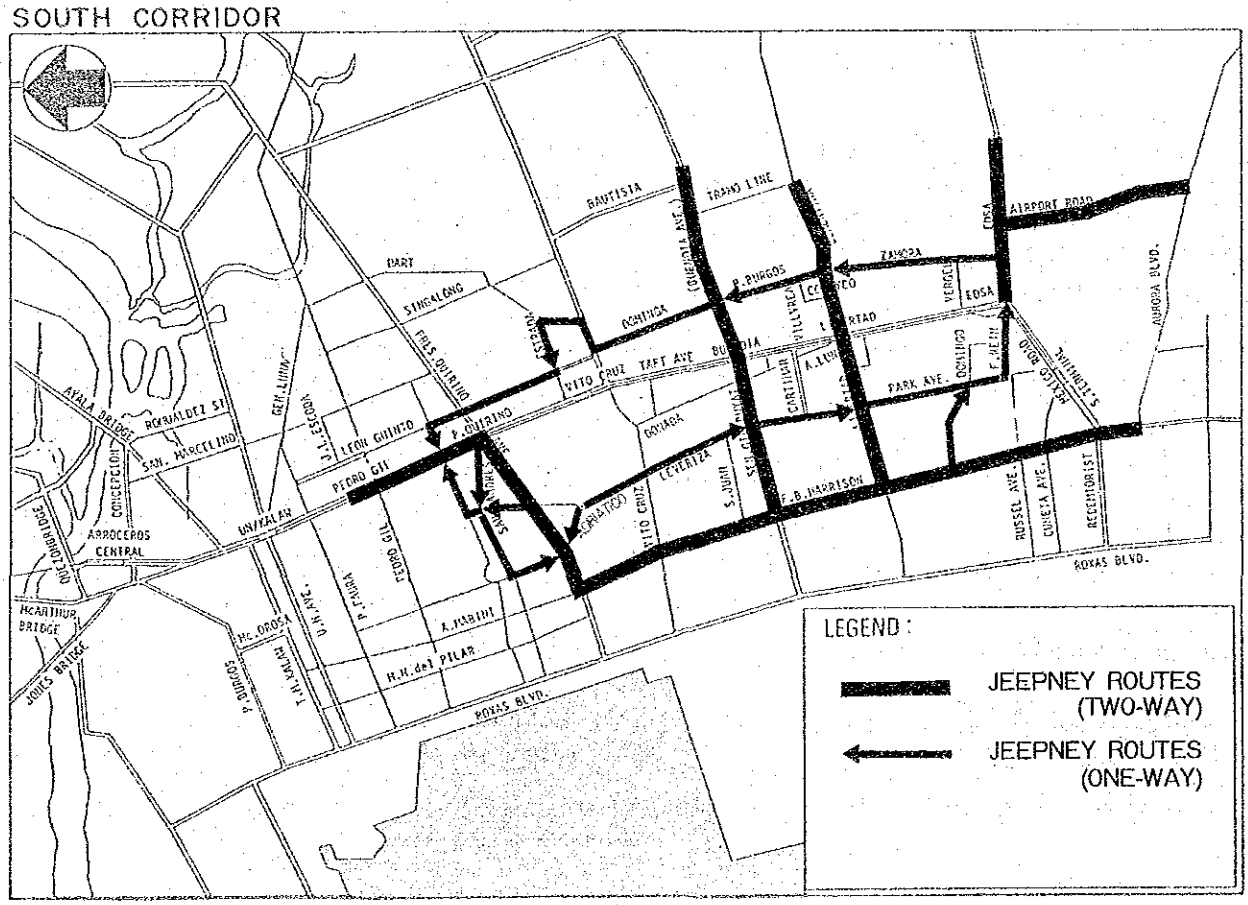


FIGURE 8.15 JEEPNEY ROUTE STRUCTURE
ALONG LRT CORRIDOR DURING LRT CONSTRUCTION

NORTH CORRIDOR



SOUTH CORRIDOR



made by converting all these narrow side streets to one-way roads. Although the traffic flow was assured one-way or another, serious traffic congestions were observed at the following road locations during the peak hours or throughout the day.

(Intersection) : – T. Mapua/Antipolo
– V. Fugoso/T. Mapua

(Road Sections) : – T. Mapua (between Antipolo and Batangas)
– T. Mapua (between V. Fugoso and Ongpin)
– Ongpin
– Evangelista

c) Of the available side streets, it was found out that traffic flow along F. Huertas and Oroquieta was fairly smooth. These streets are located close to Rizal Avenue within a walking distance of 100 to 200 meters.

South Corridor:

a) The basic rerouting structure for the southern LRT corridor is the same as in the northern LRT corridor. However, all the routes using Taft Avenue were split quite apart from each other by direction. Distance between the two directions is approximately 500 to 600 meters.
b) Although it was observed that no critical bottlenecks in the northern corridor exist, except for the Baclaran and Libertad areas and southern portion of Harrison, congestions spread all along the side streets due to insufficient capacity and substandard structure conditions.
c) As a whole, it is considered that with proper improvements most of the above roads would be considered as possible roads for rerouting.

2) **Identification and Assessment of Possible Alternative Roads**

- Appendix 8.9. shows the roads which can be possibly used for rerouting on important sections of the north (Figure A) and the south (Figure B) corridors, respectively. The information on these roads are presented in detail in Appendix 8.8. Although some side streets and secondary roads are not wide and standards are not high enough, an introduction of proper traffic control measures, particularly one-way traffic and parking control, will enable them to be used as public transport roads.

- These detour roads can be categorized into two, namely:

a) Nearby streets closely located and considered a part of the LRT corridor for direct alternatives:

F. Huertas, Oroquieta, T. Mapua, etc. (Rizal Avenue)
S. Marcelino, Singalong, Leveriza, etc. (Taft Avenue)

b) Roads which belong to different corridors but can be considered as alternatives for long distance routes:

– A. Mabini/Juan Luna, J. A. Santos, A. Bonifacio, Dimasalang, etc. (in the north)
– A. Mabini/M. H. del Pilar, F. B. Harrison, South Super Highway (in the south)

- As shown in Appendix 8.9., nearby streets which may be converted into detour routes are found in the following sections:

- between 11th Avenue and 2nd Avenue
- between Blumentritt and Plaza Sta. Cruz
- between U. N. Avenue and Pasay Rotonda

Various side streets located in the above sections have been used as jeepney detour routes since the construction work for the LRT was started. However, they are mostly narrow one-way streets and, therefore, require proper traffic control measures and road improvements when used.

- The following corridors which are parallel to the LRT corridor, may be used as alternative detour routes:

North

- A. Mabini for Monumento – J. A. Santos Section
- J. A. Santos/Jones bridge for Hermosa – Plaza Lawton Section
- A. Bonifacio/Dimasalang for Monumento – Plaza Lawton Section

South

- M. H. del Pilar/Mabini/Harrison for T. M. Kalaw – Baclaran Section
- South Super Highway for P. Quirino – Pasay Rotonda Section.

Among these corridors, A. Mabini, J. A. Santos, A. Bonifacio, and South Super Highway are considered too far from the LRT corridor. If jeepneys are diverted to these corridors, it will cause not only inconvenience to passengers but also bring about complaints from jeepney drivers and operators of these corridors. For the north and south, therefore, there is only one realistic detour corridor for each, i.e.:

a) Dimasalang/Quezon Boulevard for the north
b) M. H. del Pilar/Mabini/Harrison for the south

8.2.4 Preparation and Assessment of the Rerouting Structure Plans

1) Preparation of Alternative Rerouting Plan

- Alternative rerouting plans were prepared based on the rerouting policies agreed upon and other existing local conditions such as the availability of detour roads. It is hardly possible to ban jeepneys along the section between Plaza Lawton and T. M. Kalaw since alternative detour roads are not available. The impact of such banning on public transport route structure is large and extensive. As a result, the alternative of banning jeepneys in some specific road sections in the LRT corridor may be considered separately for the North and the South depending upon the degree of its effect.

