

INTEGRATING PÚBLICOS INTO THE PUBLIC TRANSIT SYSTEM

Tren Urbano Research Project

Year-End Research Report

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1. INTRODUCTION

1.1 Existing Público Operations and Market

Públicos are private owner-operated paratransit services in the Commonwealth of Puerto Rico. They typically provide demand-response services, utilizing passenger sedans, vans or minibuses. The majority of públicos that operate within the San Juan Metropolitan Area (SJMA) are 14-17 passenger vans (see Figure 1.1 for typical público van configurations). Públicos receive no direct government subsidy other than occasional funding for the building of terminal facilities. Only fares and licensing are regulated by the government.¹ The 3,427 square mile island has a population of 3.7 million² with approximately 9,000 públicos in operation.³ In the SJMA alone, with a population of 1.3 million or 37 percent of the total population of Puerto Rico,⁴ approximately 3,000 públicos operate on 125 routes, serving an estimated 143,000 daily passenger trips,⁵ or 65 percent of daily regional transit trips.⁶ Outside the SJMA, públicos are the only form of public transportation.

In recent years, however, públicos, like the local bus systems (AMA and the Metrobus), have been faced with declining ridership and market share. In 1964, públicos accounted for 9.2 percent of SJMA's internal person trips. In 1976, that figure decreased to 7.7 percent.⁷ In 1990, that figure had dropped to 3.7 percent, while automobile use increased from 62.7 to 81.8 to 91.9 percent during the same period (see Figure 1.2).⁸ In the past five years alone, the público fleet size has decreased by 20

¹ The Public Service Commission (PSC) is the only government agency that deals directly with the público system.

² According to the 1990 US Census.

³ Information obtained from a presentation given by Miguel A. Vescovacci of the Management and Technical Consulting Group, Inc. on January 17, 1996 at the University of Puerto Rico, Rio Piedras campus of the UPR-MIT Tren Urbano Research Project Short-Course.

⁴ Ibid..

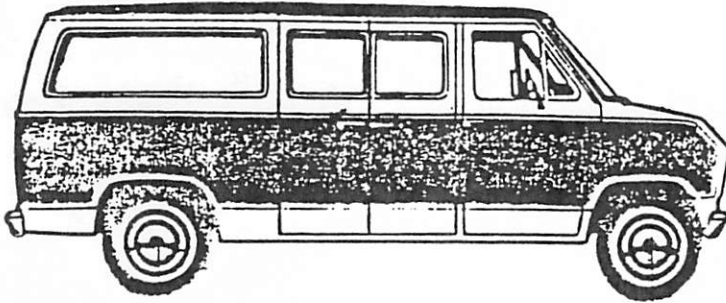
⁵ Puerto Rico Department of Transportation and Public Works, Puerto Rico Highway and Transportation Authority. *FY 1994 San Juan Público Section 15 Data Collection*. Prepared by Multisystems. December, 1994.

⁶ Commonwealth of Puerto Rico, Department of Transportation and Public Works, Metropolitan Bus Authority, 1994.

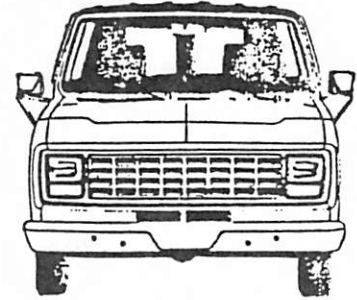
⁷ Barton-Aschman & Associates, September 1992.

⁸ Ibid..

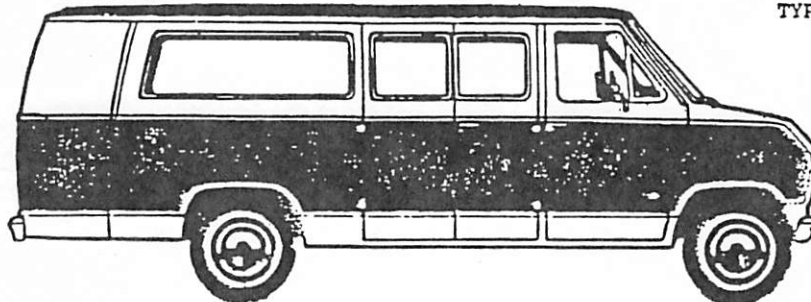
Figure 1.1: Typical Publico Van Configuration



TYPE A: 14-15 PASSENGER VAN
AVERAGE LENGTH = 17 ft. 3 in.
AVERAGE HEIGHT = 6 ft. 11 in.

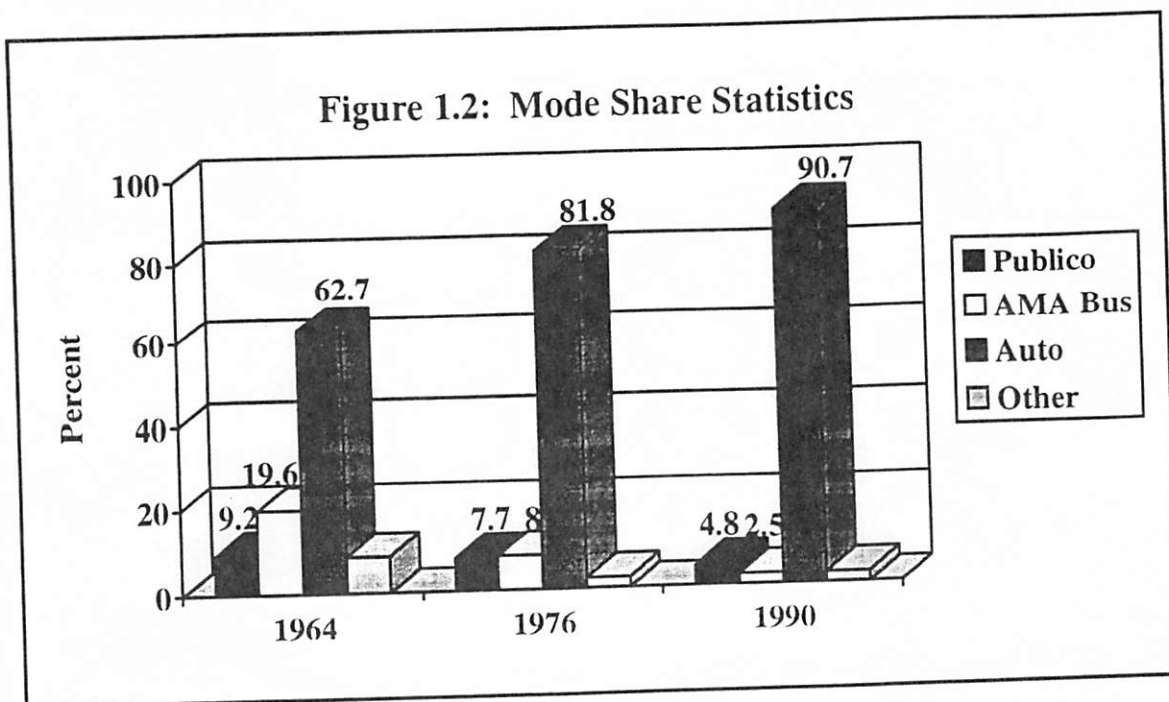


FRONT VIEW
AVERAGE WIDTH = 5 ft. 8 in.



TYPE B: 17 PASSENGER VAN
AVERAGE LENGTH=18 ft. 1
AVERAGE HEIGHT=7 ft.

FIGURE 7 TYPICAL PUBLICO PASSENGER VANS



percent.⁹ With the rise of income and increasing auto-ownership in Puerto Rico, together with a low quality of service and their inability to operate effectively in traffic congestion, públicos face an uncertain future. Furthermore, preliminary survey results show that the average age of typical público drivers is about 60 years old.¹⁰ With little influx of new and younger drivers, the future of the público labor pool is also uncertain. Currently, públicos operate independently from other public transit services. Little or no coordination and integration exist. With the coming of Tren Urbano and the need to restructure SJMA's public transportation system, the challenge is to place the públicos in a strategic position that will best utilize their potential benefits as an integral part of the enhanced public transit system. There is a great need to preserve the públicos' attractiveness as a flexible and demand-responsive paratransit service. It is apparent that new roles for the públicos will have to be defined. One of these potential roles is to provide feeder service to Tren Urbano.

⁹ Information obtained from a presentation given by Miguel A. Vescovacci of the Management and Technical Consulting Group, Inc. on January 17, 1996 at the University of Puerto Rico, Rio Piedras campus of the UPR-MIT Tren Urbano Research Project Short-Course.

¹⁰ Information according to the Public Service Commission, May 1996.

1.2 Research Objectives

The purpose of this research is 1) to identify potential problems and improvements in operating públicos in the San Juan metropolitan area (SJMA), 2) to present trade-offs and options for potential intervention scenarios and strategies for improving público operations as a transit feeder system, 3) to identify alternative models of running private paratransit feeder services from other urban areas, and 4) in anticipation of the coming of Tren Urbano in the SJMA, to analyze and present the best (or alternative) model(s) for operating públicos as a rail transit feeder system.

1.3 Research Approach and Analysis Framework

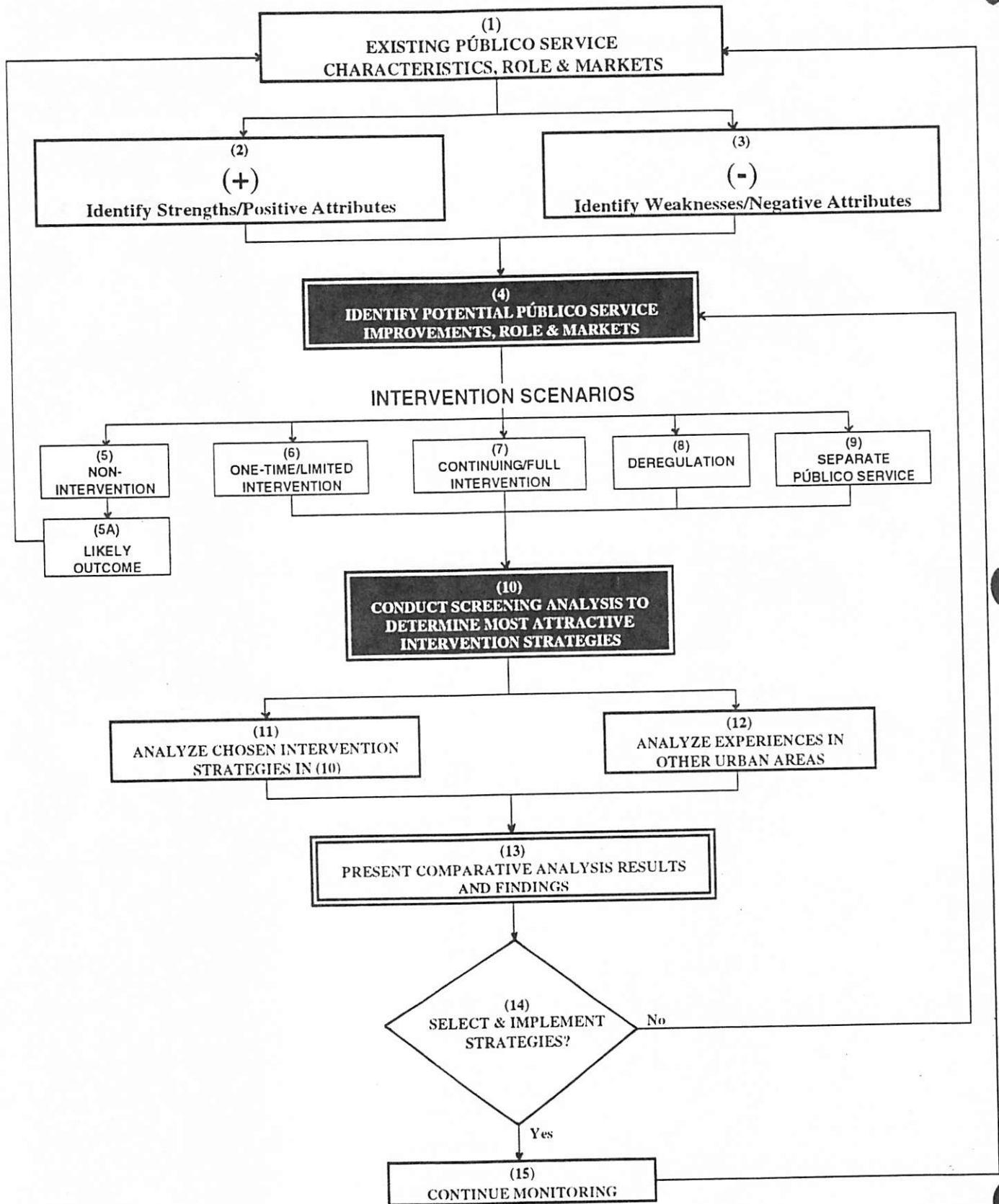
A proposed analysis framework for understanding públicos is presented to help guide the research process. A flow-diagram of the analysis framework is presented in **Figure 1: Analysis Framework Flow-Diagram**

First, existing público service characteristics, roles, and markets are analyzed to present a better understanding of existing público operations (box 1). Second, strengths/positive attributes and weaknesses/negative attributes of the system, represented by boxes 2 and 3, are identified. Separating the positive and negative attributes of the system will help us understand the strengths and weaknesses of the existing público system. It can also help to identify possible público service improvements for potential feeder functions to line-haul transit and possible government intervention (box 4). Boxes 5 through 9 represent five *intervention scenarios* that the government can potentially implement to improve público services. The likely intervention scenarios include:

- Non-Intervention
- One-Time/Limited Intervention
- Continuing/Full Intervention
- Deregulation
- Separate Público Service

Box 5A represents the outcome of non-intervention (box 5) and how it would likely affect existing público operations (return to box 1). All of the first four intervention scenarios (boxes 5 through 8) assume that changes would be made to the

Figure 1.3: Analysis Framework Flow-Diagram



existing público structure. The fifth intervention scenario *separate público service* assumes that any intervention made is independent and separate from the existing público service structure.

