Strategies for Improving Jitneys as a Public Transport Mode

by

Samuel W. Lau

M.A. Urban Planning
University of California, Los Angeles
(1994)

B.A. History
University of California, Davis
(1992)

Submitted to the Department of Civil and Environmental Engineering
in partial fulfillment of the requirements for the degree of

Master of Science in Transportation

at the

Massachusetts Institute of Technology

September 1997

© Massachusetts Institute of Technology 1997
All Rights Reserved

Signature of Author

Department of Civil and Environmental Engineering
June 13, 1997

Certified by

Nigel H.M. Wilson
Professor, Department of Civil and Environmental Engineering
Thesis Supervisor

Certified by

Frederick P. Salvucci
Senior Lecturer, Center for Transportation Studies

Accepted by

Joseph M. Sussman
Chairman, Departmental Committee on Graduate Studies
Strategies for Improving Jitneys as a Public Transport Mode

by

Samuel W. Lau

Submitted to the Department of Civil and Environmental Engineering on June 13, 1997
in partial fulfillment of the requirements for the degree of
Master of Science in Transportation

Abstract

Jitneys can be an attractive public transport mode. Their smaller size and superior acceleration characteristics provide them with a speed advantage approaching that of the private automobile. Their low cost structure resulting from constant pressures to maintain financial self-sufficiency has allowed them to survive. In congested urban areas, jitneys have the potential to provide feeder service to line-haul transit as well as a denser network. Despite such strengths, however, evidence suggests that in recent years, the rise in congestion, decline in service quality and reliability, and the increase in operating costs have hurt jitneys’ ability to compete effectively. Facing eventual gridlock, some urban areas, instead, choose a “rail solution” to the congestion problem. This decision will cause governments to consider new roles for jitneys and has the potential to alienate the industry and create a focus for opposition. As a result, the integration of jitneys with traditional public transport modes has become a major dilemma for many of these cities. One such example is in San Juan, where a rail rapid transit system, Tren Urbano, is expected to be operational in 2001, and the públicos (jitneys) are expected to provide feeder services to major transfer stations. The challenge is to help improve público service quality and reliability and place them in a strategic position that will best utilize their existing and potential strengths.

This thesis identifies potential roles that jitneys can play as a public transport mode. It evaluates strategies for improving deficient services and suggests alternative options that would position jitneys to best achieve their full potential. It will apply the lessons from other jitney systems to the San Juan case and evaluate alternative strategies for improving the público system. From a timing perspective, it recommends that a set of “experimental strategies” be implemented immediately on “weak” público routes, potential feeder routes and on routes that are expected to be directly impacted by Tren Urbano. A minibus service should be contracted out to operating groups or companies to provide a scheduled, all-day service on routes poorly served by públicos and AMA buses. Improvements within the current conditions or a contracted minibus service can be implemented on potential feeder routes to Tren Urbano. The government should also experiment with more aggressive strategies by purchasing new
vehicles, implementing fare integration, allowing owners to hire drivers, and providing a limited-term contract (leading up to *Tren Urbano* opening year) to operators on routes directly affected by *Tren Urbano*. Services on the above "experimental" routes should be monitored closely and assessed to see whether the same strategies can be applied to other routes and markets. The lessons can be used to help upgrade the remaining público routes. In the event the proposed strategies are not adequate or do not produce the desired results, the government has the option to use Siemens as an agent to operate or contract out a separate feeder service to *Tren Urbano*.

Thesis Supervisor: Nigel H.M. Wilson
Title: Professor, Department of Civil and Environmental Engineering, M.I.T.

Thesis Supervisor: Frederick P. Salvucci
Title: Senior Lecturer, Center for Transportation Studies, M.I.T.
Acknowledgments

I would like to acknowledge my advisor Professor Nigel Wilson for guiding this thesis. Much gratitude goes to Fred Salvucci for advising the latter part of this thesis, even during weekends. Without his suggestions and insightful comments on previous drafts, I would not have been able to complete this thesis.

I would like to thank Freya Toledo at the Puerto Rico Highway and Transportation Authority for frequent updates on the público situation in San Juan. Professor Felipe Luyanda at the University of Puerto Rico at Mayaguez contributed advice on early parts of this research. I would also like to thank Jim Wensley and Maria Amador at Multisystems for commenting on earlier drafts and supplying me with needed data.

I would like to thank my classmate and competitor, Joseph Barr. Without his encouragement and presence in the lab, this thesis-writing experience would not have turned out as enjoyable! (I would like to meet your mom someday, Joe.)

I would like to thank my parents, Daniel and Jasmine, for their unwavering support during my stay at MIT. I thank them for coming all the way out from California. I would have wished they could have attended my graduation ceremony.

I also would like to thank my fiancee, Peggy Ann. Without her care and encouragement while working on this “fesis,” I would not have been able to keep a cheerful outlook and a focused mind. I thank her for helping me with revisions and for working on weekends and sometimes nights proof-reading my drafts (and for cooking for me while I was busy writing). She is truly my partner and love.

And ultimately, all gratitude and thanks goes to the One above who has brought me “empty” to MIT and allowed me to leave “full.”
Table of Content

Abstract .................................................................................................................. 2
Acknowledgments .................................................................................................. 4
Table of Content .................................................................................................... 5
List of Tables .......................................................................................................... 8
List of Figures ...................................................................................................... 9
List of Exhibits ........................................................................................................ 10

Chapter 1: Introduction .......................................................................................... 11
1.1 Why Jitneys can be an Attractive Public Transport Mode......................... 11
1.2 Challenges Facing Jitneys ......................................................................... 12
1.3 Objectives of the Thesis ........................................................................... 15
1.4 Thesis Approach and Methodology ............................................................... 15
1.5 Organization of the Thesis .......................................................................... 16

Chapter 2: The Público System in Metropolitan San Juan ................................. 18
2.1 Background .................................................................................................... 18
2.2 Público Regulation ....................................................................................... 21
2.3 Público Industry Organizations ................................................................. 23
   2.3.1 Associations ......................................................................................... 23
   2.3.2 Cooperatives and Federations .............................................................. 24
2.4 Público Service Characteristics .................................................................. 25
2.5 Público Fleet ................................................................................................ 26
2.6 Público Service Quality ............................................................................. 27
2.7 Público Service Reliability .......................................................................... 28
2.8 Público User Profile ................................................................................... 30
2.9 Público Demand Profile ............................................................................ 31
2.10 Público Economics .................................................................................... 33
   2.11 Service Productivity ............................................................................. 34
      2.11.1 Service Produced ........................................................................... 34
      2.11.2 Service Consumed ........................................................................ 35
2.12 Público Analysis Framework ..................................................................... 36
2.13 Summary .................................................................................................... 40

Chapter 3: Case Studies of Jitney Systems .......................................................... 45
3.1 Introduction ................................................................................................. 45
3.2 The Caracas Por Puestos ............................................................................. 46
   3.2.1 Por Puestos and Jeep Operation .......................................................... 48
   3.2.2 Financial Characteristics ................................................................... 50
   3.2.3 Metrobus Feeder Service .................................................................... 50
3.3 The Buenos Aires Collectivos .......................................................... 51
  3.3.1 Collectivo Operation ............................................................... 51
  3.3.2 Collectivo Corporations ......................................................... 52
  3.3.3 Collectivo Regulation ............................................................ 53
3.4 The Manila Jeepneys ..................................................................... 53
  3.4.1 Jeepney Operation ................................................................. 54
  3.4.2 Jeepney Owners and Drivers ................................................ 54
  3.4.3 Jeepney Regulatory Structure ............................................... 56
  3.4.4 Jeepney Financial Characteristics ........................................ 57
  3.4.5 LRT Impact on Jeepneys ....................................................... 58
    3.4.5.1 Jeepney Rerouting Enforcement Plan ............................... 59
    3.4.5.2 Jeepney and Bus Differential Fare Plan .............................. 60
3.5 The Hong Kong Public Light Buses .............................................. 61
  3.5.1 Public Light Bus Operation ................................................... 63
  3.5.2 Public Light Bus Regulation .................................................. 67
  3.5.3 Public Light Bus Financial Characteristics ............................ 67
  3.5.4 Contribution to Traffic Congestion ....................................... 68
  3.5.5 The Green Public Light Bus System ....................................... 69
3.6 The Kuala Lumpur Minibuses ...................................................... 71
  3.6.1 Minibus Operation ............................................................... 71
  3.6.2 Minibus Regulation ............................................................. 73
  3.6.3 Financial Profitability ............................................................ 74
  3.6.4 From Minibus to Midibus - The Impact of the LRT ................. 75
3.7 The Miami Jitneys ......................................................................... 75
  3.7.1 Jitney Operation ................................................................. 76
    3.7.1.1 Jitney Quality of Service .................................................. 77
    3.7.1.2 Jitney Passenger and Trip Characteristics .......................... 79
    3.7.1.3 Jitney Productivity ............................................................ 80
  3.7.2 Jitney Financial Characteristics ............................................ 81
  3.7.3 Jitney Regulation ................................................................. 82
  3.7.4 Jitney Contracting Experience .............................................. 83
3.8 The New York City Vans ............................................................... 84
  3.8.1 Van Operation ................................................................. 84
  3.8.2 Van Regulation ................................................................. 86
  3.8.3 Jitney/Van Enforcement Experience ..................................... 86
    3.8.3.1 Description of Enforcement Area ..................................... 87
    3.8.3.2 Enforcement Program Results ........................................ 88
3.9 Summary of Findings ..................................................................... 89

Chapter 4: Alternative Strategies for Improving the Público System .......... 96

4.1 Público Service Improvement Goals and Objectives ....................... 96
  4.1.1 Goals ............................................................................ 96
  4.1.2 Objectives ..................................................................... 97
    4.1.2.1 San Juan Public Transportation System Improvement Objectives .... 98
List of Tables

Table 2.1: Público Operating Statistics (vehicle trip level).................................26
Table 2.2: Público Service Produced within the SJMA - Average Per Weekday Trip for All Routes.................................................................................................................35
Table 2.3: Público Productivity Statistics within the SJMA - Service Consumed Per Weekday.................................................................................................................36
Table 2.4: Positive Público Attributes........................................................................43
Table 2.5: Negative Público Attributes..........................................................................44
Table 3.1: The Supply of Transportation in Caracas......................................................48
Table 3.2: Buenos Aires Mode Split (1970-1995)..........................................................51
Table 3.3: Summary of Jeepney Owner and Driver Statistics........................................55
Table 3.4: Estimated Maximum Scheduled Peak Directional Performance - Hong Kong Public Transport System.........................................................................................66
Table 3.5: Comparison of Red versus Green PLB (maxicab) Operation.........................70
Table 3.6: Miami Jitney vs. Metrobus Quality of Service.................................................78
Table 3.7: Jitney Vehicle Productivity Statistics..............................................................81
Table 3.8: Jitney Operating Costs....................................................................................82
Table 3.9: Summary of Jitney/Minibus Systems................................................................95
List of Figures

Figure 2.1: SJMA Mode Share Statistics.................................................................................. 20
Figure 2.2: Público Fleet Availability for Service by Time-of-Day........................................ 29
Figure 2.3: Average Passengers per Trip by Time Period.................................................... 30
Figure 2.4: Público User Occupation.................................................................................... 31
Figure 2.5: Weekday Boardings and Occupancy by Time-of-Day......................................... 32
Figure 3.1: Mode Split in Caracas (1992)............................................................................. 47
Figure 3.2: Trip Length Distribution of Bus and Jeepney Passengers.................................... 61
Figure 3.3: Hong Kong Surface Transport Mode Split (Daily Passengers)......................... 63
Figure 3.4: Hong Kong PLB Share of Total Surface Public Transport (daily unlinked passenger trips)......................................................................................................................... 64
Figure 3.5: Mode Split in Kuala Lumpur (1984).................................................................. 73
Figure 3.6: Percent of License Holders and Fleet Size (1985)............................................ 74
Figure 3.7: Jitney Vehicle Count......................................................................................... 77
Figure 3.8: Jitney Passenger Occupation............................................................................. 79
Figure 3.9: Jitney Trip Origin and Destination................................................................. 80
Figure 3.10: Jitney Trip Frequency Per Week...................................................................... 80
List of Exhibits

Exhibit 1.2: Analytical Framework for Evaluating Público Intervention Strategies......17
Exhibit 2.1: Map of Puerto Rico and the San Juan Metropolitan Area (SJMA).............19
Exhibit 2.2: Map of the Tren Urbano Alignment and Stations......................................21
Exhibit 2.3: Público Analysis Framework.........................................................................37
Exhibit 2.4: Factors that Affect Público Economics..........................................................39
Exhibit 2.5: Factors that Affect Público Service Quality and Reliability.........................40
Exhibit 3.1: Metropolitan Caracas..................................................................................48
Exhibit 3.2: Hong Kong MTR and LRT Alignment............................................................62
Exhibit 3.3: Hong Kong Public Light Bus Terminal.........................................................66
Exhibit 3.4: Kuala Lumpur Minibus (early 1990s)............................................................72
Exhibit 3.5: Van Enforcement Program Map..................................................................88
Exhibit 4.1: Potential Público Improvement Strategies.......................................................110
Chapter 1

INTRODUCTION

This thesis identifies potential roles that jitneys can play as a public transport mode. It evaluates strategies for improving deficient services and suggests alternative options that would position jitneys to best achieve their full potential. It will apply the lessons from other jitney systems to the San Juan case and evaluate alternative strategies for improving the público (jitney) system.

1.1 Why Jitneys can be an Attractive Public Transport Mode

In much of the developing world, jitneys provide a major source of public transportation, without the benefit of public subsidy. They provide demand responsive services with the level of service varying according to demand. Their ability to adjust services can allow them to achieve high service productivity and efficiency considering the relatively small vehicles typically used. Their low cost structure resulting from constant pressures to maintain financial self-sufficiency has allowed them to survive. Compared to the cost of maintaining full-size buses, the smaller jitney vehicles are less expensive to maintain and operate. Unlike publicly-operated bus systems, jitneys have a minimal administrative overhead structure. They are privately owned and operated, providing a major source of low-skill employment. They also provide opportunities for small entrepreneurs to start a business with low initial investment. Most maintenance is done by individual owner/operator, without the need to maintain large fixed facilities. Thus, in the face of public funding shortages for public transportation, the jitney is perhaps a viable "low cost" alternative providing a dense network of routes.

In severely congested metropolitan areas, jitneys have the potential to be an attractive alternative to bus and even private auto modes. They have the potential to provide a higher level of service than bus transit in terms of operating speed and
headways. During peak periods, they typically provide higher frequency service than buses (Rimmer, 1986; Takyi, 1990). Their smaller size and superior acceleration characteristics provide them with a speed advantage approaching that of the private automobile. Moreover, their service can be flexible, allowing operators to deviate from the main route upon passenger request. This allows them to effectively avoid congested areas and to drop-off passengers closer to their destinations. In contrast to full-size buses, jitneys are more maneuverable in narrow streets and are more effective in providing demand-responsive services in low density neighborhoods. They also have the potential to provide feeder services to line-haul transit.

1.2 Challenges Facing Jitneys

Jitneys are either created as a direct result of government policies or in response to unmet needs in the public transport market. Their evolution is often characterized by a cycle of financial profitability, decline in service quality and reliability, loss of profitability, and eventual government intervention (see Exhibit 1.1). The first stage is often represented by minimal regulation, characterized by a period of profitability. Such systems often require no direct government subsidy in the early stages of their evolution. Business is often very profitable, with systems such as Hong Kong reporting that owners were typically able to regain two-thirds of the vehicle purchase price within one year (Barden and Seneviratne, 1972).

Over time, however, unsafe driving and chaotic operating practices that are often seen as threatening conventional transit and auto and truck circulation often lead to a period of increased government regulation to mitigate the negative effects of "uncontrolled" jitney competition. Such practices are characterized by intense competition at or near bus stops, aggressive driving and unsafe passenger loading and unloading practices which can contribute to roadway and curbside congestion. Consequently, the negative experiences of many urban areas have made governments more reluctant to help improve or restructure the industry for fear that it will disrupt normal transit operations and compete directly with conventional transit. In Hong Kong, Manila and Miami, the respective governments instituted stricter restrictions that prohibited jitneys from operating along designated transit corridors. In Hong Kong, the public light buses (PLB) were seen as extravagant users of space and detrimental to conventional transit operations (Wilbur Smith and Associate, 1976; Hong Kong
Government, 1979). As a result, the government tightened its regulation of the PLBs and priority was given to improve the franchised bus and rail operations. Thus, the challenge for many governments is to find ways of improving jitney services without “overly” disrupting normal traffic and negatively affecting conventional transit operation.

Over time, as the fleet begins to age and as stricter regulations slowly limit the industry's ability to operate on highly profitable corridors, service quality and reliability tend to deteriorate. This stage is characterized by a period of *decline in service quality and reliability*. The pressure to keep costs down in order to maintain profitability means that vehicle maintenance and upkeep are often neglected. Moreover, the search for profit drives many operators to provide service only during peak and high demand periods, leaving off-peak and low demand periods poorly served. The lack of scheduled services further reduce reliability during off-peak periods and along low demand routes. This service unreliability causes ridership to dwindle as users switch to more reliable modes most notably the private automobile.

At the same time, as income, auto ownership, and use begin to increase, congestion is exacerbated which seriously affects jitneys’ ability to remain competitive. Congestion reduces jitney level of service and increases operation cost, reducing its

**Exhibit 1.1: Jitney Development and Decline Cycle**

![Jitney Development and Decline Cycle Diagram]

---

13
ability to compete in congested traffic. It increases jitney travel times and decreases service reliability, resulting in longer waiting times for passengers along the route. As a result, riders who have other travel options no longer patronize jitneys, causing jitney ridership to decline. At the same time, reduced operating speed increases the cost of providing service. Over time, business becomes unprofitable as revenue received from fares is unable to cover costs. Many jitneys are relegated to serving captive riders with no incentives to attract new riders by improving services. As congestion rises and service deteriorates beyond a critical point, the industry tends to rely on government intervention to help save the industry from disappearing. Often, the challenge for governments is to implement intervention strategies that would allow them to avoid committing to ongoing financial subsidies. Such an objective has occasionally led to one-time strategies such as replacement of vehicles that resulted in short term improvements to the jitney system while the underlying problems with service unreliability and declining profitability remain unresolved.