- Four alternative plans each for the north and for the south corridors were prepared. These alternative plans are shown in Appendix 8.10. The characteristics of these plans can be highlighted as follows:

North Corridor:

Alternative A (Minor rerouting): Banning the jeepney along Rizal Avenue between V. Fugoso and Plaza Sta. Cruz where the traffic congestion is serious particularly around the intersection at C. M. Recto. Otherwise, the route structure remains basically as is.

Alternative B (Medium rerouting): Rerouting all along Rizal Avenue by banning the jeepneys along Rizal Avenue between Plaza Sta. Cruz and Solis. Al-

though the routes basically follow the existing ones, parallel roads (F. Huertas, Oroquieta, etc.) are made use of.

Alternative C (Major rerouting): Banning the jeepneys along Rizal Avenue between Solis and Plaza Lawton including McArthur bridge.

a) Routes that have both end terminals outside the section of Solis-McArthur bridge shall be diverted either to J. A. Santos/Jones bridge or Dimasalang/Andalucia/Quezon Blvd./Quezon bridge.
b) Routes that come from the north and have one end terminal within the section shall be diverted to the nearby streets running parallel to Rizal Avenue.

Consequently, the changes in route configuration between Solis and McArthur bridge is fairly considerable, though the original ends of the routes are maintained.

Alternative C' (Major rerouting): Basically the same as Alternative C except that all jeepneys passing McArthur bridge will be rerouted to Quezon bridge.

South Corridor:

Alternative I (Minor rerouting): Banning the jeepneys along the most congested section of Taft Avenue between P. Quirino and Vito Cruz. Otherwise, the basic route structure remains as is.

Alternative II (Medium rerouting): Expand the banning of jeepneys along Taft Avenue between P. Quirino and Buendia, otherwise, the route structure basically remains as is.

Alternative III (Major rerouting): Banning jeepneys all along Taft Avenue between P. Quirino and EDSA.

a) Reroute jeepney routes to the side streets; Leon Guinto, Dominga, P. Burgos, and Zamora for the north bound and Dakota, Leveriza and Park Avenue for the south bound.
b) Reroute some routes along Harrison.

Alternative IV (Major rerouting): Banning jeepneys along Taft Avenue between Vito Cruz and EDSA. Otherwise, it is basically the same as in Alternative III.

2) Evaluation of Alternatives

- In order to quantitatively evaluate these alternative plans, TRANSTEP assignment cases were selected as follows:

CASE 1 : Alt. B (North) + Alt. II (South)

Banning of Jeepneys on:
Solis – Plaza Sta. Cruz and P. Quirino – Buendia

CASE 2 : Alt. C' (North) + Alt. III (South)

Banning of Jeepneys on:
Solis – McArthur bridge and P. Quirino – Pasay Rotonda

CASE 3 : Alt. A (North) + Alt. III (South)

Banning of Jeepneys on:
V. Fugoso – Plaza Sta. Cruz and P. Quirino – Pasay Rotonda

- The alternatives were first evaluated considering the LRT patronage. The results are shown in Table 8.3.

  This exercise implies the following:

  a) The rerouting of jeepney routes from the existing LRT corridor to other corridors or to side streets is as similarly effective as cutting the jeepney routes which compete or run along the LRT corridor over the long distance.
  b) Regarding the section of the LRT corridor where jeepneys are banned, the most effective portion in terms of LRT passenger patronage is considered that between V. Fugoso and Plaza Sta. Cruz at Rizal Avenue where side streets have only insufficient capacities and passenger generation is large. Taft Avenue between P. Quirino and Buendia also needs to be banned from jeepneys.
  c) With rerouting of jeepney routes from these sections of the LRT corridor, approximately 30 percent increase in LRT passenger traffic can be expected compared to the "Do-Nothing" situation.
  d) Impact of the LRT due to the rerouting can be summarized as follows:
     i) In Case 1, the type 1 routes are extremely affected, while other types have similar tendency as other cases.
     ii) In Case 2, the LRT seems to equally affect all routes.
     iii) In Case 3, the type I and III routes are affected more than Case 2 but less than Case 1.
  e) There will be a change in the required number of units running. Approximately 3,300 – 3,800 jeepney units and 300 – 400 bus units will become surplus unless new routes are created.

- The completion of the LRT will definitely lead to a decrease in jeepney and bus passenger traffic on various roads in and around the LRT corridor.

  a) Considerable decrease in jeepney and bus passenger traffic along the LRT corridor is seen as follows:
     i) 20-30 percent decrease along Rizal Avenue Extension
     ii) More than 50 percent decrease along Rizal Avenue
     iii) More than 50 percent decrease along Taft Avenue
  b) Among the roads running parallel to the LRT corridor, F. B. Harrison and Dimasalang/Quezon Boulevard show a considerable increase of more than 20 percent due to the rerouting. However, other corridors where no routes were diverted show a decrease of about 5-40 percent.
  c) A considerable number of roads which feed into the LRT corridor shows an increase in public transport passenger traffic. This means the public transport routes on these roads are providing feeder services to the LRT.
  d) The decrease in public transport passenger traffic volume on the roads will not necessarily lead to the decrease in traffic congestions. This is due to the decrease in road capacity along the LRT corridor and the increase in traffic congestions around the LRT stations. It is to be noted that the benefit of LRT will not be limited to the LRT corridor but will spread to parallel corridors.

- Alternatives were evaluated considering road traffic aspects by major road sections. Tables 8.4 and 8.5 summarize the approximate level of jeepney traffic situation on relevant roads due to the rerouting plan. The tables indicate that the jeepney traffic

volume would not exceed that of "without LRT" situation along most of the relevant road sections after the completion of the LRT. Table 8.6 briefly summarizes the other aspects on the impact of the rerouting.

Table 8.3
Impact of Rerouting to LRT Passenger Patronage 1/, 2/

	Without LRT Without Rerouting	With LRT Without Rerouting	CASE 1	CASE 2	CASE 3
LRT					
No. of Passengers	–	48,761	64,950	58,464	59,879
Pass.-Kms (000)	–	357	425	390	402
Ave. Trip Length (Kms)	–	7.3	6.5	6.7	6.7
Jeepney					
No. of Passengers	505,736	479,341	456,904	459,444	454,387
Pass.-Kms (000)	2,941	2,791	2,628	2,663	2,623
Ave. Trip Length (Kms)	5.8	5.8	5.8	5.8	5.8
Bus					
No. of Passengers	167,866	156,039	166,201	167,370	170,211
Pass.-Kms (000)	1,371	1,183	1,280	1,276	1,302
Ave. Trip Length (Kms)	8.2	7.6	7.7	7.6	7.6
Total					
No. of Passengers	673,602	684,141	688,055	685,638	684,477
Pass.-Kms (000)	4,312	4,331	4,333	4,329	4,327
Ave. Trip Length (Kms)	6.4	6.3	6.3	6.3	6.3

1/ Morning peak hour

2/ Based on the assumption that the LRT fare level is fixed at ₱1.0 flat and passenger time value at ₱1.7/hr.

