CHAPTER 2

BAYAMON'S PUBLICO TERMINALS

A. INTRODUCTION

1. Background

The Municipality of Bayamón is Puerto Rico's second most populous city, after San Juan, according to the 1980 U.S. Census figures. As shown in Figure 2-1, the Municipality of Bayamón is located in the western sector of the San Juan Metropolitan Area (SJMA) which covers over 190 square miles of the most populous area in Puerto Rico (with 1,086,376 inhabitants--based on the results of the 1980 Census) encompassing the municipalities of Bayamón, Canóvanas, Carolina, Cataño, Guaynabo, Loiza, San Juan, Toa Alta, Toa Baja, and Trujillo Alto.

The Municipality of Bayamón comprises an area of about 44 square miles. It is bounded on the north by the municipalities of Cataño and Toa Baja; on the west by Toa Alta and Naranjito; on the south by Comerío and Aguas Buenas; and on the east by Guaynabo (See Figure 2-2).

Bayamón is composed of twelve barrios or subareas: Hato Tejas, Juan Sánchez, Pájaros, Cerro Gordo, Minillas, Buena Vista, Santa Olaya, Guaraguao Abajo, Guaraguao Arriba, Dajaos, Barrio Nuevo, and Bayamón Town. The municipality is characterized by its extensive urban development (commercial, industrial, and residential) in the northern barrios, principally concentrated along the major highways. This urban area comprises approximately two-thirds of Bayamón's land and is constantly increasing as the demand for housing continues.

The population of the Municipality of Bayamón increased from 72,000 inhabitants in 1960, to 156,192 in 1970 and to 196,206 in 1980, according to the U.S. Census Bureau statistics. These changes represent a 117 percent increase between 1960 and 1970 and a 25.6 percent increase between 1970 and 1980, or a 172.5 percent increase between 1960 and 1980. The latter represents an estimated 5.1 percent annual increase in population. The 1980 population density for the Municipality as a whole is approximately 4,459 persons per square mile.

2. Transportation

The Municipality of Bayamón is served by an extensive network of roadways ranging from major multi-lane freeway facilities to local neighborhood and country roads reaching into the more distant rural mountainous areas. Naturally, the more urbanized areas in the northern sectors have the larger and better facilities. Figure 2-3 shows the major roadway network of Bayamón.