Facing eventual gridlock, some urban areas, instead, choose a “rail solution” to the congestion problem. This decision will cause governments to consider new roles for jitneys and has the potential to alienate the industry and create a focus for opposition. Because of their ability to provide effective and lower cost service and the ability to respond to various levels of demand, jitneys are often given the role of providing feeder services to line-haul transit. However, most jitney systems operate independently from conventional transit modes. Little or no service integration exists. Many operators resist government efforts to further regulate their operation. As a result, the integration of jitneys with traditional public transport modes has become a major dilemma for many of these cities. The lack of improvements and restructuring of jitneys have resulted in their inability to effectively integrate with other formal public transport modes. In the long run, government intervention strategies can either lead to a return to financial profitability or market failure. In San Juan, the Government of Puerto Rico is currently facing such a dilemma. A rail rapid transit system Tren Urbano is expected to be operational in 2001, and the públicos are expected to provide feeder services to major transfer stations. The challenge is to help improve público service quality and reliability and place them in a strategic position that will best utilize their existing and potential strengths.
1.3 Objectives of the Thesis

The purpose of this thesis is to develop and evaluate potential strategies for improving jitneys as a viable public transport mode and to apply them to the San Juan público case. The specific objectives are as follows:

1. To describe aspects of público services that are in need of improvements.
2. To identify alternative markets and roles for the público system by describing how públicos can contribute to the overall objectives of providing higher quality public transport services in the San Juan Metropolitan Area (SJMA).
3. To identify and analyze different government intervention strategies based on case studies of other jitney systems around the world.
4. To apply the lessons from the case studies by proposing and evaluating alternative intervention strategies for improving the público system.

1.4 Thesis Approach and Methodology

The research approach in this thesis is to first identify the "critical areas" of the current público system that need improvement. The "critical areas" of intervention are areas of the público system that may need restructuring or government intervention if the system is to remain viable in the long term, especially when Tren Urbano becomes operational. A schematic diagram of the analytical framework is presented in Exhibit 1.2.

Existing público service characteristics, roles, and markets (represented by box 1) are analyzed to present a better understanding of existing público operations. 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 identify those aspects of the existing público system which need to be retained and strengthened, as well as problem areas which need to be addressed. It can also help to identify possible service improvements and potential "points" of government intervention (box 4). Next, case studies of similar jitney systems from Caracas, Buenos
Aires, Manila, Hong Kong, Kuala Lumpur, New York City and Miami (represented by boxes 5 and 6) will be presented. The objective is to draw from each of these experiences successful and failed government strategies to improve jitney services. The purpose is to identify potential intervention strategies that are likely to produce the best or most effective results, as well as potential problems and obstacles that should be avoided. In light of the San Juan context, the experiences and lessons from these systems will be used to propose and evaluate potential strategies for improving the público system (represented by box 7).

This thesis concludes with a presentation of the analysis results of the most promising strategies and suggests areas for further research (as represented by box 8). Box 9, however, represents a decision node and the beginning of a decision loop which extends beyond the scope of this thesis. Given the analysis results arrived at in box 8, the decision at hand is whether to select and implement the best or most promising strategies. The decision will be based on the financial and political feasibility of the proposed strategies. The availability of funds, budget constraints from the involved agencies, opposition from other parties, as well as the political will to implement the strategies are likely factors that will influence the decision. An answer of “no” to box 9 will begin another iteration of identifying potential areas of improvements to the público system (return to box 4), selecting and analyzing potential intervention strategies (boxes 5 through 8). This iterative process ends when a feasible strategy or set of strategies are chosen and implemented. If the recommended strategies are implemented, the results should be continually monitored (box 10) to track changes in existing público services (return to box 1).

1.5. Organization of the Thesis

The remainder of this thesis is divided into four chapters. Chapter two describes the current state of the público system and the potential roles and challenges it can play in the San Juan public transportation system (PTS). The strengths and weaknesses of the system will be discussed, and a list of the needs and relevant issues will also be presented. Chapter three presents case studies of seven jitney systems from Caracas, Buenos Aires, Manila, Hong Kong, Kuala Lumpur, New York City, and Miami. The lessons and experiences of government attempts to regulate and improve each system will be presented. The chapter will conclude by presenting potential strategies for improving jitney services. Chapter four applies the lessons to the público case and evaluates
strategies for improving the system. Finally, chapter five summarizes the findings of the thesis and suggests areas for further research.

Exhibit 1.2: Analytical Framework for Evaluating Público Intervention Strategies

1. Existing Público Service Characteristics, Role & Markets

2. Identify Strengths/Positive Attributes

3. Identify Weaknesses/Negative Attributes

4. Identify Potential Público Service Improvements, Role & Markets

5. Analyze experiences from other jitney systems

6. Present Lessons

7. Propose & evaluate alternative strategies for públicos

8. Present analysis results & findings

9. Select & implement strategies? (No, Yes)

10. Continue monitoring
Chapter 2

THE PÚBLICO SYSTEM IN METROPOLITAN SAN JUAN

This chapter presents the attributes of the públicos and the strengths and weaknesses of the system. Their current role and proposals for possible new roles will be discussed. At the end, a summary of the current state of the system as well as potential points of intervention for improvement will be presented.

2.1 Background

The público system is a mode of public transportation characteristic of many developing countries in Asia and Latin America. It dates back to the beginning of this century, with the first público franchise established in 1907. By 1930, there were over 3,000 públicos serving on the island, representing approximately one-fourth of the total registered automobiles (Luyanda, 1996). In 1994, there were approximately 9,000 públicos operating on the island, with approximately 3,000 of them operating within the San Juan Metropolitan Area (SJMA) (PRHTA, 1995; Vescovacci, 1996). In 1995, the number of públicos serving the SJMA had declined to about 2,230 (FTA. National Transit Database, 1997). Públicos often provide critical transit service and are the only public transport mode that connects the metropolitan area with the rest of the island. Outside the central portion of the SJMA, they are the only form of public transportation (see Exhibit 2.1 for a map of Puerto Rico and the SJMA).

Públicos provide demand-responsive, fixed route services, utilizing passenger sedans or vans. They provide fixed-route service and deviate from the main route upon passenger request. The majority of públicos that operate within the SJMA are 14-17

1 This figure represents the number of públicos in service.
In the past few decades, public service quality and reliability have declined steadily. The increase in congestion, rise in costs of maintaining services and the absence of any source of direct capital or operating subsidy have affected the ability of the industry to compete. As a result, ridership and market share have declined. In 1964, públicos accounted for 9.2 percent of the SJMA’s internal person trips. In 1976, públicos provide frequent services during peak periods and in low density neighborhoods where buses typically do not serve. Along certain corridors served by AMA and Metrobús, públicos compete directly with the bus system for ridership. Público operators are mostly self-employed individuals who use their vehicles to provide transit service as well as for personal use. They receive no direct operating subsidy from the government, and the fares they receive for service are their only source of income.

Exhibit 2.1: Map of Puerto Rico and the San Juan Metropolitan Area


In the past few decades, público service quality and reliability have declined steadily. The increase in congestion, rise in costs of maintaining services and the absence of any source of direct capital or operating subsidy have affected the ability of the industry to compete. As a result, ridership and market share have declined. In 1964, públicos accounted for 9.2 percent of the SJMA’s internal person trips. In 1976, público
market share decreased to 7.7 percent, and in 1990, that figure had dropped to 4.8 percent, while the automobile share increased from 62.7 percent to 90.7 percent over the same period (see Figure 2.1) (PRHTA. FEIS, 1995). In the past five years alone, the público fleet size has decreased by 20 percent. Studies have also found that the público fleet is aging (Barton-Aschman & Associates, 1992; MTCG, 1996). Currently, no public information is provided about público routes, fares, and hours of operation. For a potential user, knowledge about the system is learned by "word-of-mouth." With declining service quality, the inability to operate effectively in increasing traffic congestion, and the rise of income and auto-ownership in Puerto Rico, the público system is losing its viability as an attractive public transport mode. Moreover, the average age of the drivers are also reported to be increasing, while there is a lack of new and younger drivers entering into the business. This suggests that the perceived decline in profitability has affected the labor force. As the SJMA attempts to restructure its public transportation system (PTS), in anticipation of the completion of Tren Urbano (see Exhibit 2.2 for a map of the Tren Urbano alignment and stations), públicos face an uncertain future.

![Figure 2.1: SJMA Mode Share Statistics](image)


---

2 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.
2.2 Público Regulation

Public oversight of público operation is fragmented. Fares and route franchises are regulated by the Public Service Commission (PSC). The Puerto Rico Highway and Transportation Authority (PRHTA) is responsible for público planning. Operator and vehicle licensing fall under the jurisdiction of the Driver Services Directorate of the Department of Transportation and Public Works (DTOP) which also regulates the location and design of terminals and stops along the right-of-way of state roads. Individual municipalities also regulate público stops and terminals as well as traffic operations on municipal roadways. Until recently, the PSC was the only government agency that dealt directly with público services. The PRHTA is more oriented towards roadway 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 public transit. The PSC exercises a very limited planning role in dealing with the públicos. Constrained by a small staff and scarce resources, the PSC has been swamped with responsibilities of regulating other public service sectors of which the públicos are...
only one of many. Over the last few years, a staff of only 4 to 5 professionals has been allocated to deal specifically with the públicos.\(^4\) Staff responsibilities are concentrated in route authorization and the establishment of fares. Many have argued that the lack of personnel has limited its ability to oversee público operation effectively.

Público fares are established by the PSC (Law 109 from 1962) based on the distance of the route and the area covered. A flat fare is set for each route, although fares vary by route and, in practice, are often charged at the discretion of the driver. The lowest fare is 35 cents and the average fare is 76 cents per ride (PRHTA. \textit{FEIS}, 1995). Petition for new fares or modification of existing fares must be submitted to the PSC for approval per Article 16, Law 109. The approval process includes a formal procedure where the PSC publishes the proposed rates with an announcement for public hearings. Based on the hearings, the PSC makes the final decision on whether to grant or deny the proposal. The burden of proof is on the operator(s) and is based on the evidence and signatures submitted. The PSC need only consider the general situation, i.e., information generated from route studies and not each individual operator that would be impacted by the proposal. In the event of disputes, the PSC has the authority to set temporary fares in the public’s best interest, as stated in Article 19, Law 109 (Consultores Tecnicos Asociados, Inc., 1985). The temporary fares would be effective until a new tariff has been approved through the formal approval procedure.

In the last few years, the lack of formal regulations and enforcement on safety and regular upkeep of the público fleet have become major concerns. As vehicles begin to age, there are concerns that público safety and maintenance standards are in need of revision. Public transit user surveys within the SJMA have found that a considerable number of público passengers are concerned about safety, especially with complaints of speeding (Barton-Aschman Associates, 1992). Currently, públicos, like all other vehicles, have to pass an annual basic safety inspection when vehicle license fees are paid to DTOP.\(^5\) However, a público license or franchise is renewed every 5 years, and only then is a formal vehicle inspection required by the PSC. In the interim, no formal público vehicle 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

\(^4\) Information according to Carmen Gonzalez, GAMEC staff, Tren Urbano Office, 1996.
\(^5\) All vehicles registered in Puerto Rico are required to pass a basic safety inspection. Public transport vehicles (AMA, Metrobus) are inspected regularly.
operator petitions for an increase in fare or a change of services. However, compared to the públicos, the taxis turísticos (taxis for tourists) are required by PSC to pass an inspection every 3 months. The lack of effective regulation and regular inspection will affect long term viability of the públicos. Unsafe and poorly maintained vehicles are a safety hazard for the public. They also deter potential new riders from using the system.

2.3 Público Industry Organizations

Most públicos operators are organized into associations, cooperatives, federations, or unions. The majority of operators are union members. They are typically organized by route or terminal, consisting of associations or federations. Currently, there are about 5,960 operators who are members of such industry organizations (MTCG, 1996). Collectively, they own a total of 5,480 vehicles. The average number of members in a público union is 19, which operate an average of 17 vehicles. Membership is voluntary and open to all that operate along a route or out of a terminal. Membership fees range from $1 to $20 monthly, depending on union rules. The average monthly membership fee is less than $10 (MTCG, 1996). Many of the larger associations or federations are registered at the Puerto Rico State Department as unions. However, neither the PSC nor any other government agency officially recognizes them.

2.3.1 Associations

Associations represent the dominant type of público operator organization. They are typically organized through internal agreements made by operators of a specific route. In municipalities such as Bayamón and Río Piedras, público associations represent a major presence in large terminal operations and are typically governed by a small board of directors headed by a president. Informally, route associations often determine the number of drivers that are allowed to operate on the route(s) by day-of-week and by time-of-day. Legally, however, the PSC has the ultimate authority to determine the maximum number of operators allowed on any route by evoking or regulating the number of licenses granted as well as arbitrating disputes between operators. By law, operators or route associations cannot prevent other duly authorized operators from serving on a route.

---

6 This represents the number of registered vehicles owned by associations, not the actual number of vehicles in service.
In practice, the PSC does not inspect or interfere with the internal operation of route associations unless a dispute is brought before the Commission.

Route associations also provide extensive benefits to their members. They often purchase spare parts, tires, fuel, lubricants, etc., in bulk at a discount price. Some associations also have informal agreements with local garages to provide maintenance and repair services. They also provide legal aid or financial support for their members in the case of accidents or injuries. In some cases, low interest loans are provided for operators who wish to refurbish or replace their vehicle(s). Since insurance costs are high and only the minimum “no-fault” insurance is required for públicos, many associations use membership fees as “internally-supplied” insurance for their members. The pooled fees are used to pay a minimum income to operators who are unable to work because of an accident or illness (Consultores Tecnicos Asociados, Inc., 1985). Over the years, route associations have provided operator discipline through pooling resources and creating programs and services that benefit their members. However, the results have varied from association to association and from terminal to terminal. The reality is that público route associations have had a long organizational history and have become an important political force in San Juan.

2.3.2 Cooperatives and Federations

Popular cooperatives and federations are more formal organizations comprised of different route associations. They typically represent a large number of routes that operate out of major terminals or municipalities. Similar to the route associations, they provide benefits to their members by providing service stations for members, low interest loans for maintenance and repairs, low cost insurance, etc. Público cooperatives and federations are very politically active in representing the interests of their members in dealing with government agencies. One example was in the 1980s when they were able to lobby the PSC to implement a 10 cent surcharge for night services (Consultores Tecnicos Asociados, Inc., 1985). Traditionally, público cooperatives and federations have been very antagonistic to external pressures that require changes to their operation and organization.
2.4 Público Service Characteristics

There are two basic types of público service in the SJMA:

1. **Intercity Service**: routes that connect two municipal centers, providing transportation between cities and towns, and

2. **Local Service**: routes that service one municipal center and generally operate entirely within one municipality.

The FY1994 Section 15 data reported a total of 105 routes operating within the SJMA (26 intercity and 79 local), including approximately 18 additional intercity routes that enter the SJMA from municipalities outside the area (Multisystems, 1994). Approximately 58 percent of trips are local, and 42 percent are intercity trips. The vehicle trip level operating statistics are presented in Table 2.1. The average route length was 5.6 miles for local service and 10.5 for intercity service. The median headway was 24.2 minutes for local routes and 10.5 for intercity routes. Analyzing the data by municipality reveal that there is a high degree of variability in headway for routes that operate within the municipalities of Bayamón, Carolina, Catano and Río Piedras (see Table 2.1). Local routes that operate within the first three municipalities had headways of over 30 minutes. Routes that operate within Carolina recorded average headways of 45.6 minutes. This suggests that service frequency was unreliable. Passenger waiting time is likely to be highly variable, since headways were long and varied significantly. However, local routes operating within Río Piedras had the lowest headway with an average of 17.5 minutes. The average speed for local routes was 18 miles per hour, while the average vehicle trip time was around 20 minutes. Intercity routes recorded an average speed of 17 miles per hour with an average vehicle trip time of approximately 36 minutes. The lower average operating speed for routes in Bayamón, Guaynabo and Río Piedras reflects the fact that some of the most congested roadways in the metropolitan area are located within these municipalities. This is also reflected in the higher trip time (over 25 minutes) for públicos operating within Bayamón and Río Piedras.
### Table 2.1: Público Operating Statistics (vehicle trip level)

<table>
<thead>
<tr>
<th>MUNICIPALITY</th>
<th>Route Length (miles)</th>
<th>Headway (minutes)</th>
<th>Speed (m.p.h.)</th>
<th>Average Trip Time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bayamón</td>
<td>Median: 6.3</td>
<td>25.1</td>
<td>14.3</td>
<td>22.0</td>
</tr>
<tr>
<td></td>
<td>Mean: 6.6</td>
<td>33.9</td>
<td>15.4</td>
<td>25.9</td>
</tr>
<tr>
<td></td>
<td>Std. Dev.: 2.8</td>
<td>30.0</td>
<td>5.7</td>
<td>8.6</td>
</tr>
<tr>
<td>Carolina</td>
<td>Median: 5.0</td>
<td>42.9</td>
<td>20.2</td>
<td>17.1</td>
</tr>
<tr>
<td></td>
<td>Mean: 6.5</td>
<td>45.6</td>
<td>20.1</td>
<td>19.3</td>
</tr>
<tr>
<td></td>
<td>Std. Dev.: 2.5</td>
<td>30.9</td>
<td>2.3</td>
<td>7.0</td>
</tr>
<tr>
<td>Catano</td>
<td>Median: 6.2</td>
<td>14.6</td>
<td>24.1</td>
<td>18.3</td>
</tr>
<tr>
<td></td>
<td>Mean: 6.0</td>
<td>42.5</td>
<td>21.7</td>
<td>16.5</td>
</tr>
<tr>
<td></td>
<td>Std. Dev.: 3.4</td>
<td>60.4</td>
<td>5.3</td>
<td>7.1</td>
</tr>
<tr>
<td>Guaynabo</td>
<td>Median: 3.2</td>
<td>21.5</td>
<td>14.4</td>
<td>19.5</td>
</tr>
<tr>
<td></td>
<td>Mean: 4.1</td>
<td>22.5</td>
<td>13.7</td>
<td>18.7</td>
</tr>
<tr>
<td></td>
<td>Std. Dev.: 2.2</td>
<td>14.7</td>
<td>2.7</td>
<td>10.4</td>
</tr>
<tr>
<td>Río Piedras</td>
<td>Median: 5.6</td>
<td>13.0</td>
<td>13.9</td>
<td>23.3</td>
</tr>
<tr>
<td></td>
<td>Mean: 6.4</td>
<td>17.5</td>
<td>14.6</td>
<td>27.1</td>
</tr>
<tr>
<td></td>
<td>Std. Dev.: 3.1</td>
<td>17.5</td>
<td>4.3</td>
<td>13.0</td>
</tr>
<tr>
<td>Trujillo Alto</td>
<td>Median: 4.4</td>
<td>27.8</td>
<td>19.1</td>
<td>12.8</td>
</tr>
<tr>
<td></td>
<td>Mean: 4.1</td>
<td>24.7</td>
<td>19.8</td>
<td>12.6</td>
</tr>
<tr>
<td></td>
<td>Std. Dev.: 1.1</td>
<td>11.3</td>
<td>6.5</td>
<td>1.2</td>
</tr>
<tr>
<td>Intercity Routes</td>
<td>Median: 9.2</td>
<td>10.5</td>
<td>18.1</td>
<td>34.7</td>
</tr>
<tr>
<td></td>
<td>Mean: 10.5</td>
<td>19.4</td>
<td>17.4</td>
<td>35.5</td>
</tr>
<tr>
<td></td>
<td>Std. Dev.: 4.0</td>
<td>22.4</td>
<td>4.1</td>
<td>13.5</td>
</tr>
</tbody>
</table>


### 2.5 Público Fleet

Most públicos that operate within the SJMA are predominantly 14-17 passenger vans. The current seating configuration of a typical público van is not very functional. The forward-facing row configuration with a narrow single aisle makes it hard for passengers to board and alight the vehicle. Second, none of the vehicles are ADA compliant. If public funds are used to upgrade the fleet, the new vehicles will have to be ADA equipped which will significantly increase the cost of a new público vehicle.