Table 8.4
Comparison of Rerouting Impact on Jeepney Traffic Volume on Relevant Road Sections (North Corridor)

Road Name	Length (Kms.)	No. of Lanes	Estimated One-way Hourly Frequency (Morning Peak 7-8 am), 1983 1/ Before/ Without LRT Situation	With LRT but Without Rerouting	Alt. A	Alt. B	Alt. C	Alt.C'
Rizal Avenue (Solis-Blum.)	0.5	4	895	520	520	0	0	0
Rizal Avenue (Blum.-Bambang)	1.2	4	1,212	780	780	0	0	0
Rizal Avenue (Bambang-V. Fugoso)	0.3	4	1,104	700	700	0	0	0
Rizal Avenue V. Fugoso-Plaza Sta. Cruz	1.0	4	1,054	490	0	0	0	0
Oroquieta/F. Huertas	1.5	3	417	270	270	1,050	560	560
T. Mapua/ Evangelista	0.7	2	32	20	490	490	20	20
McArthur Bridge	0.5	4	1,022	470	470	470	0	0
Jones Bridge	0.5	2	361	280	280	280	370 2/	280
Quezon Bridge	0.5	4	1,569	1,190	1,190	1,190	1,570 2/	1,660

1/ The Jeepney Traffic Volume for Alternatives is estimated manually by using that of the relevant route calculated in the case of "With LRT but Withour Rerouting Situation." Therefore, the jeepney traffic volume shown under various alternatives will be less depending upon the degree of rerouting.

2/ It is assumed here that the traffic volume, which is supposed to be shown on McArthur Bridge, be allocated for Jones Bridge and Quezon Bridge by 20% and 80%, respectively.

Table 8.5
Comparison of Rerouting Impact on Jeepney Traffic Volume on Relevant Road Sections (South Corridor)

Road Name	Length (Kms.)	No.of Lanes	One-way Hourly Frequency (7 – 8 a.m.) 1983[1/]					
			Before LRT Construction	With LRT but Without Rerouting	Alt. I	Alt. II	Alt. III	Alt. IV
Taft Ave. (P. Gil-P. Quirino	0.7	8	1171	680	680	680	680	680
Taft Ave. (P. Quirino-Vito Cruz)	0.9	4	985	560	0	0	0	560
Taft Ave. (V. Cruz-Buendia)	0.9	4	754	420	420	0	0	0
Taft Ave. (Buendia-Libertad)	0.8	4	1027	500	500	500	0	0
Taft Ave. (Libertad-	1.1	4	730	430	430	430	0	0
Mexico Rd. (P. Rtda.-Baclaran)	0.7	4	364	280	280	280	280	280
Mabini/M.H. del Pilar (P. Gil-P Quirino)	1.0	2	756	600	600	600	600	600
Harrison (P. Quirino-Vito Cruz)	0.6	2	701	530	700	700	700	530
Harrison (V. Cruz-Buendia)	0.8	2	701	520	520	740	740	740
Harrison (Buendia-Libertad)	0.8	2	416	270	270	270	570	570
Harrison (Libertad-Baclaran	1.6	2	355	230	230	230	460	460
Dakota/L. Guinto (P. Quirino-V. Cruz)	0.9	4	186	110	500	500	500	500
Leveriza/Dominga (V. Cruz-Buendia)	0.9	2	0	0	0	200	200	200
Leveriza/Zamora (Buendia-Libertad)	0.8	2	0	0	0	0	200	200
Park Ave./Zamora (Libertad-P. Rtda.)	1.4	2	0	0	0	0	200	200

1/ The method used in Table 8.4 was also applied for estimated the jeepney traffic volume for different alternatives.

Table 8.6
Evaluation of Alternatives

Alternative	Anticipated Overloading of Traffic	LRT Patronage	Adverse Environmental Impact
NORTH CORRIDOR			
Alternative A:	Blumentritt, T. Mapua (North), T. Mapua, Evangelista	less	minimal
Alternative B:	Blumentritt, T. Mapua (North), T. Mapua, Evangelista	moderate	noticeable
Alternative C:	not significant	relatively	minimal
Alternative C':	not significant	relatively	minimal
SOUTH CORRIDOR			
Alternative I:	Baclaran	less	minimal
Alternative II:	Baclaran, Harrison: (Vito Cruz-Buendia)	moderate	minimal
Alternative III:	Baclaran, Harrison: (Vito Cruz-Baclaran)	relatively	noticeable
Alternative IV:	Baclaran, Harrison: (Vito Cruz-Baclaran)	relatively	noticeable

8.2.5 Detailed Rerouting Structure Plan by Area

- Alternative rerouting structure plans were thoroughly discussed with relevant government agencies in coordination with the on-going projects, plans and existing enforcement capabilities. The government agencies involved are the BOT, CHPG, MMC, the Police, MMTEAM and LRTA. The plan finally concurred upon is shown in Figure 8.16.

1) **Basic Concept of the Plan**

- The most important concept of this plan is the jeepney banned sections. They are:

a) Rizal Avenue Extension includes the following section:

10th Avenue – 5th Avenue (South bound)

b) Rizal Avenue includes the following sections:

Aurora – Plaza Sta. Cruz (South bound)
Lope de Vega – Antipolo (North bound)

c) Taft Avenue includes the following sections:

P. Quirino – EDSA (South bound)
EDSA – Padre Faura (North bound)

- Due to this banning, the existing routes running along the LRT corridor are affected depending on the routes' origin, destination and via.
- The existing routes currently turning at Quiapo underpass will be transferred to the LRT Central Station at Arroceros. However, it has yet to be determined whether all jeepney routes should be transferred or not.
- The existing routes which can function as feeder routes to the LRT will not be affected. The passenger demand is supposed to increase to a considerable extent owing to the LRT.
- The new routes proposed as LRT feeders aim at filling the gap caused by the jeepney banning as well as improving the linkage of LRT with major sources of passenger demand outside the LRT corridor. The concept is shown in Figure 8.17.
- The rerouting plan has no direct influence on other existing routes although the demand distribution changes to some extent depending on the route configuration.

2) **Description of the Plan by Section**

Monumento – J. A. Santos Section: There will be no major changes in this section except for the following:

a) South-bound jeepney will be banned between 10th Avenue and 5th Avenue and will be diverted to A. del Mundo, which runs parallel to Rizal Avenue Extension.
b) Jeepney routes bound for Recto from Navotas/Malabon area via Monumento will be diverted to Heroes del 96 and 10th Avenue.
c) Jeepney routes bound for Blumentritt from the north of Novaliches will have the 5th Avenue Station of LRT as its destination.
d) Turning movement at Monumento will be modified to a minor extent with due consideration of the North LRT Terminals.
e) As a feeder route, Arkong Bato-Monumento via M. H. del Pilar is proposed.

The rationale behind these rerouting schemes are as follows:

a) To mitigate traffic congestion along Rizal Avenue Extension,
b) To decongest the Monumento and Blumentritt Stations of the LRT, by diverting some jeepney routes to feed into the 5th Avenue Station.
c) To provide better access to the North LRT Terminal for jeepneys coming from the north, west and east.
d) To discourage, to some extent, south-bound jeepneys which directly compete with the LRT.