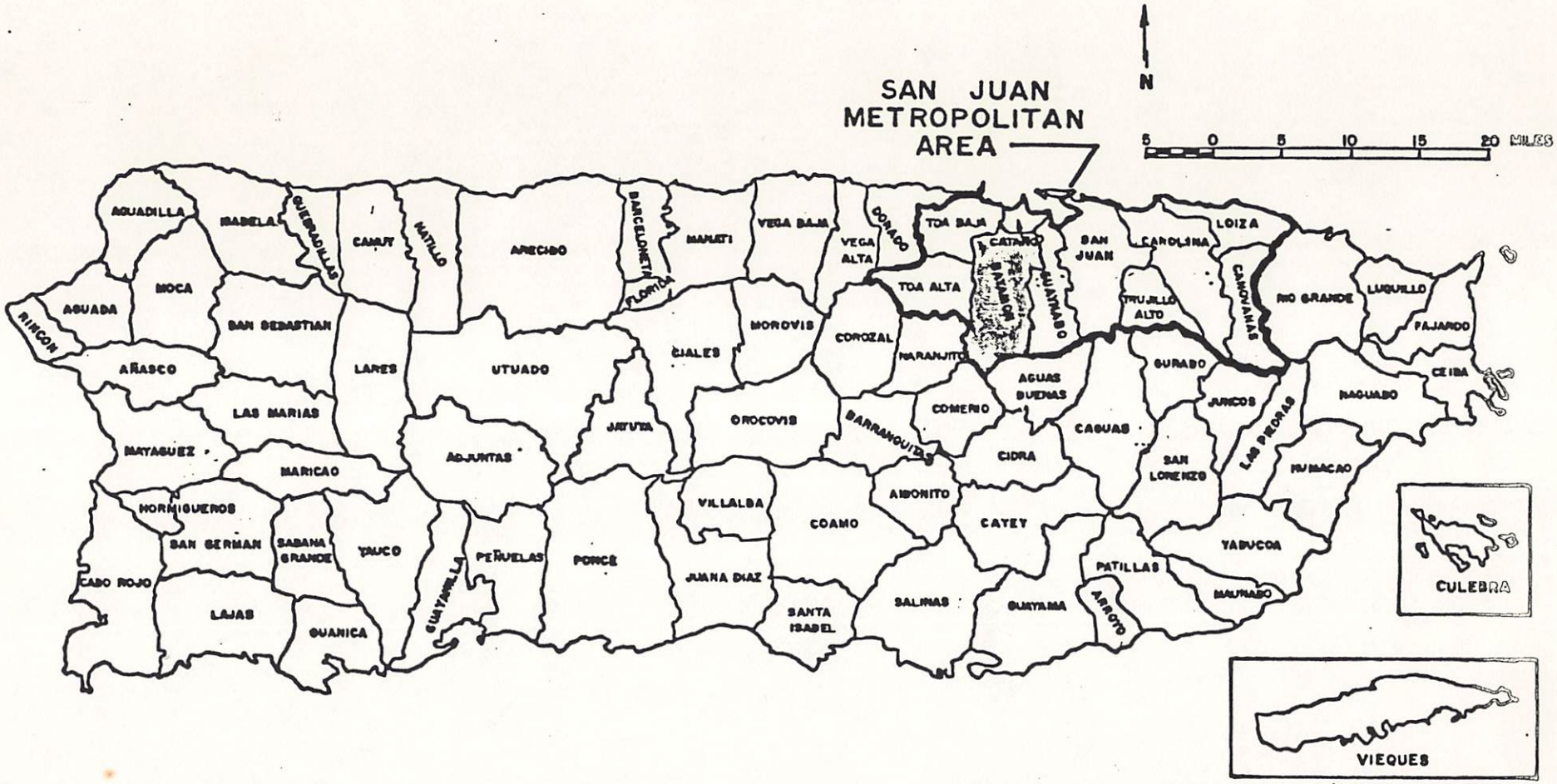


FIGURE 2-1 LOCATION OF MUNICIPALITY OF BAYAMON

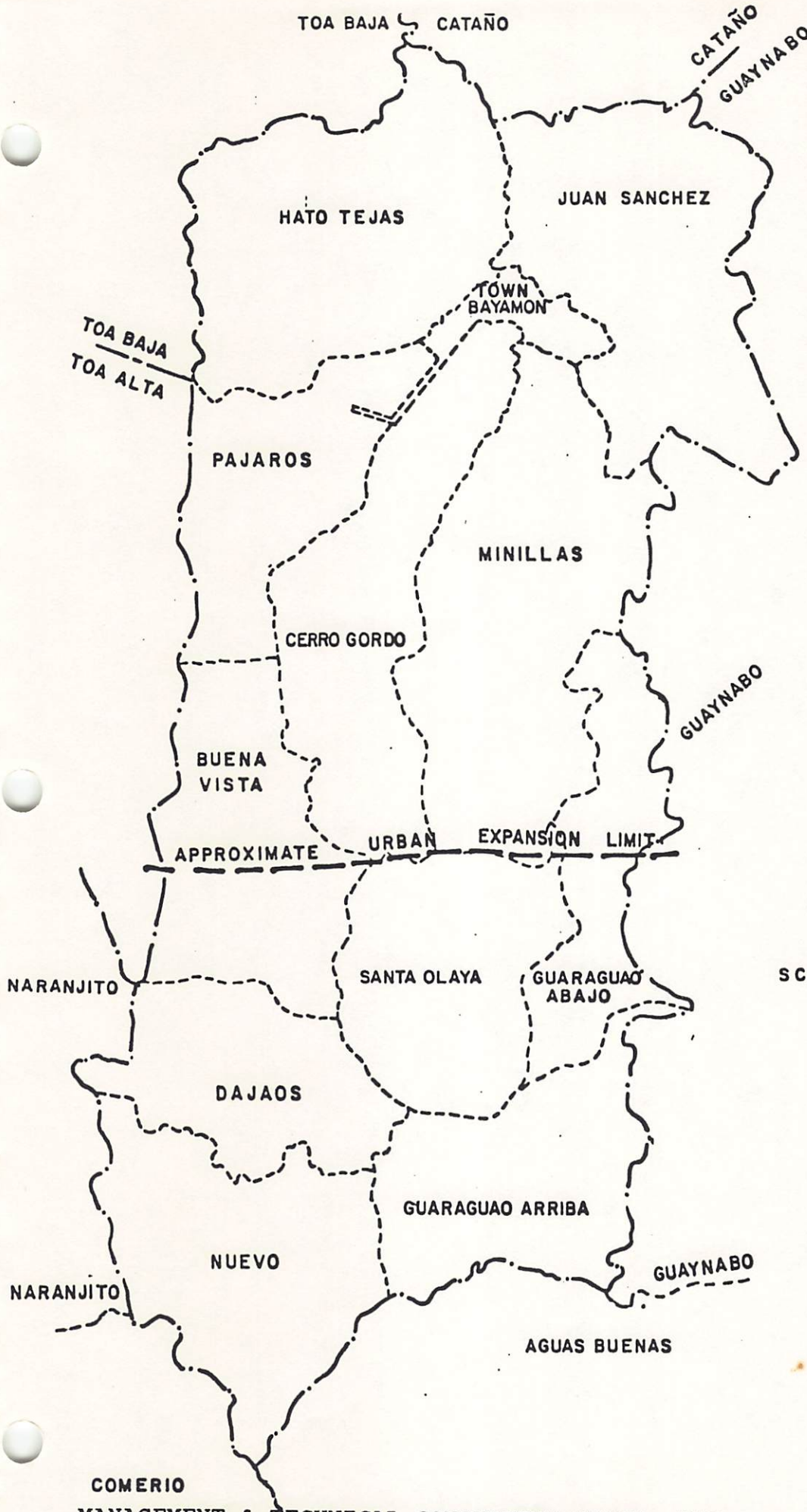


FIGURE 2-2

MUNICIPALITY
OF BAYAMON

SCALE 1: 80,000

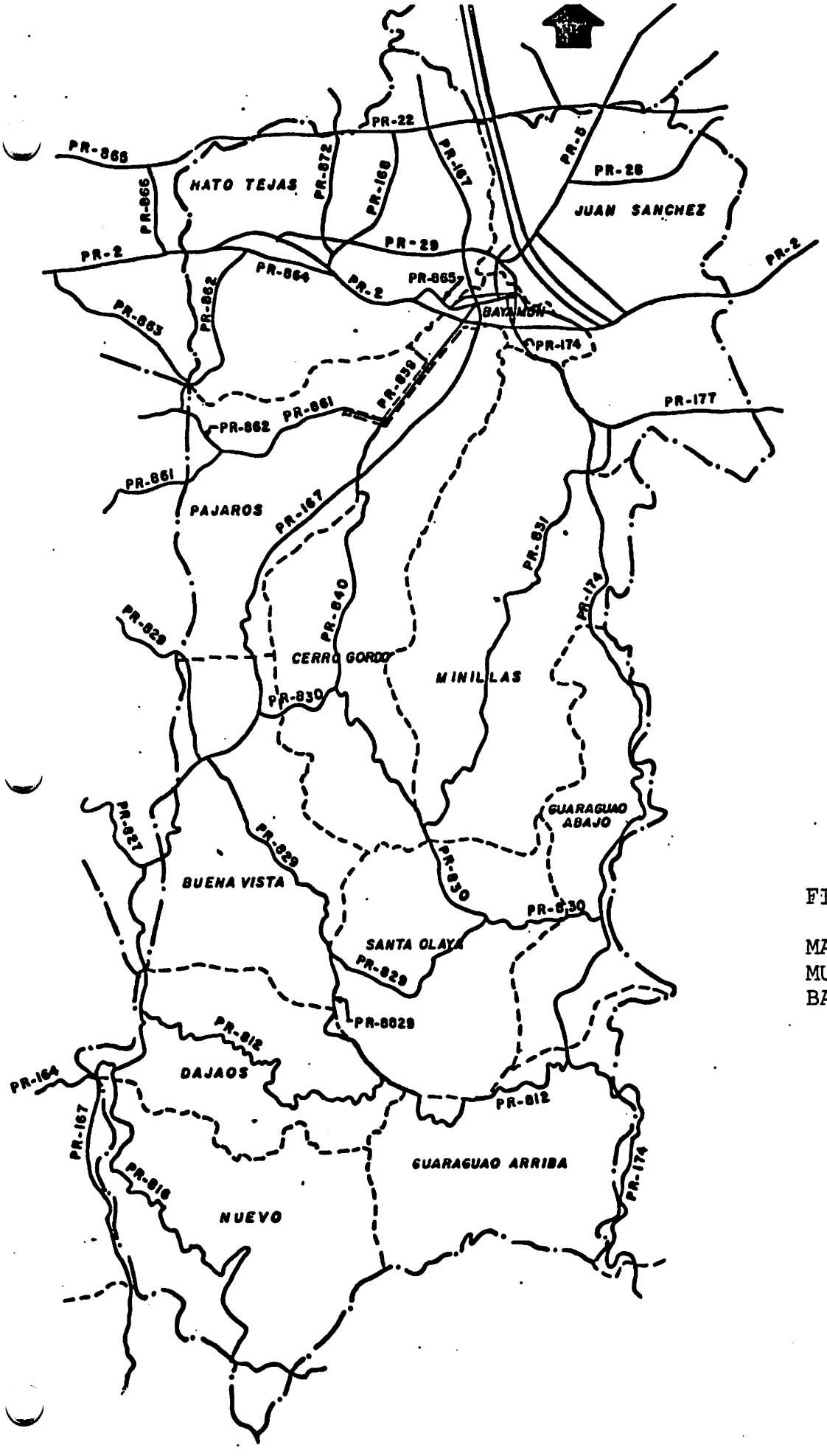


FIGURE 2-3

MAJOR ROADWAY NETWORK
MUNICIPALITY OF
BAYAMON

The development of Bayamón has been concentrated on the major crossroads consisting of PR-2 and PR-167. PR-2 is the major east-west highway extending from Santurce westward through Bayamón and connecting with the other major municipalities to the west such as Arecibo, Aguadilla, and Mayaguez, and terminating at Ponce on the south-central coast of the Island. The highway covers approximately one-half of the circumference of the Island, extending for over 162 miles.

The major north-south highway is PR-167 which extends from Levittown (Municipality of Toa Baja) north of Bayamón, through the CBD and continues south along the western length of Bayamón until reaching the town of Comerío, for a total distance of 22 miles.

Paralleling PR-167 along the eastern limit of the Municipality (along Río Bayamón), PR-174 extends 31.4 miles from its intersection with PR-2 at the eastern limit of the CBD, south to the town of Aguas Buenas.

Other major roadways consist of PR-5, connecting Bayamón with Cataño; PR-29 (Avenida Sierra Bayamón) which functions as a major urban bypass to the north of the CBD connecting PR-5 and PR-2 to the west; PR-22, a multilane toll road which extends from San Juan westward through Bayamón and Toa Baja and currently terminating near Dorado (this highway is planned to be extended to Arecibo).

The public transportation sector is served by six MBA and six private bus routes with over 50 buses of different types and sizes (from both the private and public [MBA] sectors). There are 41 authorized publico-car routes with a total of approximately 987 authorized vehicles. Taxis also service the area but to a limited degree. Table 2-1 presents a summary of the public transportation services operating in Bayamón. Table 2-2 presents an inventory of the publico-car routes serving Bayamón. The inventory includes the Public Service Commission Code, route name, number of vehicles, terminal location and union number.

3. The Bayamón Central Business District

The study area in which this study is focused upon is comprised of the central activity sector of the City of Bayamón in what is locally known as "El Casco de Bayamón" or Central Business District (see Figure 2-4). This CBD centers on the typical church-plaza-commercial area for which the towns of Puerto Rico are traditionally known for.

The Bayamón Study Area has a great diversity of activities which, together with the existing local transportation system, serves to attract a large number of visitors for shopping, visiting public and/or private services, schools, etc.

TABLE 2-1

CURRENT BAYAMON PUBLIC TRANSPORTATION

Publico-Cars	MBA Buses	Private Buses
38 routes	7 Routes-Bayamón to:	6 routes
*22 local routes with 541 vehicles	*45-Río Piedras vía Avenida Central	*Río Piedras
*16 interurban routes with 529 vehicles	*46-San Juan vía Ave. F. D. Roosevelt	*San Juan
	*46-A Parada 18 vía Ave. F. D. Roosevelt	*Corozal-Naranjito San Juan
	*47-San Juan vía Avenida Kennedy	*Comerío-San Juan
	*52-Río Piedras vía Centro Médico	*Orocovis-San Juan
	*91-Santa Juanita, Bayamón, San Juan vía F. D. Roosevelt	*Aguas Buenas
	*92- Magnolia Gardens, Bayamón, San Juan vía F. D. Roosevelt	

TABLE 2-2
PUBLICO-CAR ROUTE INVENTORY
MUNICIPALITY OF BAYAMON

PUBLIC SERVICE COMMISSION CODE	ROUTE	NUMBER OF VEHICLES	TERMINAL LOCATION	UNION No.
I-10-11	BARRANQUITAS	28	KUILAN	COOP
I-11-07	ARECIBO	5	NONE	8981
I-11-07	ARECIBO (NATAL)	7	GUARDARRAMA	8072
I-11-17	CATAÑO	74	CALLE PARQUE	5
I-11-23	COMERIO	20	KUILAN	2312
I-11-24	COROZAL	66	KUILAN	2808
I-11-26	DORADO VIA LA VIRGENCITA	35	KUILAN	3006
I-11-32	GUAYNABO VIA LOS FILTROS	3	KUILAN	
I-11-54	NARANJITO	27	KUILAN	2709
I-11-55	OROCOVIS	9	KUILAN	6735
I-11-70	SANTURCE, PARADA 15 & 18	42	KUILAN	2935
I-11-70	PARADA 18--SANTURCE	25	KUILAN	3510
I-11-71	TOA ALTA	31	KUILAN	5396
I-11-75	VEGA ALTA	6	NONE	9230
I-11-E-26	DORADO VIA CAMPANILLA	52	KUILAN	108
I-11-E-75	VEGA ALTA ----ARECIBO	30	KUILAN	8981
I-52-11	MOROVIS	12	KUILAN	5465
I-62-11	RIO PIEDRAS	35	KUILAN	96
L-11-01	BO. BUENA VISTA	20	KUILAN	4917
L-11-02	CENTRO MEDICO DE RIO PIEDRAS	23	KUILAN	3853
L-11-03	ROYAL TOWN,CORTIJO,CERRO GORD	16	KUILAN	3818
L-11-05	BARRIO DAJAOS	1	KUILAN	
L-11-06	GUARAGUAO, JUAN SANCHEZ	29	GUARDARRAMA	107-B
L-11-07	HATO TEJAS	43	KUILAN	95
L-11-08	BARRIO NUEVO	11	KUILAN	4008
L-11-09	PAJAROS, COVADONGA,CANDELARIA	25	KUILAN	6232
L-11-10	BO. PALMAS, LAS VEGAS	12	KUILAN	1
L-11-11	SABANA SECA, LEVITTOWN	37	MBA	73
L-11-12	SANTA OLAYA	15	KUILAN	10775
L-11-13	BARRIO PIÑAS	33	MBA	2250
L-11-14	SIERRA BAYAMON, RIVERVIEW	14	MBA	3007
L-11-15	LOMAS VERDES, SUB. REG. HOSP.	46	GUARDARRAMA	112
L-11-16	MINILLAS, HOSP. REG.	14	GUARDARRAMA	107-A
L-11-17	SANTA JUANITA	80	KUILAN	5949
L-11-18	VILLA RICA, FLAMINGO	8	KUILAN	5849
L-11-19	SIERRA LINDA,BAYAMON GARDENS	14	EL CANTON MALL	3009
L-11-20	REXVILLE	26	KUILAN	4917
L-11-21	VILLA DEL RIO	8	KUILAN	7508
L-11-26	URB. LAS COLINAS DE TOA BAJA	1	NONE	
L-11-E-25	TOA ALTA HEIGHTS	2	NONE	
L-71-09	BO. ORTIZ, TOA ALTA A BAYAMON	2	NONE	
	TOTAL NUMBER OF ROUTES =	41		
	TOTAL NUMBER OF VEHICLES =	987		

FIGURE 2-4

BAYAMON CENTRAL BUSINESS DISTRICT

MANAGEMENT & TECHNICAL CONSULTING GROUP, INC.

The main commercial activity in the CBD is currently concentrated at the three shopping centers (Bayamón, Bargain Town, and El Cantón Mall), along Dr. Veve and Comerío Street, and the Town Plaza area. Banking services are concentrated at the PR-2/Parque Street (PR-167) intersection and the Town Plaza. The Market Plaza (a major local food produce center) lies on the west side of Parque Street.

Two major medical facilities are found within the study area. The Municipal Hospital (Dispensary) is located in the southeastern sector while the Hermanos Meléndez Hospital is located in the southwestern sector along PR-2. In addition, there are numerous doctors' and medical services.

Residences are limited mainly to second or third floor units (above commercial units), homes interspersed within the commercial areas, and small sectors or neighborhood blocks of homes. Within the CBD Study Area there are no major apartment or housing areas.

With respect to educational facilities, the CBD contains a major public high school, secondary and elementary schools, private schools, and various commercial arts and business schools. In addition, there are large university/college facilities located nearby within easy access: The Bayamón Regional College (UPR), Interamerican University, American College and Bayamón Central College.

4. Existing Street System

The existing streets within El Casco de Bayamón consist mainly of a network of narrow, one-way streets typical of Puerto Rico's Spanish traditional inner urban areas which are centered around the town plaza. These streets normally offer at most only one full lane of traffic since one side is usually reserved for parking (or cargo zones) or publico-car terminals while the other is often plagued with illegal parking thus reducing even more the effective street widths.

The one exception in street type is Parque Street which extends from Betances Street, near the northern CBD limit, south to PR-2. This street is four lanes wide and includes marginal streets near the PR-2 intersection. Parque Street is the main north-south roadway which traverses the CBD.

Up until the construction of the Kuilan Transportation Terminal, Parque Street, between PR-2 and Dr. Veve Street, contained the largest concentration of publico-car and bus activity within the CBD. Terminals were located along both sides of the street and within the Market Plaza's parking area. Due to the locations of these terminals, which accounted for up to 2 metres of street width, or considering the perpendicular manner in which publico-cars parked along the east side of the street, taking up to 6 metres of the street width, it was found that the effective street width was

reduced to less than one-half (6.6 metres) of the total street width (14.5 metres) leading to massive congestion which transmited its effects throughout the CBD. This congestion severely impacted operations at the intersections along Parque Street--PR-2, Dr. Veve Street, and Betances Street.

B. BAYAMON'S PUBLICO-CAR TERMINAL SYSTEM

Bayamón's publico-car terminal system consists primarily of two large terminal buildings (Kuilan Terminal, capacity 442; and Guardarrama Terminal, capacity 239), two surface lots and a terminal stand at El Canton Mall. The city no longer has authorized curbside terminals. Figure 2-5 shows the location of the existing terminals. Figure 2-6 shows the location of the route terminals prior to the implementation of the terminal buildings.

1. Kuilan Terminal

The Municipality of Bayamón inaugurated the Tomás Kuilán Pérez Transportation Terminal, Puerto Rico's second of its kind, in late July 1982. The terminal, located off Parque Street to the east, between Dr. Veve Street and PR-2, and right across from the Market Plaza has a total capacity of 442 vehicles (see Figure 2-7). The ground floor includes the passenger concourse area with 55 publico-car berths, passenger dischange areas, and 66 primary vehicle holding areas. An additional 321 vehicle spaces are located in a four split-level garage structure which covers an area less than one-half of the ground floor.

The terminal building actually consists of two separate buildings. The first building (multi-services building), which fronts Parque Street, consists of three levels. The lowest level contains a parking area that is used as part of the public transit terminal. The second level functions as the main entrance to the terminal and contains various concessionaires including a cafeteria. The third level consists of various municipal offices, the municipal library, the Bayamón Regional Office of the Public Service Commission, plus other offices. A pedestrian bridge across Parque Street connects the terminal with the Market Plaza.

The second structure located immediately behind the multi-services building is the main publico-car terminal.

The main vehicular access to the terminal is off Rossy Street (one-way eastbound) at the Río Hondo Mall. Vehicles exit the terminal through this access (traffic only) or the north exit directly onto Parque Street. This access is controlled only by a stop sign. More recently, an exclusive east-west lane was added due to the closure of the street further east as a result of the construction of a new multi-level public garage. This lane is intended for the exclusive use of the publico-cars exiting the terminal with destinations to PR-167 south or PR-2 west.