A set of proposed intervention strategies are presented for each of the intervention scenarios above. The potential risks/negative outcomes and benefits/positive outcomes for each intervention strategy are also presented. An initial screening analysis is then conducted to select potentially attractive strategies for further analysis. The screening analysis is based on a ranking of the feasibility and ease of implementation of each intervention strategy, both from an operational and an institutional perspective. From the screening analysis conducted in box 10, a set of feasible strategies are chosen and analyzed in further detail (box 11). At the same time, similar experiences of running private jitney/paratransit operations from other urban areas are also analyzed (box 12). The selected set of intervention strategies from the screening analysis (box 11) are compared with the analysis findings from other urban areas (12), and the evaluation and findings from the comparative analysis is presented (box 13). The analysis results will include likely outcomes of implementing the set of strategies selected (from box 10) and what the government of Puerto Rico can reasonably expect if the chosen strategies are implemented to improve público services within the existing structure. An evaluation of the trade-offs and implications will also be presented.

For the purpose of this research, the analysis work ends at box 13. However, a *decision loop* is presented beginning at box 14 which extends beyond the scope of the research. The purpose is to provide information to policy-makers on various options and possible outcomes. Box 14 in the flow-diagram represents a *decision node*. The decision at hand is whether to select and implement the best or most promising strategies presented, given the analysis results. The decision is likely to be based on the financial and political feasibility of the proposed strategies. The availability of funds, budget constraints from the involved agencies, opposition from involved parties, as well as the political will to implement the strategies are likely factors that will influence the decision. If the strategies from the analysis presented are implemented, the results should be continually monitored (box 15) to track changes in existing público services (return to box 1). If the decision is not to implement the strategies presented, new potential improvements to the system should be identified (return to box 4) and new intervention strategies from feasible scenarios should be selected and analyzed. Thus, box 14 to boxes 4 through 13 represents a *decision loop* in which an answer of "no" to box 14 will begin another iteration of identifying potential improvements to the público system, choosing intervention strategies from feasible scenarios and analyzing the selected

strategies. This iterative process ends when a feasible strategy or set of strategies are chosen and implemented.

2. ATTRIBUTES OF CURRENT PÚBLICO SERVICES

Although the current público system is plagued by many weaknesses, it also has many strengths and potential. The strengths and weaknesses of the público system can be viewed from four perspectives:

- Público User
- Potential Tren Urbano User
- Público Owner/Operator
- The Government

A summary of the comparisons are presented in Tables 2.1 and 2.2.

2.1 Público User Perspective

The advantages and disadvantages of público services is given from the perspective of a público user.

Strengths/Positive Attributes:

- + **Demand Responsive:** Because público services are demand responsive, they can pick-up and drop-off passengers at any location along the route based on passenger requests. This gives passengers greater accessibility to the system at different locations along a público route and the convenience of being dropped off upon request.
- + **Fixed Route (with minor deviations upon passenger request):** Because públicos are demand responsive, they allow minor deviations upon passenger requests. This provides passengers with greater convenience to be dropped off close to their destination. The fact that services are generally offered along a fixed route also gives passengers a sense of "predictability" as to where the público goes.
- + **High-Frequency Service During Peak Hours:** For potential patrons, high-frequency service during peak hours means shorter headways. Shorter

Table 2.2: Negative Publico Attributes

			Público User	Potential Tren Urbano User	Público Owner/Operator	Government
Weaknesses/ Negative Attributes	Service Reliability	Lack of Fixed Service Schedule	X	X		X
		Lack of Service During Low Demand Periods (Off-Peak Periods)	X	X		X
		Lack of Evening, Weekend, and Holiday Services	X	X		X
	Service Quality	Aging Vehicle Fleet	X	X	X	X
		Lack of Air-Conditioning in Most Vehicles	X	X		X
		Crowded and "Smelly" Vehicles	X	X		X
		Few Público Terminals/Sheltered Stops	X	X		X
		Poor Safety and Vehicle Maintenance Records	X	X		X
	Service Performance	Competition with Other Públicos and MBA Buses at High Demand Routes			X	
		Affected by Traffic Congestion			X	X
		Declining Ridership			X	X
		Service Duplication with Other Public Modes				X
	Costs	High Vehicle Acquisition Cost			X	
		High Insurance Cost			X	
	Service Information	Lack of Public Information on Routes, Schedule, Fares, Transfers	X	X		X
		Stops And Routes Are Not Clearly Designated And Are Subject To Change	X	X		X
	Service Image	Poor Image Of Públicos As Transportation For The Poor/Transit-Dependent	X	X		X
		Lack Of "Mixing" Between Different Socio-Economic Groups				X
	Fares	Lack Of Fare Integration With Other Public Modes	X	X		X
	Management	Lack of Centralized Management Structure				X
		Difficult to Negotiate with/Relay Messages/Information to Operators				X
		Lack of Effective Oversight by Public Agency				X
	Intermodal Connections	Lack Of Intermodal Connections And Coordination	X	X		X
		Lack of Island-Wide Público Integration Strategy				X
	Data & Information	Lack of Information on Passenger O-D Travel Patterns				X
		Lack of Information on Passenger Transfer Patterns				X
		Lack of Reliable/Updated Information on Vehicle Fleet				X
		Lack of Evaluation Techniques and Measures of Efficiency				X

Table 2.1: Positive Publico Attributes			Público User	Potential Tren Urbano User	Público Owner/Operator	Government	
Strengths/ Positive Attributes	Service Characteristics	Demand Responsive	X	X		X	
		Fixed Route (with minor deviations upon request)	X	X	X	X	
		High-Frequency Service During Peak Hours	X	X	X	X	
		High-Frequency Service on Major Routes	X	X	X	X	
		Higher Travel Speeds than Bus on Same Facilities	X	X	X	X	
		Convenient (pick up & drop off "anywhere" by request)	X	X			
		Potential Feeder to Line-Haul Transit	X	X		X	
		Intercity Services Connecting SJMA with Rest of Island	X	X	X	X	
		Operational Characteristic	Higher Occupancy Mode than the Private Auto				X
			Flexible Operations			X	
			No Fixed Service Schedule to Adhere to			X	
			Lower Cost Structure Compared to Bus				X
			Operate More Effectively than Bus on Low Demand Routes			X	X
		Management	Privately Owned/Operated			X	X
			Gov. Control of Routes and Licensing (provide market stability & avoid competition)				X
Fare Structure	Fixed Fare (set by PSC)	X	X		X		
	Daily "Take Home" Revenue			X			
Subsidy	Terminal Facilities Built by Municipalities			X			
	No Direct Government Subsidy Required				X		

headways provide patrons with frequent service and shorter out-of-vehicle waiting times.

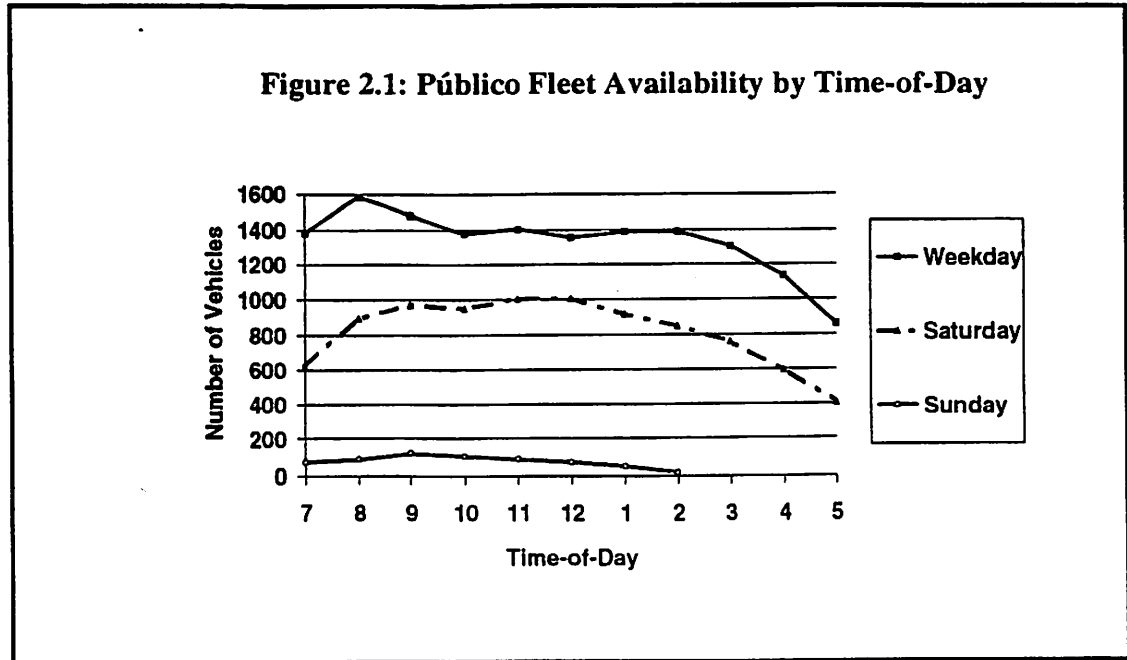
- + **High-Frequency Service on Major Routes:** When the demand along a route is great enough, público services can be provided at a higher frequency. Higher-frequency service along a high-demand route provides passengers with shorter waiting times for service. More destination options can also be provided to passengers as more públicos going to different destinations provide services along the route.
- + **Higher Travel Speeds than Bus on Same Facilities:** Because públicos are smaller in size and lighter in weight than conventional buses, and are more maneuverable and have better acceleration characteristics than conventional diesel buses, they have the potential to operate at higher speeds. Higher operating speeds mean passengers can get to their destinations faster, increasing travel time savings.
- + **Fixed Fare:** Since fares are regulated by the Public Service Commission (PSC), passengers are protected from excessive fare levels and unfair price fixing.
- + **Intercity Services Connecting the SJMA with the Rest of the Island:** Outside the SJMA, públicos are the only form of public transportation. Públicos provide an essential intercity connection between the SJMA and the rest of the island. Intercity público services provide passengers from the SJMA accessibility and mobility to other parts of the island and visa versa. Section 15 data shows that 42 percent of público trips are intercity trips.¹¹
- + **Potential Feeder Service to Line-Haul Transit:** Públicos have the potential to provide quality feeder services to line-haul transit. From the passenger's point of view, good feeder connections mean increased accessibility to line-haul transit and greater mobility (ability to reach farther destinations than with a single mode). Second, increased accessibility via público feeder services means patrons may not have to walk or travel as far to a line-haul transit stop. The demand responsive service characteristic of

¹¹Puerto Rico Department of Transportation and Public Works, Puerto Rico Highway and Transportation Authority. *FY 1994 San Juan Público Section 15 Data Collection*. Prepared by Multisystems. December, 1994.

públicos and their ability to deviate from the main route give them the flexibility to reach farther into low density or harder to reach areas which traditional line-haul transit cannot serve.

Weaknesses/Negative Attributes:

- **Lack of a Fixed Service Schedule:** Públicos operate without a fixed schedule and thus, services are not reliable.
- **Lack of Services During Low Demand Periods:** Service frequencies on low demand routes are highly irregular, since público operators find no incentive to offer frequent services during low demand periods. A potential passenger may not always be able to rely on público service when planning a trip.
- **Lack of Evening, Weekend, and Holiday Services:** Públicos typically operate six days a week until about 6 PM. After the evening peak period, público service reliability drops significantly as many driver/operators decide to terminate services for the day. Section 15 data shows that vehicle availability for service drops off significantly after 2 PM during weekdays and at 12 PM during Saturdays (see Figure 2.1). Other than in the municipality of Rio Piedras, Sunday services are virtually non-existent. Potential patrons who rely on públicos to get to line-haul transit routes or directly home in the evening or weekends are likely to find themselves stranded with no other travel options. Although the PSC does allow a fare surcharge applicable for after 6 PM services, only a handful of routes provide extra evening services. Often, the decision to run evening and weekend services is left entirely to the discretion of individual operators. This service unreliability issue affects the level of service and attractiveness of público services.
- **Crowded and "Smelly" Vehicles:** Públicos on high demand routes often operate close to or at capacity. Thus, públicos along these routes are often crowded and uncomfortable for passengers. Second, at many público terminals, most drivers will not leave until either the vehicle is full or until a specified number of passengers (often determined by the terminal or route association) have boarded. Since many vehicles are not equipped with air-conditioning, this often means a long wait for passengers crowded into hot



and poorly ventilated vans. Crowded vehicles, both at the terminals and along the route, may discourage potential patrons from using the service.