In the last few years, the aging fleet was cited to be a major factor in contributing to the decline in público service quality and reliability (MTCG, 1996). Between 1995 and 1996, the Management & Technical Consulting Group, Inc. (MTCG) conducted an island-wide fleet inventory study for the Puerto Rico Highway and Transportation Authority (PRHTA). The purpose was to gather information on the age and condition of the existing fleet in order to develop a Capital Assistance Program (CAP) for the públicos. The sample consisted of 6,218 públicos and found the average age to be 13.6
years. In the municipalities of Arecibo, Bayamón, and Caguas, the average age of the fleet was over 15 years old. In the SJMA, the average age of públicos is approximately 12.9 years with over 77 percent of the fleet over 10 years old. Since new vehicles are very expensive (estimated to be around $30,000 before tax) and the insurance cost are high, most público owners lack the financial resources to upgrade their vehicle(s). Even if funds were available, most owners may have little incentive to upgrade their vehicles, since they are profit-oriented and most público riders are low income and captive. Therefore, any government attempts to improve or upgrade the vehicle fleet, without commensurate policies to improve service quality and reliability would likely have little affect in improving the profitability of the industry.

2.6 Público Service Quality

Público service quality can be described by attributes such as service coverage, waiting time, speed, comfort, ease of use, safety, etc. Since the fleet is quite old, many públicos are not equipped with air-conditioning. This is especially uncomfortable in the hot and humid climate of 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 waiting inside a público. Preliminary survey of Metrobús II riders suggests that air-conditioning is an important amenity that transit riders consider. Approximately 40 percent of the riders surveyed indicated that they rode Metrobús because it was air-conditioned.

Currently, públicos do not provide any form of public information on the services offered. The only way that potential users can find out about público service information such as fares, routes, stops, or hours of operation is by word-of-mouth. The lack of public information limits the system's ability to expand and attract new riders. 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.

---

7 Includes routes and vehicles operating within the SJMA (Bayamón, Canovanas, Carolina, Catano, Guaynabo, Río Piedras, Toa Alta, Toa Baja, Trujillo Alto), representing a sample of 2,111 vehicles.
8 According to estimates by the Management & Technical Consulting Group, Inc., Capital Assistance Program for Públicos, 1996.
9 Metrobús II survey results from February 1996, presented by Multisystems.
Currently, there is a lack of service integration between públicos and other public transport modes. Públicos and scheduled buses operate as two distinct systems with no coordination between the PSC and the MBA, their respective operating/regulatory agencies. This is evident from the fact that bus and público terminals have been constructed separately and are often several blocks apart. Intermodal transfers are, as a result, inconvenient for passengers. Separate fares, schedules, and staging areas have resulted in few transfers between modes (less than 6 percent) (PRHTA. FEIS, 1995). The only successful intermodal integration example to date is in Bayamón. Público and AMA bus staging areas are in close proximity, and riders are provided with good accessibility and transfer options. In addition, AMA has provided nearby bus stops, permitting users direct access to and from the Kuilan and Guardarrama Terminals (Barton-Aschman Associates, 1992). However, recent efforts to integrate Metrobús II stops along Ponce de Leon Avenue near existing público stops failed when many público operators opposed the plan. Despite failed attempts to integrate públicos with buses, públicos have the potential to provide feeder services to line-haul transit.

Públicos are also sensitive to conditions on the road and are, therefore, easily affected by traffic congestion. Given the fact that públicos operate on the same congested roadways with automobiles, público operating speeds will be affected as congestion continues to increase. Currently, there are no operating privileges or dedicated lanes that would provide públicos with the speed advantage to compete effectively. Recently, some público operators along the Caguas - San Juan route requested to the PSC that they be given permission to use the bus reverse-flow lane along Ponce de Leon Avenue (PR-1) that Metrobús currently operates on. The operators believe that their use of the bus lane can produce travel time savings of 30 minutes during the peak period and recover the lost ridership that went to AMA and Metrobús. The PSC denied the petition.

2.7 Público Service Reliability

Públicos typically operate six days a week until about 6 p.m. Público service reliability, however, reduces significantly in the afternoon as many operators terminate services for the day. Section 15 data shows that vehicle availability for service drops off significantly after 2 p.m. during weekdays and at 12 noon on Saturdays (see Figure 2.2). Other than in the municipality of Río Piedras, Sunday services are virtually non-existent. Potential patrons who rely on públicos to get to line-haul transit routes or 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 services after 6 p.m., only a handful of routes provide extra evening services. The decision to run evening and weekend services is left entirely to the discretion of individual operators. The lack of reliable service and guaranteed hours of operation affect the level of service and attractiveness of the público system.

**Figure 2.2: Público Fleet Availability for Service by Time-of-Day**

![Graph showing público fleet availability by time-of-day.](image)


Currently, públicos do not provide scheduled service. The lack of a schedule during off-peak periods will affect ridership and the attractiveness of the service. The FY1995 Section 15 público data shows that ridership per trip is high during most of the day (between 9 a.m. to 6 p.m.) for both weekdays and weekends (see Figure 2.3). Moreover, the data also shows that passengers per trip is very high in the afternoon period between 3 to 6 p.m., suggesting that the fleet availability for service, which decreases significantly after 2 p.m. (see Figure 2.2), is not an accurate reflection of actual demand for service, but rather the operator’s decision to terminate service early. In the short run, this unreliability affects passenger wait time for the service and may have larger implications to passenger safety during the evening hours when service is scarce and passengers have to wait longer for a público. This finding reveals that there appears to be demand for service during time periods and days-of-the-week which públicos currently do not effectively serve and that there is a need to ensure that reliable service is available throughout the day. Since *Tren Urbano* projects that a majority of users will access key stations (Bayamón Centro, Río Piedras, Sagrado Corazón) via bus or público, it is critical
that the públicos provide a reliable, scheduled feeder service throughout the day. In the long run, the lack of a scheduled service and guaranteed hours of operation are important as públicos are expected to provide feeder service to Tren Urbano.

![Figure 2.3: Average Passengers per Trip by Time Period](image)


The practice of not leaving the terminal until the vehicle is full is another aspect of público service unreliability. From the riders’ perspective, waiting for the vehicle to “fill-up” at the terminal can be uncomfortable and time-consuming. Moreover, it increases the waiting time for passengers onboard. Since many públicos are not equipped with air conditioning and vehicles with a unit are rarely turned on while “idling” at the terminal, it can be quite hot and uncomfortable for passengers to wait inside the vehicle. However, from the operators’ perspective, this practice helps to guarantee their revenue even before a run starts. Thus, any policy that would affect that “guarantee” would likely be met with resistance.

### 2.8 Público User Profile

Luyanda (1996) reported that three out of four público users are captive riders. Statistics on público users collected by Luyanda and Gandhi (1990) showed that ridership is dominated by four major groups: students, workers, housewives, and the unemployed. In Bayamón, with the largest público terminals in the SJMA, a survey found that 52 percent of the users were reported to be students, and 18.7 percent were housewives (see
Figure 2.4) (Luyanda, 1996). The same survey found that 42 percent of público users were under 25 years old. Públicos often appear only to serve the poor and the transit-dependent. Market research based on focus group discussions has found that people are reluctant to ride públicos because of the “negative image” it portrays (Hoffman, 1996). This finding suggests that the image of the públicos as a mode of transportation for the poor and transit-dependent may deter potential patrons from using the system.

![Figure 2.4: Público User Occupation](image)

Source: Luyanda, 1996.

2.9 Público Demand Profile

The demand for público service varies by time-of-day. Because most riders are captive, with a majority of them being students, housewives, or blue-collar workers, públicos do not service typical morning and evening commute trips. Figure 2.5 suggests that the peak load occurs early in the morning (between 6 to 7 a.m.), around noon (between 11 a.m. to 1 p.m.) and again in the afternoon (between 3 to 4 p.m. and 5 to 6 p.m.) where the maximum number of passengers per trip is observed to be 13 passengers. Figure 2.5 also shows that both total passenger boardings and terminal boardings are highest during the mid-day period for weekdays, with approximately 2,254 total passenger boardings and 1,427 total terminal boardings.\(^\text{10}\) The number of terminal boardings which recorded higher terminal boardings than total passenger boardings were omitted from the analysis.

\(^{10}\) Observations which recorded higher terminal boardings than total passenger boardings were omitted from the analysis.
boardings per trip showed that the maximum occurred between 3 to 4 p.m., with an average of 11 passengers per trip. It also shows that terminal boardings are at a minimum in the morning hours between 6 and 10 a.m. There are three possible explanations for this phenomenon. One, since many público riders are students and blue-collar workers, their commute trip patterns may not correspond to typical commute trip patterns. Blue-collar workers typically have more variable work schedules, often without the need to arrive at work at 9 a.m. Second, since data is only available for trips made after 6 a.m., the público morning peak period may occur before 6 a.m. The data seems to suggest that a possible peak may exist before the 6 to 7 a.m. period. Third, the lower terminal boardings in the morning reflect the fact that trips originate from the home and that passengers board públicos along the route.

Figure 2.5: Weekday Boardings and Occupancy by Time-of-Day

Figure 2.5 also shows that the peak load per trip occurs in the afternoon period between 3 to 4 p.m. and 5 to 6 p.m. Fleet availability for service, however, drops off significantly after 2 p.m. (see Figure 2.1). The data seems to suggest that público owner/operators are not serving the afternoon trips for other reasons and not because demand is low. Fairly high occupancy levels per trip during the afternoon periods show that service demand is still high for público service. As a result, there seems to be a disparity between the demand for service and the level of service that is provided.
2.10 Público Economics

Information on the financial condition of the industry is scarce. In 1992, a Barton-Aschman study conducted for the PSC found the average net revenue of a typical público operator to be around $40 a day, without considering factors such as insurance beyond the “no-fault” required in Puerto Rico (Barton-Aschman Associates, 1992). Públicos are considered common carriers. The fact that vehicles are used for both public transport services and personal use causes liability to be high. Since insurance is expensive, many operators have no insurance other than the required “no-fault” coverage. Compared to the públicos, publicly subsidized public sector transit services such as AMA or Metrobús can afford full insurance coverage. High insurance costs, relative to modest income, could force público operators out of business or to consolidate with other routes.

From the government’s perspective, the absence of continuing financial commitment makes the público system attractive. The only form of indirect subsidy is the occasional building of off-street terminal facilities. However, since públicos receive no direct operating subsidy from the government, the industry has been struggling to remain profitable in a period when ridership has been declining and operating cost escalating. In 1993, the PSC estimated that the daily direct operating cost of a público van is around $19.81 and approximately $14.90 for a público sedan (MTCG, 1996). The figures include vehicle depreciation, repairs and maintenance, tires, plates, but excludes gasoline expenditure. The Management and Technical Consulting Group, Inc. estimates that the cost figures for 1996 are probably 10 to 20 percent higher ($21.79 to $23.77 for público vans and $16.39 to $17.88 for público sedans).

Many público drivers depend on their daily revenue for routine daily expenses. The flexibility and simplicity of the fare structure allows them to “pocket” and “take home” the fares they collect on a daily basis (for example, compared to their public employee counterparts, they do not have to wait for their paychecks to be sent). This gives público drivers the advantage of bringing home their daily income. The fact that they are individual entrepreneurs give them the ability to make individual decisions and provide them the flexibility and independence in running their own business. Some 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

---

11 The figures exclude fuel cost.
daily revenue. Since they do not receive any government subsidy for their operations and, therefore, unlike AMA and Metrobús, they are not required to provide a certain level of service, or be monitored in terms of service quality. If in the future, any form of public funds are used to subsidize the system, services will likely be subjected to government monitoring. The tradeoff is that while operators can receive public support to off-set rising operating costs, they would have to give up the flexibility to run their own business and abide by government operating rules.

2.11 Service Productivity

Compared to full-size buses, públicos can achieve higher service productivity. Because services are provided by smaller, often single unit, firms, there are less administrative and other costs compared to large public firms. Moreover, many operators perform their own maintenance and repair work and park their vehicles at home. Without the need to maintain large fixed facilities, públicos are able to keep their costs down. They also have better operating characteristics. They are smaller and lighter, more maneuverable, and have better acceleration characteristics compared to conventional diesel buses. They also have the potential to operate at higher frequency which can increase travel time savings and service productivity.

2.11.1 Service Produced

Of all the local routes operating within the SJMA, the FY1994 Section 15 Público Data show that routes operating within the municipality of Río Piedras produced the most services, with an average of 1,066 revenue vehicle-hours and 14,819 revenue vehicle-miles per weekday (see Table 2.2). The municipality of Bayamón produced the second most service with the same measures. Intercity routes providing services between two different municipalities produced an average of 2,208 revenue vehicle-hours and 38,032 revenue vehicle-miles per weekday. The average revenue vehicle-hours produced for all local routes was 2,611; whereas for revenue vehicle-miles, it was 41,787.
Table 2.2: Público Service Produced within the SJMA - Average Per Weekday Trip for All Routes by Municipality

<table>
<thead>
<tr>
<th>Municipality</th>
<th>1-Way Trips</th>
<th>Revenue Vehicle-Hours</th>
<th>Revenue Vehicle-Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bayamón</td>
<td>2,143</td>
<td>836</td>
<td>13,292</td>
</tr>
<tr>
<td>Canovanas</td>
<td>323</td>
<td>95</td>
<td>1,997</td>
</tr>
<tr>
<td>Carolina</td>
<td>237</td>
<td>94</td>
<td>1,937</td>
</tr>
<tr>
<td>Catano</td>
<td>395</td>
<td>131</td>
<td>2,981</td>
</tr>
<tr>
<td>Dorado</td>
<td>195</td>
<td>33</td>
<td>619</td>
</tr>
<tr>
<td>Guaynabo</td>
<td>434</td>
<td>85</td>
<td>1,219</td>
</tr>
<tr>
<td>Naranjito</td>
<td>112</td>
<td>41</td>
<td>815</td>
</tr>
<tr>
<td>Río Grande</td>
<td>273</td>
<td>91</td>
<td>1,856</td>
</tr>
<tr>
<td>Río Piedras</td>
<td>2,678</td>
<td>1,066</td>
<td>14,819</td>
</tr>
<tr>
<td>San Juan</td>
<td>64</td>
<td>29</td>
<td>343</td>
</tr>
<tr>
<td>Toa Alta</td>
<td>124</td>
<td>39</td>
<td>581</td>
</tr>
<tr>
<td>Toa Baja</td>
<td>67</td>
<td>25</td>
<td>429</td>
</tr>
<tr>
<td>Trujillo Alto</td>
<td>212</td>
<td>46</td>
<td>900</td>
</tr>
<tr>
<td>Total Local Routes</td>
<td>7,256</td>
<td>2,611</td>
<td>41,787</td>
</tr>
<tr>
<td>Inter-City Routes</td>
<td>3,898</td>
<td>2,208</td>
<td>38,032</td>
</tr>
<tr>
<td>Total All Routes</td>
<td>11,153</td>
<td>4,818</td>
<td>79,819</td>
</tr>
</tbody>
</table>


2.11.2 Service Consumed

Data on público ridership has been sparse and incomplete. Prior to 1980, little or no ridership data was available. Based on terminal feasibility studies, the 1982 average weekday ridership was estimated to be 180,000 (Consultores Tecnicos Asociados, Inc., 1985). For the same year, públicos were estimated to represent almost 60 percent of the total transit trips in the metropolitan area. In 1983, the estimated weekday ridership was approximately 202,000 (Consultores Tecnicos Asociados, Inc., 1985). This figure represented a 12 percent difference from the previous estimate. In 1994, públicos served an estimated 143,000 daily passenger trips (Multisystems, 1994). The two largest público terminals, Bayamón and Río Piedras, generate the most ridership in the metropolitan area. Together, público trips into and out of Bayamón and Río Piedras represent approximately 75 to 80 percent of all público trips in the SJMA. The FY1994 Section 15 data shows that there were approximately 22,809 daily passengers served on local routes in Bayamón and 41,767 daily passengers in Río Piedras (see Table 2.3). In general, local routes that operate within the municipality of Río Piedras were found to have the highest productivity for all categories reported. The average number of passengers per revenue vehicle-hour was 39, and the average passengers per revenue vehicle-mile was 3. Local
routes that operate within the municipalities of Guaynabo and Trujillo Alto produced the lowest average productivity of all local and intercity routes.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bayamon</td>
<td>22,809</td>
<td>96,592</td>
<td>11</td>
<td>27</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Canovanas</td>
<td>2,539</td>
<td>8,866</td>
<td>8</td>
<td>27</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Carolina</td>
<td>2,468</td>
<td>12,057</td>
<td>10</td>
<td>26</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Catano</td>
<td>3,769</td>
<td>20,145</td>
<td>10</td>
<td>29</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Dorado</td>
<td>1,255</td>
<td>2,568</td>
<td>6</td>
<td>39</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Guaynabo</td>
<td>1,544</td>
<td>3,031</td>
<td>4</td>
<td>18</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Naranjito</td>
<td>1,030</td>
<td>5,442</td>
<td>9</td>
<td>25</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Rio Grande</td>
<td>1,892</td>
<td>6,696</td>
<td>7</td>
<td>21</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Rio Piedras</td>
<td>41,767</td>
<td>132,871</td>
<td>16</td>
<td>39</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>San Juan</td>
<td>915</td>
<td>1,908</td>
<td>14</td>
<td>32</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Toa Alta</td>
<td>876</td>
<td>2,837</td>
<td>7</td>
<td>22</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Toa Baja</td>
<td>744</td>
<td>2,071</td>
<td>11</td>
<td>30</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Trujillo Alto</td>
<td>721</td>
<td>1,888</td>
<td>3</td>
<td>16</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Total Local Routes</td>
<td>82,383</td>
<td>296,972</td>
<td>11</td>
<td>32</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Inter-City</td>
<td>60,722</td>
<td>332,748</td>
<td>16</td>
<td>28</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Total All Routes</td>
<td>143,051</td>
<td>629,720</td>
<td>13</td>
<td>30</td>
<td>2</td>
<td>8</td>
</tr>
</tbody>
</table>


2.12 Público Analysis Framework

This section describes the públicos and the interactions that exists between different components of the system. It attempts to develop a framework to identify factors that affect the long term viability of the system and potential areas for government intervention. Exhibit 2.3 presents the main interactions between different endogenous and exogenous factors that affect público economic profitability, ridership, and the potential for competition with other modes. The flow diagram includes factors that affect long run público sustainability. At the outset, público operation is governed by government policies and regulations. These policies and regulations, in turn, influence público economics, service quality and reliability. The attractiveness and operational characteristics of other modes also affect público economics through competition and potentially through complementary effects.