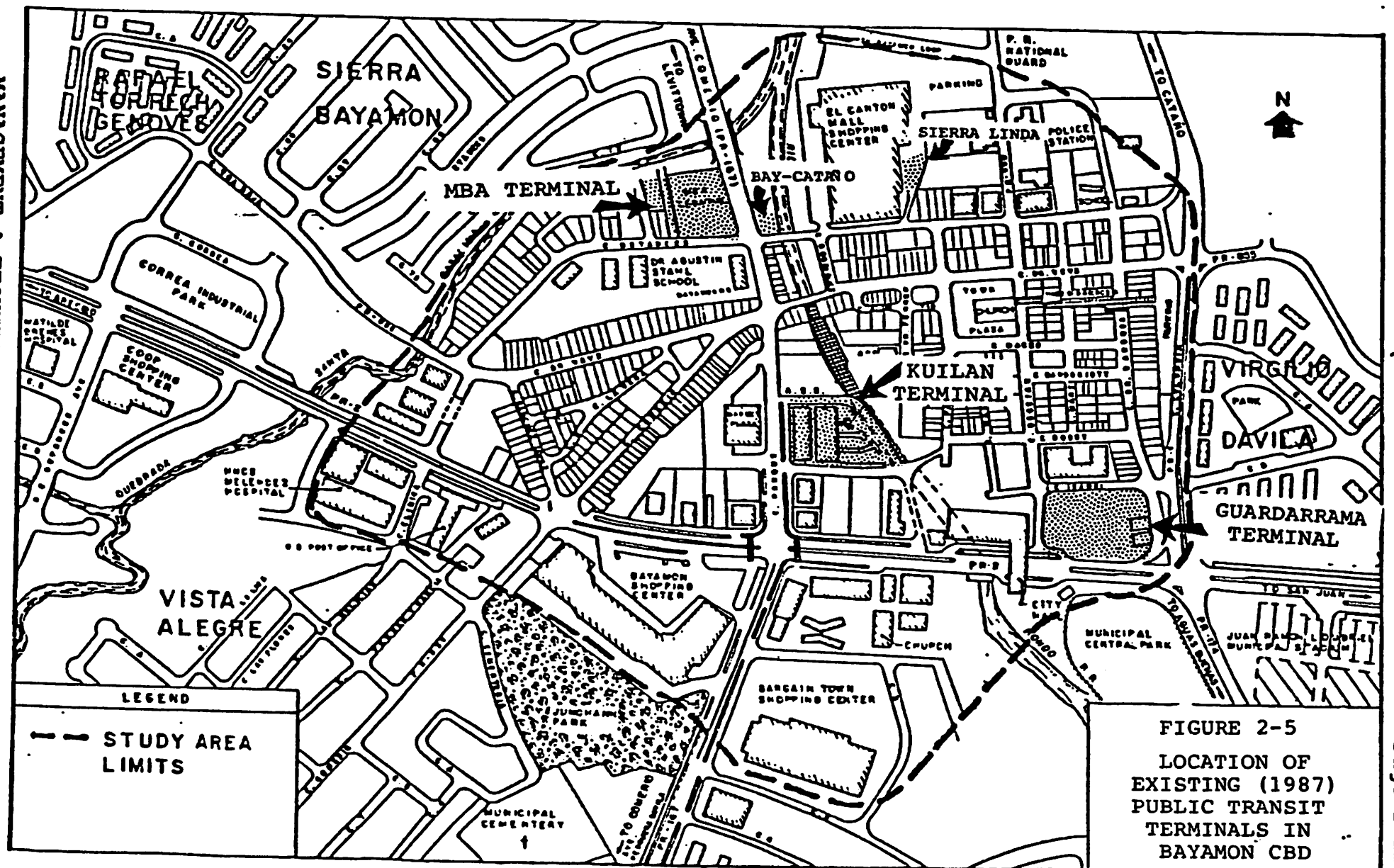
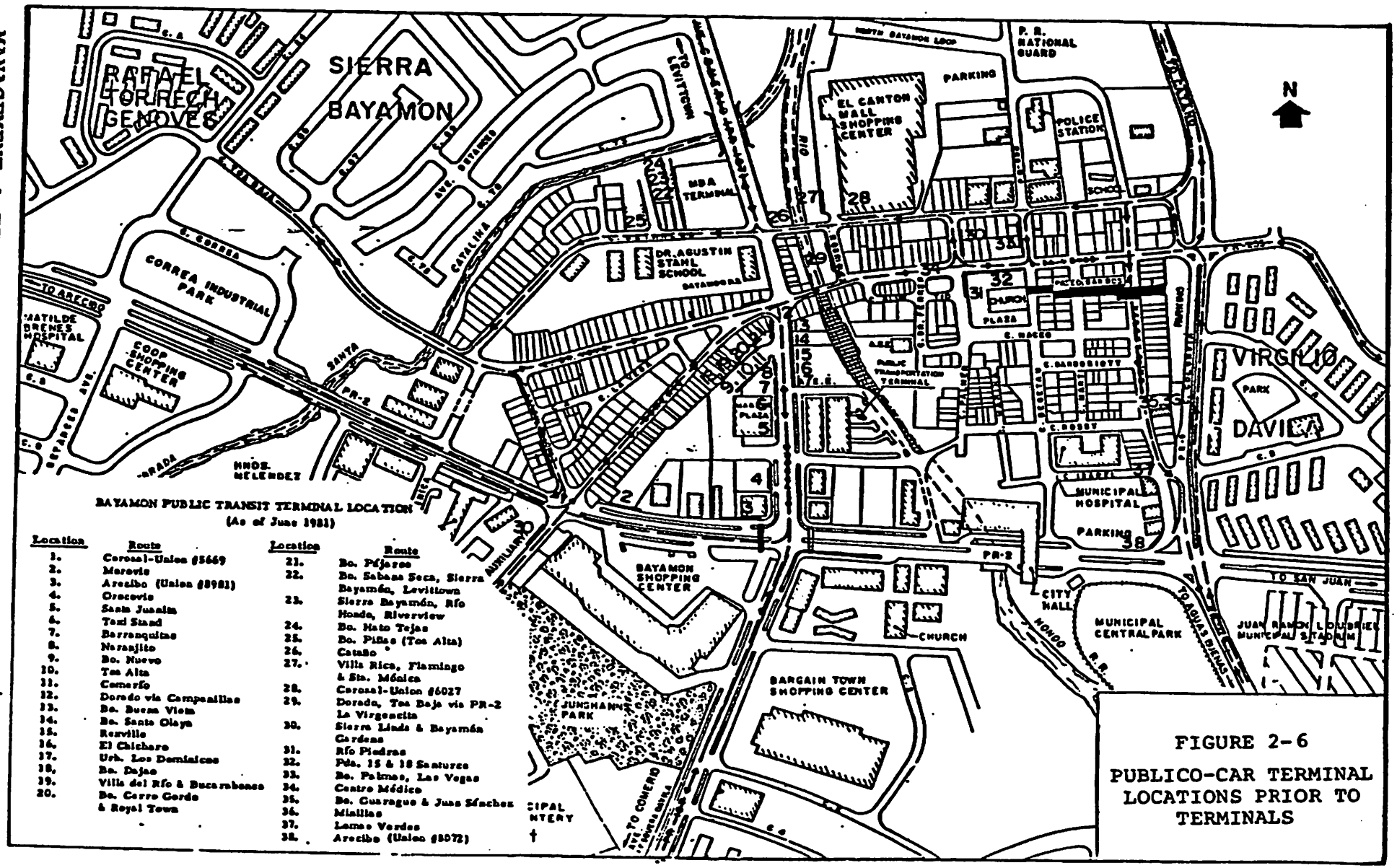


FIGURE 2-5

LOCATION OF EXISTING (1987) PUBLIC TRANSIT TERMINALS IN BAYAMON CBD



BAYAMON PUBLIC TRANSIT TERMINAL LOCATION
(As of June 1981)

Location	Route	Location	Route
1.	Carousel-Union #5669	21.	Bo. Pájaros
2.	Marevia	22.	Bo. Sabana Seca, Sierra Bayamón, Levittown
3.	Arecibo (Union #8981)	23.	Sierra Bayamón, Río Hondo, Riverview
4.	Orocovis	24.	Bo. Hato Tejas
5.	Santa Juanita	25.	Bo. Piñas (Toa Alta)
6.	Taxi Stand	26.	Cataño
7.	Barranquitas	27.	Villa Rica, Flamingo & Sta. Mónica
8.	Naranjito	28.	Carousel-Union #6027
9.	Bo. Nuevo	29.	Dorado, Toa Baja via PR-2 La Virgencita
10.	Toa Alta	30.	Sierra Linda & Bayamón Gardens
11.	Comerío	31.	Río Piedras
12.	Dorado via Campanillas	32.	Pda. 15 & 18 Santurce
13.	Bo. Buena Vista	33.	Bo. Palmas, Las Vegas
14.	Bo. Santa Olaya	34.	Centro Médico
15.	Rexville	35.	Bo. Guaraguao & Juan Sánchez
16.	El Chichare	36.	Minillas
17.	Urb. Los Dominicos	37.	Lomas Verdes
18.	Bo. Dajao	38.	Arecibo (Union #8072)
19.	Villa del Río & Bucarabones		
20.	Bo. Cerro Gordo & Royal Town		

FIGURE 2-6

PUBLICO-CAR TERMINAL LOCATIONS PRIOR TO TERMINALS

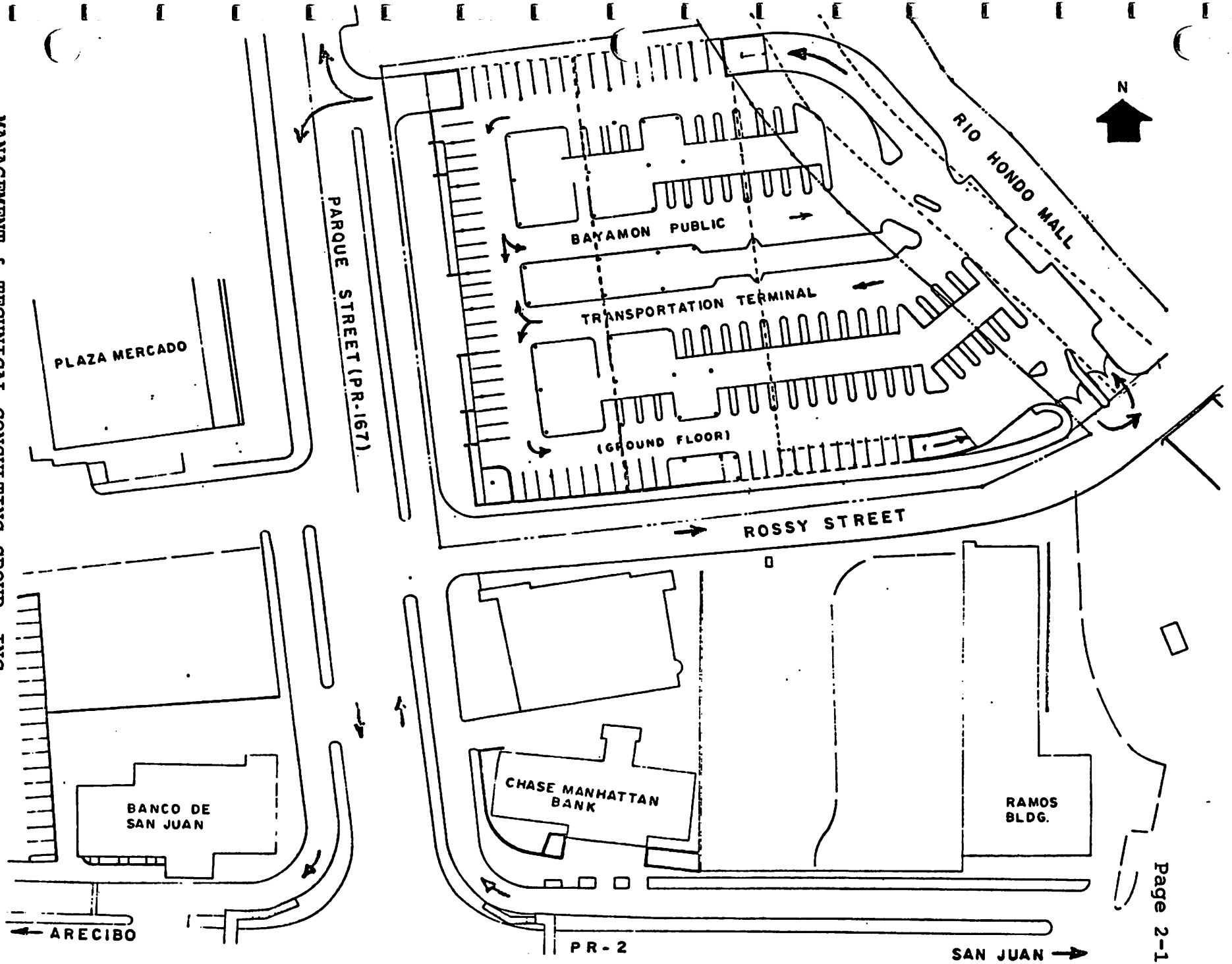


FIGURE 2-7 LAYOUT OF KUILAN TERMINAL

Each publico-car route (or union where there are more than one serving the same route) is assigned a certain number of loading spaces. Here, the vehicles pick up their passengers in an orderly fashion and exit vía the north ramp onto Parque Street or the main gate on Rossy Steet. The ground floor waiting areas are assigned to different routes according to internal route movement and proximity to their loading berths. Almost half of the loading areas are covered by small customized roof sections. This addition was implemented after the opening of the terminal in order to provide a much needed protection. The terminal was constructed with the high-rise holding area due to the interference of high tension electric cables which extend through the terminal's eastern section.