J. A. Santos – Tayuman Section: This section includes Blumentritt, which is a major junction point of the three corridors, i.e., A. Bonifacio, Rizal Avenue Extension, and Rizal Avenue. Changes are as follows:

a) Routes coming from the direction of Rizal Avenue Extension are connected to Oroquieta via J. A. Santos, T. Bugallon, T. Mapua and Laguna. However, for the return trip, F. Huertas, Antipolo, Rizal Avenue and Aurora will be used.
b) Routes coming from the direction of A. Bonifacio and Retiro are linked to Oroquieta through Blumentritt, P. Guevarra and Antipolo. For the return trip, F. Huertas, Antipolo, P. Guevarra and Cavite will be used.
c) Turning movement at Blumentritt will be changed with due consideration of the following points:
   - not to cross major roads as much as possible
   - not to make left-turn movements as much as possible
   - not to cross PNR as much as possible
   - provide a good link to LRT to transfer passengers
   - not to make a long jeepney queue along major roads
d) As a feeder to LRT, Blumentritt – Altura/R. Magsaysay via Maceda, Santiago is proposed.

These reroutings can be justified as follows:

a) To mitigate traffic congestion of Rizal Avenue especially around the crossing of PNR.
b) To decongest Blumentritt area by rationalizing the turning movement of jeepneys.
c) To provide better access to the LRT Blumentritt Station for jeepneys coming from the north, west and east.

Tayuman – McArthur Bridge Section: This section includes one of the busiest areas of Metro Manila. The characteristics are as follows:

a) Routes coming from the north pass the side streets including Oroquieta, Bambang and T. Mapua up to Plaza Sta. Cruz, although the Recto-bound routes branch-off from Oroquieta at V. Fugoso. Those going north-bound will branch-off from Rizal Avenue using Lope de Vega and F. Huertas.
b) Recto, Plaza Lacson and Dasmariñas/Nueva/Escolta will be used as turning points for routes coming from the north. Plaza Lacson and Dasmariñas/Nueva/Escolta will be new turning circuits prepared for possible route cutting.
c) As feeder services for LRT, the following new routes which will feed into the LRT Bambang Station considering the current traffic control measures in the CBD area are proposed:
   i) Divisoria – Bambang via A. Rivera
   ii) Bambang – España Rotonda via Dapitan, Gov. Forbes
   iii) Balut – Bambang

The rationale are as follows:

a) To mitigate traffic congestion along Rizal Avenue
b) To rationalize jeepney turning movement considering the expected jeepney queues at LRT stations including Carriedo.
c) To give better access to LRT by developing feeder routes from busy areas in the CBD to the Bambang Station, which will alleviate the expected load at Blumentritt, D. Jose and Carriedo Stations.

McArthur Bridge – T. M. Kalaw Section: This section is the busiest section in Metro Manila in terms of traffic volume. No rerouting is planned here except that a certain percentage of jeepneys turning at Quiapo Underpass at present will be transferred to the LRT Central Station.

T. M. Kalaw – P. Quirino Section: The rerouting plan covers the following:

a) South-bound jeepneys can continue to pass Taft Avenue. However, all jeepneys except those turning at San Andres/Remedios have to make a right turn to San Andres to enter Adriatico.
b) On the other hand, north-bound jeepneys will have to use Leon Guinto up to Padre Faura.
c) The turning points of this section will not be largely changed. However, a new turning point is proposed at San Andres/Remedios taking the possible route cutting into account.
d) A new feeder route Pandacan – Pier is proposed.

This rerouting is planned due to the following reasons:

a) To alleviate the traffic congestion along Taft Avenue especially at the intersections at P. Faura and P. Gil by diverting jeepneys to L. Guinto.
b) To give a better access to the LRT Station by developing a new feeder route between Pier and Pandacan where the service level of public transport is considered to be low.

P. Quirino – Baclaran Section: This is presumably the section which will be most affected by the rerouting plan.

a) Mabini/Harrison will be converted into a south-bound one-way street (at least for jeepneys) between San Juan and San Andres in order to facilitate the turning movement around P. Quirino and Vito Cruz.
b) The routes passing Taft, Harrison and Dakota at present will be rerouted as follows:

Vito Cruz Bound Jeepneys:

via Mabini : to M. H. del Pilar, P. Quirino, Harrison, Vito Cruz, Adriatico, Leveriza, San Andres, Mabini

via Dakota : to Taft, San Andres, Adriatico, Vito Cruz (U-turn), Adriatico, Leveriza, Remedios, L. Guinto

via Taft : to Taft, San Andres, Adriatico, Vito Cruz, L. Guinto

Libertad Bound Jeepneys:

via Mabini : to M. H. del Pilar, P. Quirino, Harrison, Buendia, Leveriza, Libertad, Harrison, San Juan, Leveriza, Adriatico, Leveriza, San Andres, Mabini

via Dakota/Taft : to Taft, San Andres, Adriatico, Vito Cruz, Donada, Buendia, Leveriza, Libertad, P. Burgos, Dominga, L. Guinto

Pasay Rotonda Bound Jeepneys:

via Mabini : M. H. del Pilar, P. Quirino, Harrison, Libertad, Park Avenue, F. Rein, Mexico Road, Harrison, San Juan, Leveriza, Adriatico, Leveriza, San Andres, Mabini

via Dakota/Taft : Taft, San Andres, Adriatico, Vito Cruz, Donada, Buendia, Leveriza, Park Avenue, F. Rein, EDSA, Zamora, P. Burgos, Dominga

Baclaran Bound Jeepneys:

via Mabini : M. H. del Pilar, P. Quirino, Harrison, Redemptorist, Roxas Boulevard (Service Road), T. Claudio, Quirino Avenue, Harrison, San Juan, Leveriza, Adriatico, Leveriza, San Andres, Mabini

via Dakota/Taft : Taft, San Andres, Adriatico, Vito Cruz, Harrison, Redemptorist, Roxas Boulevard (Service Road), T. Claudio, Quirino Avenue, Harrison, San Juan, Leveriza, Adriatico, Leveriza, Remedios, L. Guinto

d) The existing feeder routes will basically remain as they are, although there will be minor modifications in their turning points.

e) In this section, due to considerable rerouting, new feeder routes are proposed as follows:

i) Nichols – Pasay Rotonda
ii) Libertad – Barangay Palanan via Dian
iii) Libertad – Baclaran
iv) Libertad – San Andres
v) Bacoor – Vito Cruz via Harrison, Park Avenue
vi) Nichols Gate – Vito Cruz via P. Burgos, Park Avenue
vii) Baltao – Buendia via Harrison

This rerouting aims to:

a) mitigate traffic congestion along Taft Avenue, which becomes narrower in this section than the northern part (from eight lanes to four lanes)
b) rationalize jeepney turning movements by converting a number of side roads into one-way streets
c) give good access to all the LRT stations by avoiding anticipated jeepney queues and by developing new feeder routes

8.2.6 Assessment of the Proposed Rerouting Structure Plan

- The proposed structure plan was finally assessed using TRANSTEP to confirm the various indicators which have been used for the discussions on topics of the previous sections. The results are presented in Tables 8.7, 8.8, 8.9 and 8.10 and Figures 8.18 and 8.19.
- Tables 8.7 and 8.8 indicate the following characteristics:

a) LRT patronage will be guaranteed with the rerouting.