The items described in the público economics box are mainly of concern to público owners and operators. Issues such as revenue, capital and operating costs, as well as association benefits affect the economic viability of the público system. Issues such as
the extent of government subsidy, licensing and fare regulations would be the concern of both the government and the owner/operators. Items in the público service quality and reliability box are mainly operational characteristics and are of concern to existing and potential users. These service characteristics directly affect the attractiveness and demand for service. The combination of público economic profitability (as a function of revenue, costs, level of subsidy, association benefits, etc.), ridership potential (as a function of service quality and reliability), and the level of competition from other public modes will ultimately affect the long term sustainability and the public transport service role of the público system.

The characteristics of other modes such as AMA, Metrobús, auto, and Tren Urbano can also affect the público system. Improvements to the other modes can either
hurt or enhance its performance and economic viability. Thus público economics, público service quality and reliability, and the characteristics of other modes are linked and potentially interact with each other. For example, changes in the hours of operation, service coverage, travel times, or implementing fare integration will all affect público operating costs and revenue (from changes in demand and ridership). Any improvements to the públicos will likewise affect AMA, Metrobús and ultimately Tren Urbano either through direct competition for ridership or by providing complimentary feeder services.

Exhibit 2.4 presents a more detailed description of the interaction between different factors that affect público economics. The assumption is that net revenue is of greatest concern and interest to an individual owner/operator. The flow chart attempts to depict factors that will likely affect net revenue. The “filled” boxes highlighted in “black” represent potential areas of intervention where the government can intervene to affect público economics, as well as the quality and reliability of the service. First, gross revenue is affected by demand for service in the form of actual ridership, fare structure and regulations, and the presence of direct or indirect subsidy. However, the presence of subsidy also affects the total cost of providing service. Total costs are a function of capital cost for the vehicle(s), operating expenses in the form of fuel and lubricant costs, vehicle maintenance costs, as well as operating conditions and characteristics such as operating speeds, idle time at terminal, use of air-conditioning (increases fuel cost), and the hours of operation, etc. Vehicle maintenance costs are also a function of vehicle use (such as hours of operation, operating speeds, idle time, etc.) and wear and tear (such as the use of air-conditioning). In the público case, it is important to recognize that the role of associations and federation has traditionally helped to defray part of the operating costs by providing bulk fuel, lubricant and tires as well as agreements with local garages to perform maintenance work at a reduced cost to its members.
Service quality and reliability is of concern for existing and potential público riders. Exhibit 2.5 presents a schematic description of the factors that affect público passenger utility. The “filled” boxes highlighted in “black” represent potential areas of government intervention that may improve público service quality and reliability. Passenger utility can be described as a function of in-vehicle travel time, waiting time, the comfort and reliability of the vehicle, safety, hours of operation, whether public information is provided on the service, the extent of service coverage and ease of transfer to other modes. To facilitate the ease of transfer, fare integration and favorable fare policies will likely encourage passengers to transfer between public modes. Moreover, making transfers more convenient also helps to increase service coverage. Having an
integrated system allows passengers to have access to more travel options and destinations. At terminals and along the route, regular headways and a scheduled service affects waiting time for passengers. Furthermore, the age and appearance of the vehicles, as well as the use of air-conditioning, affects the comfort and reliability of the service. Route structure and travel speeds (as a result of congestion on the road) also affects in-vehicle travel time. Therefore, in order to compete effectively and avoid congestion, públicos may require some form of operating privileges.

2.13 Summary

Although the current público system is plagued by many weaknesses, it also has many strengths and positive attributes. The strengths and weaknesses of the system can be viewed from four perspectives: público user, potential Tren Urbano user, público owner/operator, and the government. A summary of the strengths and weaknesses of the
system is presented in Tables 2.4 and 2.5. The rows represent characteristics of the system. The columns represent the four major “parties” that have a stake in the público system. An “X” in the row corresponding to the appropriate column represents attributes that affect the corresponding “parties.”

Based on the attributes of the current público system, there are some potential areas that require improvements:

**Service Quality and Reliability Improvements**

- The need for a scheduled service to improve reliability during off-peak periods
- The need for evening and weekend services
- The need to provide guaranteed hours of service to improve reliability
- The need to prevent operators from waiting at terminals until vehicles are filled
- The need to provide públicos with operating privileges to avoid congestion and increase operating speed and efficiency
- The need to facilitate and encourage the use of air conditioning to improve comfort
- The need to built more sheltered stops and terminals to improve waiting conditions
- The need to provide public information on service and attract new riders
- The need to integrate fares with other public modes to increase service integration
- The need to develop a reliable feeder network for Tren Urbano

**Vehicle Fleet Improvements**

- The need to upgrade or replace the aging fleet to improve the image and reliability of the vehicles
- The need to bring the fleet into ADA compliance (especially if public funds are used to improve services)
Capital and Operating Subsidies

- The need to help operators purchase new vehicles
- The need to help operators defray the high cost of vehicle insurance

Regulatory Improvements

- The need to require regular vehicle inspection to ensure compliance to safety and maintenance standards
- The need to allow owners to hire multiple drivers for shifts to increase vehicle utilization
- The need to strengthen and centralize public oversight of público operation and planning
<table>
<thead>
<tr>
<th>Strengths/Attributes</th>
<th>Service Characteristics</th>
<th>Public User</th>
<th>Potential Urban User</th>
<th>Public Owner/Operator</th>
<th>Government</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>Demand Responsive</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Fixed Route (with minor deviations upon request)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>x</td>
</tr>
<tr>
<td>Attributes</td>
<td>High-Frequency Service During Peak Hours</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>High-Frequency Service on Major Routes</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Higher Travel Speeds than Bus on Same Facilities</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Convenient (pick up &amp; drop off &quot;anywhere&quot; by request)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Potential Feeder to Line-Haul Transit</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Intercity Services Connecting SJMA with Rest of Island</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>x</td>
</tr>
<tr>
<td>Operational Characteristics</td>
<td>Higher Occupancy Mode than the Private Auto</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Flexible Operations</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>No Fixed Service Schedule to Adhere to</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Lower Cost Structure Compared to Bus</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Operate More Effectively than Bus on Low Demand Routes</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>x</td>
</tr>
<tr>
<td>Management</td>
<td>Privately Owned/Operated</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Gov. Control of Routes and Licensing (provide market stability &amp; avoid competition)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>x</td>
</tr>
<tr>
<td>Fare Structure</td>
<td>Fixed Fare (set by PSC)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Daily “Take Home” Revenue</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>x</td>
</tr>
<tr>
<td>Subsidy</td>
<td>Terminal Facilities Built by Municipalities</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>No Direct Government Subsidy Required</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>x</td>
</tr>
<tr>
<td>Weaknesses/Attributes</td>
<td>Service Reliability</td>
<td>Negative Services/Reliability</td>
<td>Service Quality</td>
<td>Service Performance</td>
<td>Costs</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>---------------------</td>
<td>-------------------------------</td>
<td>-----------------</td>
<td>---------------------</td>
<td>------</td>
</tr>
<tr>
<td><strong>Service Reliability</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of Fixed Service Schedule</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of Service During Low Demand Periods (Off-Peak Periods)</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of Evenig, Weekend, and Holiday Services</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aging Vehicle Fleet</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of Air-Conditioning in Most Vehicles</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crowded and “Smelly” Vehicles</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Few Público Terminals/Sheltered Stops</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor Safety and Vehicle Maintenance Records</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Service Performance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competition with Other Públicos and MBA Buses at High Demand Routes</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affected by Traffic Congestion</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Declining Ridership</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service Duplication with Other Public Modes</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Vehicle Acquisition Cost</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Insurance Cost</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Service Information</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of Public Information on Routes, Schedule, Fares, Transfers</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stops And Routes Are Not Clearly Designated And Are Subject To Change</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Service Image</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor Image Of Públicos As Transportation For The Poor/ Transit-Dependent</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack Of “Mixing” Between Different Socio-Economic Groups</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fares</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack Of Fare Integration With Other Public Modes</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Management</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of Centralized Management Structure</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difficult to Negotiate with/Relay Messages/Information to Operators</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of Effective Oversight by Public Agency</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Intermodal Connections</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack Of Intermodal Connections And Coordination</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Data &amp; Information</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of Information on Passenger O-D Travel Patterns</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of Information on Passenger Transfer Patterns</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of Reliable/Updated Information on Vehicle Fleet</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of Evaluation Techniques and Measures of Efficiency</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Chapter 3

CASE STUDIES OF JITNEY SYSTEMS

This chapter traces the historical development of jitneys in Caracas, Buenos Aires, Manila, Hong Kong, Kuala Lumpur, New York City, and Miami. It will explore the extent of government regulation and intervention. The goal is to highlight strategies that seemed to have “worked well,” as well as those that have failed. The criteria for choosing the selected cases are cities/metropolitan areas that: (1) have an existing jitney system, (2) have implemented, contemplated, or are in the process of implementing rail-based projects, and/or (3) have a long history of regulating jitney systems. Whenever data is available, evaluations of operational and financial performance will be presented. In light of Tren Urbano and the San Juan context, the lessons and experiences from these case studies will subsequently be applied to the público case. The chapter will conclude by presenting a list of most promising strategies and implementation mechanisms for improving jitneys as a public transport system.

3.1 Introduction

Jitneys are a dominant form of public transportation in most developing countries. They provide a critical source of transport services and have traditionally been profitable. In Asia, where the largest of these systems are found, they are called jeepneys in Manila, public light buses (PLB) in Hong Kong, and minibuses in Kuala Lumpur. In Latin America, they are called carros por puestos in Caracas and collectivos in Buenos Aires. In the U.S., the only comparable systems are the jitneys in Miami and the commuter vans and dollar vans in New York City. Jitneys have generally carved out a market niche for themselves by providing frequent service during peak periods and price somewhere between buses and taxis. Frequently, due to increasing service costs and the inability of the public transport sector to adapt to changes in demand and customer preference, jitneys have traditionally “skimmed the cream” off of buses. By providing flexible demand-
responsive services and with auto-like characteristics of speed and comfort, jitneys can adapt to changes in demand and have increased their market share as reflected by their popularity.

In recent years, however, ridership, service, and reliability for many of these systems have declined. The fleets are aging, resulting in unsafe and poorly maintained vehicles and increasing maintenance costs for the owners. The rise in income, increase in auto ownership and congestion in city centers have also seriously hurt the ability of jitneys to compete. Over the last two decades, many cities with existing jitney systems have also implemented massive public transport infrastructure investments such as the building of light rail or heavy rail rapid transit systems to relieve congestion. This has put jitneys at odds with the new public transport structure and convinced many governments that there was a need for strict regulation and control.

3.2 The Caracas Por Puestos

Caracas, the capital of Venezuela, is one of the wealthiest capital cities closest to Puerto Rico. It has an extensive jitney system consisting of por puestos and jeeps. The Capital Region has a population of almost 4 million and accounts for approximately 42 percent of the country’s private automobile fleet and 39 percent of its public transport vehicles (World Bank, 1993). Caracas also has an extensive jitney system consisting of por puestos and jeeps. More than 95 percent of the public transport fleet consists of privately owned buses, minibuses, jitneys and jeeps. The por puestos first appeared sometime after 1948 as a response to intolerably poor bus service. In the last few decades, although the private automobile has consistently accounted for anywhere between 34 to 46 percent of the total supply of the urban transport fleet, the role of public transport modes has been critical to providing mobility in an increasingly congested metropolitan area. In terms of mode split, the Caracas metro (CAMETRO) accounts for nearly 15 percent of all trips, buses and por puestos for 28 percent, private auto for 41 percent and walking for approximately 16 percent (see Figure 3.1) (The World Bank, 1993). Since the 1960s, with rapid urbanization and population growth, rising personal
income, the prominent role of the private automobile, and one of the world's lowest gasoline prices, Caracas has been battling with increasing traffic congestion (Owen, 1973). Government response to impeding gridlock was the construction of CAMETRO in the early 1980s, with two lines totaling 40 kilometers. Since then, the *por puestos* continue to be patronized by a large portion of the traveling public who have accepted its "status" and refuse to use the somewhat less expensive, slower, more crowded and less comfortable buses (Roschlau, 1981). In the last few years, however, there is evidence that congestion has taken a toll on the *por puestos*' ability to compete with the private automobile and the faster and more comfortable CAMETRO and Metrobus. In 1990, *por puesto* service accounted for only 5.7 percent of the total supply of transportation in Caracas, while the private auto accounted for 93.8 percent of the total supply (see Table 3.1). Between 1990 and 1995, CAMETRO and Metrobus increased their market share by 89.4 percent (The World Bank, 1993). The Caracas *por puestos* experience is a good Latin American example which provides useful insight into government policies to improve and integrate jitneys into the urban public transportation system.

![Figure 3.1: Mode Split in Caracas (1992)](image)

Table 3.1: The Supply of Transportation in Caracas

<table>
<thead>
<tr>
<th>Mode</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Auto</td>
<td>93.8%</td>
</tr>
<tr>
<td>Buses</td>
<td>0.01</td>
</tr>
<tr>
<td>Tramways</td>
<td>-</td>
</tr>
<tr>
<td>Por Puestos/Jeeps</td>
<td>5.7</td>
</tr>
<tr>
<td>Metro &amp; Metrobus</td>
<td>0.4</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>


3.2.1 Por Puestos and Jeep Operation

There are about 100,000 por puestos registered in the country, of which 39 percent are in the Capital Region of Caracas (see Exhibit 3.1 for a map of the capital region) (The World Bank, 1993). In 1995, there were an estimated 8,000 por puestos and 5,000 “jeeps,” operating on approximately 400 routes (Fondo Nacional De Transporte Urbano “Fontur”, 1996). The average vehicle capacity is 17 seats, which includes a large amount of 12-seat jeeps which serve poor neighborhoods along the edge of the region’s steep mountains. The predominant por puestos in Caracas are 32-seat minibuses. With an additional standing capacity of 10 to 15 passengers, they compete directly with a fleet of approximately 400 buses (Fondo Nacional De Transporte Urbano “Fontur”, 1996).

Exhibit 3.1: Metropolitan Caracas

Source: Fondo Nacional De Transporte Urbano “Fontur”, 1996
Jeeps carry an average of 90,041 passengers per year, while the *por puestos* carry 97,140 passenger per year (Fondo Nacional De Transporte Urbano “Fontur”, 1996). Approximately 20 percent of *por puestos* riders are students. The average age of jeeps are 13 years old, whereas the average age of *por puestos* is 9 years. Both jeeps and *por puestos* provide service 14 hours a day during weekdays and 12 hours a day during weekends. There are four peak-hours, corresponding to morning, noon, and afternoon commute and lunch trips (6:30-8:00 a.m., 12:00-1:00 p.m., and 5:00-6:30 p.m.). The peak operating speeds for jeeps range from 7.0 to 13.3 kilometers per hour, while the off-peak operating speeds range from 6.0 to 18.5 kilometers per hour. Average peak operating speeds for *por puestos* range between 6.4 to 33.6 kilometers per hour, and off-peak speeds range from 3.3 to 34.2 kilometers per hour. Average jeep headways are 20 minutes or five vehicles per hour, whereas *por puestos* operate on 28 minute headways with four vehicles per hour.

From the passenger’s perspective, *por puesto* provide high frequency service. They are demand responsive and have the ability to deviate from the main route to pick-up or drop-off passengers. They provide a reasonable level of comfort. For poor neighborhoods along the hillside, the jeeps are the only source of public transportation. A typical home-to-work trip for a poor hillside dweller consists of descending to a jeep stop, taking a jeep to a *por puesto* stop and transferring onto a *por puesto* to reach the CAMETRO. During late-evenings and weekends, however, *por puesto* service is scarce. From the government’s perspective, the large number of owner-operators make them difficult to regulate. Moreover, their aggressive driving practices contribute to frequent curbside congestion.

*Por puestos* are privately owned and operated. According to a 1962 law, each owner is only allowed to own one vehicle. They, however, are allowed to hire drivers, and this practice has been reported to be wide-spread and has helped to increase vehicle utilization and revenue (The World Bank, 1993). *Por puestos* also operate on specific routes. They tend to form route associations. Currently, there are approximately 80 *por puestos* associations and 50 *jeep* associations. On average, each association has between 10 to 100 vehicles. Other than the *Central Unica de Asociaciones de Venezuela* which acts as the national drivers’ union, *por puestos* industry organizations are fragmented and difficult for any level of government control.
3.2.2 Financial Characteristics

*Por puestos* fares are distance-based and are generally higher than buses which charge a fixed fare. During the evening and weekends, higher fares are charged. Fuel comprises a small share of the total vehicle operating costs. In 1989, fuel cost represented 15 percent of the vehicle operating costs for a 24-seat minibus, whereas, it represented as little as 3 percent for a 32-seat minibus (The World Bank, 1993). In Venezuela, a new van costs anywhere from US$18,000 to $36,000 (Wright, 1996).

3.2.3 Metrobus Feeder Service

In 1987, under the request of the President, the Metrobus was introduced to provide feeder and distributor service for CAMETRO. It was organized under a separate division within CAMETRO called *Gerencia Ejecutiva de Transporte Superficial*. In 1992, Metrobus operated a fleet of 141 buses on 16 routes (The World Bank, 1993). In 1995, there were 175 units, operating 19 routes (Fondo Nacional De Transporte Urbano “Fontur”, 1996). Service is provided between 6 a.m. to 11 p.m., with a staff of 328 operators and 170 other personnel. The average route length was 5.4 kilometers for short routes, and 15 kilometers for long routes. The average operating speed ranged from 7.8 to 24.5 kilometers per mile. The annual total vehicle distance traveled was 6.8 million kilometers. Average weekday productivity was 5.5 passengers per bus-kilometer. Metrobus fares are integrated with CAMETRO, allowing free transfers onto the rail system. In 1992, metrobus ridership was approximately 111,000 passengers per weekday, with an average revenue of B$16 (US$0.20)\(^{12}\) per rider (The World Bank, 1993). Because revenue is unable to cover operating costs, the Metrobus is subsidized by the government.

The lessons from Caracas show that creating a separate feeder network operated by the rail system operator is a feasible alternative to providing reliable feeder service. Metrobus, operated by CAMETRO, the rail system operator, is a potential strategy that San Juan can implement. Second, the ability to hire drivers for *por puesto* and jeep owners suggests that vehicle can be better utilized.