Publicos entering the terminal discharge their passengers along the central pier. This section provides a parallel curbside condition for fast unloading and exiting. It has been observed that during peak hours (morning), the large number of publicos, nearly all filled to capacity, form a long queue (of over 20 vehicles) extending to the exterior of the terminal. This situation also causes internal congestion affecting exiting vehicles.

The local Bayamón taxi services are provided with spaces along a marginal street fronting Parque Street and the terminal building.

The Kuilán Terminal serves as the base for 26 routes (987 vehicles). These routes were mainly those that had terminals assigned along Parque Street, at the Market Plaza, along Doctor Veve and Betances Streets, and some from the area adjacent to the MBA Terminal. Figure 2-8 presents the public route terminal distribution within the Kuilan Terminal.

2. Guardarrama Terminal

The second facility, the Guardarrama Terminal, was inaugurated in 1986. The terminal, with a capacity for 239 vehicles, is located in the southeastern sector of the Bayamón CBD. It is bordered on the north by Isabel Street, on the east by PR-5, on the south by PR-2 and on the west by Degetau Street and the Bayamón City Hall (See Figure 2-5).

The terminal consists of a ground level passenger concourse area with 26 loading berths and three additional levels of holding areas with a total of 213 spaces, yielding a total of 239 spaces. The passenger loading area has half of its area (13 spaces) utilized for an antique auto museum. The terminal is connected to the City Hall vía a pedestrian bridge.

Both the vehicular entrance and exit are off Isabel Street. The pedestrian access points are mainly concentrated along Degetau Street. The principal passenger drop-off area is also along Degetau Street.

FIGURE 2-8
KUILAN TERMINAL
ROUTE DISTRIBUTION

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This terminal is used by only four of Bayamon's routes (96 vehicles). These routes were originally located in two off-street lots along Barbosa Street in the eastern area of the CBD. Three of the routes serve the southeastern urbanizations along the PR-174 corridor.

Because of the underutilization of the terminal and the lack of adequate parking facilities in the CBD, the top level of the terminal is currently being used for parking by municipal government employees. Access to and from this level must be made at the same points as the publicos.

Like the Kuilán Terminal, the publicos stationed at the Guardarrama Terminal have assigned boarding areas. In addition, the routes have assigned spaces on the second level of the terminal. Figure 2-9 presents a schematic layout of the internal route terminal distribution.

The design of the Guardarrama Terminal differs greatly with that of the Kuilán Terminal. Whereas the latter has a large area of its boarding area only partially protected, the Guardarrama Terminal's area is completely covered. Passenger discharge is made externally at Guardarrama , while at Kuilán, it's made internally. Pedestrian circulation is more controlled at Guardarrama; whereas, circulation at Kuilán can be chaotic at times. Only three small concessionaires are located at this terminal.

3. Metropolitan Bus Authority Terminal

This terminal is located in the northern sector of the CBD. It is bordered on the north by the Santa Catalina Creek and Sierra Bayamón Urbanization, on the east by Avenida Comerío (Calle Parque, PR-167), on the south by Betances Street, and on the west by a local street (See Figure 2-5).

This terminal functions as a main bus terminal for all of the MBA buses (except express) serving Bayamón (see Table 2-1). The terminal layout has parallel berths with several passenger shelters. The entrance is off Betances Street and the exit is directly onto Comerío Avenue.

The MBA terminal is not used completely for bus service. The western sector of the terminal has been sectioned off and is being utilized by three publico-car routes (total of 84 vehicles, see Table 2-2).

4. Other Terminals

Besides the above mentioned terminal facilities, there are two other off-street areas utilized by publicos. The first of these is located at the northeast quadrant of the intersection of Betances and Parque Streets/Comerío Avenue. The area, containing a paved

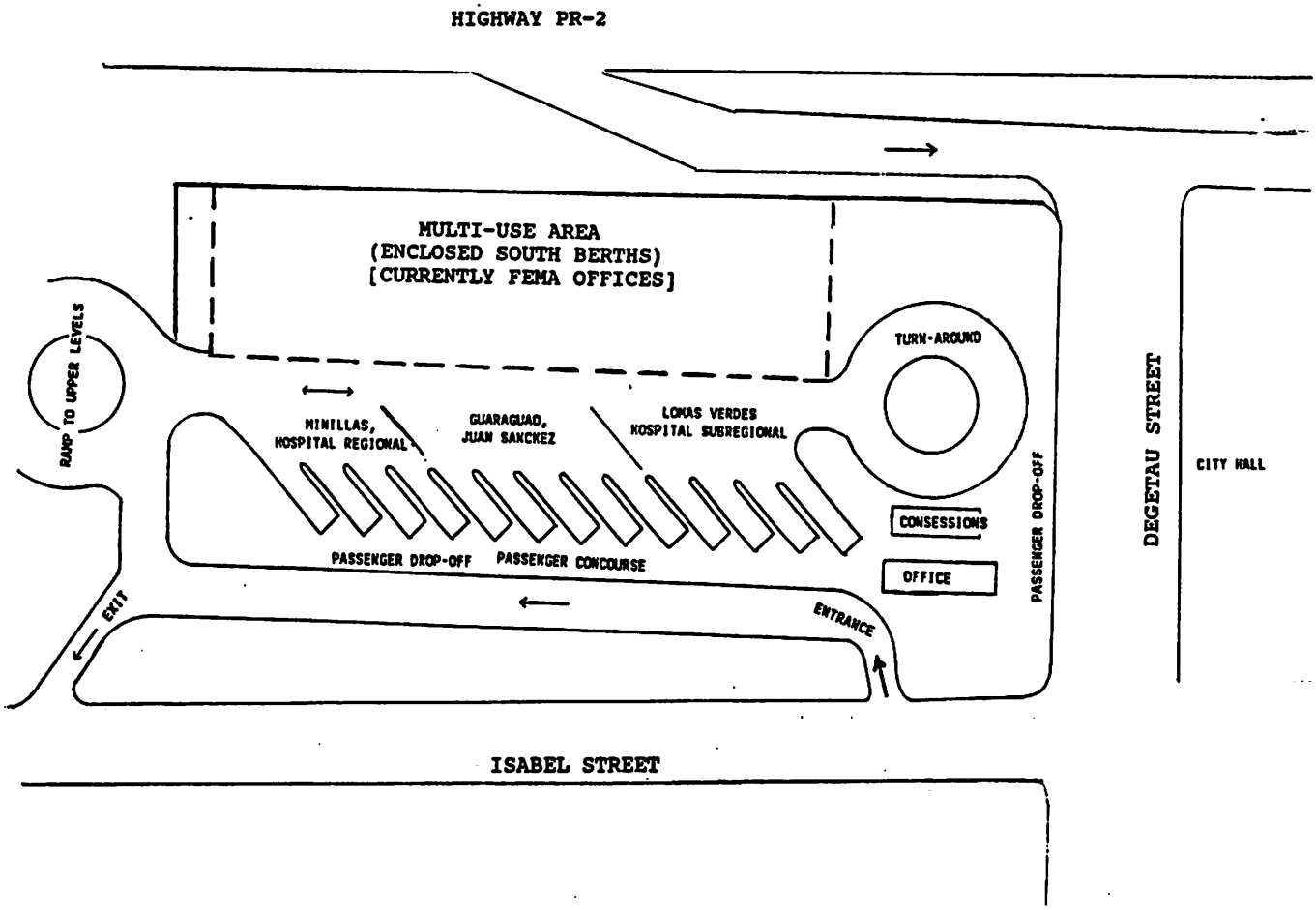


FIGURE 2-9 GUARDARRAMA TERMINAL
ROUTE DISTRIBUTION

section and a small office/waiting area, is utilized by the Cataño-Bayamón route (74 vehicles).

The second off-street terminal represents a good example of private sector initiative. A small terminal area, occupying several spaces within the parking area of El Cantón Mall Shopping Center, has been reserved for the use of the Sierra Linda, Bayamón Gardens route (8 vehicles).

C. PUBLIC TRANSIT PASSENGER AND VEHICLE VOLUMES

1. Current Service

In order to assess the impact of the terminal facilities upon the existing publico-car operations in Bayamón, it was necessary to obtain information concerning current average vehicle and passenger volumes. For this purpose an extensive public transit vehicle and passenger count survey was conducted during the first week of April 1987.

The field survey included the establishment of selected cordon and interior count stations as shown in Figure 2-10. Table 2-3 gives the results of the vehicle and passenger counts at each station. Appendix A contains a series of the detailed counts by 10-minute periods and hourly summaries for each station and direction of flow.

The results of the counts indicate that the number of daily publico-car passenger and vehicles entering the Bayamón CBD is approximately 15,680 and 2,434, respectively. Exiting the CBD, the numbers are 23,734 and 2,475, respectively. Table 2-4 shows the estimated volumes and directional distribution.

2. Private Bus Service

Table 2-5 presents the results of the counts with respect to the private bus services. The results shown in Table 2-5 indicated that, although the total number of passengers carried by the private buses is low compared to that of the publico-cars, the private buses are well utilized. The average bus occupancies are over 15 passengers per bus.

3. Comparison with Previous Volumes

A comparison of the existing publico-car vehicle and passenger volumes can be made with similar data obtained prior to the opening of the Kuilan Terminal. Publico-car vehicle and passenger volumes were obtained from field surveys conducted during January 1981 as part of the terminal feasibility study for the East Bayamón (now Guardarrama) Terminal ("Bayamón Public Transportation Terminal Alternative Location Analysis," Final Report, Consultores Técnicos Asociados, July 1982).