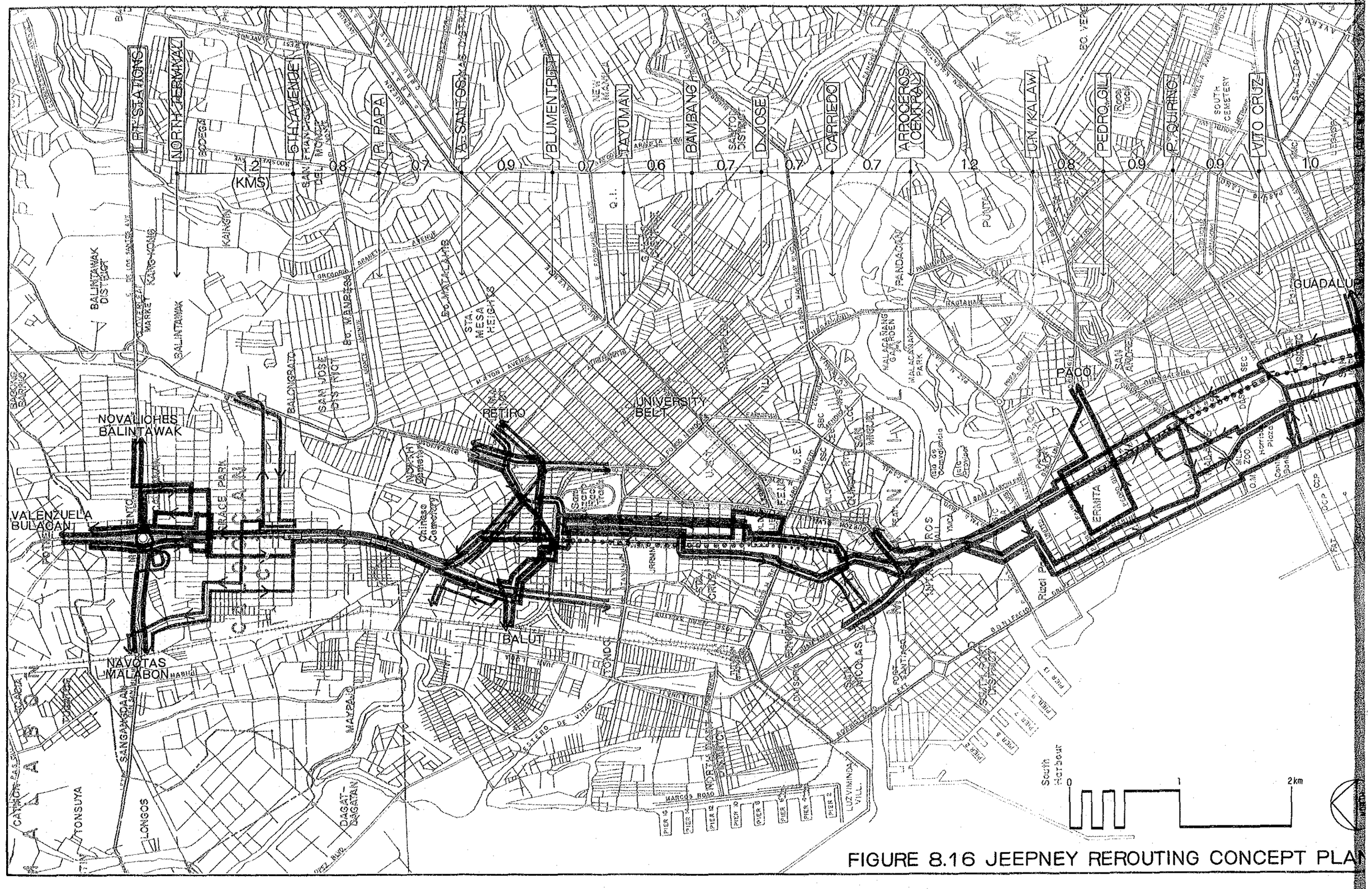
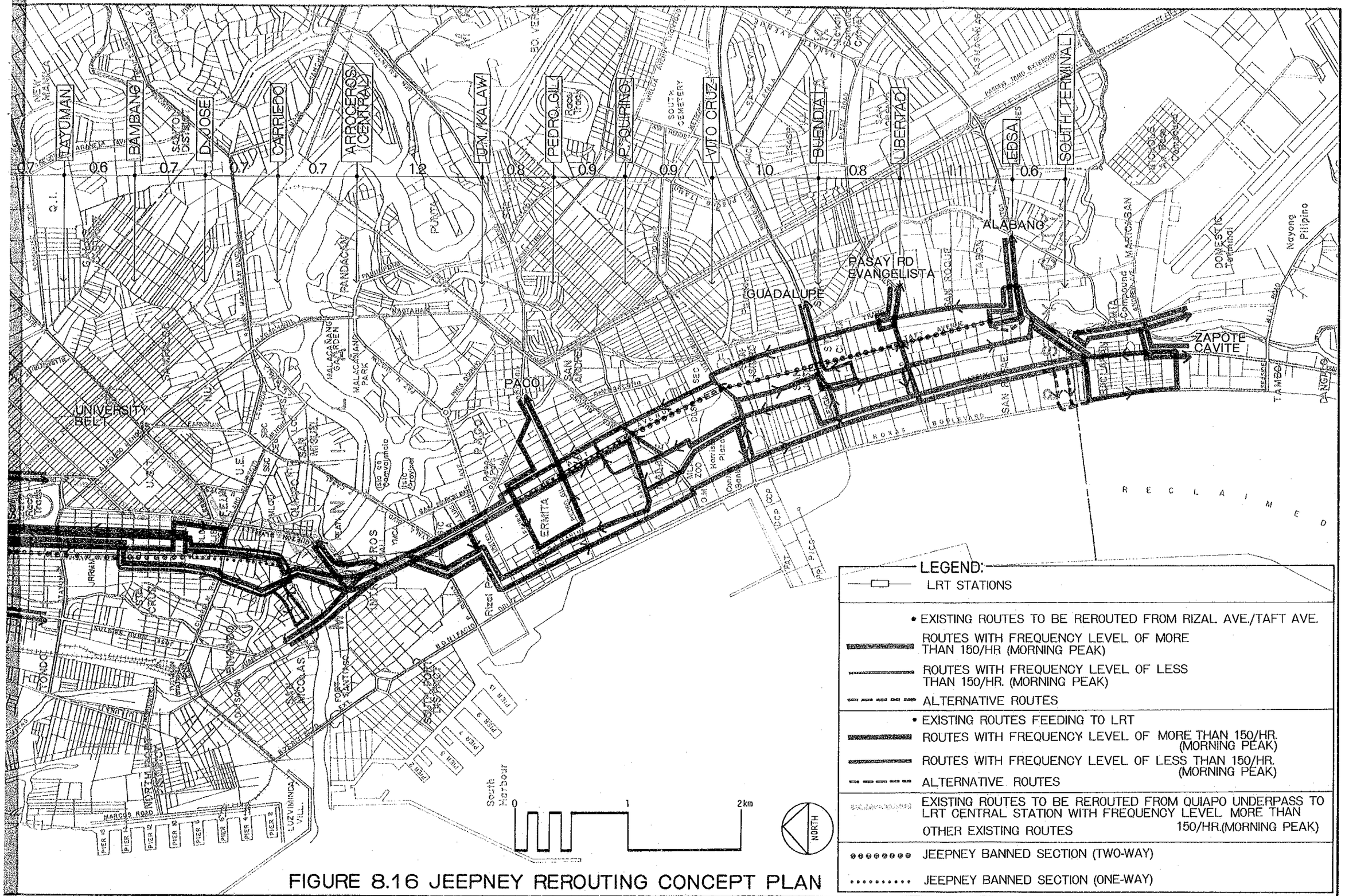