---

\(^{12}\) The exchange rate is approximated from the rate on January, 1993 and was obtain through the internet (http://venezuela.mit.edu/embassy/economia/exchange.html).
3.3 The Buenos Aires Collectivos

Buenos Aires is the capital of the Argentine Republic. In 1991, the Greater Buenos Aires Region had a population of 12 million, making an estimated 18 million daily trips (Larocca, 1996). In 1995, the number of daily trips remained fairly constant. The Buenos Aires collectivos first appeared in 1928. Up until 1948, they were privately owned and operated. Between 1948 and 1960, the bus system was nationalized under Transportes de Buenos Aires. Mode split data show that collectivo use decreased by 21 percent between 1970 and 1995, while auto use increased by 121 percent (Table 3.2).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto</td>
<td>15.4%</td>
<td>24.3%</td>
<td>34.1%</td>
</tr>
<tr>
<td>Buses (collectivos)</td>
<td>54.3</td>
<td>49.9</td>
<td>42.7</td>
</tr>
<tr>
<td>Subway</td>
<td>5.4</td>
<td>3.6</td>
<td>4.3</td>
</tr>
<tr>
<td>Railways</td>
<td>7.0</td>
<td>6.4</td>
<td>6.5</td>
</tr>
<tr>
<td>Taxis</td>
<td>6.7</td>
<td>3.2</td>
<td>4.1</td>
</tr>
<tr>
<td>Other</td>
<td>11.2</td>
<td>12.7</td>
<td>8.4</td>
</tr>
</tbody>
</table>


3.3.1 Collectivo Operation

There are two types of services: basic service and the Grupo II suburban service. The former provides local service, while the latter provide longer distance service up to 60 kilometers outside of Buenos Aires. Passenger demand for service has decreased slightly from 1987 to 1992, from 2.2 million to 2.1 million (Larocca, 1996). Both types of services use non-air conditioned buses. The capacity of basic services are typically 21-seats with up to 50 passengers with standees. The Grupo II services use 36 to 40-seat buses. The average age of the fleet is 6.9 years (Larocca, 1996). They operate on frequencies of 3 to 4 minutes during the peak. Minimum fares are US$0.55, with a maximum fare of US$1.20. The average fare is US$0.72. Some buses are equipped with automated ticket machines. (The collectivo driver’s union has been seeking the installation of ticket machines or the reestablishment of conductors for some time. The owners reason that the ticket machines would allow the drivers to operate the vehicles more safely and adequately control the collection of revenue.)
In 1980, a special type of service called *diferencial* was started. This was an attempt to differentiate a higher quality service with air-conditioned vehicles. Fares were higher at US$2.50 for a 10 kilometer (8.6 mile) ride. The buses had a seating capacity of 49 passengers with no standing permitted. When the buses are full, they do not stop. From 1992 to 1993, the number of *diferencial* lines increased from 19 to 46, mainly in suburban areas, showing a clear demand for the new type of higher quality service. Since their fares are not regulated by the authorities, some routes charge discounted fares on route that do not operate at capacity. This type of competition has hurt the normal *collectivos* whose fares are regulated. During the same time, the *semirrpidos* appeared, offering express service by skipping stops. This type of service is not very widespread and charge a 25 percent higher fare. On the other hand, a new type of *charter* service is gaining popularity with suburban users. After the 1992 railway strike, suburban users at certain areas hired vehicles to provide service to the downtown area. Service is predominantly for work trip purposes. The *charter* service does not stop once the vehicle is full, until arriving in downtown. These types of services are often not licensed but provide a higher level of service with the speed and convenience of the automobile which make them attractive to many suburban professionals.

### 3.3.2 Collectivo Corporations

Collectivo drivers organize themselves into corporations and abide by operating agreements that govern vehicle operation (Larocca, 1996). Legally, they are viewed as partners in the enterprise and are entitled to a share of the corporation. In practice, however, they are allowed to retain ownership of their vehicles and collect the revenue from the farebox to cover operating expenses. Maintenance is solely the responsibility of the vehicle owner. This arrangement provides owners the incentive to carefully maintain their vehicles, while providing the maximum amount of service possible. It can be explained by the fact that an average *collectivo* operates 80,000 to 90,000 kilometers per year, which are considered high mileage for vehicles deployed for public transportation (Larocca, 1996).

Corporations also provide their members with special privileges. They provide financing to help owners replace their vehicles through the contribution of the partners. They also provide repair services and the purchase of bulk materials such as tires, fuel, lubricants, etc. Some large corporations also provide maintenance facilities for their
members. Furthermore, in order to ensure that each partner receives a “fair” amount of work and income, there are rules that specify the rotation of vehicles for service. Some larger corporations also place all the revenue into a common account and distribute them according to the number of kilometers the vehicles have provided service. This is believed to have facilitated a reliable scheduled operation.

3.3.3 Collectivo Regulation

The collectivos are regulated by the Secretaria de Transporte. It specifies the type of vehicle and the maximum age allowed to operate services. The latter requirement is meant to stimulate the renewal of the fleet. The location of stops are specified by the Direccion Municipal de Transito. Since 1985, a law requires that any changes to service would necessitate demand studies and user surveys to determine impact of the proposed changes to other routes. Vehicle inspection is performed every six months by the Consultora Ejcutiva Nacional del Transporte through private garages. Exhaust emissions are also monitored and recorded during each inspection.

Experience from Buenos Aires shows that: (1) jitney operators are open to the installation of advanced fare collection technology such as automated ticket machines, as long as it helps to guarantee the safe collection of revenue, (2) a higher quality service can attract new riders and have the ability to charge higher fares, (3) regulating the maximum age of vehicles can help stimulate the renewal of the fleet, (4) frequent inspections can be performed by using private garages, (5) jitneys are able to operate a reliable scheduled service, and (6) the ability to hire drivers can increase vehicle utilization.

3.4 The Manila Jeepneys

Of all jitney systems in Asian countries, the Manila jeepney is perhaps the largest. Jeepneys are a distinct part of the Filipino culture and have been celebrated in local folklore with their unique style, custom accessories, color schemes and designs. In Metro Manila, they operate and carry more passengers in total than buses. Jeepneys have a seating capacity of 9-14 passengers but often operate over the maximum capacity. They do not receive any operating subsidy from the government. In 1983, a study by Kurokawa and Iwata (1984) concluded that jeepney operation was financially viable even without the need for public subsidy. However, recent concerns over rising operating
costs, regulated low fares, and increasing congestion have raised the issue of the possible need for government intervention (Ebata et al., 1996). Like the público system in San Juan, the jeepney industry has shown signs of decline in revenue and ridership. Especially applicable to the San Juan case is the Filipino experience of integrating jeepneys as a feeder to the light rail transit (LRT) system.

3.4.1 Jeepney Operation

Up to the early 1980s, no comprehensive data existed for jeepneys in terms of their costs, inventory, and operation. Over the years, while the bus fleet reduced in number and deteriorated in service, the total number of jeepneys have also decreased. In 1984, there were an estimated 36,000 jeepneys in Metro Manila, of which approximately 9,000 were “colorum” jeepneys, operating illegally without a license (Takyi, 1990). Three-fourths of the total trips in Metro Manila were public transport trips of which jeepneys represented 77 percent, and buses and other motorized modes represented approximately 16 percent. By 1988, the number of jeepneys decreased to approximately 28,000, carrying over 2 million passengers per day (Midgley, 1993). By 1995, jeepneys carried 55 percent of total daily person trips, while buses had a 15 percent share (Ebata et al., 1996).

Jeepney fares are regulated at P1.5 (US$0.058) for the first 4 kilometers and P0.37 (US$0.014) for every subsequent kilometer thereafter.13 A jeepney driver survey also found that most jeepneys are relatively old, with an average age of 7 years (Ebata et al., 1996).14 The average purchase price of a jeepney is P151,300 (US$5,900). Most vehicles, an overwhelming 99 percent, use diesel fuel and are significant contributors to air pollution.

3.4.2 Jeepney Owners and Drivers

In 1995, a survey of 200 jeepney drivers was conducted to learn more about daily operating procedures, costs, and other aspects related to jeepney service (Ebata et al.,

---

13 The exchange rate for pesos hereafter represents the rate on June 20, 1995 and was obtained through the internet (http://www.oanda.com/cgi-bin/ncc).
14 Note that jeepneys are assembled from second-hand engines and reconditioned for further use. Therefore, the years in service may not reveal the “real” age of the vehicle.
As summarized in Table 3.3, the survey found that only 13 percent of the drivers owned the vehicle they drove. Most drivers (87 percent) rented the vehicles for an average daily rental fee of ₱334 (US$13). This fee accounts for almost half of the average weekday gross revenue collected by the driver, which amounts to approximately ₱695 (US$26). The average daily work hours for a driver is 12 hours, with a range of 6 to 19 hours. The average number of work days per week is 5 days. A majority of the drivers (41 percent) responded that their income had remained unchanged over the past year, and 33 percent responded that their income had remained unchanged over the past five years. Thirteen percent said their net income had increased by about 5 to 10 percent, while 11 percent reported a decrease of the same magnitude. The Ebata et al. (1996) study suggests that although the actual monetary value of many of the drivers’ income has increased, the real value in terms of purchasing power has declined. The survey also found that 54 percent of drivers are sole income earners for their family, with an average of 3.8 dependents per family.

<table>
<thead>
<tr>
<th>Table 3.3: Summary of Jeepney Owner and Driver Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Vehicle Owner</td>
</tr>
<tr>
<td>Driver and Owner of Vehicle</td>
</tr>
<tr>
<td>Average No. of Vehicles per Owner</td>
</tr>
<tr>
<td>Average Daily Work Hours</td>
</tr>
<tr>
<td>Average Number of Working Days per Week</td>
</tr>
<tr>
<td>Average Weekday Gross Revenue</td>
</tr>
<tr>
<td>Average Daily Vehicle Rent Fee</td>
</tr>
<tr>
<td>Average No. of Dependents for Typical Driver</td>
</tr>
<tr>
<td>Average Annual Family Income for Typical Driver</td>
</tr>
<tr>
<td>Average Daily Net Income (less operating cost and boundary fee)</td>
</tr>
</tbody>
</table>


The demographic profile of jeepney drivers reveal that many are in their middle age, with 62 percent between 30 and 50 years of age (Ebata et al, 1996). Eighteen percent are less than 30 years of age, and 20 percent are over 50 years of age. More than half of the drivers surveyed had 10 or less years of experience driving jeepneys, and 37 percent claimed more than 10 years of experience. Thirty-one percent had 6 to 10 years of experience, while 21 percent had 2 to 5 years. Sixty nine percent claimed to have an equivalent of a high school degree or above. As the current labor force ages, there are
concerns whether the industry can attract new and younger drivers. In San Juan, the públicos are facing a similar dilemma.

Most jeepney owners recognized the need for policies and measures that will benefit the jeepney industry. An overwhelming 97 percent agreed with the implementation of strict enforcement against illegal “colorum” jeepneys which the drivers claimed represent 24 percent of jeepneys currently in operation. Responding to the problem of an aging fleet, 72 percent said they agreed to the policy of phasing out old jeepneys and buses. Thirty-six percent even agreed with stricter enforcement of traffic laws, somewhat surprising since jeepneys are often associated with speeding and unsafe traffic maneuvers.

3.4.3 Jeepney Regulatory Structure

Jeepneys are regulated by the Land Transportation Franchising and Regulatory Board (LTFRB). The LTFRB exercises strict control of jeepney licensing through the Certificate of Public Conveyance (CPC) which every operator must apply to run services. A basic prerequisite for applying for a CPC is to furnish proof of garage or terminal parking space for the vehicle. The issue of jeepney parking has often been a problem for operators. The lack of overnight parking has resulted in many operators parking their vehicles in public parking spaces or abandoned lots. Approximately 19 percent of the drivers surveyed said they park their vehicles along public roads (Ebata et al, 1996). About 10 percent said they park in or along vacant public spaces. The majority of operators (59 percent) have privately owned garages. The survey revealed that another 15 percent of the drivers bring their vehicles home and park in their residence.

The government also actively encourages small operators to join cooperative societies. Guidelines are laid down to allow both drivers and owners to become members. The society is responsible for licensing, insuring and dispatching vehicles. A great degree of self-discipline is imposed by societies. Vehicle repair and maintenance remain the responsibility of the owner. Because of the important role jeepneys play in the public transport system in Metro Manila, jeepney owners and operators are quite organized and influential. As the basic structure of jeepney business, the Ebata et al (1996) study suggests that it is the users who ultimately drive the demand for jeepney service and influence the evolution of the jeepney industry. The drivers act as immediate
service providers that act and react to the demand for jeepney service on routes. Factory assemblers supply the demand for vehicles by importing parts, assembling and selling vehicle units. The government merely issues licenses to operate services based on requests by operators.

3.4.4 Jeepney Financial Characteristics

In 1995, 10 jeepney routes were surveyed and the results suggest that the jeepney business is still relatively profitable (Ebata et al, 1996). The continued high demand for public transport in Metro Manila assures factory assemblers and owners of their business. Passengers are assured of a mode of public transportation with a reasonable level of service at a reasonable fare. However, the Ebata et al (1996) study found that income for jeepney drivers has declined in the past few years. The average daily take-home revenue is only P220 (US$8), and the average annual income of jeepney drivers is approximately P56,922 (US$2,160).\(^\text{15}\) A comparison of the average jeepney driver’s family income with an average family’s income shows a huge disparity. The average annual family income in Metro Manila is P138,256 (US$5,250) for 5.1 dependents and P56,922 (US$2,160) for the typical jeepney driver’s family with an average of 3.8 dependents. A percentage per family member comparison shows that the annual income per family member for a typical jeepney driver is a little more than half of the annual income per member for an average family member in Metro Manila. Moreover, with drivers being responsible for the fuel they use, daily fuel cost as a percentage of the driver’s wage increased from 58.9% in 1985 to 71.4% in 1995 (Ebata et al, 1996). This shows that the driver’s daily fuel cost, accounting for a majority of the operating cost, is gradually approaching his daily earnings. The study suggests that with looming oil and fuel deregulation in the Philippines, rising operating costs will cut into the wages of drivers and undermine any improvements to their income.

The Ebata et al (1996) study also cited the regulation of fares as a crucial factor in hindering the growth of driver wages. While owners are getting their rent fees and assemblers and manufacturers their profits from vehicle sales, jeepney driver wages are solely dependent on the revenue they receive from fares. Since fares are heavily regulated by the government and are purposely set low, any increases in operating costs are

\(^{15}\) The annual jeepney driver income is calculated assuming an average of 4.7 days per week of work and 52 weeks per year.
absorbed by the drivers. The growth in operating costs have not been matched by growth in wages through an increase in fare revenue. Although inflation has increased annually, current fares have been unchanged since December of 1990. As a result, the study recommends fare deregulation, as well as three other possible proposals that should be further studied:

1. **Cross Subsidization**: the operator pays wages to drivers from the total revenue of all operating routes, consisting of both profitable and unprofitable routes.

2. **Government Subsidy of Unprofitable Routes**

3. **Differential Fares**: each route determines its own fare in order to remain profitable.

In the San Juan case, since most público drivers own the vehicles they drive, and their revenue depends solely on the fares they receive, the lesson from Manila suggests that it is important to consider whether government regulation of fares has hindered the wage growth for operators by keeping revenue fairly constant while operating costs have been increasing.

### 3.4.5 LRT Impact on Jeepneys

Since the 1960s, several rail-based schemes for Manila have been considered by the Philippine Government. Eventually, the government implemented a rail-based scheme that is very similar in length and size to *Tren Urbano*. The Light Rail Transit (LRT) alignment, 15 kilometers in length with elevated sections, became operational in 1984. It was expected to carry roughly half a million passengers per day or approximately 25 percent of the total daily public transport demand and would operate along some of the most profitable jeepney routes (Japan International Cooperation Agency, 1984). By 1987, however, the LRT carried only 56 percent of its projected ridership at 278,000 passengers per day (Midgley, 1993).

The LRT operated along the busiest transportation corridor with more than half of the existing jeepney routes directly affected. It was immediately apparent that fierce competition would arise between jeepneys and the LRT. As a result, the government instituted two policies to encourage LRT use and to limit the activity of jeepneys along the alignment. The first plan was to reroute jeepneys to "insulate" the LRT from
competition. As the LRT was expected to attract longer distance, line-haul trips, the jeepneys were given the role of providing short-haul, feeder services. Little government attention, however, was given to improve the feeder nodes where different modes interacted (Rimmer, 1986). The second plan was to implement differential fares on the bus and jeepney systems.

3.4.5.1 Jeepney Rerouting Enforcement Plan

During the LRT construction phases, the Government began implementing the Jeepney Rerouting Enforcement Plan (JREP). The JREP was based on three objectives: (1) to maximize the economic benefits of the LRT operation, (2) to maximize LRT patronage and revenue, and (3) to minimize impact of LRT on bus and jeepney operations.

The JUMSUT study documented several enforcement strategies for rerouting jeepney routes (Japan International Cooperation Agency, 1984). They included:

1. Detouring longer jeepney routes that ran parallel to the LRT alignment so that jeepneys would not compete directly with the LRT
2. Restricting jeepneys from operating more than 1/4 to 1/3 of the LRT corridor distance
3. Whenever possible, no drastic rerouting would be done for jeepneys
4. Facilitating bans on jeepneys at certain sections of the LRT corridor where jeepneys were detoured from the LRT
5. Creating new routes, including feeder services to the LRT, to replace routes that were being rerouted.

The JUMSUT study found that during the construction phases, many secondary roads were sufficient for rerouting purposes. No serious level of traffic and volume changes were found along many of the side-streets close to the LRT construction sites. Some streets, particularly one-way and narrow streets, however, required traffic control measures or road improvements. As a result of the rerouting plan, the study estimated a likely surplus of approximately 3,300 to 3,800 jeepneys and 300 to 400 buses (Japan International Cooperation Agency, 1984). However, due to increased demand for transport in Metro Manila, the study suggested that this surplus would easily be absorbed
within a year or two. Second, the newly created feeder routes were expected to divert some of the surplus services. Passenger traffic for jeepneys and buses along the LRT corridor were estimated to decrease from 20 to over 50 percent. However, a considerable number of roads feeding into the LRT corridor were expected to show an increase in passenger traffic.

In 1985, a before and after comparison of the LRT impact was conducted using the JUMSUT study data from surveys collected in December of 1982 and 1983 as the before data and the jeepney count survey in August 1985 as the after data (Mortero and Ishida, 1985). The analysis found that rerouting jeepneys from sections of the LRT corridor produced a 30 percent increase in LRT ridership compared to the “do-nothing” scenario. The results showed that there was a general reduction of 2 to 7 percent in the number of jeepneys at three of the four survey points while at some points, jeepney volumes decreased by 15 to 34 percent (Mortero and Ishida, 1985). On the other hand, the survey also found an increase of 10 to 53 percent in jeepney volumes on side-streets parallel to the LRT corridor. Jeepney traffic intersecting the LRT alignment or entering LRT stations increased dramatically, as high as 85 percent at the Libertad/P. Burgos Station. Most of the twenty-four new jeepney routes which did not exist before the LRT were also observed to be short distance feeder routes to stations. They were located in the central portion of the LRT corridor, possibly due to the absence of tricycle feeder services to the stations. The survey also found that three jeepney terminals had relocated closer to LRT stations.