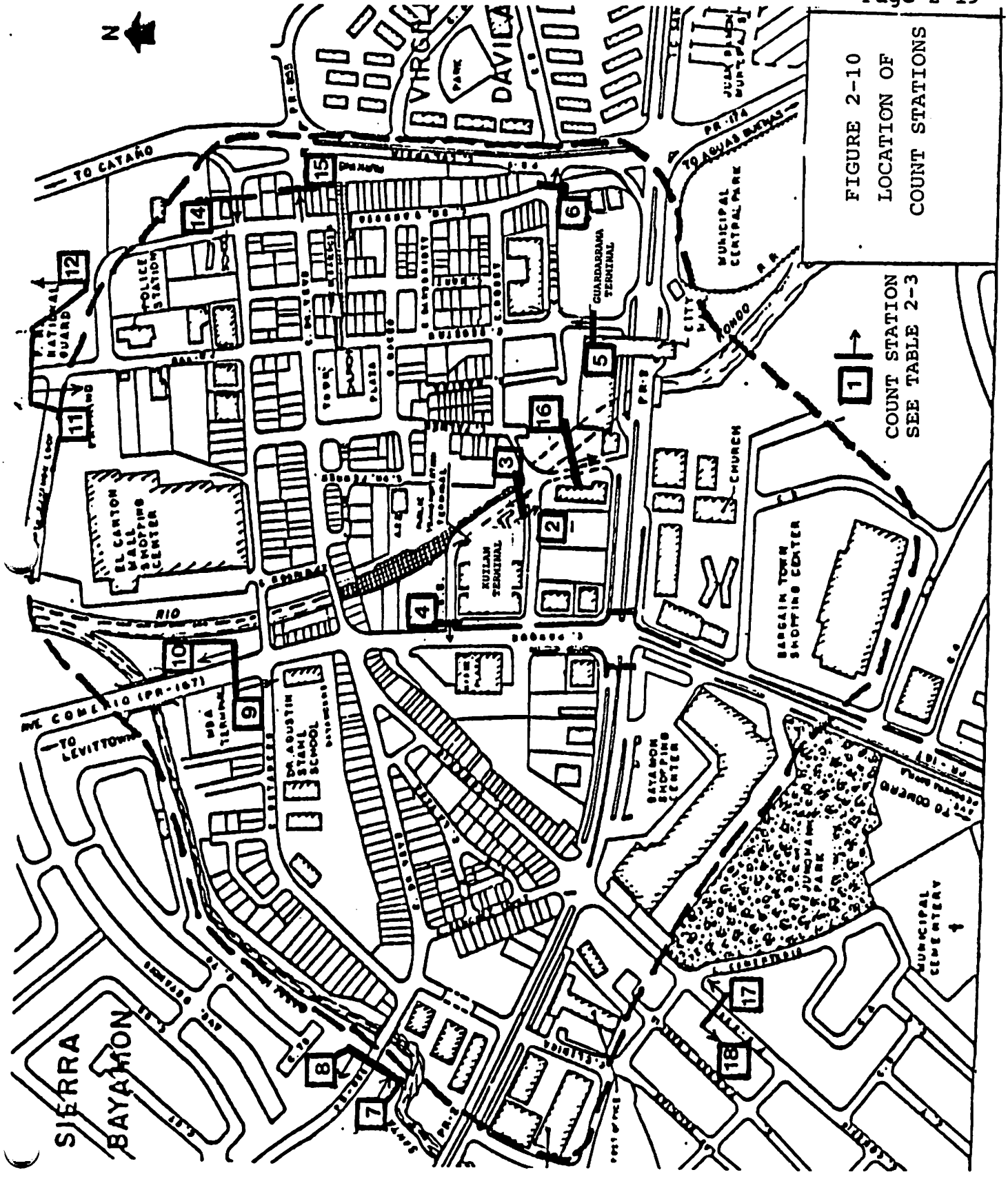


FIGURE 2-10
LOCATION OF
COUNT STATIONS

COUNT STATION
SEE TABLE 2-3

TABLE 2-3

SUMMARY OF BAYAMON PUBLICO-CAR VEHICLE AND PASSENGER COUNTS

Station Number	Location and Direction	Number of Vehicles	Number of Passengers	Average Occupancy
2	Kuilan Terminal, Rossy Street exit, Outbound	873	7,935	9.1
3	Kuilan Terminal, Rossy Street entrance, Inbound	1,677	10,684	6.4
4	Kuilan Terminal, Parque Street exit, Outbound	820	8,321	10.1
5	Degetan Street, Guardarrama Terminal, Inbound	384	2,869	7.5
6	Isabel Street, Guardarrama Terminal, Outbound	519	4,199	8.1
7	Dr. Veve Street, Inbound West Sector	118	1,069	9.1
8	Dr. Veve Street, Outbound West Sector	369	3,557	9.1
9	Ave. Comerio at Betances, Inbound	344	1,917	5.6
10	Ave. Comerio at Betances, Outbound	151	1,157	7.7
11	Degetau Street, Inbound North Sector	118	715	6.1
12	Degetau Street, Outbound	7	16	2.3
14	Dr. Veve Street, Inbound East Sector	135	1,542	11.4
15	Betances Street, Outbound East Sector	177	1,295	7.3
16	Street connector between Rossy St. and PR-2, Outbound	485	5,118	10.6
17	Comercio St. (PR-839) Inbound	133	1,131	8.5
18	Comercio St. (PR-839) Outbound	109	954	8.8

TABLE 2-4

BAYAMON PUBLICO-CAR AND PASSENGER VOLUMES,
DIRECTIONAL DISTRIBUTION SUMMARY

	Total Publicos	Percent (%) Distribution	Total Passengers	Percent (%) Distribution	Average Vehicle Occupancy
Inbound	2,434	49.6%	15,680	39.8%	6.4
Outbound	2,475	50.4%	23,734	60.2%	9.6
Totals	4,909	100.0%	39,414	100.0%	8.0

TABLE 2-5

BAYAMON PRIVATE BUS
AND PASSENGER VOLUMES

Station	Location and Direction	Number of Buses	Number of Passengers	Average Occupancy
6	Isabel St. at Barbosa Outbound	6	80	15.0
14	Dr. Veve Street, East Sector Outbound	46	710	15.4
15	Betances Street, East Sector Inbound	65	1,097	16.9
17	Calle Comerío (PR-839) Inbound	49	994	20.3
18	Calle Comerío (PR-839) Outbound	56	879	15.7

The following summary presents a comparison of the 1981 counts with the present counts (1987).

Trips (In+Out)	1981 Counts (Before)	1987 Counts (After)	% Change (1981-1987)
Publico-cars	7,397	4,909	-33.6%
Passengers	54,543	39,414	-27.7%
Occupancy	7.4	8.0	+7.9%

The results presented in the above table indicate that both the number of publico-car vehicle and passenger trips entering and leaving the Bayamón CBD has been reduced significantly. The only positive factor is the vehicle occupancy which increased by almost 8 percent.

While the preceding numbers seem to indicate a possible negative impact with respect to passenger volumes caused directly or indirectly by the terminals, it is not possible to correctly assess the negative impact. The reduction in passenger vehicle trips can be due to various factors not associated with the terminals. For example, since 1981, private vehicle acquisition and use in Bayamón (and the SJMA) has increased, reflecting the general driving characteristics towards the use of the private auto in place of the public transit modes. For example, the following statistics for private automobile registration in the Municipalities of Bayamon, Caguas and Mayaguez, as well as for Puerto Rico for fiscal years 1985-1988 indicate an average annual rate of increase in ownership from 5.08 percent to 5.38 percent. In contrast, the observed change in publico-car passengers results in an average annual rate of -5.27 percent for Bayamon between fiscal years 1985 and 1987.

	Automobile Registration, Fiscal Year				
Municipality	1985	1986	1987	1988	Annual % Growth Rate
Bayamon	98,174	105,282	112,064	114,397	5.23
Caguas	49,588	53,178	56,605	57,536	5.08
Mayaguez	39,114	41,945	44,648	45,776	5.38
Puerto Rico	1,114,359	1,195,027	1,272,013	1,304,171	5.38

Another related cause may be an increase in the use of private vehicles in areas not presently served or inadequately served by publicos. This may be due directly to poor route coverage and infrequent service.

Because the terminals are located at points very close to the majority of the previous curbside terminals, it cannot be readily concluded that the terminals or their locations are the root cause of the decrease in publico-car passenger volumes at the CBD.

D. TERMINAL UTILIZATION

1. Introduction

A very important factor to consider in evaluating the impact of a publico-car terminal is the determination of the utilization of the terminal. The method used herein to determine the utilization is based upon the accumulation of the publico-cars within the terminal in relation to the terminal's capacity. This accumulation includes those vehicles within the loading areas, holding areas and in circulation within the terminal.

The accumulation is determined by recording each vehicle that enters and exits the terminal within a specified time period (30 minute intervals for this study). Knowing the number of vehicles present in the terminal prior to the counts will help determine the accumulation more accurately.

2. Utilization Evaluation

Utilizing the field survey, Table 2-6 shows the publico-car accumulation pattern at the Kuilán Terminal. The table presents the number of vehicles entering and exiting the terminal (by access), the total accumulation by 30 minute interval, the capacity of the terminal, the percent accumulation or utilizaiton (by 30 minute interval), the maximum accumulation, and the percent utilization at maximum accumulation. Figure 2-11 graphically illustrates the accumulation pattern.

From the table it can be seen that the maximum accumulation of 209 vehicles at the Kuilán Terminal occured between 10 and 10:30 AM, representing 47.3 percent of the terminal's capacity. This indicates what can be considered as an underutilized terminal facility.

This 1987 accumulation can be compared to the one that was determined for the same routes in the 1981 Terminal Study previously referenced. The maximum accumulation determined for the routes that, at that time, were to be assigned to the Kuilán Terminal was determined to be approximately 277 vehicles (this includes the Hato

TABLE 2-6

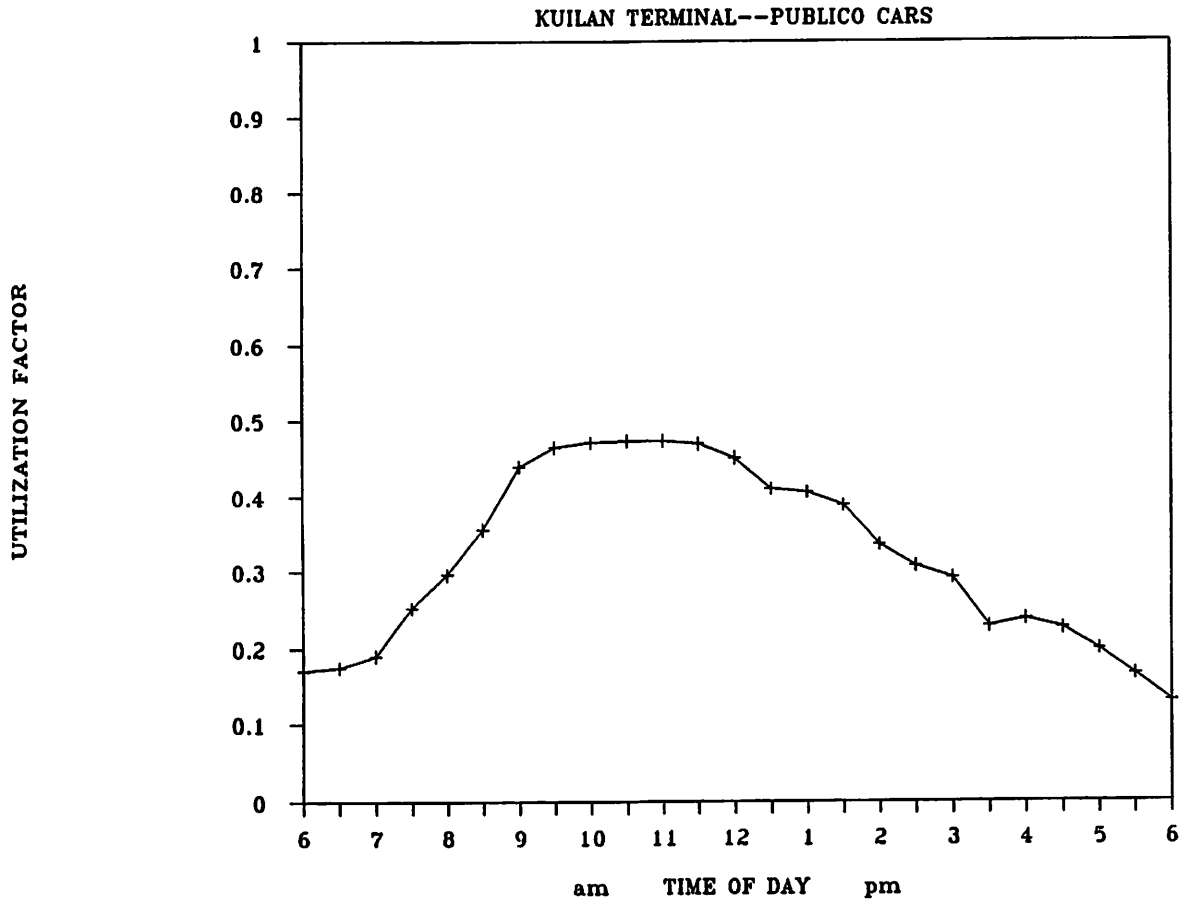
PUBLICO-CAR ACCUMULATION
AT KUILAN TERMINAL
MUNICIPALITY OF BAYAMON

HOUR	NUMBER IN	NUMBER OUT SOUTH ACCESS	NUMBER OUT NORTH ACCESS	TOTAL OUT	TOTAL ACCUMU-LATION	CAPACITY	PERCENT ACCUMU-LATION
6 AM			AT START======>		75	442	17.0%
	74	35	37	72	77	442	17.4%
7	82	40	35	75	84	442	19.0%
	103	36	40	76	111	442	25.1%
8	86	22	44	66	131	442	29.6%
	111	38	47	85	157	442	35.5%
9	90	21	32	53	194	442	43.9%
	76	30	35	65	205	442	46.4%
10	56	17	36	53	208	442	47.1%
	53	27	25	52	209	442	47.3%
11	60	29	31	60	209	442	47.3%
	52	23	31	54	207	442	46.8%
12 PM	56	32	32	64	199	442	45.0%
	56	43	31	74	181	442	41.0%
1	58	28	32	60	179	442	40.5%
	62	37	33	70	171	442	38.7%
2	60	41	42	83	148	442	33.5%
	73	42	43	85	136	442	30.8%
3	74	47	34	81	129	442	29.2%
	60	46	42	88	101	442	22.9%
4	72	41	27	68	105	442	23.8%
	76	46	35	81	100	442	22.6%
5	69	47	34	81	88	442	19.9%
	44	32	27	59	73	442	16.5%
6 PM	30	32	14	46	57	442	12.9%
TOTALS	1633	832	819	1651			

MAXIMUM CAPACITY = 442
MAXIMUM ACCUMULATION = 209
% UTILIZATION = 47.3%

FIGURE 2-11

TERMINAL UTILIZATION



Tejas and Barrio Palmas routes which were not previously assigned to the terminal). The current accumulation represents 75.5 percent of the projected accumulation.