FIGURE 8.16 JEEPNEY REROUTING CONCEPT PLAN

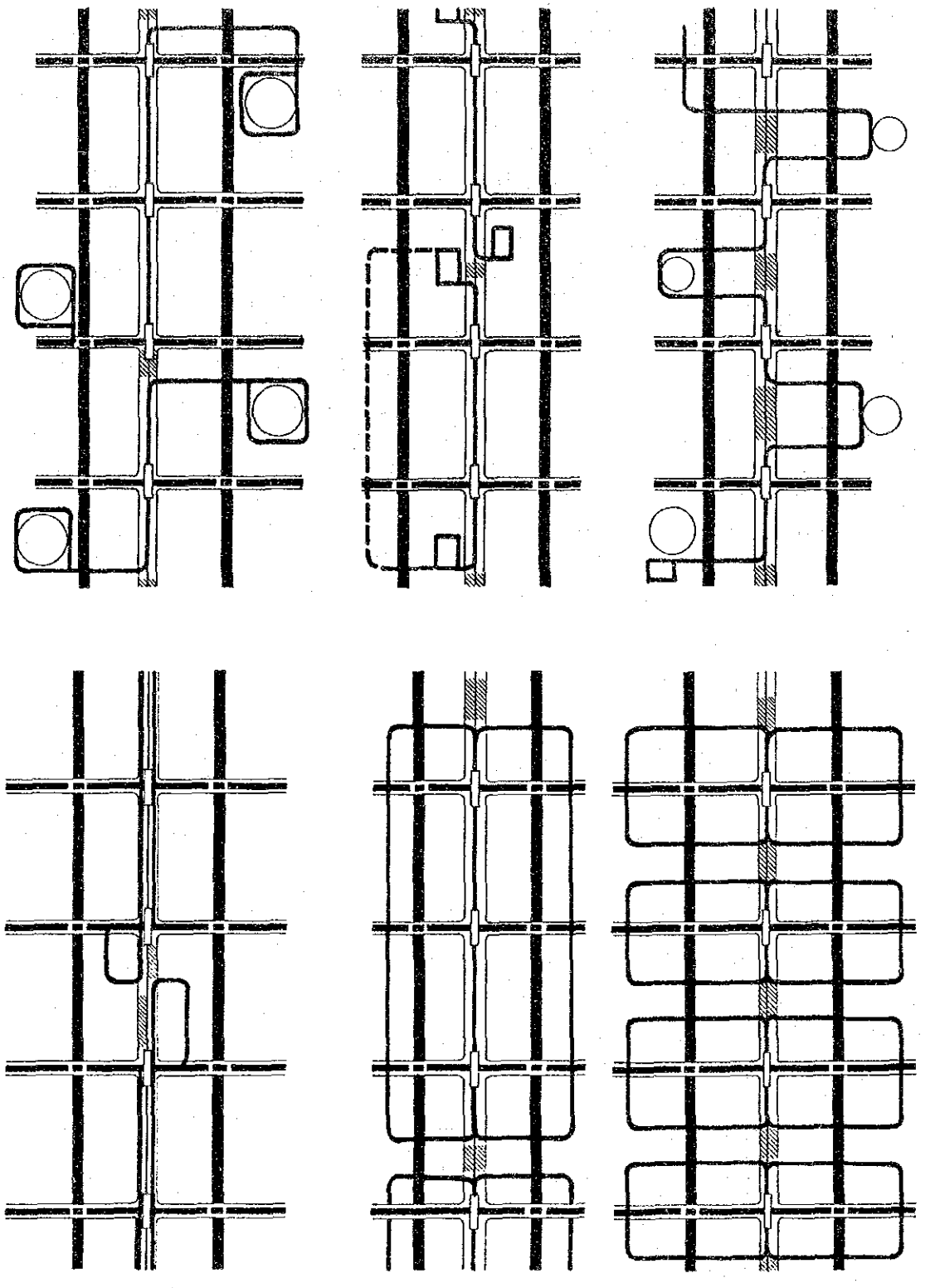


LEGEND:

- LRT STATIONS
- • EXISTING ROUTES TO BE REROUTED FROM RIZAL AVE./TAFT AVE.
- ROUTES WITH FREQUENCY LEVEL OF MORE THAN 150/HR (MORNING PEAK)
- ROUTES WITH FREQUENCY LEVEL OF LESS THAN 150/HR. (MORNING PEAK)
- ALTERNATIVE ROUTES
- • EXISTING ROUTES FEEDING TO LRT
- ROUTES WITH FREQUENCY LEVEL OF MORE THAN 150/HR. (MORNING PEAK)
- ROUTES WITH FREQUENCY LEVEL OF LESS THAN 150/HR. (MORNING PEAK)
- ALTERNATIVE ROUTES
- EXISTING ROUTES TO BE REROUTED FROM QUIAPO UNDERPASS TO LRT CENTRAL STATION WITH FREQUENCY LEVEL MORE THAN 150/HR.(MORNING PEAK)
- OTHER EXISTING ROUTES
- JEEPNEY BANNED SECTION (TWO-WAY)
- JEEPNEY BANNED SECTION (ONE-WAY)

FIGURE 8.16 JEEPNEY REROUTING CONCEPT PLAN

Figure 8.17
Concept of Feeder Services



b) The LRT together with the rerouting will bring about a 10 percent decrease in the number of passengers and passenger-kilometers for the jeepney.
c) The LRT alone will cause a decrease of seven percent in the number of passengers and 14 percent in passenger-kilometers for the bus. However, with the combined effect of rerouting, the number of passengers will retain its existing level while a decrease of six percent in passenger-kilometers is foreseen.
d) Adverse economic impact due to rerouting will be minimal.
e) Due to the LRT and associated rerouting, there will be a surplus of approximately 3,600 jeepneys and 300 buses on the demand level of 1980. However, considering the natural increase in transport demand of Metro Manila, this surplus will be easily absorbed within a year or two. Moreover, feeder routes newly created in connection with the LRT will be able to accommodate several hundreds of jeepneys.

- Figure 8.18 gives the LRT passenger ridership pattern, which is not considered too different from those shown and discussed in previous sections.
- Tables 8.9 and 8.10 give the idea on how the jeepney and bus routes/operation will be affected by the LRT. The impact varies depending upon the route type and where the routes pass. The longer the parallelism of a route to the LRT, the more it will be affected. They will be mostly the Types I and II. On the other hand, there are some corridors (typically seen in Buendia) which will show considerable increase in passenger traffic because the routes along the corridor provide a significant feeder service to the LRT.
- Figure 8.19 summarizes the impact of rerouting and LRT on the existing public transport.