- **Lack of Air-Conditioning in Many Vehicles:** Since the público fleet is quite old, many are not equipped with air-conditioning. This is especially uncomfortable in a hot and humid climate such as Puerto Rico. Furthermore, since many drivers at most público terminals wait until the vehicle is mostly or completely full before leaving, it can be very uncomfortable for passengers sitting and waiting inside a público. Preliminary survey of Metrobus II riders suggests that air-conditioning is an important amenity that transit riders consider.¹² Approximately 40 percent of the riders surveyed indicated that they rode Metrobus because it was air-conditioned.
- **Aging Vehicle Fleet:** Presently, the público vehicle fleet is quite old. A recent survey done by the Management and Technical Consulting Group, Inc. found that approximately 70 percent of públicos in Caguas are over 10 years old.¹³ This poses significant safety and vehicle reliability problems as older

¹² Metrobus II survey results from February 1996, presented by Multisystems.

¹³ Information obtained from a presentation given by Miguel A. Vescovacci of the Management and Technical Consulting Group, Inc. on January 17, 1996 at the University of Puerto Rico, Rio Piedras campus of the UPR-MIT Tren Urbano Research Project Short-Course.

vehicles are more likely to breakdown. An old vehicle fleet contributes to poor ride comfort, unreliability and presents a negative image to the general public.

- **Few Público Terminals/Sheltered Stops:** Each municipality usually has only one or two publicly-owned público terminals. Público terminal facilities are typically terminal buildings with parking and staging areas for públicos or separate on-street terminal areas. The two largest are in Bayamón and Río Piedras. On-street sheltered stops, however, are few. Since públicos can stop to drop-off or pick-up passengers at any point along a route, the lack of on-street sheltered stops may cause many passengers to wait at different street corners, causing confusion and safety concerns for users. Furthermore, the frequent and unpredictable tropical showers and simmering heat from the sun makes waiting for a público very uncomfortable for potential patrons.

- **Poor Safety and Vehicle Maintenance Records:** Because many of the públicos are old, many are quite uncomfortable and may be unsafe to ride. Public transit user surveys within the SJMA have consistently found that a considerable number of público passengers are concerned about vehicle safety, especially with complaints of speeding.¹⁴ Although the Public Service Commission (PSC) and other government agencies inspect público vehicles for compliance with safety requirements, there are still concerns over safety and poor maintenance of the vehicle fleet. Público license or franchise are renewed every 5 years, in which a formal vehicle inspection is required. Little or no interim inspections are required. Other than the required inspection during license and franchise renewal, the only time the PSC will inspect a vehicle is when the operator goes to PSC to petition an increase in fare or change of services. However, publicos, like all other vehicles, have to pass an annual basic safety inspection when vehicle license fees are paid to DTOP. Compared to the publicos, the *taxis turmsticos* (taxis for tourists) are required by PSC to pass an inspection every 3 months.

- **Lack of Public Information on Routes, Schedule, Fares, etc.:** Presently, there are no printed information on público routes or schedules. Almost all information on routes, cost and where to board a público that goes to one's

¹⁴ Barton-Aschman Associates, Inc. *Final Report: Integration of San Juan Metropolitan Region Público and Private Bus Routes into the Metrobus Transportation System*. September 1992.

desired destination are passed on by word of mouth. Therefore, it is extremely difficult for new potential patrons to find service information about públicos in the region other than asking friends or others who have ridden in one. Second, stops and routes are not clearly designated and are subject to change. This can cause confusion for existing users and deter new users from using the system.

- **Poor Image of Públicos as Transportation for the Poor and the Transit-Dependent:** Públicos often appear only to serve the poor and the transit-dependent population. There is a general sense that most público riders are "captive riders." Initial market research based on focus group discussions has found that people are reluctant to ride públicos because of the negative image it portrays.¹⁵ A negative image of the públicos may deter potential patrons from considering using the system.
- **Lack of "Mixing" Between Different Socio-Economic Groups Within the "Público" System:** Because públicos are mainly patronized by lower income groups, students, and the transit-dependent, there is a lack of "mixing" of different socio-economic groups (white-collar office workers, professionals, etc.) that ride the públicos. The initial market research based on focus group discussions has found that some people are reluctant to ride públicos because there is no one of the same socio-economic group that the person can "identify with."¹⁶
- **No Fare Integration with Other Public Modes:** Currently, there is no fare integration between públicos and other public modes. All passengers boarding any public transit modes are required to pay full fare. Públicos and scheduled buses have separate fare structures, and no coordination exists between the PSC and the MBA. The lack of fare integration discourages existing and potential public transit patrons from transferring onto different modes. Transferring between modes and having to pay fares several times before one reaches one's final destination may be seen as an inconvenience and hindrance.

¹⁵ Information presented by Alan Hoffman in a research presentation presented on January 25, 1996 at MIT.

¹⁶ Information presented by Alan Hoffman in a research presentation presented on January 25, 1996 at MIT.

- **Lack of Intermodal Connections and Coordination:** SJMA's público and scheduled bus system operate as two distinct public transportation systems with no formal coordination between the PSC and the MBA. This is evident from the fact that bus and público terminals have often been constructed separately and often several blocks apart. Intermodal transfers are, as a result, inconvenient for passengers wishing to make transfers. Separate fares, schedules, and service areas have resulted in few transfers between modes (less than 6 percent).¹⁷ The only successful intermodal integration example to date, not necessarily as a planned effort, is in Bayamón. Públicos and AMA buses share an off-street terminal, and riders are provided with excellent accessibility and transfer capabilities. In addition, the AMA has provided nearby bus stops, permitting users direct access to and from the Kuilan and Guardarrama Terminals.¹⁸ However, recent efforts to integrate Metrobus II stops along Ponce de Leon Avenue near público stops failed when many público operators opposed the plan.

- **Lack of Handicap Accessibility:** Públicos are currently not required nor equipped to provide handicap access. In the near future, especially if federal funding is involved, handicap accessibility on públicos may become an important issue. Second, if the handicap community decides to raise the issue, ADA implications for the públicos will become a major issue that needs to be addressed.

2.2 Potential Tren Urbano User Perspective

Strengths/Positive Attributes:

- + **Demand Responsive Services:** (See previous comments from *público user perspective*.)

- + **Fixed Route (with minor deviations upon passenger request):** (See previous comments from *público user perspective*.)

¹⁷ U.S. Department of Transportation, Federal Transit Administration and the Government of Puerto Rico, the Department of Transportation and Public Works, and the Highway and Transportation Authority. *Final Environmental Impact Statement: Tren Urbano, San Juan Metropolitan Area, Puerto Rico*. November, 1995.

¹⁸ Barton-Aschman Associates, Inc. *Final Report: Integration of San Juan Metropolitan Region Público and Private Bus Routes into the Metrobus Transportation System*. September 1992.

- + **High-Frequency Service During Peak Hours:** (See previous comments from *público user perspective*.)
- + **High-Frequency Service on Major Routes:** (See previous comments from *público user perspective*.)
- + **Higher Travel Speeds than Bus on Same Facilities:** (See previous comments from *público user perspective*.)
- + **Fixed Fare:** (See previous comments from *público user perspective*.)
- + **Intercity Services Connecting the SJMA with the Rest of the Island:** (See previous comments from *público user perspective*.)
- + **Potential Feeder Service to Line-Haul Transit:** (See previous comments from *público user perspective*.)

Weaknesses/Negative Attributes:

- **Lack of a Fixed Service Schedule:** (See previous comments from *público user perspective*.)
- **Lack of Service During Low Demand Periods:** (See previous comments from *público user perspective*.)
- **Lack of Evening, Weekend, and Holiday Services:** (See previous comments from *público user perspective*.)
- **Crowded and "Smelly" Vehicles:** (See previous comments from *público user perspective*.)
- **Lack of Air-Conditioning in Most Vehicles:** (See previous comments from *público user perspective*.)
- **Aging Vehicle Fleet:** (See previous comments from *público user perspective*.)

- **Few Público Terminals/Sheltered Stops:** (See previous comments from *público user perspective*.)
- **Poor Safety and Vehicle Maintenance Records:** (See previous comments from *público user perspective*.)
- **Lack of Public Information on Routes, Schedule, Fares, etc.:** (See previous comments from *público user perspective*.)
- **Poor Image of Públicos as Transportation for the Poor and the Transit-Dependent:** (See previous comments from *público user perspective*.)
- **Lack of "Mixing" Between Different Socio-Economic Groups Within the "Público" System:** (See previous comments from *público user perspective*.)
- **No Fare Integration with Other Public Modes:** (See previous comments from *público user perspective*.)
- **Lack of Intermodal Connections and Coordination:** (See previous comments from *público user perspective*.)
- **Lack of Handicap Accessibility:** (See previous comments from *público user perspective*.)

2.3 Owner/Operator Perspective

The strengths and weaknesses of providing público services is described from the perspective of the público owner/operator.

Strengths/Positive Attributes:

- + **Flexible Operations:** Público services are demand responsive. They can operate along a fixed route with minor deviations allowed upon driver or passenger requests. This gives público drivers flexibility in avoiding traffic congestion by deviating from a main route after conferring with passengers. Second, an important differentiation from the AMA and Metrobús operations

is that the establishment of público routes is made upon the initiative of the operator(s) based on perceived market demands without requiring complex planning and analyses. The extent of público services depends largely upon actual demand and service limitations (number of available vehicles, accessibility, hours of operations, etc.).

- + **No Fixed Service Schedule to Adhere to:** Públicos have no published fixed schedules. Therefore, operators do not have to adhere to strict schedules in terms of arrivals and departures from stops or terminals. Many operators see it as an advantage to wait at público terminals until a maximum or a specified number of passengers have boarded before leaving so as to maximize their revenue.
- + **Operate More Effectively than Bus Transit on Low Demand Routes:** Because bus transit along low demand routes typically has longer headways and less service frequency, públicos tend to operate more effectively because of lower operating cost compared to a full-size bus on low demand routes. The ability to serve specific markets more effectively gives públicos a competitive edge.
- + **Privately Owned/Operated:** Público operators are typically self-employed individuals who use their own vehicles for both public transit service and personal use. The fact that they are individual entrepreneurs, making individual decisions, gives them the flexibility and independence in running their own business/operations. Many use their vehicles to earn supplementary income on the weekends or after-work hours. Some rent a vehicle from a fleet owner, agreeing to pay a predetermined percentage of their daily revenues. Público operators do not receive any government subsidy for their operations and, therefore unlike AMA and the Metrobús, are not required to provide a certain level of service, or monitored in terms of service quality.
- + **Daily "Take Home" Fare Revenue:** All público services do not have tickets or monthly passes. Therefore, operators "pocket" and "take home" the fare revenues they have earned on a daily basis (for example, without having to wait for paychecks to be sent). This gives público drivers the advantage of bringing home their daily income directly from the farebox revenue (to buy groceries and daily necessities, for example).

- + **Terminal Facilities Built by Municipalities:** This is the only form of government support provided for público services. The terminal facilities in Bayamón and Río Piedras, the largest of all público terminals, for example, are heavily used by público operators.

Weaknesses/Negative Attributes:

- **Competition with Other Públicos and AMA Buses on High Demand Routes:** Públicos compete directly with other públicos, AMA and Metrobús on high demand routes. Heated competition between all public modes exists along major corridors such as highways PR-1, PR-2, PR-3, PR-21, and PR-167. Numerous público routes tend to concentrate along these "common" high demand corridors, all competing for the same passengers, including those associated with AMA and the Metrobús. Initial market research based on focus group discussions have found that passengers often decide whether to board a bus or público depending on which vehicle arrives first.¹⁹ Second, since the operations of Metrobús II, initial observations have found that the Metrobús II services along F.D. Roosevelt Avenue, from Hato Rey to Bayamón, have significantly affected público services along the same corridor.²⁰ Although Metrobús II has reduced público ridership along the corridor, it has, however, increased ridership for públicos that are used to access it. Initial Metrobús survey results show that 14 percent of Metrobús riders accessed Metrobús via públicos.²¹ Furthermore, in the Final Environmental Impact Statement (FEIS) done for the Tren Urbano Project, it is projected that three main existing público routes will be negatively impacted by the proposed alignment. The three identified routes are 1) I-62-11 (Río Piedras - Bayamón), 2) L-11-02 (Bayamón - Centro Médico), and 3) L-62-06 (Río Piedras - Centro Médico). The impact of público competition with other modes presents many uncertainties as to the viability and sustainability of público services.
- **Affected by Traffic Congestion:** Públicos are sensitive to conditions on the road and are, therefore, affected by traffic congestion. Given the fact that

¹⁹ Information presented by Alan Hoffman in a research presentation presented on January 25, 1996 at MIT.

²⁰ Information obtained from Frederic Salvucci, Senior Lecturer, Department of Civil & Environmental Engineering, Massachusetts Institute of Technology, February 1996.

²¹ Initial Metrobus II survey results obtained from Multisystems, May 1996.

públicos operate on these same congested roadways with automobiles, it can be expected that congestion will worsen in the future and that público levels of service will deteriorate as traffic congestion continues to increase. Currently, no dedicated lanes that públicos are permitted to operate on. Recently, some público operators along the Caguas - San Juan route requested to PSC that they be given permission to use the HOV lane that AMA and Metrobus currently use along Ponce de Leon Avenue (PR-1), between Domenech Street and Kalaf Street. The operators believe that their use of the HOV lane can produce travel time savings of 30 minutes during the peak period and recover the lost ridership that went to AMA and Metrobus. The PSC denied the petition.