3.4.5.2 Jeepney and Bus Differential Fare Plan

An effort was also made to regulate bus and jeepney mode shares by changing the fare structure in favor of the LRT. A flat P1.0 (US3.8 cents) fare was set for the LRT. Based on the bus and jeepney fare of P0.65 (US2.5 cents) for the first 5 kilometers and P0.13 (US0.5 cents) for every subsequent kilometer thereafter, passengers were found to use the bus for longer trips and the jeepney for shorter trips. Approximately 40 percent of jeepney trips (compared to 15 percent for bus) were less than 2.5 kilometers, while the bus dominated trips longer than 7.5 kilometers (Figure 3.2). The average trip length for bus and jeepney was 7.8 and 3.8 kilometers, respectively. The trip length of 2.6 to 7.5 kilometers, which form the largest public transport market, were found to be common for both the bus and the jeepney. The Ebata et al (1996) study
suggests that for this trip length range, bus and jeepney may have a competitive relationship. The policy outcome was to segment the market and introduce a cheaper fare for jeepney passengers traveling less than 5 kilometers and similarly for bus passengers traveling over 5 kilometers. As a result, differential fares were simulated, and the analysis showed: (1) a clearer distinction between bus and jeepney trips, and (2) a projected increase in LRT ridership due to the discouragement of longer trips via jeepneys.

In summary, the Manila jeepney experience reveal that: (1) increasing operating costs and the lack of effort to raise fares to match the rise in operating costs have contributed to a decline in driver wages, and (2) jeepneys provided feeder service to rail stations without the need of incentives or government subsidy.

![Figure 3.2: Trip Length Distribution of Bus and Jeepney Passengers](source: The JUMSUT Study, Japan International Cooperation Agency, 1984)

### 3.5 The Hong Kong Public Light Buses

With a land area of only 1,091 square kilometers and a population of over 6 million, public transit in Hong Kong is provided by six major modes: the public light buses (PLB), the private bus system, the electric tramway system, the Mass Transit Railway (MTR) system, a suburban heavy rail system and the Light Rail Transit (LRT) system. The latter three systems are operated by public corporations owned by the
government. Hong Kong also has an extensive ferry system operating between the Kowloon Peninsula and Hong Kong Island. In February 1980, the MTR, the Colony’s first rail rapid transit system, was completed and in operation. The initial system was 15.2 kilometers in length (see Exhibit 3.2), similar in length to Tren Urbano in San Juan. In 1986, the LRT, an extension of the MRT on Hong Kong Island, was completed and operational. The purpose for building the MTR was: (1) to ease congestion and reduce traffic volumes on roads, (2) to free up limited curb space for loading and unloading passengers transferring between modes, (3) to reduce travel time, and (4) to ease the pressure on existing modes and allow franchised buses and PLBs to be used for other transport tasks (Rimmer, 1986). The private bus system, the tramway system, and the ferry system are all operated under franchises. The private bus system is comprised of three main corporate franchises. The China Motor Bus (CMB) Company Limited and the Citybus Limited have exclusive rights to operate in Hong Kong Island and the Kowloon Motor Bus (KMB) Company in Kowloon and parts of the New Territories. There are also a few companies that operate under a pooled mileage scheme and operate an extensive network of 53 routes on cross-harbor services. Together, they consist of a fleet of 4,620 buses, operating on 447 routes, carrying an estimated 3.75 million passengers daily, or 41 percent of the total daily surface public transport ridership (Hong Kong Government, Information and Public Relations Unit, 1997). The MTR carries another 3.72 million passengers daily, or 26 percent of total public transport mode share (see Figure 3.3). The PLB system (red and green minibuses) consists of privately owned and operated 14-passenger minibuses. It accounts for 19 percent of the total daily public transport mode share.

**Exhibit 3.2: Hong Kong MTR and LRT Alignment**

![Hong Kong MTR and LRT Alignment Map]


---

16 The information was obtained from the internet at: http://www.info.gov.hk/td/transp01.html.
3.5.1 Public Light Bus Operation

Currently, there are red and green public light buses (PLBs) operating in Hong Kong. The red PLBs are unregulated in terms of fares and routes, but the number of licenses are strictly controlled by the government. In the early 1980s, the government introduced green PLBs to encourage more red PLBs to provide a reliable scheduled service. In 1972, the red PLBs carried approximately 1 million daily trips, or one-third of all public transport trips (Wilbur Smith and Associates, 1976). In 1978, the franchised bus system carried 3.1 million daily passengers, while the PLB system carried 1.5 million passengers, or approximately 27 percent of the total daily transit ridership on the Colony (Rimmer, 1986). In 1986, the PLB carried 14.2 percent of all motorized trips, while the private franchised buses and rail carried 42.3 and 20.8 percent, respectively. In terms of total daily transit ridership, the PLB carried a total of 960,000 daily passengers, or 13.6 percent, in 1987 while the franchise bus and rail systems carried 54.6 and 31.8 percent of the total daily transit ridership (Midgley, 1993). By the end of 1995, red PLBs carried on average 1 million passengers per day, while the green PLBs carried 755,000 daily passengers on 271 routes.17

![Figure 3.3: Hong Kong Surface Transport Mode Split (Daily Passengers)](image)


Figure 3.4 presents a historic trend of PLB share of the total surface public transport for the past two decades. It shows that PLB mode share declined during the 1980s as a result of the introduction of the MTR and the LRT and the implementation of stricter restrictions against PLB operation. The faster and higher capacity rail rapid transit systems, in conjunction with PLB operating restrictions on major transit corridors, significantly affected PLB market share. However, PLB daily ridership increased and seem to have stabilized in the 1990s. The introduction of the green PLBs, with their reliable, scheduled service and single-fare system, have contributed significantly to the "rebound" in ridership. Currently, they account for 42 to 44 percent of total PLB daily ridership. As the government attempts to convert more red PLBs to green PLBs, that share has been steadily increasing. It is important, however, to recognize that the high population density in Hong Kong, together with steady population growth, may have also helped the PLB industry to make the arduous "comeback" in the face of unfavorable government policies. In San Juan, however, the lower population density, higher auto ownership rates and less reliance on public transit may make it hard for the públicos to face similar conditions.

Like the públicos, the red and the green PLBs are privately owned and operated. In 1972, almost 90 percent of the owners drove their own vehicle, and approximately 8 percent owned 2 vehicles (Rimmer, 1986). The Hong Kong Government has periodically set a maximum cap on the number of PLB licenses. The total fleet size in 1972 was
3,825 vehicles with the largest enterprise operating 52 vehicles. By 1982, the PLB fleet was fixed at 4,350 vehicles, and its number has remained stable since then. In 1987, there were an estimated 4,340 PLBs operating on 123 routes and carrying 221 daily passengers per vehicle (Midgley, 1993). As of October 1996, there were a total of 4,325 licensed PLBs with approximately 2,530 red PLBs and 1,820 green PLBs. The government has been consistent in setting a policy to convert more red PLBs to scheduled service green PLBs. The combined policy to limit the maximum number of licensed PLBs and to actively convert to more green PLBs has resulted in the increase of reliable, scheduled services for the traveling public. In the long run, this has helped the industry to remain profitable through ridership gains, even when new public transport modes (MTR, LRT) were introduced.

Although red PLBs are not required to operate on fixed routes, they operate on well-defined routes and terminal networks (see Exhibit 3.3 for a typical PLB terminal), often paralleling franchised buses while having the flexibility to deviate from a main route based on market demand and congestion. Because red PLB fares are unregulated, operators can charge 40 to 100 percent higher than franchised bus fares during peak periods or during poor weather when conditions make it unpleasant to wait for buses (Walters, 1979). The red PLB system does not provide public information on fares and routes as fares currently vary from HK$2 (US$0.26) to as high as HK$15 (US$1.94). Green PLBs, however, are promoted in conjunction with other public modes. The government provides information on fares and schedules, and fares are set by route and are generally higher than those of franchised buses. Compared to the franchised bus system, their ability to charge a higher fare is a result of faster travel times and speed, shorter headways, guaranteed seating, and a wider coverage through closer access to trip origin and destinations (see Table 3.4 for a comparison of operating performances between public modes). Their popularity with the public is reflected in the fact that many white-collar professionals and the middle class are frequent users of the system, while red PLBs serve mainly blue-collar workers (Rimmer, 1986). Walters (1979) reported that the red PLBs were providing services, on average, eight times the frequency of buses (with an average waiting time of 5 minutes on comparable routes) and 15 percent higher than the average bus operating speed. By 1980s, many of the vehicles were also equipped with  

---


19 The exchange rates were obtained for March 11, 1997 from the internet (http://www.olsen.ch/cgi-bin/exmenu).
air-conditioning - a must in the hot, humid summers in Southeast Asia. In severe weather conditions such as typhoons, the PLB is the only form of surface public transportation that remains operational in Hong Kong. They are also extremely flexible in meeting “spot/point” demand at special events such as horse races and soccer games.

Table 3.4: Estimated Maximum Scheduled Peak Directional Performance - Hong Kong Public Transport System

<table>
<thead>
<tr>
<th>Mode</th>
<th>Scheduled Peak Capacity (per direction per hr.)</th>
<th>Min. Headway (minutes)</th>
<th>Distance Between Stops (km)</th>
<th>Average speed (km/hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass Transit Railway (MTR)</td>
<td>60,000</td>
<td>2.0</td>
<td>1.1</td>
<td>34</td>
</tr>
<tr>
<td>Franchised Bus (double-decker)</td>
<td>24,000</td>
<td>7.0 - 8.0</td>
<td>0.5</td>
<td>13 - 14</td>
</tr>
<tr>
<td>Tram (2-car trains)</td>
<td>17,000</td>
<td>0.92</td>
<td>0.27</td>
<td>10 - 11</td>
</tr>
<tr>
<td>Public Light Bus</td>
<td>6,500</td>
<td>0.12</td>
<td>-</td>
<td>18</td>
</tr>
</tbody>
</table>

3.5.2 Public Light Bus Regulation

The predecessor of the PLBs began operating illegally in the 1960s. In 1969, they were officially recognized after a politically-motivated bus strike that disrupted franchised bus operation. As precursors to the PLB, they were able to prove their ability to “fill the gap” and provide reliable public transit services. Their popularity and acceptance by the public led to their public recognition as the public light bus. PLBs are required to pass annual vehicle inspections to ensure safety and emissions compliance. Vehicle specifications are also tightly regulated. The government only allows certain vehicle types and models to be used as PLBs. They are required to conform to two exact color schemes - yellow and red for red PLBs and yellow and green for green PLBs. From the street, they can easily be identified. This strict policy has enabled the government to ensure a uniform and well maintained fleet.

3.5.3 Public Light Bus Financial Characteristics

The success of the PLB system was reflected in its high rate of return on investment. Early data for 1972 show that owners can typically recoup two-thirds of the vehicle purchase price within one year (Barden and Seneviratne, 1972). The estimate is based on the assumption that the vehicle has a 4 year and 320,000 km life. In 1972, a typical for-hire driver is paid HK$50-55 (US$6-7) for a shift. Barden and Seneviratne (1972) also found that the average operating costs were HK$1.00 (US$0.13) per kilometer, and revenue varied from HK$0.64 (US$0.08) to HK$3.88 (US$0.50) per kilometer. The fare recovery ratio was estimated to be 5.2. The fixed cost was estimated to be around 29 percent of the total cost of starting a business, which included vehicle depreciation, insurance cost, license fees, interests, vehicle purchase price, etc. The operating cost was estimated to be around 71 percent of the total cost which included all maintenance, repair, parts, driver wages (for the two-shift system), and lubricant and fuel costs. The largest portion of the operating cost is wages for the hired driver which represented 59 percent of the operating cost. The policy to allow owners to hire drivers for multiple shifts has contributed to the profitability of the PLB. It allows the owners to better utilize their vehicles.
3.5.4 Contribution to Traffic Congestion

In the 1970s, the PLBs were frequently seen as contributors to traffic congestion and disruptive to the efficient operation of scheduled franchised buses. In the *Hong Kong Comprehensive Transport Study of 1976*, Wilbur Smith and Associates (1976) contended that profit motives and the lack of service obligations have resulted in the undesirable concentration of PLB services in congested corridors where their aggressive driving tactics interfered with the operation of franchised buses. Since PLB operators are private entrepreneurs, they tend to maximize their revenue potential by operating *en masse* on high demand routes that are often very congested.

The PLBs were also seen as a barrier to the expansion of the franchised bus and tram systems. The PLBs were viewed as taking up valuable curb and road space that limited the expansion of more formal transit modes. Therefore, the PLBs were recommended to be curtailed in congested corridors and that franchised buses be granted exclusive monopoly to operate on congested corridors (Wilbur Smith and Associates, 1976). In return for displacing affected PLBs, the consultants to the government recommended that the operators be provided with better vehicles to help improve their services. The consultants also recommended that the PLB be used as feeder services.

As a result, the government prohibited PLB operation in areas of downtown Kowloon (Tsim Sha Tsui). There were also a number of prohibition and restriction zones introduced, involving either entry prohibitions or pick-up and drop-off restrictions, to reduce curbside stops and traffic obstruction on congested corridors (Hong Kong Government, Environmental Branch, 1979). Since the implementation of such policies, PLB ridership decreased from 1.3 million daily passengers in 1976 to approximately 1 million in 1982 (Yu, 1982; Commissioner for Transport, 1983; Rimmer, 1986). This represented a 23 percent decrease in total daily ridership. In 1987, PLB ridership declined to 960,000 daily passengers, representing only 13.6 percent of total daily transit ridership (Midgley, 1993). The result was that traditional transit gained in ridership at the expense of the PLB system. What the Hong Kong Government found was that strict enforcement of traffic laws and restrictions on PLB operation was necessary for the sustainability of formal transit modes. Government actions have prompted a few threatened strikes and complaints by PLB operators. However, since there were many
other public modes and options for the traveling public, any organized PLB actions against government policies were largely ineffective.

3.5.5 The Green Public Light Bus System

In order to encourage red PLB operators to serve off-peak periods and low demand routes, the government created a separate minibus system in the 1980s called the maxicab. The maxicab was the precursor to the green PLB system and was created by giving selected PLB operators exclusive franchises to operate on certain routes. Initial estimates cited approximately 500 units that were converted when the program was first implemented (Rimmer, 1986). Table 3.5 presents a comparison of green and red PLB service and operational characteristics. Compared to the red PLB system, the green PLBs differ in terms of their route structure, fare, time-table, form of ownership, maintenance requirements, vehicle storage requirements and operational restrictions. Green PLBs are required to provide fixed-route service, avoid major bus corridors, and provide feeder service to line-haul bus and rail systems. Unlike the red PLBs, green PLB fares are regulated by the government. They are allowed to enter prohibited zones to drop off passengers. The green PLB also shifted vehicle ownership from single owner-operators to multi-vehicle companies. The establishment of companies allowed individual owners to participate in the green PLB program while continuing to driving their own vehicles. It also allowed the government to create some order and discipline in the industry through the formation of multi-vehicle companies. Other strategies were considered by the government but did not materialize. One of such strategies was allowing existing PLB operators to form a third franchised bus company, using large buses instead of minibuses. However, the implementation of allowing operators to trade a PLB license for a larger bus license was deemed too difficult and complicated to merit further consideration. The outcome of intense government restrictions on the number as well as the operation of the PLBs have resulted in decreased vehicle and passenger trips and vehicle kilometers traveled. However, the green PLB program has helped to convert a large portion of red PLBs to provide reliable, scheduled service. It has also allowed the fleet to be upgraded as new green PLB license applicants were required to meet stricter vehicle, safety and maintenance requirements. In the long run, as more PLBs were converted to provide scheduled service, the ridership trend began to rise.

The PLB experience is important to San Juan for two reasons. First, the experience and results of implementing a new fixed-route, scheduled minibus service can
be helpful to San Juan. Since the PLBs existed before the MTR and LRT, the
government has gained significant experience in integrating privately owned and operated
minibuses into the overall public transportation system. Specifically, the experience of
creating a separate minibus system would provide insight into the benefits and risks of
implementing a separate público/minibus system for San Juan. Second, Hong Kong has
dealt extensively with PLB regulations in terms of reducing negative impacts of PLB
operation on traditional transit operations and congestion on curbside and major road
intersections. The lessons from Hong Kong can potentially be of value to San Juan.

Hong Kong’s experience has demonstrated that a dual-service system,
complemented by determined government policies to convert informal PLBs to more
structured and reliable ones, is a plausible alternative for converting privately owned and
operated jitney services into a formal public transport mode. The PLB system of Hong
Kong has often been judged by its Asian neighbors as a model for incorporating the
private sector in providing high quality public transport. Other Asian capital cities such
as Kuala Lumpur and Manila have often cited and looked to Hong Kong for examples of
integrating private jitneys/minibuses into the public transit system.