A similar analysis can be made with the Guardarrama Terminal. Table 2-7 presents the tabulated accumulation pattern for the terminal; whereas, Figure 2-12 illustrates the accumulation pattern. The maximum accumulation of 69 vehicles was recorded at 11 AM representing a utilization of 28.9%. This represents a significant underutilization of the terminal (capacity of 239 spaces). This can be construed to mean that this terminal was over designed.

In comparing the 1987 results at the Guardarrama Terminal with those determinded in 1981, it is found that the estimated values are relatively close; 74 vehicles in 1981 and 69 vehicles in 1987. It should be noted that the 1981 Study indicated that the East Terminal (Guardarrama) should have a minimum capacity of 124 vehicles based upon a 30 year design period.

3. Private Vehicles in Terminals

One situation that has been observed is the use of the terminals by private vehicles. This use is not limited just to passenger discharge or pickup but also to parking.

The field surveys included the recording of all private vehicles entering and exiting the terminals. Table 2-8 presents the private vehicle flow and accumulation at the Kuilán Terminal. Figure 2-13 presents the corresponding graphic pattern.

From the above sources it was found that the maximum accumulation of private vehicles within the Kuilán Terminal was 27 vehicles recorded at 12 Noon. This represents 11.3 percent of the terminal's capacity. It should be noted that only a small number of these vehicles actually park within the terminal. The large majority are motorists entering to discharge passengers. The terminal's layout seems to promote this situation.

The situation at the Guardarrama Terminal is completely different. Table 2-9 and Figure 2-14 show that a large number of private vehicles use the terminal for parking. The maximum accumulation of private vehicles was recorded as 138 vehicles at 11 AM. This represents 57.7 percent of the terminal's capacity, twice as much as that determined for publico-cars.

These private vehicles are not those that come in to discharge transfering passengers but rather actually use the top levels for parking. These vehicles belong to municipal employees who are permitted to park at the terminal in an effort to help alleviate the chronic parking conditions in the CBD. Nevertheless, the utilization of the Guardarrama Terminal is mainly by private vehicles.

TABLE 2-7

PUBLICO-CAR ACCUMULATION AT GUARDARRAMA TERMINAL MUNICIPALITY OF BAYAMON

HOUR	NUMBER PUBLICOS IN	NUMBER PUBLICOS OUT	TOTAL ACCUMUALTION	CAPACITY	PERCENT ACCUMUALTION
6 AM	AT START======>		22	239	9.2%
	15	15	22	239	9.2%
7	26	21	27	239	11.3%
	30	20	37	239	15.5%
8	35	19	53	239	22.2%
	25	23	55	239	23.0%
9	20	22	53	239	22.2%
	24	19	58	239	24.3%
10	30	24	64	239	26.8%
	24	24	64	239	26.8%
11	19	14	69	239	28.9%
	10	14	65	239	27.2%
12	8	8	65	239	27.2%
	6	15	56	239	23.4%
1 PM	9	12	53	239	22.2%
	10	10	53	239	22.2%
2	6	15	44	239	18.4%
	12	17	39	239	16.3%
3	6	11	34	239	14.2%
	7	17	24	239	10.0%
4	9	6	27	239	11.3%
	9	12	24	239	10.0%
5	2	16	10	239	4.2%
	3	7	6	239	2.5%
6	2	2	6	239	2.5%
TOTALS	347	363	69		

MAXIMUM CAPACITY = 239
MAXIMUM ACCUMULATION = 69
MAXIMUM % UTILIZATION = 28.9%

FIGURE 2-12

TERMINAL UTILIZATION

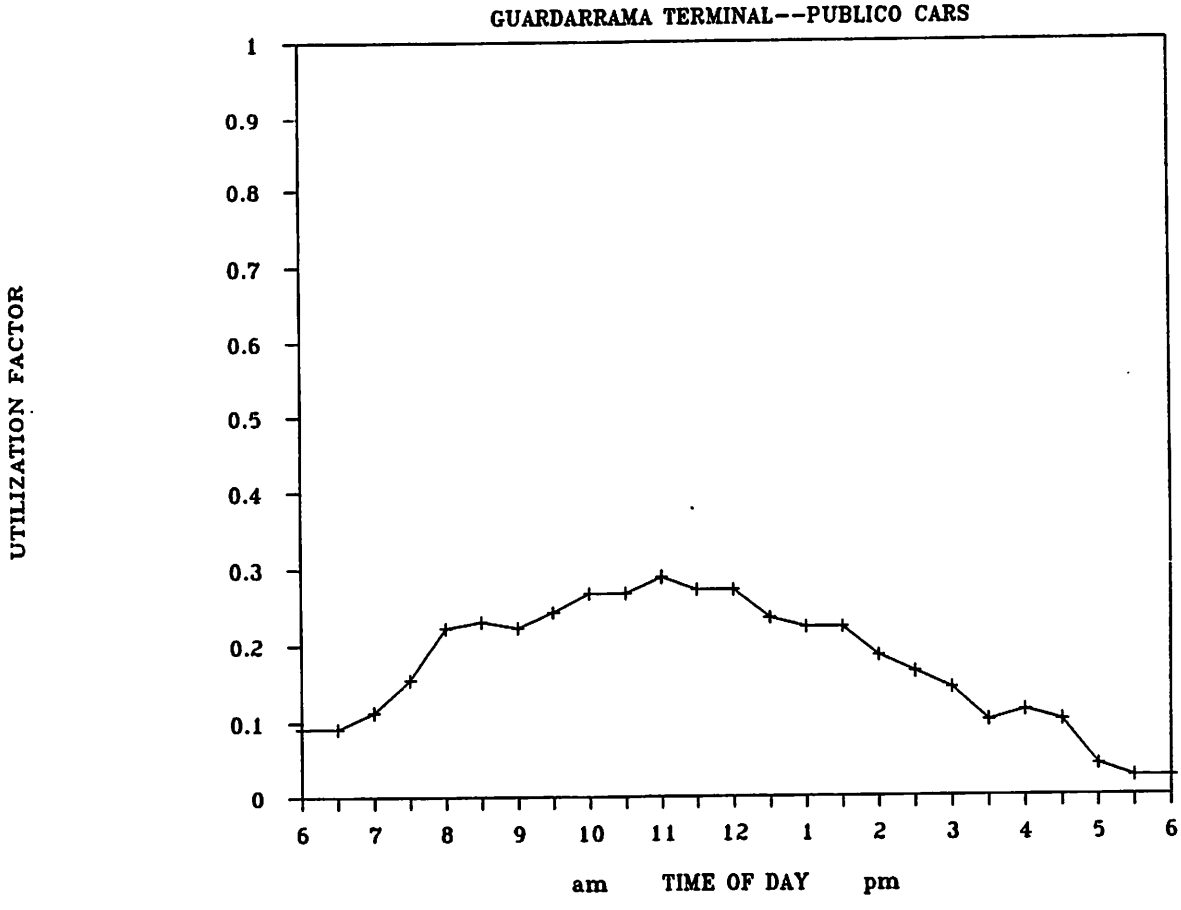


TABLE 2-8

PRIVATE VEHICLE ACCUMULATION AT KUILAN TERMINAL MUNICIPALITY OF BAYAMON

HOUR	NUMBER PRIVATE IN	NUMBER PRIVATE OUT	TOTAL ACCUMULATION	CAPACITY	PERCENT ACCUMULATION
6 AM		AT START>	0	442	0.0%
	8	8	0	442	0.0%
7	5	5	0	442	0.0%
	5	2	3	442	0.7%
8	6	6	3	442	0.7%
	16	16	3	442	0.7%
9	13	12	4	442	0.9%
	7	1	10	442	2.3%
10	7	1	16	442	3.6%
	8	1	23	442	5.2%
11	10	13	20	442	4.5%
	12	11	21	442	4.8%
12 PM	8	2	27	442	6.1%
	8	9	26	442	5.9%
1	2	11	17	442	3.8%
	15	14	18	442	4.1%
2	5	8	15	442	3.4%
	18	20	13	442	2.9%
3	2	12	3	442	0.7%
	15	14	4	442	0.9%
4	5	3	6	442	1.4%
	3	7	2	442	0.5%
5	7	6	3	442	0.7%
	9	6	6	442	1.4%
6 PM	7	3	10	442	2.3%
TOTALS	201	191			