- **High Vehicle Acquisition Cost:** Operators wishing to enter the público market must bear all the costs starting with vehicle acquisition cost (a new 17 passenger van may cost over \$35,000 before taxes), with operating and maintenance costs after beginning operations. The reason for the high vehicle acquisition cost is that the vehicle cost is tied with the franchise (or license to operate) cost. The value of a franchise is often more expensive than the vehicle. If a vehicle costs \$10,000 and the license \$15,000, the cost of the franchise increases the value of the vehicle to \$25,000. Public Service Commission data show that a new público can cost up to \$40,000 - \$45,000, and used vehicles average around \$25,000.²² This is a high capital cost for potential owner/operators entering into the business, considering the average yearly income of a typical público driver is around \$10,000.²³
- **High Insurance Cost:** Many público operators have no insurance other than the required "no-fault" insurance. Since públicos are considered common carriers, even though they are privately owned and operated and that many of the drivers use their vehicles for personal use, liability is high. Many operators, therefore, operate without purchasing the required amount of insurance, because insurance cost is high. In 1992, a Barton-Aschman study conducted for the PSC found that average net revenue of a typical público operator to be around \$40 a day, without considering factors such as

²² Barton-Aschman Associates, Inc. *Final Report: Integration of San Juan Metropolitan Region Público and Private Bus Routes into the Metrobus Transportation System*. September 1992.

²³ Information obtained from a presentation given by Miguel A. Vescovacci of the Management and Technical Consulting Group, Inc. on January 17, 1996 at the University of Puerto Rico, Rio Piedras campus of the UPR-MIT Tren Urbano Research Project Short-Course.

insurance beyond the “no-fault” required in Puerto Rico.²⁴ Compared to the private sector, public sector transit services such as the AMA or Metrobús can afford full coverage insurance due to their scale of operations. High insurance costs, relative to modest income, could force público operators out of business or to consolidate with other routes.

- **Aging Vehicle Fleet:** Presently, the público vehicle fleet is quite old. A recent survey done by the Management and Technical Consulting Group, Inc. found that approximately 70 percent of públicos in Bayamon and Rio Piedras are over 10 years old.²⁵ This poses significant safety and vehicle reliability problems as older vehicles are more likely to breakdown. Older vehicles are likely to increase maintenance and thus operating cost for público operators.

- **Lack of Government Subsidy and Support Compared to AMA and Metrobús:** One of the most voiced complaints by the operators is the perceived lack of attention and support by government agencies and to a limited degree by the municipalities. Although the municipalities, in coordination with the DTOP, have built off-street terminals (costing up to several million dollars) and special vehicle tax and license fee exemptions, operators tend to complain about high operating costs, high insurance costs, high interest rates on new and used vehicle purchases, and the perceived unequal and unfair subsidizing of the AMA and Metrobús systems.²⁶

2.4 Government Perspective

A government perspective is given from the viewpoint of a transportation official or planner from the Puerto Rico Department of Transportation and Public Works (DTOP) or the Puerto Rico Highway and Transportation Authority (PRHTA).

²⁴ Barton-Aschman Associates, Inc. *Final Report: Integration of San Juan Metropolitan Region Público and Private Bus Routes into the Metrobus Transportation System*. September 1992.

²⁵ Information obtained from a presentation given by Miguel A. Vescovacci of the Management and Technical Consulting Group, Inc. on January 17, 1996 at the University of Puerto Rico, Rio Piedras campus of the UPR-MIT Tren Urbano Research Project Short-Course.

²⁶ Barton-Aschman Associates, Inc. *Final Report: Integration of San Juan Metropolitan Region Público and Private Bus Routes into the Metrobus Transportation System*. September 1992.

Strengths/Positive Attributes:

- + **Demand Responsive Services:** Públicos provide demand responsive services by their ability to pick-up and drop-off passengers at any location along the route. It's route structure and itinerary are not as rigid as traditional public transit and are closer to shared-taxis. Públicos provide an alternative to the automobile and an addition travel option to existing and potential public transit patrons in the SJMA.
- + **Higher Occupancy Mode than the Private Auto:** Since most públicos are 15-17 passenger vans, they have a higher average vehicle occupancy (AVO) than the private automobile. In the SJMA, increasing AVO in a congested, single-occupant, auto-dominated metropolitan area is highly desirable. Higher AVOs have the potential to reduce the number of single-occupant private automobiles, facilitate the use of high occupancy vehicle (HOV) lanes, reduce traffic congestion, reduce emissions, and reduce the need to build large parking facilities in city centers.
- + **Flexible Operations:** Público services are demand responsive. They can operate along a fixed route with minor deviations allowed upon driver or passenger requests. This gives públicos the flexibility in avoiding traffic congestion by deviating along a main route after conferring with passengers. Second, an important differentiation from the AMA and Metrobús operations is that the establishment of público routes is made upon the initiative of the operator(s) based on perceived market demands without requiring a complex government planning and analysis process. The extent of público services depends highly upon actual demand and service limitations (number of available vehicles, accessibility, hours of operations, etc.).
- + **Provide Services in Areas Where Bus Transit Do Not Operate Effectively:** Because bus transit along low demand routes typically have longer headways and less service frequency, públicos tend to operate more effectively because of lower operating cost compared to a full-size bus running along the same routes. The ability to serve markets more effectively where scheduled buses are not as effective gives públicos a competitive edge.

- + **Higher Travel Speeds than Bus on Same Facilities:** Because públicos are smaller in size and lighter in weight than conventional buses, and have better acceleration characteristics than conventional diesel buses, they have the potential to operate at higher speeds. Higher operating speeds mean passengers can get to their destination faster, increasing travel time savings.
- + **Intercity Services Connecting SJMA with the Rest of the Island:** Outside of the SJMA, públicos are the only form of public transportation. públicos provide an essential intercity connection between the SJMA and the rest of the island. Intercity público services provide passengers from the SJMA accessibility and mobility to other parts of the island and visa versa.
- + **Licensing and Routes Regulated:** Público routes and licensing is regulated by the PSC. This ensures a controlled population of público fleet and needed routes based on regional transit needs and necessity. Furthermore, público licensing allows the government to screen potential operators. It also provides market stability and avoid excessive pricing competition.
- + **No Direct Government Operating Subsidy Required:** Presently, públicos receive no direct government operating subsidy. The only forms of indirect subsidy is the occasional building of off-street terminal facilities, mostly funded by the municipalities, and reduced vehicle taxes.
- + **Have Potential to Provide Feeder Services to Line-Haul Transit:** Públicos have the potential to provide quality feeder services to line-haul transit. The demand responsive service characteristic of públicos and their ability to deviate from the main route give them the flexibility to reach farther into low density or harder to reach areas which traditional line-haul transit cannot serve. The Final EIS for the Tren Urbano project predicts that públicos will develop new roles as Tren Urbano becomes operational, and one of such role is providing feeder connections to Tren Urbano.²⁷ It also assumes that público operators are individual decision makers and are capable of making decisions that are responsive to market conditions. In essence, the Final EIS predicts that Tren Urbano will afford important financial benefits

²⁷ U.S. Department of Transportation, Federal Transit Administration and the Government of Puerto Rico, the Department of Transportation and Public Works, and the Highway and Transportation Authority. *Final Environmental Impact Statement: Tren Urbano, San Juan Metropolitan Area, Puerto Rico*. November, 1995.

for público operators with opportunities to expand existing services, attract new riders, and increase revenue. The important issue to consider is whether this assumption will hold true.

Weaknesses/Negative Attributes:

- **Declining Ridership:** Públicos have been faced with declining ridership and market share. In 1964, públicos accounted for 9.2 percent of SJMA's internal person trips. In 1976, that figure decreased to 7.7 percent.²⁸ In 1990, that figure had dropped to 3.7 percent, while automobile use increased from 62.7 to 81.8 to 91.9 percent during the same period.²⁹ In the past five years alone, the público fleet size has decreased by 20 percent.³⁰ In Bayamón, for example, the 1981 público passenger volumes for the Bayamón CBD were approximately 54,543 passengers daily.³¹ By 1987, this volume had reduced to around 39,414 passengers daily. This represented an average 5 percent decrease annually between fiscal years 1981 and 1987. During the same period, automobile registration in Bayamón increased by 5 percent annually.³²

- **Affected by Traffic Congestion:** Públicos are sensitive to conditions on the road and is, therefore, affected by traffic congestion on roadways. Traffic counts taken in 1964, 1970, and 1990 indicate significant traffic growth in the SJMA.³³ An assessment of average daily traffic volumes and levels of service on major roadways in the SJMA indicates that numerous roadways are operating at or above capacity. Of the 90 roadways in the SJMA, 36 segments are operating above capacity throughout the day, 7 segments are operating at 80 percent capacity or more, and another 19 segments are

²⁸ Barton-Aschman & Associates, September 1992.

²⁹ Ibid..

³⁰ Information obtained from a presentation given by Miguel A. Vescovacci of the Management and Technical Consulting Group, Inc. on January 17, 1996 at the University of Puerto Rico, Rio Piedras campus of the UPR-MIT Tren Urbano Research Project Short-Course.

³¹ Management and Technical Consulting Group, Inc. (MTCG, Inc.) *Study and Evaluation of Existing Público Vehicle Terminals in Bayamón, Caguas, and Mayaguez - Final Report*. Department of Transportation and Public Works, MTCG, Inc., November 1989.

³² Ibid..

³³ U.S. Department of Transportation, Federal Transit Administration and the Government of Puerto Rico, the Department of Transportation and Public Works, and the Highway and Transportation Authority. *Final Environmental Impact Statement: Tren Urbano, San Juan Metropolitan Area, Puerto Rico*. November, 1995.

operating between 60 and 80 percent of capacity.³⁴ Furthermore, a high degree of illegal curbside and double parking further restricts street capacity and público access. Given these statistics and the fact that públicos operate on these same congested roadways with automobiles, it can be expected that congestion will worsen in the future and that público levels of service will deteriorate as traffic congestion continues to increase.

- **Service Duplication and Competition with Other Public Modes:** Públicos compete directly with other públicos, AMA and Metrobus on high demand routes. Heated competition between all public modes exists along major corridors such as highways PR-1, PR-2, PR-3, PR-21, and PR-167. Numerous público routes tend to concentrate along these "common" high demand corridors, all competing for the same passengers, including those associated with AMA and the Metrobús. Service duplication and competition between públicos and buses is prevalent in the central SJMA along the Río Piedras - Bayamón corridor, the Bayamón - Santurce corridor, PR-27 to Stop 26 via Barbosa Avenue, and the Río Piedras - Carolina corridor.³⁵
- **Lack of a Centralized Management Structure:** Públicos have a decentralized management system. With the exception of the Bayamón and the Río Piedras Terminal Associations, many público owners and/or operators are not organized in any way. Since there are many owner/operators and route designations, it is often hard to understand who the stakeholders are and who represents the interests of público owners and/or operators.
- **Difficult to Negotiate with or Relay Messages/Information to Público Owners/Operators:** The lack of an organized and centralized público management system makes it especially difficult when negotiating and relaying information to público operators or when the government needs information to plan and improve público services.
- **Lack of Effective Oversight by Public Agency in Terms of Planning and Enforcement:** Until recently, the PSC was the only government agency that

³⁴ Ibid..

³⁵ Barton-Aschman Associates, Inc. *Final Report: Integration of San Juan Metropolitan Region Público and Private Bus Routes into the Metrobus Transportation System*. September 1992.

dealt directly on any level with público services. The DTOP was more oriented towards roadways and large-scale transit planning efforts. Most, if not all, planning and funding efforts (except for local and federal funding used to build público terminals) went to the public sector. The PSC was the only regulatory agency with very limited planning role in dealing with público services. Its main responsibilities were concentrated in route authorization and the establishment of fares. The lack of effective oversight and planning by public agencies has been reflected through the assumption that público operators could readily adhere to any changes, no matter how drastic.³⁶ The irony is that there are some concerns within the PSC that many of the público operators/drivers are getting older in age, and this is perhaps a barrier for them to understand the government's policies and approach to improving the transportation system.

- **Lack of Information on Passenger O-D Travel Patterns:** This type of data is virtually non-existent. Neither the público operators nor the government have attempted to collect passenger O-D travel data.
- **Lack of Information on Passenger Transfer Patterns:** Currently, no data exist on público passenger transfer patterns (what mode they transfer onto or from, average wait time for transfer, etc.).
- **Lack of Reliable/Updated Information on Vehicle Fleet:** Up until recently, information on the público fleet was lacking and dated. Recent efforts by DTOP and PRHTA have attempted to update information on the público vehicle fleet. The effort to give a complete inventory of the público vehicle fleet island-wide is still on-going.
- **Lack of Island-Wide Integration Strategy:** Currently, there are no island-wide público integration strategies being implemented. The 1994 Section 15 data show that of all público trips made on the island, 42 percent were intercity trips to or from outside the SJMA.³⁷ If a little less than half of all público trips originate from or are destined to areas outside of the SJMA and

³⁶ Barton-Aschman Associates, Inc. *Final Report: Integration of San Juan Metropolitan Region Público and Private Bus Routes into the Metrobus Transportation System*. September 1992.