Table 8.7
Change in Intermodal Relations of the Rerouting Plan

	Without LRT Without Rerouting	With LRT Without Rerouting	Rerouting Plan
LRT			
No. of Passengers	–	48,761 (100)	58,298 (120)
Pass.-Kms (000)	–	357 (100)	405 (113)
Ave. Trip Length (kms)	–	7.3	7.0
Jeepney			
No. of Passengers	505,736 (100)	497,341 (95)	462,027 (91)
Pass.-Kms (000)	2,941 (100)	2,791 (95)	2,640 (90)
Ave. Trip Length (kms)	5.8	5.8	5.7
Bus			
No. of Passengers	167,866 (100)	156,039 (93)	168,938 (101)
Pass. Kms (000)	1,371 (100)	1,183 (86)	1,289 (94)
Ave. Trip Length (kms)	6.2	7.6	7.6
Total			
No. of Passengers	673,602 (100)	684,141 (102)	689,262 (102)
Pass.-Kms (000)	4,312 (100)	4,331 (100)	4,335 (101)
Ave. Trip Length (kms)	6.4	6.3	6.3

Table 8.8
Estimated Number of Units Running of the Rerouting Plan

	Without LRT Without Rerouting	With LRT Without Rerouting	Rerouting Plan
Jeepney	35,500	33,700	31,900
Bus	5,900	5,100	5,600

FIGURE 8.18 LRT PASSENGER TRAFFIC FLOW (REROUTING PLAN) -MORNING PEAK HOUR

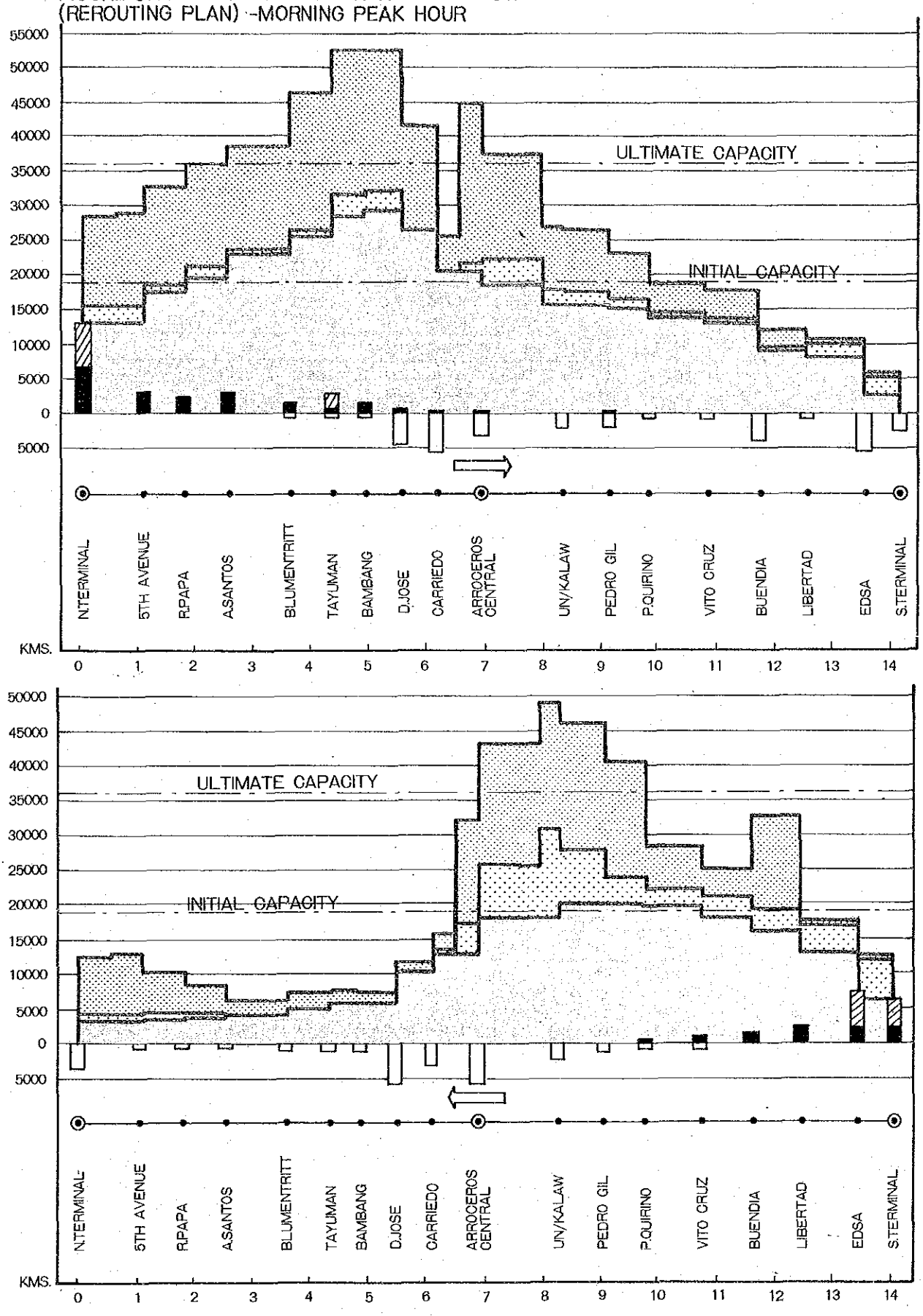


Table 8.9
Impact of the Rerouting Plan on Jeepney

Route Type	Corridor Used (Other than LRT Corridor)	Number of Passengers					Passenger – Kms				
		W/out LRT Without Rerouting	With LRT Without Rerouting	(Ratio)	Rerouting Plan	(Ratio)	W/out LRT Without Rerouting	With LRT Without Rerouting	(Ratio)	Rerouting Plan	(Ratio)
I	–	46,210	36,579	(0.79)	29,166	(0.63)	190,305	103,575	(0.54)	76,236	(0.40)
II	McArthur	7,798	6,663	(0.85)	6,361	(0.82)	68,940	57,201	(0.83)	50,879	(0.74)
	Harrison	1,208	345	(0.29)	351	(0.29)	7,306	1,199	(0.16)	887	(0.12)
	A. Bonifacio	4,728	4,307	(0.91)	3,201	(0.68)	27,136	17,242	(0.64)	11,367	(0.42)
	J.A. Santos	2,008	1,523	(0.76)	1,570	(0.78)	9,651	7,992	(0.83)	8,007	(0.83)
	Pier South	3,512	2,339	(0.67)	1,685	(0.48)	16,560	7,459	(0.45)	4,872	(0.29)
	Edsa (North)	28,244	24,043	(0.85)	23,018	(0.81)	96,538	78,319	(0.81)	69,777	(0.72)
	Espana	28,147	23,214	(0.83)	22,214	(0.79)	187,087	158,827	(0.85)	147,728	(.079)
	Jones Bridge	9,424	7,258	(0.77)	5,508	(0.58)	38,687	20,480	(0.53)	17,088	(0.44)
	Vito Cruz	1,647	1,647	(1.00)	1,457	(0.88)	1,904	1,904	(1.00)	1,568	(0.82)
Subtotal		86,716	71,392	(0.82)	65,365	(0.75)	453,809	350,623	(0.77)	312,173	(0.69)
III	McArthur	17,810	15,089	(0.85)	14,946	(0.84)	129,812	111,871	(0.78)	99,180	(0.76)
	A. Bonifacio	5,514	4,006	(0.73)	3,492	(0.63)	19,453	14,752	(0.75)	13,108	(0.67)
	España	57,238	55,506	(0.97)	54,063	(0.94)	360,986	414,916	(1.12)	337,474	(0.93)
	Jones Bridge	609	421	(0.69)	157	(0.26)	1,904	1,207	(0.63)	599	(0.31)
Subtotal		81,171	75,022	(0.92)	72,658	(0.90)	512,245	522,746	(1.02)	450,361	(0.88)
IV	–	110,672	116,848	(1.06)	115,798	(1.05)	697,477	789,745	(1.13)	763,478	(1.09)
V	–	41,900	44,261	(1.06)	44,971	(1.07)	121,914	124,349	(1.02)	117,945	(0.97)
VI	–	139,067	135,239	(0.97)	134,069	(0.96)	965,289	899,839	(0.93)	919,957	(0.95)
TOTAL	–	505,736	479,341	(0.95)	462,027	(0.91)	2,941,039	2,790,877	(0.95)	2,640,150	(0.90)