MAXIMUM ACCUMULATION = 239
MAXIMUM ACCUMULATION = 27
MAXIMUM % UTILIZATION = 11.3%

FIGURE 2-13

TERMINAL UTILIZATION

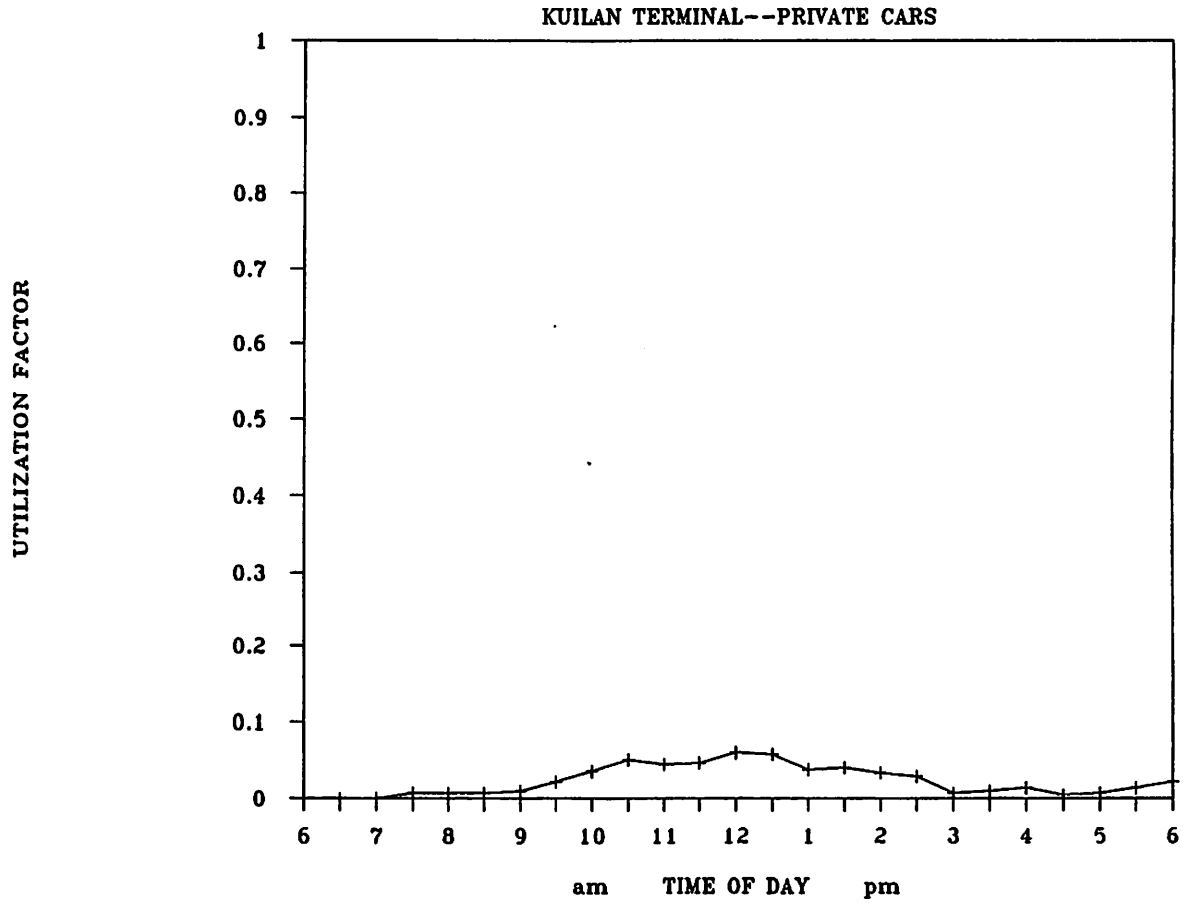


TABLE 2-9

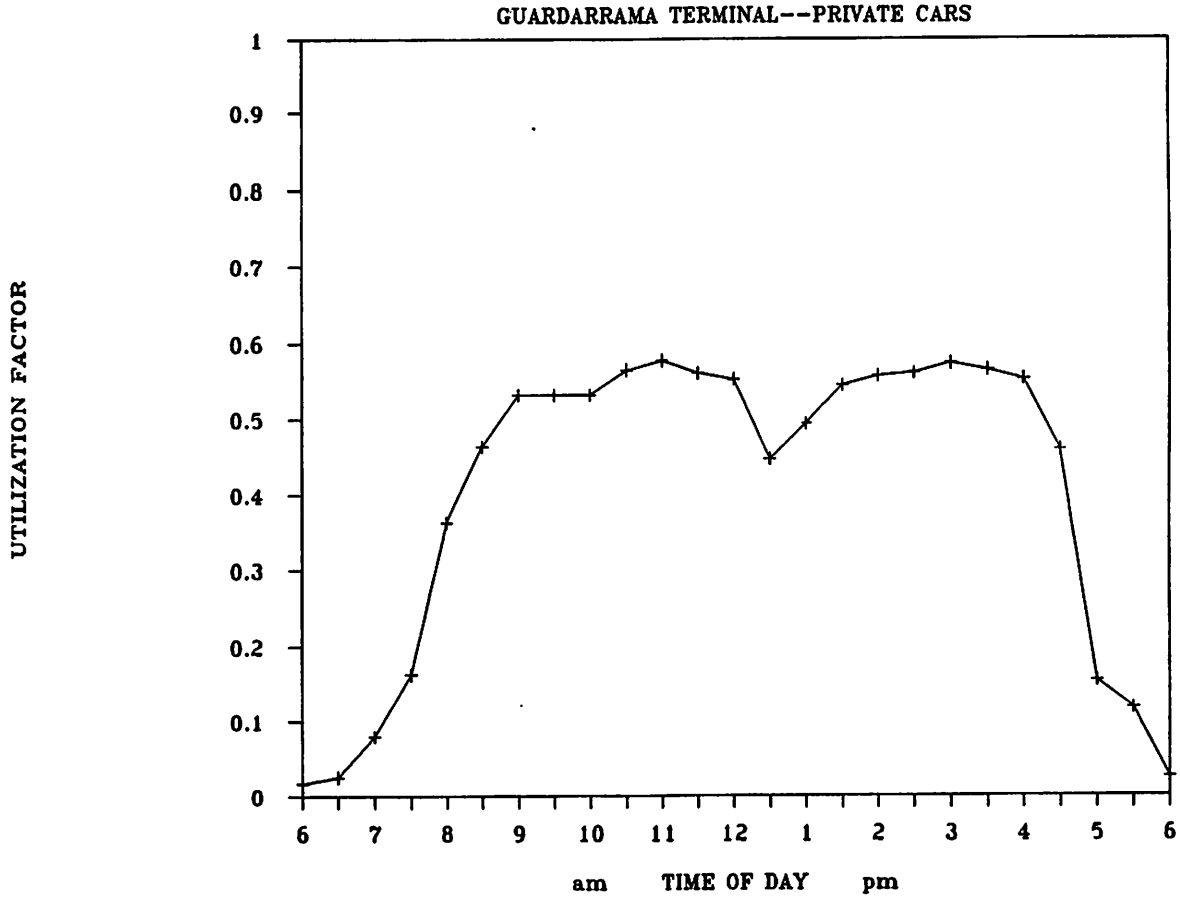
PRIVATE VEHICLE ACCUMULATION
AT GUARDARRAMA TERMINAL
MUNICIPALITY OF BAYAMON

HOUR	NUMBER PRIVATE IN	NUMBER PRIVATE OUT	TOTAL ACCUMULATION	CAPACITY	PERCENT ACCUMULATION
6 AM	AT START==========>		4	239	1.7%
	5	3	6	239	2.5%
7	14	1	19	239	7.9%
	20	0	39	239	16.3%
8	50	2	87	239	36.4%
	39	15	111	239	46.4%
9	23	7	127	239	53.1%
	10	10	127	239	53.1%
10	7	7	127	239	53.1%
	19	11	135	239	56.5%
11	8	5	138	239	57.7%
	3	7	134	239	56.1%
12 PM	7	9	132	239	55.2%
	5	30	107	239	44.8%
1	21	10	118	239	49.4%
	15	3	130	239	54.4%
2	8	5	133	239	55.6%
	16	15	134	239	56.1%
3	18	15	137	239	57.3%
	10	12	135	239	56.5%
4	11	14	132	239	55.2%
	6	28	110	239	46.0%
5	11	84	37	239	15.5%
	2	11	28	239	11.7%
6 PM	3	25	6	239	2.5%
	331	329	138		

MAXIMUM CAPACITY = 239
MAXIMUM ACCUMULATION = 138
MAXIMUM % UTILIZATION = 57.7%

FIGURE 2-14

TERMINAL UTILIZATION



E. SURVEY OF PUBLICO-CAR USERS

The survey of publico-car users in Bayamón was conducted in order to obtain information on the users' opinion concerning the existing service and opinions on the terminal facilities. A total of 302 interviews were made during January 1988, concentrated primarily within the terminals. Of the total, 30 were made at the Guardarrama Terminal. Appendix B presents a copy of the questionnaire.

Table 2-10 presents the Bayamón publico-car users' opinions concerning the existing publico-car service. More than 84 percent of those interviewed indicated that the existing service is acceptable or better. Only 15.7 percent said that it was deficient or poor.

With respect to their opinions about the perceived impacts of the Kuilán Terminal, Table 2-11 shows the survey results concerning location, passenger boarding area, passenger drop-off area, sanitary facilites, cafeteria facilities, and the administration and maintenance.

Slightly over 90 percent of those surveyed said that the terminal location was good; whereas, only 1.1 percent said that it was poor.

The passenger boarding area was given a good rating by 83.5 percent; while 77.5 percent rated the drop-off area as good. The main complaint about the boarding areas concerned the lack of adequate roofing.

Possibly the worst complaints deal with the terminal's sanitary facilities. About 65.7 percent of the users said that these facilities were poor. Many indicated the lack of maintenance while another third said that more were needed.

The cafeteria facilities are generally acceptable with almost 60 percent of the users giving them a good rating. Some of the negative comments concerning the cafeteria facilities were orientated mainly towards their appearances.

The administration and maintenance sector of the terminal operations received a generally good approval (56.2 percent) with a little over a third of the respondents (38.1 percent) saying that it was fair. The general comments concerning the overall condition indicated that the sanitary facilities needed more maintenance than any other sector of the terminal.

A smaller similar survey was conducted concerning the users' opinions of the Guardarrama Terminal. A total of 30 persons who utilized the terminal were surveyed. Table 2-12 presents the results of the opinions concerning the principal aspects of the Terminal.

TABLE 2-10

PUBLICO-CAR USERS' OPINIONS CONCERNING EXISTING PUBLICO-CAR SERVICE MUNICIPALITY OF BAYAMON

Opinion of Service	Number of Responses	Percent of Total
Excellent	53	19.4
Good	110	40.3
Acceptable	67	24.6
Deficient	20	7.3
Poor	23	8.4
TOTAL	243	100.0

TABLE 2-11

PUBLICO-CAR USERS' OPINIONS
CONCERNING TERMINAL CHARACTERISTICS
MUNICIPALITY OF BAYAMON
KUILAN TERMINAL

TERMINAL ASPECT	GOOD No.	GOOD %	FAIR No.	FAIR %	POOR No.	POOR %	TOTAL RESPONSES
LOCATION	247	91.1%	21	7.7%	3	1.1%	271
PASSENGER BOARDING AREA	227	83.5%	39	14.3%	6	2.2%	272
PASSENGER DROP-OFF AREA	203	77.5%	46	17.6%	13	5.0%	262
SANITARY FACILITIES	35	14.1%	50	20.2%	163	65.7%	248
CAFETERIA FACILITIES	148	59.0%	93	37.1%	10	4.0%	251
ADMINISTRATION & MAINTENANCE	149	56.2%	101	38.1%	15	5.7%	265

TABLE 2-12

PUBLICO-CAR USERS' OPINIONS
CONCERNING TERMINAL CHARACTERISTICS
MUNICIPALITY OF BAYAMON
GUARDARRAMA TERMINAL

TERMINAL ASPECT	GOOD No.	GOOD %	FAIR No.	FAIR %	POOR No.	POOR %	TOTAL RESPONSES
LOCATION	27	90.0%	3	10.0%	0	0.0%	30
PASSENGER BOARDING AREA	26	86.7%	4	13.3%	0	0.0%	30
PASSENGER DROP-OFF AREA	23	76.7%	7	23.3%	0	0.0%	30
SANITARY FACILITIES	10	33.3%	11	36.7%	9	30.0%	30
CAFETERIA FACILITIES	13	43.3%	15	50.0%	2	6.7%	30
ADMINISTRATION & MAINTENANCE	11	57.9%	7	36.8%	1	5.3%	19

Of the total surveyed, 90 percent expressed that the location of the terminal was good. The remaining 10 percent indicated a fair acceptance. Although the difference in sample size is significant, the proportion of the opinions of the Kuilán and Guardarrama users is about the same.

Both the passenger boarding and discharge areas received high good ratings (86.7% and 76.7%, respectively). The remaining opinions were the fair classification (13.3% and 23.3%, respectively.

The Guardarrama Terminal's sanitary facilities seem to fare much better than those of the Kuilán Terminal with only 30 percent commenting that the facilites are poor (versus 65.7 percent at Kuilán) and one-third indicating that the facilities are good.

The cafeteria facilities are assessed as fair by 50 percent of the users with 43.3 percent indicating a good rating and only 6.7 percent rating them as poor.

The opinion concerning the administration and maintenance of the facility mirrored that of the Kuilán Terminal. Overall, there was a general commendation directed towards the administration for its upkeeping of the terminal in a clean and attractive appearance.

Since the principal objective of this study is the evaluation of the impact of a publico-car terminal facility on the urban area, a question requesting the users' opinion on the most important effect of the terminal facility was included in all of the users' questionnaries. This question was also included in the publico-car operators', and businessmen's questionnaires.

The most frequent responses of the users concerning impacts of the terminals include (1) easy access due to good location, (2) facilitates transfer, and (3) has helped to improve service. Some of the critical comments include:

(1) The lack of adequate maintenance of the sanitary facilities,

(2) Need for additional roofing in the open area of the terminal, (Kuiban Terminal), and

(3) The need for more security.

F. SURVEY OF PUBLICO-CAR OPERATORS

A survey similar to that of the publico-car users was made of the publico-car operators. This survey was directed to obtain the operators' opinions concerning the terminals and perceived impacts that these terminals may have had upon their services.

The survey was conducted during April-May 1987. The survey questionnaire (Appendix C) was directed to the official route representative (usually the president of the route union) whose opinions were assumed to reflect the general feelings concerning the type and extent of the impacts directly or indirectly related to the establishment of a terminal system. A total of 31 questionnaires were sent to each of the routes operating from the Kuilán and Guardarranma Terminals. A total of 22 (71 percent) route representatives filled out the form and returned it.

Table 2-13 presents a summary of the Bayamón publico-car operators' opinions concerning several of the physical and operational aspects of the terminals.

The majority of the operators (86.4 percent) indicated that the location was good, while 13.6 percent indicated that it was fair. The larger number of operators were previously assigned spaces along Parque Street, the Market Plaza and other adjacent streets where chronic congestion was the norm.

The operators were queried about the terminals' internal circulation. Slightly over half (54.5 percent) said that it was good, while 31.8 percent indicated that it was fair and 13.6 percent that it was poor. Some of the problems that were cited included (1) private vehicles within the terminal, (2) a high degree of pedestrian/vehicle conflicts and (3) inadequate passenger discharge areas.