³⁷ Puerto Rico Department of Transportation and Public Works, Puerto Rico Highway and Transportation Authority. *FY 1994 San Juan Público Section 15 Data Collection*. Prepared by Multisystems. December, 1994.

if the integration of public transit within the SJMA is to be successful, a careful evaluation will have to be conducted to assess the need for an island-wide público integration strategy.

- **Lack of Evaluation Techniques and Measures of Efficiency:** Over the years, much of the government efforts on improving public transit and monitoring of service performance were focused upon AMA services. As a result, data collection and analysis procedures to assess AMA operations were implemented. No concentrated effort in a similar manner was made of the private sector.
- **Lack of a Fixed Service Schedule:** (See previous comments from *público user perspective*.)
- **Lack of Service During Low Demand Periods:** (See previous comments from *público user perspective*.)
- **Lack of Evening, Weekend, and Holiday Services:** (See previous comments from *público user perspective*.)
- **Crowded and "Smelly" Vehicles:** (See previous comments from *público user perspective*.)
- **Aging Vehicle Fleet:** (See previous comments from *público user perspective*.)
- **Lack of Air-Conditioning in Many Vehicles:** (See previous comments from *público user perspective*.)
- **Poor Safety and Vehicle Maintenance Records:** (See previous comments from *público user perspective*.)
- **Lack of Public Information on Routes, Schedule, Fares, etc.:** (See previous comments from *público user perspective*.)
- **Poor Image of Públicos as Transportation for the Poor and the Transit-Dependent:** (See previous comments from *público user perspective*.)

- **Lack of "Mixing" Between Different Socio-Economic Groups Within the "Público" System:** (See previous comments from *público user perspective*.)
- **No Fare Integration with Other Public Modes:** (See previous comments from *público user perspective*.)
- **Lack of Intermodal Connections and Integration with Other Public Modes:** (See previous comments from *público user perspective*.)
- **Lack of Handicap Accessibility:** (See previous comments from *público user perspective*.)

3. POTENTIAL PÚBLICO SERVICE IMPROVEMENTS

After tracing the positive and negative attributes of the público system in the previous section, there are potential areas of improvement that can be identified to improve público services. There are four potential areas of improvement:

1. Service Reliability
2. Service Quality
3. Service Performance and Efficiency
4. Management and Planning

3.1 Service Reliability

Currently, públicos do not provide scheduled service. This is an issue that would be important to look at in relations to providing scheduled versus non-scheduled services for regular público and público to *Tren Urbano* feeder services. If headways are short (less than 10 minutes) along high demand routes, then a scheduled service may not make a lot of difference, since most passengers do not consult time tables and since most Puerto Ricans are used to waiting for transit without a time table (they probably would not believe in it if given one). The only situation in which providing a scheduled service would make sense is during off-peak, low demand periods, or during evening and weekends. Eventhough the 1994 Section 15 data suggest that ridership decreases in the early evening and weekend periods, the available data on evening and weekend periods, however, might not reflect just demand than of vehicle and service availability (fleet availability declines sharply after the early afternoon). More analysis will need to be done on evaluating the advantages and cost-benefit of providing scheduled services.

The second issue concerning service reliability is the need to improve intermodal connections. Currently, públicos and other public modes (AMA and Metrobus) are not coordinated in any way. Since the FEIS for *Tren Urbano* estimated that approximately 55 percent of *Tren Urbano* riders will arrive at the stations via bus or público,³⁸ a

³⁸ U.S. Department of Transportation, Federal Transit Administration and the Government of Puerto Rico, the Department of Transportation and Public Works, and the Highway and Transportation Authority. *Final Environmental Impact Statement: Tren Urbano, San Juan Metropolitan Area, Puerto Rico*. November, 1995.

carefully devised plan to integrate different public modes is critical to the success of *Tren Urbano* and the new *transit center* concept plan in San Juan.

3.2 Service Quality

Since the vehicle fleet is aging quickly and there are concerns over both the maintenance and safety conditions, there is a great need to upgrade the existing fleet. Second, the size and equipment of the vehicles are an important consideration when assessing strategies for fleet upgrade. Most públicos that operate within the SJMA are predominantly 14-17 passenger vans. An assessment will have to be made to determine whether the existing vehicle configuration will be able to meet the needs of a future público fleet based on projected demand, operating cost and maintenance considerations. For example, what would be the cost advantages or disadvantages of using smaller vehicles versus larger vehicles (vans versus minibuses or full-size buses)? How would vehicle size affect demand and service frequency? It is clear that using smaller vehicles will provide higher service frequency, compared to using buses. However, using more small vehicles on the road, especially on congested routes, may contribute to more traffic congestion. Finally, there is the need to consider vehicle subsidy issues when considering fleet upgrade. Are all públicos included in the fleet upgrade plan, or will a selected group be upgraded? If a group is to be selected, how will the selection process be devised? What form of subsidy is appropriate to minimize cost and risk to the government while achieving the desired goals? It is apparent that there is a need to analyze the affects of vehicle size on congestion, demand, cost, utilization, and subsidy, etc. when considering público fleet upgrade.

The second area of potential service quality improvements is safety and maintenance standards. Currently, públicos, like all other vehicles, have to pass an annual basic safety inspection when vehicle license fees are paid to DTOP. Second, público license or franchise are renewed every 5 years, in which a formal vehicle inspection is required. Little or no interim inspections are required. Other than the required inspection during license and franchise renewal, the only time the PSC will inspect a vehicle is when the operator goes to PSC to petition an increase in fare or change of services. However, Compared to the públicos, the *taxis turmsticos* (taxis for tourists) are required by PSC to pass an inspection every 3 months. The safety and regular upkeep of the público fleet is, therefore, a major concern. Unsafe and poorly maintained públicos are a safety hazard for the public. They also deter potential new riders from using the system. A new safety and maintenance plan will have to be devised

to ensure that públicos are regularly inspected and meet minimum safety requirements. Some important considerations are:

1. What kind of safety and maintenance standards (on top of the annual license fee inspection) should be imposed on the público owner/operators?
2. What government agency should be in-charge of the regular inspection process?
3. Should some sort of incentives be tied to require público owner/operators to satisfy new safety and maintenance standards set by the government?

Another area of improvement is the provision of public information on público services. Currently, there are no information provided to the public on público services. Information is passed on by word-of-mouth. To ensure that públicos will retain their market niche and attract new riders, especially in anticipation of *Tren Urbano*, it is important that public information on the system be provided. Some important issues to consider are whether the government or the operators should be responsible for providing public information and who should pay for the cost of providing it.

3.3 Service Performance and Efficiency

As ridership declines as a result of poor service quality and performance and públicos face fierce competition with the private automobile and other public modes, there is a need to improve the service performance and efficiency of the público system. Some potential improvements to performance and efficiency may be the use of dedicated/HOV lanes, head-of-the-line priority and signal pre-emption techniques. Recent efforts by some público operators along the Caguas - San Juan route to request the use of a portion of the HOV lane along PR-1 was denied by the PSC. The operators claimed that the use of the HOV lane would reduce their travel time by 30 minutes during the peak periods and help recover lost ridership that went to AMA and Metrobus. It is clear that a detailed analysis will have to be done to explore the benefits of using different traffic management strategies to improve público performance and efficiency. Moreover, no measure of efficiency exists for the públicos. Only recently has the Section 15 data collection effort began to provide some performance and productivity information on the público system. It is clear that there is a need to devise performance measures for the system, especially if the government is to contemplate on providing operating subsidy in the future.

Another area of improving service efficiency is to look at the issue of público service duplication with other public modes. Públicos compete directly with other públicos, AMA and Metrobus on high demand routes. Heated competition between all public modes exists along major corridors such as highways PR-1, PR-2, PR-3, PR-21, and PR-167. Numerous público routes tend to concentrate along these "common" high demand corridors, all competing for the same passengers, including those associated with AMA and Metrobús. Service duplication and competition between públicos and buses is prevalent in the central SJMA along the Río Piedras - Bayamón corridor, the Bayamón - Santurce corridor, PR-27 to Stop 26 via Barbosa Avenue, and the Río Piedras - Carolina corridor.³⁹ While service duplication along many high demand routes may seem like a waste of valuable resources, there has not been any detailed analysis on the merits of having competition of different public modes along a corridor, specifically, whether competition stimulates demand and whether it helps to increase the level of service and improve service quality.

3.4 Management and Planning

Currently, the Public Service Commission is the only government agency that deals directly with the público system. There is evidence, however, that the PSC is under-staffed and unable to provide effective oversight. Other than regulating fares, licensing and route authorization, the PSC is not involved in any planning capacity. As a result, little or no público planning is done on the part of the government. Second, no formal coordination exists between the públicos and other public modes. If públicos are to survive and become an integrated part of the new public transit system, envisioned by the new *transit center* concept and *Tren Urbano*, the government will have to provide a more effective oversight of the system. Better planning and coordination with other public modes (in terms of routing, fare integration, etc.) will have to take place.

Second, públicos have a decentralized management structure. Some owner/operators based in larger terminal facilities, such as Bayamon and Rio Piedras, organize themselves into federations, terminal or route associations. A decentralized management structure often creates conflict within the público system as different terminal and route associations have different interests. Furthermore, a decentralized management structure lends complexity in planning and negotiations with owner/operators. However, compared to a centralized public management structure, the

³⁹ Barton-Aschman Associates, Inc. *Final Report: Integration of San Juan Metropolitan Region Público and Private Bus Routes into the Metrobus Transportation System*. September 1992.

private, decentralized management structure of the público system may be more cost effective and less bureaucratic in implementing transportation strategies. The reality, however, is not clear. There is a need to investigate the advantages and disadvantages of a public versus a private management structure (whether economies of scale exist in large centralized management systems such as AMA) and the merits of keeping a private urban transportation system like the públicos.

4. INTERVENTION SCENARIOS FOR THE EXISTING PÚBLICO SERVICE STRUCTURE

4.1 Intervention Scenarios

Four *intervention scenarios* are presented to illustrate what the government can reasonably expect, if intervention occurs, to improve público services within the **existing** service structure. The fourth intervention scenario deals with possible outcomes if intervention is independent of the existing público service structure.

The four intervention scenarios, and the non-intervention scenario, are:

- **Non-Intervention Scenario:** This scenario assumes that the government **will not intervene** to change existing público operations and that the level of government involvement will remain essentially as it exists (only licensing and route request authorization).
- **One-Time or Limited Intervention:** This scenario assumes that the government will continue to regulate público competition in the marketplace and, in addition, “one-time” or **limited** strategies to improve público prospects.
- **Continuing or Full Intervention:** This intervention scenario involves **longer term, periodic** policies or subsidies over a period of time (1 to 5 years) that the government will implement to improve público services. Incremental intervention strategies are targeted towards operational and service improvements, as compared with typical “one-time” capital improvements such as upgrading the vehicle fleet or the construction of terminal facilities. The rationale is that operational and service improvements need continuing monitoring and revision; therefore, requiring a longer term view. Under incremental intervention strategies, however, the government can make longer term commitments (over a period of 1 to 5 years) to improving público services without straining its financial resources. This intervention scenario also assumes that the government will examine in a more fundamental manner into possible roles in the viability and sustainability

of público services. This means considering different forms of regulation and subsidy for público services. Examples of a full intervention strategy would be to mandate improved safety or maintenance requirements, to upgrade vehicle fleet to meet government-set standards, provide and extend government-prescribed services beyond the existing services, or an overhaul of existing público management structure to extend public oversight and control of all público operations.

- **Deregulation:** Under this scenario, the government will deregulate the público industry and allow individual operators to make their own decisions as to services and standards. No form of direct or indirect subsidies is provided, and the government will apply a “hands-off” approach.
- **Separate Público Service:** Under this scenario a separate público service, independent from the existing system, would be created by the government. Potential services might include separate feeder services to line-haul transit, community feeder, or dedicated worksite or shopping trip services.

4.2 Intervention Strategies

Tables 4.1 and 4.2 presents a list of potential intervention strategies for each of the four scenarios. The potential risks/negative outcomes and benefits/positive outcomes for each intervention strategy are also presented.

Non-Intervention Scenario

If the present público system is left to operate “as is” without restructuring or government intervention to help improve it, many of the negative attributes of the system described earlier in section 2 will likely continue to deteriorate. The advantages, however, is that there will be continued regulated competition by the PSC, and little or no direct government subsidy would be required. However, the like risks are that públicos will continue to deteriorate in service reliability, quality and patronage. Público operating efficiency will likely be affected by traffic congestion. Moreover, mobility for low-income patrons will likely be constrained as service quality and frequency decreases. If públicos are expected to provide feeder services to *Tren Urbano* in year 2001, non-

intervention to improve the público system will likely result in an uncertain future for both the públicos and the role, in the context of *Tren Urbano*, that it is expected to play.

"One-Time"/Limited Intervention Scenario

Intervention Strategies:

1. Provide "One-Time" Financial Support for Vehicle Upgrade

The subsidy for the vehicle upgrade is assumed to be tied to the capital improvement of the fleet. No regular operating subsidy is assumed. A "one-time" vehicle upgrade strategy will likely improve the short term safety and quality of the público fleet. The upgraded vehicles can be held to stricter safety and maintenance standards set by the government. If the upgrade involves new vehicles, it will likely have an important effect on energy use and air quality, as new vehicles are often more fuel efficient and produce less emissions compared to the older fleet. A newer and more fuel-efficient vehicle fleet may help lower the maintenance and operating costs of many público owner/operators. In the short term, it will also help to increase vehicle reliability and help to attract new riders. A "one-time" strategy will also help the government to avoid being involved in long-term financial commitments.