### Table 3.5: Comparison of Red versus Green PLB (maxicab) Operation

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Red Public Light Bus</th>
<th>Green Public Light Bus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fleet Size</td>
<td>2,530</td>
<td>1,820</td>
</tr>
<tr>
<td>Daily Ridership</td>
<td>1,007,000</td>
<td>755,000</td>
</tr>
<tr>
<td>No. of Routes</td>
<td>-</td>
<td>271</td>
</tr>
<tr>
<td>Route Structure</td>
<td>• Unregulated</td>
<td>• Fixed-route</td>
</tr>
<tr>
<td></td>
<td>• Tend to travel on high demand &amp; congested corridors</td>
<td>• Regulated by authority</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Feeder function</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Avoids major bus corridors</td>
</tr>
<tr>
<td>Fare</td>
<td>• Unregulated</td>
<td>• Fixed (by authority) based on distance</td>
</tr>
<tr>
<td></td>
<td>• Higher during peak periods</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Lower during off-peak period</td>
<td></td>
</tr>
<tr>
<td>Operating Hours and Timetable</td>
<td>• No fixed time-table</td>
<td>• Hours of operation established by the authority</td>
</tr>
<tr>
<td></td>
<td>• Terminate service at driver’s discretion</td>
<td>• Service frequency established by the authority</td>
</tr>
<tr>
<td></td>
<td>• Operate late-night services to get higher fares</td>
<td></td>
</tr>
<tr>
<td>Ownership</td>
<td>• Varied (owner-operator or drivers for hire)</td>
<td>• Multi-vehicle companies</td>
</tr>
<tr>
<td>Maintenance</td>
<td>• Contracted-out to local garages</td>
<td>• Company required to provide maintenance function and facilities</td>
</tr>
<tr>
<td>Vehicle Storage</td>
<td>• Parked overnight at public light bus terminal/deposits</td>
<td>• Company required to provide depot facilities</td>
</tr>
<tr>
<td>Restrictions</td>
<td>• Prohibit operation on major bus corridors</td>
<td>• Allowed to enter prohibited zones to drop-off passengers</td>
</tr>
<tr>
<td></td>
<td>• Some form of restrictions on passenger pick-up and drop-offs on most main streets</td>
<td>• Similar restrictions as red public light bus on most main streets</td>
</tr>
</tbody>
</table>

*Hong Kong Government, Information and Public Relations Unit, 1996 (http://www.info.gov.hk/td/transp01.html).*
3.6 The Kuala Lumpur Minibuses

In the 1970s, Kuala Lumpur (KL) experienced similar problems to those San Juan is currently facing. Public transport services were deteriorating while private auto use was rapidly increasing, causing severe congestion in the central areas. To relieve congestion, in 1975 the Malaysian Government invited applications to operate minibuses, modeled after the public light bus system in Hong Kong, to supplement the failing services of eight unsubsidized, franchised bus companies. The result was 1,009 applicants for 225 licenses (Rimmer, 1986). The debut of the minibus was also in preparation for the introduction of automobile restraint policies such as taxes, parking levy, and an Area Road Pricing Scheme in hopes that auto pricing policies and better transit service would lure some auto drivers out of cars. Furthermore, the government felt the need to inject a greater degree of competition in the public transport market to ensure that service quality remains at a higher level. The minibuses were introduced to increase mobility for the lower income class and exploit the strong preference for the automobile as opposed to mass transit modes. In addition to the minibus program, the Malaysian government has been planning a rail system for Kuala Lumpur for the last two decades. The Sistem Transit Alvian Ringan (STAR) system is similar in scale and size to Tren Urbano in San Juan and line 1 has been operational since December 1996. The KL minibus program provides useful insight on what San Juan might expect if a new rail rapid transit system is introduced with existing jitney services.

3.6.1 Minibus Operation

The minibuses have a capacity of 16 seats (see Exhibit 3.4 for a typical minibus). Although standing is not permitted, minibuses often operate above the load factor. The average peak load factor is approximately 1.07, suggesting that the “no standee” regulation was not effectively enforced (Walters, 1979). The KL minibuses are demand-responsive. They provide fixed-route service with the flexibility to deviate from the main route. In 1978, there were 400 minibuses operating 17 routes and carrying 19 percent of total person trips (Rimmer, 1986). By 1984, minibuses carried the same number of person trips (19 percent) as the franchised buses, while the auto carried 39 percent of total person trips (see Figure 3.5) (Pendakur, 1984; Rimmer, 1986; Takyi, 1990).

---

20 The taxes and parking levy schemes were implemented, but the Area Road Pricing Scheme was not (Pendakur, 1984).
A typical minibus shift requires a driver and a conductor. Most minibuses are owned by single owner-operators. Approximately two-thirds of the licensed operators operate a single vehicle, while the largest of the licensed operator operated 35 vehicles (see Figure 3.6). Minibus fares are set between those of buses and taxis. The average minibus trip length was 11 kilometers (Roth, 1984). Although they accounted for only 17 percent of the total stage bus capacity, minibuses carried over half of the total bus passenger kilometers and 35 percent of total daily inbound trips into the city center (38 percent in the peak) (Walters, 1979; Roth, 1984). By 1983, there were approximately 490 minibuses, operating 38 routes and carrying 160,000 passengers per day (Midgley, 1993). Minibuses carried 327 daily passengers per vehicle and operated 112,600 daily vehicle kilometers.

A new government policy, implemented in early 1997, prohibited minibuses from operating in the center of Kuala Lumpur. Instead, only two consolidated minibus companies, Intrakota Sdn. Bhd. and Park May Sdn. Bhd., were granted franchises to operate services. Intrakota currently operates 500 minibuses and has plans to expand to
approximately 1,000. The government has successfully encouraged them to use fareboxes which provide change.

![Figure 3.5: Mode Split in Kuala Lumpur (1984)](image)


### 3.6.2 Minibus Regulation

Minibus fares and routes are regulated by the government. The number of licenses are also strictly controlled in order to protect the regular franchised buses. This policy has brought substantial financial returns for the fortunate minibus license holders (Roth, 1982). Like the Hong Kong public light buses, the government enforces strict vehicle specifications and standards. Many minibus owners are organized into owner associations. In 1977, approximately 55 of the 167 license holders, or 33 percent, formed the Selangor and Federal Territory Minibus Owners Association (Rimmer, 1986). Collectively, the associations had 1,600 members.

![Figure 3.5: Mode Split in Kuala Lumpur (1984)](image)

3.6.3 Financial Profitability

Financial data on the minibuses are scarce. Although little official cost and revenue figures are published to lend insight on whether minibus operation is profitable, frequent pressures to increase the number of licenses seem to suggest that they are (Walters, 1979; Roth, 1984; Rimmer, 1986). In 1975 alone, there were 2,200 applications for service. Walters’ (1979) best estimate of the total annual profit was approximately M$7,900 (US$3,160) which represented a 130 percent return on capital or a 30 percent profit rate.22 Roth (1984) also reported annual profit for a licensed operator to be around 37 percent. The total fixed cost is estimated to be M$15,300 (US$6,120) for vehicle depreciation, insurance, license fees, road tax and driver wages. The annual operating cost was estimated to be M$2,000 (US$800) for fuel, maintenance and repairs, and the annual revenue was approximately M$25,200 (US$10,080). The estimated daily revenue was M$84 (US$33.60). Walters suggested that the benefits of the minibus system were not due to the special circumstances pertaining to Kuala Lumpur, since most governments tend to proceed cautiously with introducing any form of private sector participation in providing public services. Instead, they were due to the speed and

22 Walters’ assumptions are based on the fact that minibuses operate on an average load factor of 0.5 (7 passengers), 300 days per year, and 8 hours per day. The average trip length was 4 miles, with an average speed of 15 m.p.h.
unconventional practice of introducing a new service in one large program, largely due to the influence of the World Bank in the 1970s which advocated the introduction of minibuses and the resistance to the nationalization of buses (World Bank, 1975). The Kuala Lumpur minibus experience also suggests that strict government control of the fleet size has potential positive effects on profitability. The experience in Hong Kong seems to support this finding.

### 3.6.4 From Minibus to Midibus - The Impact of the LRT

In 1982, the *Kuala Lumpur Draft Structure Plan* proposed that the bus and the light rapid transit (LRT) system shall be the major future public transport system in Kuala Lumpur. Since then, the minibuses have received less attention as the government entertained plans for the Aerobus (similar to the cable car concept) and the LRT. The plan was to consolidate all the stage bus enterprises into a single state-run entity. The minibuses were recommended to be upgraded to midibuses with higher carrying capacity (approximately 20 to 25 passengers) and relegated to providing feeder services to the LRT (Rimmer, 1986). They were also recommended to be used on low demand areas to supplement the lack of stage bus services. In late 1996, the first phase of the LRT became operational. The second phase, PUTRA (Line 2) is under construction. It is designing a feeder system to provide access to rail stations and is expected to be solely funded by PUTRA.

The experience in Kuala Lumpur reveal that strict control of minibus licensing can help to ensure profitability for the few fortunate owners. Furthermore, effective government oversight can also ensure that vehicles are well maintained. Kuala Lumpur’s strategy of allowing the rail system operators to conduct franchised feeder service can be a potential strategy for San Juan. It also shows that private jitney operations can be encouraged to switch to automated fareboxes.

### 3.7 The Miami Jitneys

Dade County, Miami presents an interesting example of recent U.S. experience in operating jitney services. Most jitney drivers and owners in Miami are recent immigrants from Central or Latin America who have experience with jitneys similar to those found in

---

23 The Aerobus plan was later abandoned.
Puerto Rico. Jitney operation in Miami originated from Pre-World War II years as an informal public transport mode (Lombardo, 1994). Jitneys provided service between low income neighborhoods and the central city, filling a transit need which the local public transit routes did not serve. As a result of the disruption of regular transit service from Hurricane Andrew (1992), the Metro Dade Transit Agency (MDTA) contracted with private jitneys to provide transit service in the Miami area. The contracting experience provides useful insight for San Juan if the government decides to contract público services to a subset of existing operators.

3.7.1 Jitney Operation

Up until the 1980s, the number of jitneys remained fairly constant (Lombardo, 1994). However, a state statute in 1989 resulted in a proliferation of illegal jitneys that flooded the market. Since then, sporadic efforts by the County to regulate illegal jitneys have managed to control, but not eliminate, their operation. A 1992 study by the Urban Mobility Corporation (UMC) for the Federal Transit Administration found that jitneys carried an average of 110-120 passengers per vehicle per day with an estimated 43,000 to 49,000 passengers per weekday and approximately 946,000 to 1,078,000 riders per month.²⁴ 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 (MDTA, 1992). Jitney headways range from 2 to 47 minutes, with a mean headway of 13.6 minutes during the 7 to 10 a.m. period and 13.7 minutes between the 11 a.m. to 3 p.m. period (Parsons Brinckerhoff Quade and Douglas et al, 1992). Vehicle counts at 26 locations reveal that vehicle availability for service is at a peak between 8 and 9 a.m. for both the inbound and outbound directions, coinciding with work trips (see Figure 3.7). The second peak occurs between 12 and 1 p.m., coinciding with lunch trips. Vehicle availability for inbound trips into the CBD is higher at all hours of the day, except after 2 p.m., when vehicle availability for outbound trips from the CBD begins to increase. The prevalent vehicle type used are 15-passenger vans.

²⁴ The estimated ridership figures assumed a conservative systemwide average daily vehicle ridership of 110 to 125 passengers per weekday multiplied by the jitney fleet of 393. Monthly ridership estimates assumed weekend ridership to be one-half of weekday ridership.
As part of the 1992 UMC study, an independent survey also found that jitneys have developed a market of their own, instead of “siphoning” riders from the public bus system. More than 50 percent of the respondents indicated they “always ride the jitney (UMC, 1992).” Thirty-one 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 jitneys were not available, they would rather use other modes of travel instead of Metrobus. Approximately 65 percent of the respondents said they were drawn to the jitneys because of faster service to their desired destination, and 21 percent said they ride jitneys because they were less expensive. The survey found strong evidence to conclude that jitneys were successful in carving out its own independent market niche and developed a loyal clientele that considers them their travel mode of choice.

3.7.1.1 Jitney Quality of Service

Although there are no formal studies comparing the quality of service of jitneys with the Metrobus, an evaluation performed by the Miami Herald (“Minibuses vs. Metrobuses,” The Miami Herald, April 14, 1991) provides a qualitative comparison. The evaluation was performed by assigning two reporters to ride and compare the services and evaluate them according to the following seven categories: frequency, speed, cleanliness,
comfort, friendliness, price, and driving. The results of the evaluation are summarized in Table 3.6.

Jitneys were observed to provide more frequent service during peak periods than the Metrobus. However, they were also less comfortable compared to the Metrobus in terms of ride comfort and the lack of air conditioning. The evaluation also cited that it was hard for passengers in the back to board and exit the vehicle. The Metrobus, on the other hand, was observed to arrive late at stops after a few jitneys traveling the same direction had passed. Drivers were unfriendly and uncourteous, as opposed to jitney drivers who were always helpful in getting spare change or stopping to pick-up or drop-off at passengers’ request. Both the jitney and the Metrobus were observed to be clean, but some jitneys were observed to have old seats with taped upholstery. Although jitney fares were cheaper ($1 versus $1.25 on the Metrobus), the evaluation also cited that Metrobus was a “better deal” because a transfer was available for 25 cents extra, as compared to no transfer allowed on jitneys. This suggests that fare integration may play an important role in making jitneys more attractive.

<table>
<thead>
<tr>
<th>Service Category</th>
<th>Jitney</th>
<th>Metrobus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>Frequent during peak period</td>
<td>Less frequent</td>
</tr>
<tr>
<td>Speed</td>
<td>1 minute more than Metrobus on a comparable route</td>
<td>1 min. less than jitney on same route</td>
</tr>
<tr>
<td>Cleanliness</td>
<td>Free of garbage</td>
<td>Very clean</td>
</tr>
<tr>
<td>Comfort</td>
<td>Lack of air conditioning; vehicle compartment can become hot</td>
<td>Very large and comfortable</td>
</tr>
<tr>
<td>Friendliness</td>
<td>Drivers were courteous and friendly</td>
<td>Drivers were unfriendly and uncourteous</td>
</tr>
<tr>
<td>Price</td>
<td>Fare was $1, 25 cents less than Metrobus</td>
<td>Better deal because one can get a transfer for 25 cents</td>
</tr>
<tr>
<td>Driving</td>
<td>Average driving, sluggish brakes</td>
<td>Smooth ride; occasionally fast</td>
</tr>
</tbody>
</table>

Table 3.6: Miami Jitney vs. Metrobus Quality of Service


*The categories are ranked on a zero to five circle “●” rating, with five filled circles “●●●●” representing the highest rating. The half-filled circle “●” represents a “half” rating.
3.7.1.2 Jitney Passenger and Trip Characteristics

Most jitney passengers are low-income workers. An on-board passenger survey revealed that 77.5 percent of jitney users have an annual household income of less than $20,000 (UMC, 1992). Only 4 percent of users have an annual household income of over $40,000. Approximately 58.6 percent of all respondents were full-time workers, and 12.1 percent were part-time (see Figure 3.8). The survey found that 10.6 percent of users were full-time students. Over 60 percent of respondents were non-native English speakers, of which approximately 86 percent said they usually speak Spanish. Almost 54 percent of jitney users were male, and 46 percent were female.

![Figure 3.8: Jitney Passenger Occupation](source: UMC, 1992).

Most jitney trips (54.5 percent) originate from home, while 21.7 percent originate from work (see Figure 3.9). Over 39 percent of trips are work-related, while 7.9 percent are shopping trips, and another 7.4 percent are school trips. Most jitney passengers are frequent users. Over 72 percent use jitneys over 4 or 5 times a week, with approximately 26.8 percent using the service 10 or more times a week (see Figure 3.10).
3.7.1.3 Jitney Productivity

In 1991, as part of a jitney study, the UMC (1992) gathered jitney vehicle productivity data from five selected routes which were representative of jitney service
throughout Dade County. Vehicle productivity varied across routes, ranging from a low of 11.33 to a high of 22.91 passengers per revenue-hour. The mean was 16.27 passengers per revenue-hour (see Table 3.7). Jitneys typically operated 7 to 8 hours a day in revenue service, excluding layovers, deadheading. Depending on the route and demand, the jitneys surveyed carried as many as 160 daily passengers to a low of 80. Assuming a daily operating cost of $70-75 and an average work day of 7-8 revenue service hours, vehicle productivity of a typical jitney in terms of operating cost per revenue service hour is roughly within the range of $8.75-10.71.

<table>
<thead>
<tr>
<th>Table 3.7: Jitney Vehicle Productivity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Daily Vehicle Trips on Surveyed Routes</td>
</tr>
<tr>
<td>Estimated Daily Ridership on Surveyed Routes</td>
</tr>
<tr>
<td>Percent of Vehicle Trips Surveyed</td>
</tr>
<tr>
<td>Average Passengers/Vehicle Trip Surveyed*</td>
</tr>
<tr>
<td>Revenue Hours on Surveyed Vehicle Trips</td>
</tr>
<tr>
<td>Average Revenue-Hours/Trip</td>
</tr>
<tr>
<td>Passengers/Revenue-Hour</td>
</tr>
<tr>
<td>Operating Cost/Revenue-Hour*</td>
</tr>
</tbody>
</table>

* There were a total of 31 vehicle trips surveyed with a total of 942 passengers.
# Assuming a daily operating cost of $70-75 and an average work day of 7-8 revenue service hours.

3.7.2 Jitney Financial Characteristics

Jitney operating costs were estimated within the range of $400 to $450 per week, depending on the lease fee for the vehicles (UMC, 1992). A breakdown of jitney operating costs is presented in Table 3.8. Assuming a flat fare of $1 per passenger and an average of 110 to 125 passengers per day, the study estimated a daily net profit for a typical jitney driver to be around $40 to $55 (or $960 to $1,320 a month), roughly equal to the minimum wage. The study also cited that the derived ridership and financial estimates represented a conservative estimate of systemwide jitney productivity and financial characteristics. Although the financial results show that jitney drivers earn minimum wage, jitneys are still profitable and are able to recover costs.

---

25 See next section for a more detailed description of jitney financial condition.
26 Assuming a, average 6-day work week and 4 weeks per month.
### Table 3.8: Jitney Operating Costs

<table>
<thead>
<tr>
<th>Category</th>
<th>Monthly</th>
<th>Weekly</th>
<th>Daily*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital</td>
<td>$250</td>
<td>$62</td>
<td>$10</td>
</tr>
<tr>
<td>Fuel</td>
<td>400</td>
<td>120</td>
<td>20</td>
</tr>
<tr>
<td>Maintenance</td>
<td>400</td>
<td>100</td>
<td>16</td>
</tr>
<tr>
<td>Insurance</td>
<td>375</td>
<td>94</td>
<td>15</td>
</tr>
<tr>
<td>Lease Fee</td>
<td>200-300</td>
<td>50-75</td>
<td>8-12</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$1,625-1,725</strong></td>
<td><strong>$400-450</strong></td>
<td><strong>$70-75</strong></td>
</tr>
</tbody>
</table>

* Based on a six-day week.

#### 3.7.3 Jitney Regulation

Jitneys are regulated by the Dade County Passenger Transportation Regulatory Division (PTRD). It sets the licensing, insurance, vehicle, and safety standards for the industry. The PTRD submits information for proposed new jitney routes to the MDTA for approval. The certificate holders are authorized to provide fixed route service and make stops anywhere along the route. Owners of jitney companies would lease their permits on a daily basis to drivers for a flat fee. The operator would be responsible for all operating expenses.

In 1981 and 1985, Dade County adopted several ordinances which were later codified into the Metropolitan Dade County Code governing “Passenger Motor Carriers” (Chapter 31, Article III, Sections 31-101 to 31-115) (UMC, 1992). Section 31-101 allowed private sector participation in providing public transportation services. As a result of the ordinance, the County received applications for proposed new jitney routes, many of which duplicated or closely paralleled major Metrobus routes. Concerned that jitneys would compete directly with MDTA buses, the County concluded that jitneys were allowed to operate anywhere in Dade County but prohibited from operating on or near “transit core corridors”27 where Metrobus operated. This recommendation was incorporated in the new Jitney Ordinance (85-20), which was adopted in April 1985 and which still governs jitney operations today (UMC, 1992). The 1983 report virtually designated all of the core area of Dade County as “transit core corridors,” which prevented jitneys from operating in or near them.