Table 8.10
Impact of the Rerouting Plan on Bus

Route Type	Corridor Used (Other than LRT Corridor)	Number of Passengers					Passenger-Kilometers				
		W/out LRT Without Rerouting	With LRT Without Rerouting	(Ratio)	Rerouting Plan	(Ratio)	W/out LRT Without Rerouting	With LRT Without Rerouting	(Ratio)	Rerouting Plan	(Ratio)
II	España	5,598	2,676	(0.48)	3,803	(0.68)	40,525	22,987	(0.57)	25,442	(0.63)
	Quirino Ave.	1,792	940	(0.52)	1,017	(0.57)	25,417	12,784	(0.50)	14,143	(0.56)
	S.S.H-way	8,661	5,841	(0.68)	7,024	(0.81)	163,521	59,734	(0.37)	103,258	(0.63)
	Roxas Blvd.	–	–	–	–	–	–	–	–	–	–
	Buendia	758	887	(1.17)	1,131	(1.49)	7,813	10,419	(1.33)	13,410	(1.72)
	A. Bonifacio	6,037	5,266	(0.87)	6,318	(1.05)	45,300	37,197	(0.82)	43,522	(0.96)
Subtotal		22,846	15,617	(0.68)	19,293	(0.84)	282,576	143,121	(0.51)	199,770	(0.71)
III	Dimasalang	3,168	2,491	(0.71)	4,182	(1.32)	28,134	18,943	(0.67)	32,447	(1.15)
	P. Gil	10,207	10,014	(0.98)	10,407	(1.02)	43,572	45,538	(0.98)	45,899	(1.05)
	Buendia	11,704	7,473	(0.64)	7,035	(0.60)	64,161	46,071	(0.72)	41,133	(0.64)
	U.N. Avenue	4,570	4,762	(1.04)	5,125	(1.12)	13,130	13,562	(1.03)	15,039	(1.15)
	McArthur North Diversion	590	136	(0.23)	445	(0.75)	5,258	1,781	(0.34)	3,174	(0.60)
	Road	4,448	4,441	(1.00)	4,609	(1.04)	31,628	32,976	(1.04)	35,156	(1.11)
	España	385	300	(0.78)	311	(0.81)	5,377	3,537	(0.66)	3,796	(0.71)
	Quirino	4,023	2,484	(0.62)	2,997	(0.74)	39,496	25,516	(0.65)	33,519	(0.85)
	Jones Bridge	12,023	12,027	(1.00)	12,723	(1.06)	34,449	33,839	(0.98)	37,193	(1.08)
Subtotal		51,118	44,128	(0.86)	47,834	(0.94)	266,205	218,763	(0.82)	247,356	(0.93)
IV	–	5,640	6,061	(1.07)	6,195	(1.10)	40,488	42,520	(1.06)	44,853	(1.11)
V	–	15,807	15,667	(0.99)	17,654	(1.12)	72,813	74,434	(1.02)	86,531	(1.19)
VI	–	14,618	15,195	(1.04)	15,992	(1.09)	241,711	229,848	(0.95)	249,725	(1.03)
VII	–	57,837	59,371	(1.03)	61,970	(1.07)	467,911	474,551	(1.01)	460,939	(0.99)
TOTAL	–	167,866	156,039	(0.93)	168,938	(1.01)	1,370,784	1,183,437	(0.86)	1,289,170	(0.94)

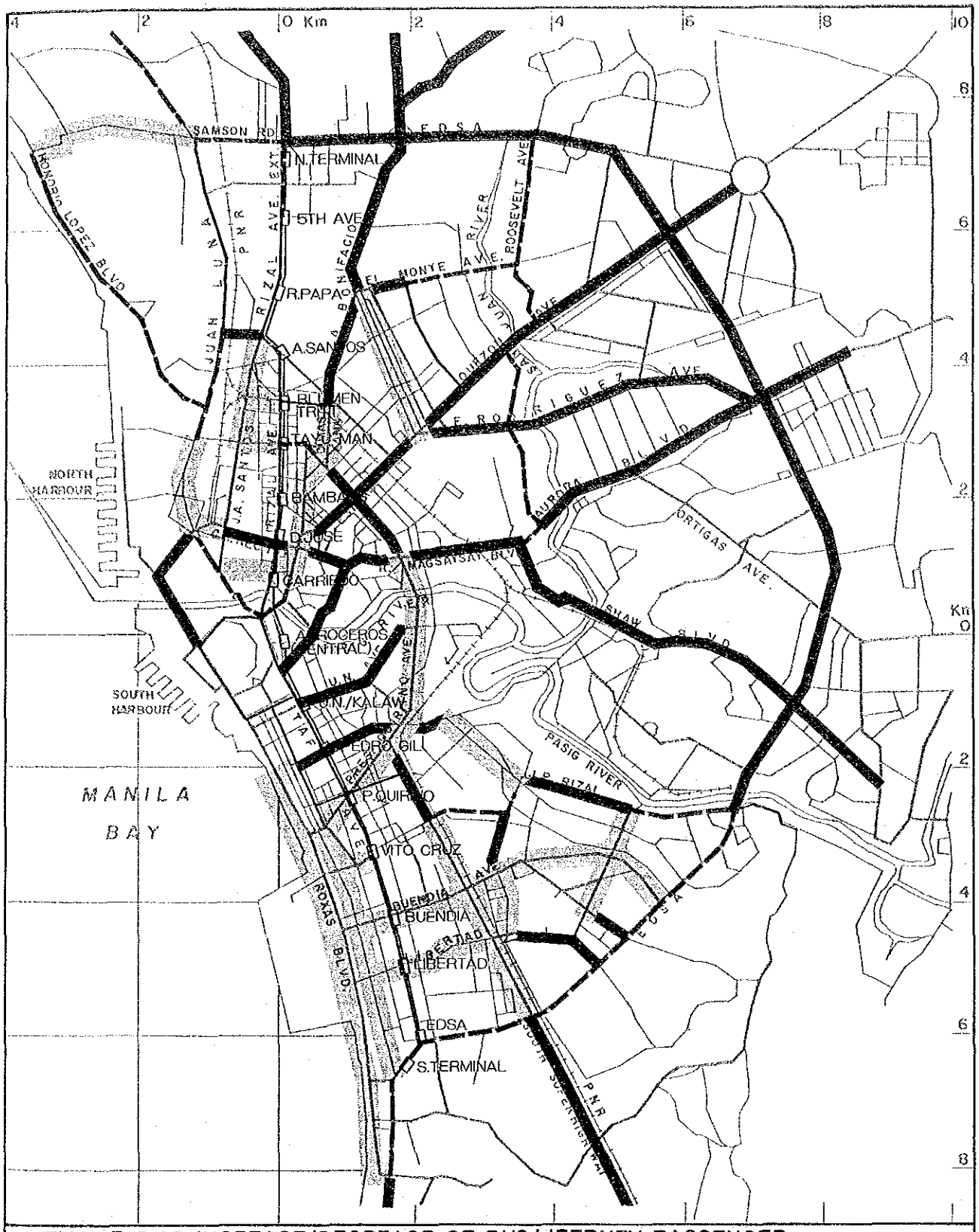


FIGURE 8.19 INCREASE/DECREASE OF BUS/JEEPNEY PASSENGER TRAFFIC VOLUME ON ROAD SECTIONS-"WITH LRT AND REROUTING" IN COMPARISON WITH "WITHOUT LRT AND REROUTING"

1.1 AND OVER

0.9-1.1

0.7-0.9

LESS THAN 0.7

LRT

INCREASE/DECREASE RATIO:
WITH LRT AND REROUTING
WITHOUT LRT AND REROUTING

NORTH