The improvements, however, is a short term "fix" to the problem. The fleet will likely age and need to be replaced or upgraded in 4 to 6 years. Although ridership may increase in the short-run, it will likely decline in the long-run as the quality of the service and the fleet condition begin to deteriorate. Finally, since many of the público drivers also use their vehicles for personal use, there needs to be a monitoring mechanism that ensures that the new vehicles are used to provide público services instead of private use. The PSC has recently found that many público drivers do not work regularly or have other jobs while still receiving car allowances from their route associations. The PSC has found that only 50 percent of the operators usually work full-time, while 20 percent work part-time and 30 percent are not operating públicos at all.⁴⁰ The issue of upgrading the fleet then becomes a complex issue. The process of selecting which público operator(s) are allowed to receive government subsidy for vehicle upgrade will

⁴⁰ Information obtained from Carmen Gonzalez, Tren Urbano Office and Esteban Rodriguez, Public Service Commission.

Table 4.1: Intervention Strategies and Potential Benefits/Positive Outcomes and Risks/Negative Outcomes

Scenarios	Intervention Strategies	Potential Benefits/Positive Outcomes	Potential Risks/Negative Outcomes
Non-Intervention	- None -	-Continued Regulated Competition -No Need For Direct Government Subsidy	-Continued Deterioration In Service Reliability, Quality And Patronage -Público Operating Efficiency Affected By Traffic Congestion -Constrained Mobility For Low-Income And Transit-Dependent Patrons -Inadequate feeder service to Tren Urbano
"One-Time"/ Limited Intervention	1) Provide "One-Time" Financial Support For Vehicle Upgrade	-Safer And More Comfortable Vehicle Fleet -More Fuel Efficient Vehicle Fleet (Energy And Air Quality Implications) -Less Maintenance And Vehicle Reliability Problems -Short-Term Improvement To Image Of Público Services -Potential To Attract New Riders; Minor Short-Term Increase In Ridership	-Short-Term Improvements To Vehicle Fleet; Likely To Age And Need To Be Replaced In 4 To 6 Years -Patronage Still Likely To Decline In The Long-Run -Need to ensure vehicles are used for Público services
	2) Provide "One-Time" Government Support For Construction Of Terminal And On-Street Facilities	-More Público Terminal And On-Street Facilities -Improve Image Of Público Services -Potential To Attract New Riders	-Need Funding Or Subsidy For Continued Maintenance Of Terminal Facilities -"One-Time" Terminal Facilities Improvement Only
	3) Conduct "One-Time" Industry-Wide And Público Passenger Data Collection Effort	-More Complete Data On Público To Help Government Assess Needs Of The Industry -Provide Accurate Público Passenger Data For Planning And Modeling Purposes	-Data Collection Effort Costly And Time-Consuming For The Government -Needs Cooperation Of Público Owner/Operators -Not Historical Data-"One-Time" Data Collected Only Valid For A Few Years
Continuing Or Full Intervention	1) Require Scheduled Service On Low Demand Routes, Plus Evening, Weekend, Holiday And Adequate Off-Peak Services Through Operating Contracts	-More Service Reliability On Low Demand Routes -More Convenient Trip Planning For Potential Patrons Through Fixed Schedule Service -Potential To Attract New Riders -Better Service Reliability During Evening, Weekend, Holiday & Off-Peak Periods -Better Service Connectivity To Other Public Modes During Evening, Weekend, Holiday & Off-Peak Periods -Continued Regulated Competition -Relieve Financial Burden Of Owner/Operators -Potential To Induce Better Service Quality And Reliability -Longer-Term Improvement To Image Of Público Services -Potential Increase In Ridership & Revenue -Potential Market Entry Of New Owner/Operators	-Require Monitoring And Enforcement Of Schedule Adherence -Require Long Term Financial Commitment In Return For Service -Entering Contractual Relationship With Público Owner/Operators May Cause Complications -Must Devise Method Of Selecting Which Owner/Operators To Contract With
	2) Provide Subsidy In Form Of A Loan Or Monthly Payments For Vehicle Upgrade, Plus Required Minimum Regular Maintenance Standards	-Safer And More Comfortable Vehicle Fleet -More Fuel Efficient Vehicle Fleet (Energy And Air Quality Implications) -Less Maintenance And Vehicle Reliability Problems -Improvement To Image Of Público Services -Potential To Attract New Riders	-Require Long Term Financial Commitment In Return For Service -Entering Contractual Relationship With Público Owner/Operators May Cause Complications
	3) Require Min. Safety Standards Through Regular Vehicle Inspection as Prerequisite for Receiving Operating Contracts	-Safer And More Reliable Vehicle Fleet -Better Maintained Vehicle Fleet -Improvement To Image And Reliability Of Público Services	-Require Monitoring And Enforcement Of Adherence To Safety Standards -Require Long Term Financial Commitment By The Government To Provide Operating Subsidy
	4) Require Provision Of Public Information On Público Services	-Better And More Complete Public Information On Público Services -More Convenient Trip Planning For Potential Patrons -Improvement To Image Of Público Services -Potential To Attract New Riders	-Público Information Must Be Updated Periodically -Must Determine Who Is Responsible For Updating Público Service Information (Government or Público Operators) -High Cost Involved In Providing Updated Public Information
	5) Require Fare Integration With Other Public Modes	-Promote Image Of A "System" Through "One-Fare" Policy -Potential To Encourage Transfers Between Modes -Potential To Increase Ridership On Públicos And Other Public Modes	-Difficult To Distribute Revenue Across Different Modes -Difficult For Público Owner/Operators To Integrate Fares When They Are Used To Receiving "Take-Home" Revenue At The End Of The Day
	6) Require Consistent Reporting Of Público Data Through Financial Incentive Schemes	-More Complete Data On Público To Help Government Assess Needs Of The Industry -Provide Accurate Público Passenger Data For Planning And Modeling Purposes	-Require Long-Term Financial Commitment By Government -Require Public Agency To Facilitate & Oversee Data Collection Efforts
	7) Government To Devise Criteria For Measures Of Efficiency Through Incentive Schemes	-Government-Set Standards To Facilitate Interest Of The Public -Improve Service Efficiency And Reliability -Ability For Government To Monitor Operations And Service Productivity -Ability To Have Real And Achievable Goals	-Must Determine Which Public Agency Is Responsible -Require Monitoring And Enforcement Of MOE -Compliance And Enforcement Issues May Complicate Government And Público Industry Relations
	8) Bring Público Management Under Government Control	-A More Centralized Management Structure -More Public Oversight Of Público Operations -Better Long-Term Planning Of Público Services By The Gov. -Better Service Coordination With Other Public Modes -Reduce Service Duplication -Availability Of Public Subsidy For Público Operations	-High Cost To Government -Likely Complicated Enforcement And Monitoring Issues -Need For A Public Agency To Be Responsible For Planning And Enforcement -Too Complicated For Gov. To Deal With Many Independent Owner/Operators

Table 4.2: Intervention Strategies and Potential Benefits/Positive Outcomes and Risks/Negative Outcomes

Intervention Scenarios	Intervention Strategies	Potential Benefits/Positive Outcomes	Potential Risks/Negative Outcomes
Deregulation	1) Eliminate Pricing Regulation	<ul style="list-style-type: none"> -No Need For Any Government Subsidy -No Need For Government Enforcement Or Monitoring -Allow Differentiation of Product and Services (Potential for Premium Público Services) 	<ul style="list-style-type: none"> -Fierce, Unregulated Competition -Unregulated Random Market Entries And Exits -Unstable Público Industry
	2) Allow Público Owner/Operators To Freely Create Or Terminate Route	<ul style="list-style-type: none"> -No Need For Any Government Subsidy -No Need For Government Enforcement Or Monitoring -Público Service Based On Perceived Demand And Economic Viability Of Routes -High-Frequency Service Along High Demand Routes 	<ul style="list-style-type: none"> -Fierce, Unregulated Competition -Little Or No Service Along Low Demand Route -Service Reliability, Quality and Patronage Likely To Deteriorate Over Time
Separate Público Service	Contract-Out Separate Público Service To Público Owner/Operators (Capital And Operating Cost Subsidized By The Government)	<ul style="list-style-type: none"> -Ability To Employ Existing Público Owner/Operators As Potential Service Contractors -Separate And Independent Público Service Unlikely To Be Affected By Poor Image Of Existing Services -Potential To Achieve Service Differentiation -Potential To Provide Better Service Reliability And Quality -Better Maintained Vehicle Fleet -Potential To Integrate Fares With Other Public Modes -Potential To Employ Or Experiment With ITS Technology (AVL, AVI, Signal Preemption, Etc.) -Potential Immediate Improvement To Image Of Público Services -Potential To Attract New Riders -More Public Oversight Of Público Operations -Government Control Of Operations And Service Provisions -Potential For Better Long-Term Planning Of Público Services By The Gov. -Potential For Better Service Coordination With Other Public Modes -Potential To Employ As Feeder Service To Line-Haul Bus Or Rail Transit (Tren Urbano) -Potential To Act As "Model" For Traditional Público Services 	<ul style="list-style-type: none"> -Still Need To Deal With Existing Público Owner/Operators -Require Monitoring And Enforcement To Ensure Adequate Service Is Provided -Require Long Term Financial Commitment By The Government -Entering Contractual Relationship With Público Owner/Operators May Cause Complications -Must Devise Method Of Selecting Which Owner/Operators To Contract With -Have Potential To Compete With Traditional Público Services



need to be determined. From the owner/operators' perspective, there may be additional legal requirements related to the fleet upgrade, such as additional insurance and licensing requirements, that may make it difficult for some to bear financially.

2. Provide "One-Time" Government Support For Construction Of Terminals And On-Street Facilities

Most existing público terminal facilities were built by funding from local municipalities. No regular government strategy exist to build or maintain new or existing terminal and on-street facilities. The construction of terminal facilities are often done based on need and the availability of funding. Many on-street shelters and facilities for público riders are often lacking or in serious need for repair. A "one-time" government funding and political support to build new terminal and on-street facilities will likely help improve the image of the público system. The terminal facilities will help to provide more stationing areas for públicos and the on-street sheltered facilities will likely help to make it more comfortable for waiting passengers to avoid the harsh weather of Puerto Rico (sudden rains and scorching heat). In the short-run, it will likely help to attract new riders or retain the existing clientele. For the long-run, however, there is still a need for continued funding for the regular upkeep and maintenance of the terminal and on-street facilities. A "one-time" strategy is not sufficient to address long term maintenance and need issues.

3. Conduct "One-Time" Industry-Wide and Público Passenger Data Collection Effort

Since público data is very scarce and incomplete, especially for origin-destination information at the trip level, a "one-time" system-wide data collection effort will help to provide more information on passenger origin-destination, passenger preference, transfer patterns, and fleet and owner/operator information. The data can help the government to assess the needs of the system as well as the entire público industry. The data can also provide accurate information for planning and modeling purposes.

The disadvantages, however, of a "one-time" data collection effort are that it is costly and time-consuming for the government. Without periodic updates, the data will become useless in matter of time. Second, the industry-wide data collection effort to obtain information on fleet and owner/operator information will need the cooperation of

público owner/operators. It is unclear whether the effort to obtain proprietary information will be met with resistance.

Continuing or Full Intervention Scenario

Intervention Strategies:

1. Require Scheduled Service on Low Demand Routes, Plus Evening, Weekend, Holiday, and Adequate Off-Peak Services Through Operating Subsidies

This strategy stipulates that in order to receive operating subsidy, the owner/operator must provide a certain level of service. This strategy has the potential to require scheduled services to ensure more service reliability on low demand routes, more convenient trip planning for potential patrons. It also has the potential to require owner/operators to extend their hours of operation and provide better service reliability and service connectivity to other public transit modes during evening, weekend, holiday and off-peak periods. It ensures continued regulated competition through the PSC or any other government agency that is put in-charge. It also helps to reduce the financial burden of owner/operators in terms of operating expenses. An operating subsidy provides a longer-term improvement to image of público services and has the potential to increase ridership and revenue. It also allows for the potential market entry of new owner/operators.

The risks, however, is that a periodic subsidy requires monitoring and enforcement of promised service and schedule adherence, and it require long term financial commitment on the part of the government. It requires the government to enter into a contractual relationship with público owner/operators. A method or process will have to be devised to determine which owner/operators qualifies for subsidy.

2. Provide Subsidy in Form of a Loan or Monthly Payments for Vehicle Upgrade, Plus Require Minimum Regular Maintenance Standards

This strategy is aimed at capital and maintenance improvements of the vehicle fleet. The subsidy can either be provided in the form of a low interest loan or a monthly subsidy tied to capital improvements. The result is a safer and more comfortable vehicle fleet, a more fuel efficient vehicle fleet (has energy and air quality implications) with less maintenance and vehicle reliability problems. Improvements to the fleet will also help to

improve the image of the público system and help attract new riders. The disadvantages of the strategy are that it requires long-term financial commitment in return for service and requires the government to enter into a contractual relationship with público owner/operators. The need for monitoring and enforcement penalties will also become important issues. Furthermore, since many of the público drivers also use their vehicles for personal use, there needs to be a monitoring mechanism that ensures that the new vehicles are used to provide público services instead of private use.