The passenger boarding area was considered as good by 63.6 percent, fair by 22.7 percent and poor by 13.6 percent. Some of the general critiques concerning this sector of the terminal included (1) interference from the activities of the numerous commercial facilities, and (2) the lack of adequate roofing (the roof structure in the open sector covers only the passenger boarding or alighting from the vehicles concourse but does not extend outward to cover the vehicles; thus, the passengers boarding or alighting from the vehicles and operators are subjected to the elements).

The passenger drop-off or discharge area was considered to be rated as good by 77.3 percent of the operators, fair by 18.2 percent and poor by 4.5 percent (1 route). As previously mentioned, the operators mentioned the inefficient queuing occuring during short periods during the peak rush hours.

As with the users, the operators tended to rate the sanitary facilities as poor (50 percent). Only four operators (18.2 percent) rated them as good with 31.8 percent rating them as fair.

The cafeteria facilities tended to receive a good rating (68.2 percent) with two operators (9.1 percent) rating them as poor.

TABLE 2-13

PUBLICO-CAR OPERATORS' OPINIONS
CONCERNING TERMINAL CHARACTERISTICS
MUNICIPALITY OF BAYAMON

TERMINAL ASPECT	GOOD No.	GOOD %	FAIR No.	FAIR %	POOR No.	POOR %	TOTAL RESPONSES
LOCATION	19	86.4%	3	13.6%	0	0.0%	22
INTERNAL CIRCULATION	12	54.5%	7	31.8%	3	13.6%	22
PASSENGER BOARDING AREA	14	63.6%	5	22.7%	3	13.6%	22
PASSENGER DROP-OFF AREA	17	77.3%	4	18.2%	1	4.5%	22
SANITARY FACILITIES	4	18.2%	7	31.8%	11	50.0%	22
CAFETERIA FACILITIES	15	68.2%	5	22.7%	2	9.1%	22
ADMINISTRATION & MAINTENANCE	13	59.1%	8	36.4%	1	4.5%	22

The administration and maintenance of the terminal received a relatively favorable rating with 59.1 percent indicating the service as good, 36.4 percent as fair, and 4.5 percent (1 operator) as poor.

Table 2-14 presents the operators' opinions concerning the terminals' impact upon several aspects of their services. These included:

(1) Fare

(2) Gasoline Expenditures

(3) Number of Passengers

(4) Operator Comfort

(5) Transit User Comfort

(6) Operators' Income

Twenty of the route representives (90.9 percent of total) indicated that their fares have not changed because of the terminal. The changes that have occured between 1981 and 1987 were due primarily to increases in fuel prices, maintenance costs, and vehicle replacement costs.

With respect to gasoline cost expenditures, over half of the operators (54.5 percent) said that these had increased. Seven routes (31.8 percent) indicated that no significant change was observed. The estimated average daily gasoline cost expenditure per operator was determined to be around $16.00. This result would at first instance seem to be contradictory to one of the stated goals for a terminal, that is, to help reduce operators' costs. It is possible that in this case, the operators were refering to the general gasoline cost increases industry-wide rather than the cost increase caused by the implementation of the terminal.

Slightly over half of the routes (13, 59.1 percent) claim that their ridership has decreased since the opening of the terminals. This claim can be reinforced with the results of the field surveys which indicate a reduction of about 27.7 percent. Just how much of this reduction is due to the terminal and how much is due to the general trend in the reduction of public transit use in the metropolitan area is not known. Of the total respondents, 31.8 percent (7 routes) indicate that they have not perceived any significant change in their route passenger volumes, whereas, only two (9.1 percent) have indicated an increase in passengers.

TABLE 2-14

PUBLICO-CAR OPERATORS' OPINION CONCERNING
IMPACT OF TERMINAL UPON SERVICE CHARACTERISTICS
MUNICIPALITY OF BAYAMON

SERVICE ASPECT	INCREASED No.	%	DECREASED No.	%	NO CHANGE No.	%	TOTAL RESPONSES
FARE	1	4.5%	1	4.5%	20	90.9%	22
GASOLINE EXPENDITURES	12	54.5%	3	13.6%	7	31.8%	22
NUMBER OF PASSENGERS	2	9.1%	13	59.1%	7	31.8%	22
OPERATOR COMFORT	17	77.3%	3	13.6%	2	9.1%	22
TRANSIT USER COMFORT	20	90.9%	0	0.0%	2	9.1%	22
OPERATORS' INCOME	0	0.0%	10	45.5%	12	54.5%	22

A large majority of the operators (17, 77.3 percent) find that they have benefitted in terms of comfort. These benefits include less time looking for a parking space, easy access, and a better control of the route operations. Three routes (13.6 percent) claim a decrease in driver comfort, citing in some cases, the long distance from the Town Plaza where they formally had their terminals.

Practically all of the operators (20, 90.9% percent) agree that the transit user benefits have increased. Only two (9.1 percent) have said that no change has occured.

In terms of income, none of the operators said that their incomes had increased, 12 (54.5 percent) said that no change has occurred, and 10 (45.5 percent) have indicated that they have experienced a decrease in income.

Asked about their opinion concerning the principal impact of the publico-car terminals, the operators' responses included the following:

(1) Reduction in traffic congestion

(2) Increased passenger comforts

(3) Improved passenger tranfers

(4) Decreased passenger volumes

(5) More competition, some of it illegal

(6) Too many businesses in the terminal

(7) Too many private vehicles allowed in terminals

The terminal size was considered adequate by 17 (77.2 percent) of the operators. The other five respondents said that the terminal was either too large (3) because of the high holding levels or too small (2) because of the poor ramps and turning radii.

Some of the terminal items that the operators indicated should be improved include:

(1) Improvement of Parque Street exit

(2) Repair sanitary facilities

(3) Widen ramps (turning raii)

(4) Repair roofs (leaking)

(5) more security

(6) Provide adequate roofs in open boarding area to cover the vehicles as well as the passenger concourse.

(7) Improve discharge operations which cause internal circulations during morning rush.

G. SURVEY OF LOCAL MERCHANTS

One of the most important impacts to be considered is that caused by the implementation of a terminal system upon the local CBD businesses. These impacts can be classifed into two categories:

(1) Direct impact upon sales of a business established at or near where the curb-side publico-car terminals used to be located, and

(2) The business development influence upon the CBD.

The survery conducted amongst the local merchants had the objective of receiving their opinions as input to this study. The businesses surveyed (a total of 135) included a wide range of establishments as shown in Table 2-15. The survey was conducted during January-February 1988. Appendix D presents a sample of the questionnaire utilized.

Table 2-16 shows the distribution of responses related to the merchant's preferred publico-car terminal system. Of the 135 merchants interviewed, 71 (or 52.6 percent) indicated that they preferred cubside terminals. A total of 41 merchants (30.4 percent) said that they preferred the terminal buildings; whereas, 23 (17 percent) had no preference. These results seem to be consistent with similar surveys for the location of terminals in other urban areas in Puerto Rico. It seems that the merchants like to have the activities associated with curbside terminals since these automatically bring many passengers who are potential customers.

Table 2-17 presents the merchants' opinions (128 responses) concerning the location of the Kuilán Terminal. About one-half of the merchants (65, 50.8 percent) indicated that they considered the location as good. Another twenty merchants (15.6 percent) said that it was fair; but, about one-third (43,33.6 percent) consider its location as poor.

On the other hand, Table 2-18 presents the opinions of 113 merchants' opinions concerning the location of the Guardarrama Terminal. In contrast to the Kuilán Terminal, the majority of the merchants (66, 58.4 percent) considered the terminal's location as poor. Another 30 merchants (26.6 percent) consider it as fair. Only 17 merchants (15 percent) give it a good rating.

TABLE 2-15

DISTRIBUTION OF TYPE OF
BUSINESS ESTABLISHMENT SURVEYED
MUNICIPALITY OF BAYAMON

TYPE OF BUSINESS	NUMBER SURVEYED	PERCENT OF TOTAL
DEPARTMENT STORE	12	8.9%
CLOTHING STORE	29	21.5%
SHOE RETAIL	15	11.1%
RESTAURANT/CAFETERIA	7	5.2%
JEWELRY STORE	17	12.6%
FURNITURE STORE	19	14.1%
PHARMACY	6	4.4%
OTHER	30	22.2%
TOTAL	135	100.0%

TABLE 2-16

PREFERENCE OF LOCAL BUSINESSMEN
TYPE OF PUBLICO-CAR TERMINAL
MUNICIPALITY OF BAYAMON

TYPE OF PUBLICO-CAR TERMINAL	NUMBER OF RESPONSES	PERCENT OF TOTAL
PUBLICO-CARS AT CURBSIDE TERMINALS	71	52.6%
PUBLICO-CARS AT CENTRAL TERMINAL	41	30.4%
NO PREFERENCE	23	17.0%
TOTAL =	135	100.0%

TABLE 2-17

OPINION OF LOCAL BUSINESSMEN
CONCERNING LOCATION OF TERMINAL BUILDING
KUILAN TERMINAL
MUNICIPALITY OF BAYAMON

OPINION	NUMBER OF RESPONSES	PERCENT OF TOTAL
GOOD	65	50.8%
FAIR	20	15.6%
POOR	43	33.6%
TOTAL	128	100.0%

TABLE 2-18

OPINION OF LOCAL BUSINESSMEN
CONCERNING LOCATION OF TERMINAL BUILDING
GUARDARRAMA TERMINAL
MUNICIPALITY OF BAYAMON

OPINION	NUMBER OF RESPONSES	PERCENT OF TOTAL
GOOD	17	15.0%
FAIR	30	26.5%
POOR	66	58.4%
TOTAL	113	100.0%

It should be pointed out, that the majority of the merchants who indicated displeasure with the terminal locations (especially the Guardarrama Terminal) were mainly those located at or near the Town Plaza or Barbosa Street which used to have a large number of curbside or small parcels of publico-car terminals. Many of these businesses also tend to be furthest away as well as having accesses impeded either by the street layout or the step slope leading from the terminals to the Town Plaza area.

Table 2-19 presents the distribution of the merchants' opinions concerning the perceived impacts of the terminals upon several aspects such as sales, number of local and other customers, and traffic congestion.

From the table it can be seen that just over half of the merchants (59, 54.6 percent of the 108 respondents) said that their sales had experienced a general decrease. Less than 20 percent (21 respondents) said that their sales have increased while slightly over one-quarter (28, 25.9 percent) said that they have not experienced any significant change.

Before making any valid conclusions concerning significant negative impacts upon the merchants' incomes, it is necessary to review the merchants' responses concerning the impacts upon the number of customers, both local and external. From Table 2-19 it can be observed almost one third of the merchants (126 to 128 respondents) have indicated that they have experienced an increase in both types of customers. Less than fifty percent have indicated a decrease in customers while between 22 and 24 percent have not perceived any significant changes.

A scrutiny of the surveyed merchants has indicated that the majority of the businesses which are said to have experienced a decrease in sales and customers are those located in the northeastern (Town Plaza) and eastern (Barbosa Street) sector of the CBD. These are the same areas which had a number of important routes and curbside terminals along Dr. Véve Street and the Town Plaza.

With respect to traffic congestion, of the total 107 respondents to this question, 63 or 58.9 percent of the merchants said that they perceived a significant reduction. Almost one-third (30, 23.8 percent) perceived no significant change; whereas, 9 (or 8.4 percent) felt that the congestion had increased.

TABLE 2-19

OPINIONS OF BUSINESSMEN CONCERNING
IMPACT OF PUBLICO-CAR TERMINAL
UPON THEIR BUSINESSES
MUNICIPALITY OF BAYAMON

IMPACT UPON....	INCREASED	PERCENT	DECREASED	PERCENT	NO CHANGE	PERCENT
SALES	21	19.4%	59	54.6%	28	25.9%
NUMBER OF LOCAL CUSTOMERS	42	32.8%	58	45.3%	28	21.9%
NUMBER OF OTHER CUSTOMERS	41	32.5%	55	43.7%	30	23.8%
TRAFFIC CONGESTION	9	8.4%	63	58.9%	35	32.7%

General merchants' opinions concerning the impacts of the terminals included the following:

(1) Beneficial to operators and users,

(2) Distance from several CBD sectors too far, negatively affecting businesses in those areas since many passengers will not walk "up" to them;

(3) Has helped to reduce the degree of congestion especially along Parque Street and the Town Plaza area

(4) Some publico-car routes altered so as shorten path to terminal; this has adversely affected several businesses near major discharge areas.