3. Require Safety Standards Through Regular Vehicle Inspection as a Prerequisite for Receiving Operating Subsidy

Currently, the PSC only requires públicos to go through a full inspection every five years when licenses are renewed. In the interim, no regular vehicle inspection exclusively for the públicos is required. Compared to the públicos, the *taxis turmsticos* (taxis for tourists) are required to pass an inspection every three months. This strategy is aimed at tying the operating subsidy with a required safety and maintenance standard. The outcome of this strategy is likely to be a safer and better maintained vehicle fleet. The likely disadvantages is that the strategy requires monitoring and enforcement of adherence to safety standards. It requires a long-term financial commitment by the government to provide operating subsidy.

4. Require Provision Of Public Information On Público Services

Since no public information exists for público services, the strategy to require the provision of public information will no doubt help to better educate the traveling public about public transportation options. It will help improve the image of the público system and have the potential to attract new riders. The provision of public information will ensure better and more complete public information on público services and more convenient trip planning for potential patrons. The disadvantage is that público information must be updated periodically and the government must determine who is responsible for updating público service information (government or público operators). Moreover, there is likely to be a high cost involved in providing regular updated public information on públicos.

5. Require Fare Integration With Other Public Modes

This strategy assumes that some público owner/operators would volunteer to participate in a fare integration program. It assumes that transfer passes will be given

and accepted on públicos when a passenger transfers from another public mode onto a público, or from a público to another public mode. The operators can then redeem the cash value of a transfer pass. The strategy helps to promote an image of a "system" through a "one-fare" policy. It has the potential to encourage transfers between modes and increase ridership on públicos and other public modes. The likely risk is that it is difficult to distribute revenue across different modes, and it is difficult for público owner/operators to integrate fares when they are used to receiving "take-home" revenue at the end of the day. Furthermore, it may be hard to convince existing operators to participate in the program without some sort of incentives by guaranteeing that their current revenue base will not decrease.

6. Regular Data Collection Effort

Since público data is scarce, the government should conduct regular data collection efforts. Since 1994, through the Section 15 data collection effort, the government has begun to collect consistent público data. Fleet and industry-wide data collection efforts, however, have been minimal and scarce. More complete data on público can help the government to assess the needs of the industry and provide accurate público passenger data for planning and modeling purposes. The disadvantage is that data collection is often costly and periodic updates are required.

7. Government To Devise Criteria For Measures Of Efficiency Through Incentive Schemes

Eventhough públicos are private enterprises and are only interested in profit and not efficiency, from the government's perspective, efficiency is important when a public service is provided. Efficient operation ensures that the needs are served at an acceptable quality. Because públicos are private enterprises, they are likely to seek their own individual interests. There is, therefore, a need for the government to set standards to facilitate the interest of the public and improve service efficiency and reliability. Moreover, the government has the ability to monitor operations and service productivity. The difficulty of requiring measures of efficiency is that the government must determine which public agency is responsible for monitoring and enforcement. Moreover, compliance and enforcement issues may complicate government and público industry relations.

8. Bring Público Management Under Government Control

Since the público management structure is decentralized and there are many owner/operators and route designations, it is often hard to understand who the stakeholders are and who represents the interests of público owners and/or operators. The lack of an organized and centralized público management system makes it especially difficult when negotiating and relaying information to público operators or when the government needs information to plan and improve público services. As a result, this strategy essentially attempts to make público operations public. The potential benefits are: 1) a more centralized management structure, 2) more public oversight of público operations, 3) better long-term planning of público services by the government, 4) better service coordination with other public modes, and 5) reduce service duplication. The likely difficulty is that this strategy is likely to be very costly for the government. Furthermore, it will likely become a complicated enforcement and monitoring issue and need a public agency to be responsible for planning and enforcement. With so many individual owner/operators, it would be too complicated for government to deal with each of them.

Deregulation

Intervention Strategies:

1. Eliminate Fare Regulation

Currently, the PSC regulates the maximum fare público operators are allowed to charge. Surcharges are allowed for operators who provide services in the evening. Fares are distance based. Deregulation would mean that operators would be able to set their own prices based on market demand. Públicos operating during the peak period and along high demand routes can charge higher fares to increase their income, and similarly, fares can be adjusted during off-peak periods to reflect demand. The elimination of fare regulation can also help to differentiate different types and levels of service. It also allows the potential for a premium público service aimed at higher-end users (and perhaps *Tren urbano* users). Another advantage of deregulation is that the government will not need to provide any form of subsidy. The need for enforcement and monitoring of fares can be eliminated. Valuable resources previously utilized at the PSC to monitor and regulate público fare activities can be redistributed.

The risk of eliminating fare regulation, however, is that it may result in fierce, unregulated competition with high fares. Furthermore, certain high demand corridors will be over-served while others will be under-served. It may also result in an unstable público industry. The financial implications of fare deregulation is still unclear. More detailed analysis will have to be done to explore the possible outcomes.

2. Allow Público Owner/Operators To Freely Create Or Terminate Route Services

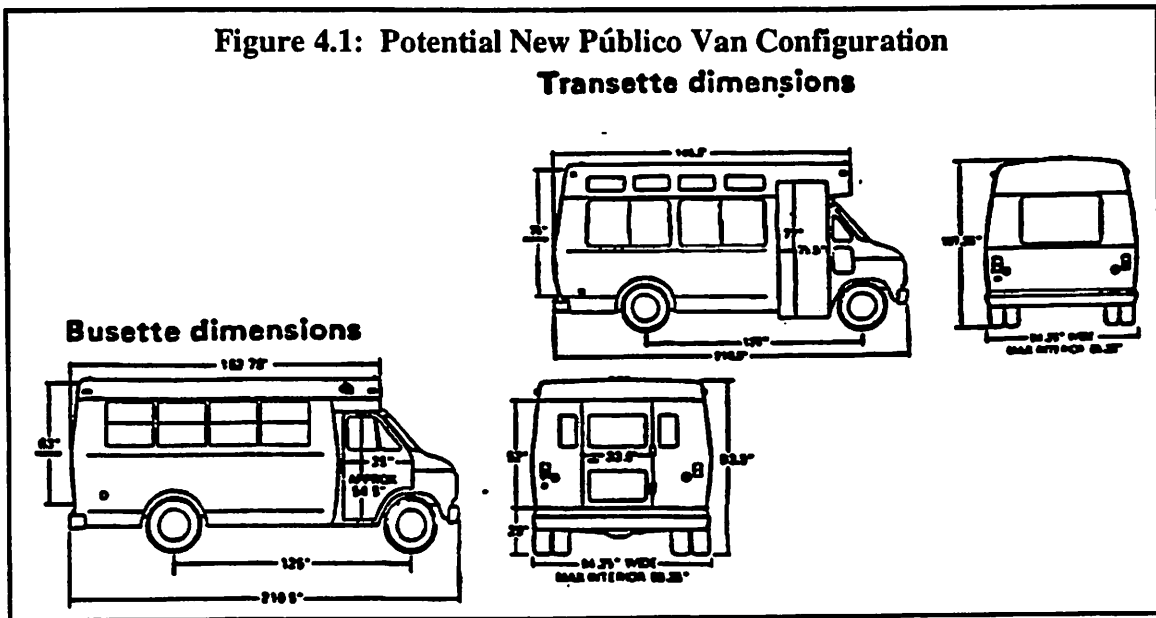
This deregulation strategy assumes that the request for creation and termination of route services will no longer be done at the government (PSC) level but instead, at the público terminal and route association level. The advantage of this strategy is that there is no need for government enforcement or monitoring. The provision of público services will likely be based on perceived demand and economic viability of the routes. High demand routes will continue to receive high frequency service. The disadvantages are likely to be fierce, unregulated competition, little or no service along low demand routes. Furthermore, service reliability, quality and ridership are likely to deteriorate over time as certain high demand corridors are over-served while others are under-served.

Separate Público Service

Intervention Strategy:

Contract-Out Separate Público Service To Público Owner/Operators (Capital And Operating Cost Subsidized By The Government)

A separate contracted-out público service assumes that existing público operators will be used as drivers. The function and types of services provided, however, may be different from the existing system. The idea is that an operating subsidy would be provided in return for providing a certain quality and level of service specified by the government. The capital cost of acquiring a new vehicle (separate types with logos and same color scheme and a raised roof to allow handicap accessibility) can also be subsidized by the government (see Figure 4.1 for example of a potential separate público service vehicle configuration). The regular operating subsidy would help to ensure a better maintained fleet. This strategy allows for a separate público system, independent of the existing system. It has the potential to achieve service differentiation and avoid being plagued by the poor service quality and negative images of the existing system. It has also has the potential to provide better service reliability and quality by specifying the



provision of a scheduled service with regular headways and extended hours of operation in the contract. The fact that the service receives regular government subsidy, it has the potential to integrate fares with other public modes, as well as employ or experiment with different ITS technologies (AVL, AVI, signal preemption, etc.).

From a management perspective, a separate contracted service will ensure more public oversight of público operations through government control of operations and service provisions. Furthermore, it has the potential for better long-term planning of público services and better service coordination with other public modes. A contracted service also has the potential to be employed as feeder service to line-haul bus or rail transit (*Tren Urbano*) and to act as a "model" for traditional público services. Immediate improvements to the image of público services and potential to attract new riders are likely.

The risk, however, of a separate contracted service is that the likely contractors will be existing público owner/operators and that the government will still need to deal with them. The contracted service will require monitoring and enforcement to ensure adequate service is provided, maybe at a more involved level than the current PSC role. Furthermore, the separate service has the potential to compete with traditional público services. The separate service will also require long-term financial commitment by the government to enter into a contractual relationship with público owner/operators. Moreover, a method or process must be devised to select the appropriate público owner/operators to contract with.

5. EXPERIENCES FROM OTHER URBAN AREAS

A preliminary analyses of experiences of running private paratransit services similar to the públicos in San Juan are presented in this section. Similarities and differences between the selected cities or metropolitan areas will be presented as a basis for comparison and analysis with the SJMA experience. Different models for operating jitney/paratransit services will also be presented and evaluated as to their role and potential benefits to the regions they serve. Some of the work are still ongoing, and new information will be supplemented as they become available.

5.1 Caracas, Venezuela

Jitneys in Caracas are called "carros por puestos." Vehicle types include jeeps, 6-seat sedan cars, or 11-seat minibuses. In 1979, there were 6,000 registered *por puestos* with 90 percent of them having a carrying capacity of 9 or more passengers. In 1966, the *por puestos* served 17.7 percent of all public transport trips; in 1975, this figure increased to 23.5 percent, and in 1979, *por puestos* carried 38.4 percent of all public transport trips. They operate mainly on fixed routes with peak period headways between 36 seconds and 3 minutes. The fares are fixed, and entry is regulated and restricted by the government. In 1979, an estimated 6,000 taxi-cabs operated as "pirate"⁴¹ *por puestos* during peak periods and along high-demand routes.

A 1979 survey⁴² conducted by the Universidad Simon Bolivar found that the *por puestos* captured 47 percent of the transit market in Caracas. Approximately 90 percent of the vehicles were found to have a 12 to 16 passenger capacity. Approximately 23 percent of *por puestos* routes were below 10 km in length, 41 percent between 10 and 20 km, and 36 percent above 20 km. *Por puestos* were found to organize by associations, with 5 to 300 vehicles per association. Members pay dues to affiliated associations. Drivers change routes after consulting with passengers to go faster or detour to avoid congestion. *Por puestos* absorb additional demand from bus transport and offer passengers flexibility, speed and an alternative from regular bus transit.

⁴¹ "Pirate" taxi-cabs operate with disregard for statutory requirements.

⁴² Cajiao, 1979.

In 1983, the Metro system began operations in Caracas. The purpose for looking at por puestos in the Caracas area is to identify and evaluate the roles the por puestos played before and after the introduction of the Metro. Relevant experiences from Caracas will shed light on the potential roles jitney-type systems can play in a pre-rail based and a post-rail based urban transport environment.

5.2 Dade County, Miami

Dade County, Miami presents an interesting example of recent U.S. experiences in operating jitney services. Since most jitney drivers or operators in Miami, as well as many patrons, are Caribbean immigrants from Central or Latin America who operate jitanes much like how it is operated in Puerto Rico, it would be interesting to see what lessons can be learned from the jitney services that is literally a transplant from Central America. A 1992 study by the Urban Mobility Corporation (UMC) for the Federal Transit Administration found that jitanes carry an average of 110-120 passengers per vehicle per day with an estimated total of 43,000 to 49,000 passengers per weekday and approximately 946,000 to 1,078,000 riders per month. These figures represented approximately 23 to 27 percent of the weekday Metrobus ridership of 183,000 and 18 to 20 percent of the weekday public transit system ridership (Metrobus, Metrorail, Metromover and Paratransit) of 244,000. It also found that the jitney fleet in Miami consisted of nearly 400 vehicles. Jitney operating costs were estimated within the range of \$70 to \$75 per day.

As part of the 1992 UMC study, an independent survey was also conducted by behavioral Science Research Inc. of Miami. The survey found that jitanes have developed a market of their own, instead of siphoning off riders from the public bus system. More than 50 percent of the respondents indicated they "always ride the jitney." Only 31 percent said they would either use the bus or the jitney, depending on which vehicle arrived first. Approximately 30 percent of the respondents indicated that if jitanes were not available, they would rather use other modes of travel than the Metrobus. Jitney riders were found to be predominantly low-income workers (78 percent of respondents earned below \$20,000 per year). Approximately 53 percent of the respondents were non-English speaking or recent immigrants. Approximately 65 percent of the respondents said they were drawn to the jitanes because of faster service to their desired destination, and 21 percent said they ride jitanes because they were less expensive. The survey found strong evidence to conclude that jitanes were successful in

carving out its own independent market niche and developed a loyal clientele that considers them their travel mode of choice.

In September 1992, approximately two weeks after Hurricane Andrew, the Metro-Dade Transit Agency (MDTA), with financial assistance from the Federal Emergency Management Agency (FEMA), contracted with four private van and minibus companies to provide transportation relief to the disaster areas. Many private jitney owner-operators were recruited to supplement the vehicle fleet and enlisted in the program under the four prime contractors. The MDTA negotiated a \$28/hour standard turnkey rate⁴³ (revenue service plus deadhead hours) with the four prime contractors. The prime contractors subcontracted service to private providers at the rate of approximately \$21 per hour. A total of 12 fixed routes were established. The spine of the system was South Dixie Highway (US 1) between the Dadeland South Metrorail station and Florida City (15 miles). Feeder services branched out from the Metrorail station and points along the route, penetrating into adjoining residential, commercial, industrial and agricultural areas. Over 200 private vans, jitneys and minibuses were in operation in the impacted areas. The jitneys and vans operated on 5 and 10 minute headways. Typical operations lasted from 12 to 18 hours a day. Operations in the South Dixie Corridor only lasted 20 hours a day, designed to match the operating hours of Metrorail. Service is free to all users. Service adjustments and schedule changes were made daily to respond to changing transportation needs and travel patterns in the disaster impacted areas. In March 1993, the system was carrying an average of 20,500 riders daily.⁴⁴

As a result, the emergency transportation program demonstrated the feasibility of providing high-volume, high-frequency transit service utilizing exclusively small vehicles. The program showed the practicality of complementing regular transit service with private contracted service at an adequate level of control and quality and at an economically attractive cost of \$28 per hour. The program demonstrated the ability of the contracted services to adapt rapidly to fluctuating demand and changing travel patterns. Dade County's experience proved that compliance by private jitney operators to local safety, insurance and other requirements could be achieved quickly and effectively with the help of economic leverages, without relying on regulatory and police action which could be costly and time consuming. After the 1992 Hurricane Andrew and the termination of FEMA's financial support, the jitney market in Miami has declined

⁴³ The turnkey rate included cost for vehicles, drivers, insurance, maintenance, dispatching and normal on-street supervision (Federal Transit Administration. *Private Sector Briefs*, March 1993).

⁴⁴ The ridership figures were provided by the service contractors.

sharply. Presently, there are 21 private jitney certificate holders, serving 13 routes in Dade County. The prevalent vehicle type used are 15-passenger vans.

5.3 New York City, New York

Jitneys operate both legally and illegally in New York City. Similar to Miami, many jitney drivers and operators are also recent immigrants from the Caribbeans. During a transit strike in 1980, unauthorized private jitneys operated both as local and feeder services to the Long Island Railroad Station in Jamaica (Southeast Queens). Popularly referred to as *vans*, New York jitneys continue to operate along well-established and heavy transit demand corridors in the Brooklyn and Queens areas of New York City. They frequently run along or parallel to major bus routes. Therefore, looking at the experiences in New York City will help contribute to our understanding of how private jitneys can serve as complimentary and feeder services to transit. In 1993, a study⁴⁵ documented the findings of jitney enforcement efforts in New York City and their applicability to Dade County.

The study found that jitney operation was quite a political issue among New York City politicians. Most hoped that jitneys and buses could coexist. City politicians see jitney licensing as a revenue generator for the city, as well as a source of increased employment opportunities to the community. Integrating jitneys into the public transportation system was seen as a long-term goal. Safety was viewed as paramount, since many illegal jitneys operated without license and were often uninsured and uninspected. Other immediate concerns included reliability, efficiency and equity. Transit unions were viewed as a major stumbling block in integrating jitneys into the transit system. Transit perspectives on jitney operations were found to be mixed. But in conjunction with service improvements or fare initiatives, jitney enforcement was found to be effective. The study concluded that the most promising method of integrating jitneys into the transit system is to allow jitneys to serve existing areas or neighborhoods along under-served bus routes. The study also found that cooperation between the union and the transit agency is necessary in resolving jitney issues.

⁴⁵ The Center for Urban Transportation Research (CUTR) of the University of South Florida undertook a study for the Metropolitan Dade County, Florida to examine jitney enforcement strategies in other major U.S. cities (Boyle, 1993).

5.4 Riyadh, Saudi Arabia

In 1992, the Saudi Arabian Public Transport Company (SAPTCO) commissioned a study to gather public transit information and data in Riyadh.⁴⁶ The findings would be used to help manage and improve Riyadh's competing bus transit and private jitney operations. The study found that private jitneys, also known as the *Minibus Paratransit System* (MPS), operated with 25 passenger minibuses since 1979. The minibuses were run by private owner-operators with a vehicle fleet of 671 minibuses on weekdays and 1,100 on weekends. The differences in fleet size between the weekdays and weekends may indicate that many of the minibus owner-operators have other jobs on the weekdays and use their vehicles to generate additional income on the weekends. They provided demand-responsive service with no schedules. Patrons have the ability to flag minibuses at any street corner and get off upon request. The data collection effort found that minibuses competed with public bus transit on high-demand routes.

The data collection effort also found that the minibuses had an average ridership of 75,000 passengers per day on weekdays and 95,000 passengers per day on weekends. Minibuses were found to make an average of 6,095 vehicle trips per day on weekdays and 6,659 trips per day on weekends. The average headway was 3 minutes for weekends and 5 minutes for weekdays. Average waiting time was 3 minutes on weekends and 7 minutes on weekdays. The analysis found that it costs 60 percent less to operate minibuses than to operate transit buses. Minibuses were found to produce more daily vehicle trips than transit buses (6,095 versus 895 vehicle trips on weekdays and 6,659 versus 948 vehicle trips on weekends). Compared to transit buses, the minibuses have shorter service headways and less out-of-vehicle waiting time. Compared to the minibuses, the transit buses were less reliable (only 50 percent of the trips were on time and 42 percent of the scheduled trips were not undertaken).

The study documented that Riyadh's city officials face two dilemmas: 1) how to serve the areas that lost public transportation services, either minibuses or SAPTCO buses, and 2) how to integrate the minibuses into Riyadh's public transportation system without harming the SAPTCO bus market. The study recommended 1) to regulate minibus operations through cooperative associations to coordinate minibus activities and 2) to identify separate markets to be served by minibuses and regular transit buses.

⁴⁶ The study was conducted through the Research Center, College of Engineering, King Saud University.

5.5 Manila, Philippines

Popularly known as "jeepneys", the jitneys in the Philippines is a major form of public transportation. Jeepneys are surplus US military jeeps from WWII converted to extended-body 12 to 15 passenger jeeps. Approximately 75 percent of Metro Manila residents use public transport; of those who use public transport, 77 percent use jeepneys. Around 1985, an estimated 36,000 jeepneys operated in Metro Manila and 9,000 operated without a franchise. Jeepneys covered 610 km of Metro Manila roads while buses covered 310 km. Fares are regulated and set by the government. The research will look at the role and impact of jeepneys in Metro Manila; especially, the role and impact of jeepneys to the LRT, the elevated rail system.

5.6 Kuala Lumpur, Malaysia

Jitneys in Kuala Lumpur are 16-seat "minibuses" with no standing permitted. In 1978, there were 400 minibuses with 17 routes and carried 19 percent of total person trips. The minibuses provide demand-responsive service, and fares and routes are regulated by the government. Most minibuses are owned by operators with small fleets. Approximately 65 percent of licenses are held by single-unit enterprises. Kuala Lumpur is planning to open the first phase of its light rail transit system to operation in 1996. The Sistem Transit Alvia Ringan (STAR), as it's called, has similar characteristics to Tren Urbano in the SJMA. One of the main purpose for building the STAR is to relieve congestion in Kuala Lumpur. The purpose for looking at Kuala Lumpur is to see how jitneys there were evaluated and planned in anticipation of the coming of a new rail system to Kuala Lumpur.

6. RESEARCH PROGRESS

6.1 Research Direction

The content of this research has evolved over the past nine months. From understanding and documenting the overall conditions of the existing público system (presented in section 2), the research evolved to looking at what strategies can be devised to help improve the system (presented in sections 3 and 4). To further narrow the scope, this research will attempt to concentrate on the feeder aspect of the público system, specifically in looking at feeder functions of small vehicles (públicos) as compared to large vehicles (AMA). Each issue will be tied to *Tren Urbano*, specifically in looking at the operational issues (appropriate vehicle size, scheduled vs. non-scheduled service), cost issues (cost of large vs. small vehicles, utilization), management issues (a centralized public management structure versus a decentralized private management structure, the advantages and disadvantages of each management structure in terms of operational and institutional efficiency), and strategies for setting up a potentially effective feeder service to *Tren Urbano*. In light of recent developments in San Juan, the possible demonstration plan of supplementing AMA with públicos on a few poorly served AMA routes would be a good case study to look at, since there are very few of such cases around.

The following are four important aspects of the público feeder issue that the remainder of this research will attempt to address:

1. ***Cost of Providing Feeder Service in Relations to Vehicle Size:*** What would be the cost advantages or disadvantages of using smaller vehicles versus larger vehicles (vans versus minibuses or full-size buses) to serve *Tren Urbano* users? How would vehicle size affect demand and service frequency? It seems obvious that using smaller vehicles will provide higher service frequency, compared to using buses. However, using a larger number of smaller vehicles on the road, especially on congested routes, may contribute to more traffic congestion. Therefore, there is a need to analyze the affects of vehicle size on congestion, demand, cost, utilization, etc. Second, públicos should be compared with AMA for the analysis to provide a perspective and frame of reference. The comparison is important in

evaluating the two systems: públicos - private, decentralized management structure, small vehicles - and AMA - public, centralized management structure, large vehicles.

2. ***Scheduled versus Non-Scheduled Service and Expanded Hours of Operation:*** This is an issue that is important to look at in relations to providing scheduled versus non-scheduled services for público to Tren Urbano feeder services as well as regular público services. If headways are short (less than 10 minutes) along high demand routes, then a scheduled service may not make a lot of difference, since most passengers do not consult time tables and since most Puerto Ricans are used to waiting for transit without a timetable (they probably would not believe in it if given one). The only situation in which providing a scheduled service would make sense is during off-peak, low demand periods, or during evenings and weekends. The Section 15 data seems to suggest that demand in the early evening and weekend periods are low (especially on Sundays). However, the available data on evening and weekend periods may not simply be a reflection of demand than it is of vehicle and service availability (the data suggests that fleet availability declines sharply after the early afternoon). Furthermore, if the current público hours of operation is from 7 AM to approximately 6 PM and the expected hours of operation for *Tren Urbano* is 5 AM to 1 AM, there will be a serious lack of schedule and service coordination if públicos are expected to provide feeder service to *Tren Urbano*. More analysis will need to be done on evaluating the advantages and cost-benefit of providing scheduled services and expanded hours of operations on públicos.
3. ***Institutional Issues (a Public versus a Private Management Structure):*** What are some of the advantages and disadvantages of a public versus a private management structure? It would be interesting to compare the públicos with AMA to provide a perspective on the merits of keeping a private urban transportation system alive. Furthermore, the research will attempt to analyze institutional issues related to the cost and economies of scale of a private versus a public transit management structure in providing a quality level of service for transit users.
4. ***Short Term versus Long Term Objectives and Strategies of Achieving Objectives:*** What are some short term objectives and strategies for improving público services? What are some longer term objectives and

strategies for ensuring that públicos will service as feeder services to *Tren Urbano*? The answer may be a separate contracted service, but analysis needs to be done on evaluating how effective a contracted service is in steering the "right" behavior from público operators and stimulating market demand for improved services for potential *Tren Urbano* users.

6.2 Research Plan for 1996-97

Summer 1996

For the summer of 1996, attempts will be made to gather data and relevant research material, documenting experiences from the other urban areas mentioned in section 5. At the same time, a more complete set of data from the 1992 Barton-Aschman Study, the PSC and the Section 15 data collection effort (point check data) will be obtained.

Fall 1996

The main bulk of the analyses on the Section 15 data as well as other relevant data will be performed during this period. The following is a list of the analyses that are planned to be conducted:

- Evaluation of Cost and Service Implications of Providing Feeder Services to *Tren Urbano* in Relations to Vehicle Size
- Evaluation of the Advantages and Disadvantages of Scheduled versus Non-Scheduled Services

Spring 1997

For spring 1997, the remainder of the analyses as well as most of the write-ups will be performed. The following are two pieces of the analyses that will be conducted during this period:

- Evaluation of Institutional Issues Related to the Cost and Economies of Scale of a Private versus a Public Transit Management Structure

- Evaluation of Short Term versus Long Term Objectives of Implementing a Público Feeder Service to *Tren Urbano* and Strategies of Achieving Objectives