---

27 A “transit core corridor” was defined as “one-half mile sectors of land centered along routes where current Metrobus service is provided every half-hour or more frequently (MDTA, 1983).
3.7.4 Jitney Contracting Experience

In September 1992, approximately two weeks after Hurricane Andrew, the 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 operators were recruited to supplement the vehicle fleet and enlisted in the program under the four prime contractors. The MDTA negotiated a $28/hour turnkey rate\(^{28}\) (revenue service plus deadhead hours) with the four prime contractors. The prime contractors subcontracted service to private operators 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. 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, with hours of operation that matched Metrorail. Service was free to all users. In March 1993, the system was carrying an average of 20,500 daily riders.\(^{29}\)

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 price. The program demonstrated the ability of the contracted jitneys to adapt rapidly to fluctuating demand and changing travel patterns. Dade County's experience showed that compliance by private jitney operators to local safety, insurance and other requirements could be achieved quickly and effectively with the help of economic incentives. Many of the contracted operators who previously did not meet insurance, safety, or maintenance requirements were found to be in compliance as soon as the contract was binding. After Hurricane Andrew and the termination of FEMA's financial support, the jitney market in Miami has declined sharply. Presently, there are 21 private jitney certificate holders, serving 13 routes.\(^{30}\)

\(^{28}\) The turnkey rate included cost for vehicles, drivers, insurance, maintenance, dispatching and normal on-street supervision (Federal Transit Administration. Private Sector Briefs. March 1993).

\(^{29}\) The ridership figures were provided by the service contractors.

\(^{30}\) Information according to Steven Bode, MDTA, 1996.
The lesson for San Juan is that contracting services to private operators can potentially reduce the cost of providing services, while still allowing the government to maintain an adequate level of control.

3.8 The New York City Vans

Other than the Miami jitneys, the New York City Vans are the only comparable privately owned and operated jitney system in the U.S. There are two jitney systems that operate in the boroughs around New York City - one legal and one illegal. The legal jitneys are called commuter vans, and the illegal ones are known as dollar vans. The commuter vans operate on fixed routes and typically during the peak periods, catering to work trips. The dollar vans operate mostly in poor and immigrant neighborhoods, providing transportation and access to local transit. Vans typically operate along well-established and high demand transit corridors in Brooklyn and Queens and to a lesser extent in the Bronx. Some provide local and feeder services to subway stations and serve local transit needs that the NYCTA buses do not provide. New York City has had extensive experience in dealing with a dual jitney system. The New York experience can provide lessons for understanding the nature of competition between legal and illegal jitneys, their relationship to bus and rail systems, as well as provide a U.S. example of the institutional complexity of regulating jitneys in a multi-agency, multimodal environment in which the latter situation might apply to San Juan.

3.8.1 Van Operation

New York City vans have a typical capacity of 14 to 20 passengers. While private sedans were first used, 14-passenger vans became the vehicle of choice. Recently, an increase on the number of 20-passenger vans have also been observed (Boyle, 1994). Commuter vans typically provide service from the boroughs into Manhattan. Pick-up and drop-off times and locations are pre-arranged, and no curb-side "hails" are permitted. Dollar vans, on the other hand, operate in direct competition with local buses. Many of them compete with buses to pick-up and drop-off passengers at or near bus stops. Their fares are also competitive with bus fares, often charging slight less than the standard bus fare. Dollar van operation tend to concentrate around transit hubs, providing

---

31 Dollar Vans are called such because they typically charge $1.00 for service.
complimentary service to subway stations. During a transit strike in 1980, unlicensed vans operated both as local and feeder services to the Long Island Railroad Station in Jamaica (Southeast Queens) (Boyle, 1994). The dollar van operators have, in numerous occasions, petitioned the NYCDOT and the Taxi and Limousine Commission for license and authorization to provide feeder services to and from subway stations and certain neighborhoods. An estimated 2,400 to 5,000 vans provide feeder services in New York City (MTA, 1992).

Similar to Miami, many van drivers and operators are recent immigrants from the Caribbean. A 1992 MTA staff report indicated that jitney vans tend to proliferate in neighborhoods with high concentration of Caribbean immigrants, since jitneys are a popular form of transportation in Jamaica, Puerto Rico, Haiti and other islands in the West Indies (MTA, 1992). Recently, there is also a proliferation of van services serving different ethnic communities. Many of them operate from immigrant neighborhoods to major destinations in Manhattan or as feeder services for accessing public transportation. Vans currently serve Chinese/Asian communities in the Queens and Chinatown areas. Many of these vans are operated by Chinese/Asian operators. There are also van services that serve mostly African-American neighborhoods in Brooklyn.

Vans typically operate on 3 to 5 minute headways during peak periods, picking-up and dropping-off passengers at or near busy bus stops. Their hours of operation vary, depending on demand. In general, they operate from early in the morning (around 6 a.m.) till late in the evening. Sometimes, one can still find a few dollar vans operating as late as midnight. They mainly provide peak period service with less service in the midday and off-peak periods. Dollar van fares tend to lag NYCTA bus fares for a period of time, but tend to increase to match bus fares within one to two years. Currently, the New York subway, bus, and private bus systems charge $1.50, while most van operators charge anywhere from $1.00 to $3.50. Commuter vans that provide service into and out of Chinatown from points in Queens charge higher fares. Most of the higher fare vans are typically newer and better maintained. The more expensive fares are related to higher insurance and capital costs of purchasing newer vans.

32 In the New York Metropolitan Area, only licensed taxis are allowed to accept street “hails.”
3.8.2 Van Regulation

Van operation is regulated by the New York City Taxi and Limousine Commission (TLC). Fares are not regulated, but licensees are required to report the fares charged for service. Entry and route are regulated. An applicant submits an application to the New York City Department of Transportation (NYCDOT) for review. The NYCDOT reviews requests on a case-by-case basis and makes recommendation to the TLC for approval if the operators can demonstrate that there is sufficient demand for service. The TLC then makes recommendation to the City Council for final approval. Previously, van operation was regulated by the New York State Department of Transportation (NYDOT), until a 1993 State enabling legislation transferred the responsibility of jitney/van regulation to the City. A telephone conversation with a TLC official reveals that the current administration would like to provide licenses to more qualified illegal vans. The hope is that more illegal operators can be brought into the “regulatory umbrella” to ensure that service and safety standards are maintained.

In 1994, a study by Boyle (1994) found that jitney regulation 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 not inspected. Other immediate concerns included reliability, efficiency and equity. Transit unions were viewed as a major stumbling block in integrating the vans into the transit system.

3.8.3 Jitney/Van Enforcement Experience

In March and April of 1992, the NYCTA implemented a six week, 18-hour weekday and 8½-hour weekend Van Enforcement Program (called the B41 Experiment) in Brooklyn (NYCTA, undated). In December of the same year, a concentrated effort under the leadership of the New York City Police Department was also undertaken in the immediate area near the Jamaica Center subway station in Queens. A second phase

---

34 The NYCPD was assisted by the NYCTA’s Surface Crime Unit, the NYSDOT Motor Carrier Investigators, the Taxi and Limousine Commission, the Long Island Railroad Police, and the NYCDOT.
follow-up enforcement program also took place in mid-February 1992 through the end of June 1993 at the same location in Queens. The purpose of the programs was to assess ridership and revenue impacts, resource requirements, and cost effectiveness of concentrated enforcement efforts. Most of the affected bus routes had been losing ridership to the vans. The efforts focused on major traffic corridors (Flatbush Avenue in Brooklyn and the Merrick Boulevard corridor in Queens) which experience a large influx of illegal van operations.

3.8.3.1 Description of Enforcement Area

The Flatbush Avenue corridor extends for approximately 7 miles from downtown Brooklyn to Kings Plaza, a suburban-style shopping mall in the borough of Brooklyn with major trip generators at opposite ends of the route, resulting in a strong demand for service in both directions for most of the day (see Exhibit 3.5). The B41 bus route also operates along this corridor as a feeder route to the No. 2 and No. 5 rapid transit lines. The Flatbush Avenue Station is the terminus to the No. 2 and No. 5 subway lines. The average B41 weekday ridership at the time of the enforcement program was 35,000 (NYCTA, undated).

The Merrick Boulevard corridor in Queens leads to the Jamaica Center Station, the terminus for the E, J, and Z subway lines. Several bus terminals, as well as bus routes, are also located near the station, providing feeder services into the Jamaica Center Station (see Exhibit 3.5). The Merrick Boulevard corridor, leading into Archer Avenue, is one of the busiest corridor leading into the Jamaica Center Station. Bus services along that route have traditionally been affected by heavy jitney/van competition. Therefore, enforcement efforts were greatly needed.
3.8.3.2 Enforcement Program Results

The New York City jitney/van enforcement efforts found that enforcement is complex, both from an institutional and from an operational perspective. Often, the task of enforcing jitney/van regulation is a multi-agency efforts. The TLC is the main agency that regulates licensing, routes, and safety standards. As the enforcement agents, the NYC Transit Police Surface Crime Unit and the NYC Police Department have primary responsibility for enforcement. They are often supported by NYDOT Motor Carrier Investigators, NYDOT agents, TLC personnel, Long Island Police officers, and the NYCDOT for towing and storage resources. This demonstrates the complexity of jitney/van regulation in a multimodal, multi-agency environment and shows that a concentrated and coordinated effort is essential for any successful regulatory and enforcement effort. Sufficient resources must be properly allocated across all agencies and parties involved.

An annual cost/benefit analysis was performed for the Flatbush Avenue Enforcement Program to estimate the annual cost and revenue impact of the enforcement effort to the NYCTA. It showed an estimated $2.82 million annual increase in NYCTA
revenue as a result of ridership increase from the enforcement effort (NYCTA, undated). The annual cost of enforcement was estimated to be around $1.9 million ($1.1 million for enforcement and $0.8 million for increase in service), with a resulting net annual benefit of $920,000. This amount does not include any projected revenue resulting from notices of violation. For the six week enforcement effort, the total revenue from citation sources amounted to approximately $187,000.

After the enforcement program terminated in April 1992, van activity resumed in the Flatbush Avenue corridor, and route B41 ridership and revenue decreased. By September 1992, approximately half of the ridership and revenue gains from the enforcement efforts have been lost as enforcement efforts were redirected elsewhere in the city. In the absence of an ongoing enforcement effort, the experiment results could not conclusively determine the optimal level and duration of enforcement. The Van Enforcement Program in Brooklyn and Queens demonstrated that jitney/van enforcement in conjunction with bus service improvements or fare reductions were necessary to reverse declining ridership and revenue trends on bus routes directly affected by jitney/van competition.

3.9 Summary of Findings

The following section provides a summary of findings from the case studies. Table 3.9 presents a summary of the jitney/minibus systems that were evaluated. The findings are divided into the following eight categories:

1. Operation
2. Vehicle Replacement
3. Financial Characteristic
4. Regulation
5. Industry Associations
6. Integration with Other Public Modes
7. Experience with Contracting Out
8. Enforcement
Operation

- Most urban areas, with the exception of Buenos Aires, have found that jitneys compete directly with buses. In Hong Kong, Manila, Miami, and New York City, jitneys and minibuses have been found to negatively affect bus ridership.
- In order to protect buses and other subsidized modes, authorities in Hong Kong, Manila, Miami, and New York City have implemented operating restrictions for jitneys on designated transit corridors.
- With the exception of Manila, most cities did not find jitney operation to negatively impact urban rail transit.\(^{35}\)
- In Caracas, Buenos Aires, Hong Kong, Miami, and New York City, jitneys have been found to provide informal feeder service to rail transit stations.
- Hong Kong’s experience has found that the use of small vehicles, especially on congested routes, may contribute to more traffic congestion.
- With the exception of Buenos Aires and Manila, most jitneys do not permit standees. This guaranteed seating policy ensures a minimum level of service quality.
- Evidence from Hong Kong demonstrated that a high frequency and high quality service can attract white-collar professionals and middle-class patrons.
- Experience from Buenos Aires shows that a high quality service (diferencial), with air-conditioned vehicles, guaranteed seat, and an express “skip-stop” service is able to attract suburban riders.
- Evidences from Hong Kong, New York City, Miami suggests that given the right incentives (the ability to charge higher fares or provided with a contract for service), some operators might be induced to extend services beyond the traditional hours of operation to provide reliable evening service.
- Hong Kong’s experience found that a separate, scheduled minibus system can increase service reliability during off-peak periods and is reflected in the green PLB ridership growth.
- Experience in Hong Kong has shown that implementing a separate minibus service and promoting services in conjunction with other public modes have been effective in overcoming the lack of public information on the red PLBs.

\(^{35}\) This finding reflects more of the fact that little analysis has been performed in evaluating the impact of jitney and rail competition, while most of the analysis in the literature focuses more on jitney and bus competition.
**Vehicle Replacement**

- The evidence from the case studies reveals that small vehicles, especially vans and minibuses, are the mode of choice for private operators.\(^\text{36}\) There is also an increasing trend to switch to larger vehicles, such as 25-30 seat medium buses.
- The use of vans in New York and Miami were cited as cumbersome and inconvenient for boardings and alightings. Systems that use minibuses did not record any complaints about comfort and inconvenience.
- Compared to vans, minibuses are seen as a half-way size between conventional jitneys and standard size buses. They can penetrate into narrow and crowded streets which is more difficult for a full-size bus. Their cost structure is similar to those of vans but have the advantage of a higher seating capacity.
- Only Kuala Lumpur has experimented with providing minibus owners with a one-time low interest loan to purchase new vehicles. In none of the other cases did authorities provide any direct subsidy for vehicle replacement.
- Buenos Aires’ experience in limiting the maximum age that vehicles are allowed to operate services suggests that this regulatory strategy can potentially stimulate the replacement of old vehicles.

**Financial Characteristics**

- Private ownership and provision of jitney services have been shown to be profitable and is reflected in systems in Caracas, Buenos Aires, Manila, Hong Kong, Kuala Lumpur, and New York City where jitneys require no ongoing government subsidy and are, on the most part, more profitable than conventional buses. There are lower overheads associated with providing service. Operators are willing to work longer hours and sometimes employ their family members as drivers for lower pay.
- The experiences from most systems show that there is a direct relationship between profitability with the size of the vehicles used. Small vehicles have been shown to be more cost-effective compared to full-size buses in Kuala Lumpur and Miami. They are often cheaper, because they are mass produced and can be purchased “off the shelf.” They are also less expensive to maintain.

\(^{36}\) This may be due to legal restrictions that prohibit the use of standard-size buses by jitney operators.
• Profitability is also linked to vehicle ownership. Experience from Manila, Kuala Lumpur, Buenos Aires, and Caracas show that self-ownership encourages owners to take better care of their vehicles. Minor repairs and cleaning are done by the operators, reducing the cost of maintenance.
• In Manila, the lack of increases in fares, as a result of escalating operating costs, have been cited to reduce driver wages.
• In Miami, government efforts to restrict jitney operation on high demand transit corridors have been cited to reduce jitney profitability and market growth.
• In New York City, the growth of illegal vans suggests that a market exists for jitneys and that business is still profitable.
• In Buenos Aires, the diferencial service shows that a high quality, exclusive service, with a differentiated market and the ability to charge higher fares, can be very profitable.
• None of the urban areas that have jitneys provided direct operating subsidy.

Regulations

• In terms of route regulations, experience in Hong Kong, Manila, New York City and Miami has shown that restriction on jitney operation is needed, especially along congested, high demand transit corridors and near bus stops. Instead of implementing operating restrictions, Kuala Lumpur responded differently by increasing vehicle capacity and at the same time limiting the number of minibuses.
• The strict regulation of the number of minibuses in Hong Kong and Kuala Lumpur has provided government control of the fleet as well as profitability to the fortunate license holders.
• In terms of fare regulation, flat fares have generally hurt profits (Walters, 1979).
• Graduated fares based on distance might benefit operators, especially for long distance trips.
• In Caracas, Buenos Aires and Hong Kong, the experience of allowing owners to hire drivers for different shifts can increase vehicle productivity and profitability.
• Hong Kong has found that the only way to maintain a disciplined minibus system, that would operate under government rules, was to create a new service, separate from the existing system.
The experience in Buenos Aires reveal that encouraging owners and operators to form companies would increase the level of self-discipline and reduce the level of government enforcement into collectivo operation.

**Industry Associations**

- Most owners and operators organize themselves according to routes or geographical areas where they serve.
- Route associations provide extensive benefits to its members, reducing the need for operating subsidy.

**Integration with Other Public Modes**

- In Hong Kong, the government created the green PLB system to provide feeder service to the MTR and LRT. The effort encouraged existing red PLBs to feed into rail stations.
- By prohibiting operation along the LRT alignment in Manila, jeepneys were initially hurt by the government policy but later found new markets, one of which was to provide feeder service to LRT stations.
- In Caracas and Kuala Lumpur, exclusive feeder networks were created under the control of the rail system operators to provide reliable feeder service.
- Most authorities separate buses from jitneys in fear of direct competition that would hurt bus operation. In New York, van operation on a pre-arranged basis was seen as the only acceptable way to integrate vans into the public transportation system (Boyle, 1994). In Miami, jitneys are relegated to operate in non-transit designated corridors, effectively separating competition between jitneys and buses.

**Experience with Contracting Out**

- The Miami jitney contracting experience demonstrated the feasibility of providing high-volume, high-frequency transit service utilizing small vehicles and at an economically attractive cost.
- The Miami experience showed the practicality of complementing regular transit service with private contracted service at an adequate level of control.
• The Miami experience demonstrated the ability of the contractors to adapt rapidly to fluctuating demand and changing travel patterns. It demonstrated that operators were able to provide reliable feeder service to line-haul transit (Metrorail).
• Dade County’s experience showed that compliance by jitney operators to local safety and insurance requirements can be achieved quickly and effectively with the help of economic incentives, without relying on regulatory and police action which could be costly and time consuming.
• In Caracas, the contracted CAMETRO Metrobús system demonstrates that the rail operator can provide a reliable feeder service.

Enforcement

• The New York experience shows that jitney enforcement is complex, both from an institutional and from an operational perspective. Often, the task of enforcing jitney regulation involves a multi-agency effort.
• Experience from Miami and New York City show that reliance on one-time enforcement strategies without sustained effort is ineffective.
• The New York van enforcement program reveal that the combination of ongoing enforcement and service improvement are necessary to reverse declining ridership and revenue trends on bus routes directly affected by jitney competition.
<table>
<thead>
<tr>
<th>System</th>
<th>Fleet Size</th>
<th>Vehicle Capacity</th>
<th># of Routes</th>
<th>Other Public Modes</th>
<th>% Share of Total Transit Use</th>
<th>Government Regulation</th>
<th>Industry Organization</th>
<th>Profitability</th>
<th>Feeder to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caracas(^1)</td>
<td>Carros por Puestos</td>
<td>8,000</td>
<td>18-32</td>
<td>CAMETRO, Metrobús,</td>
<td>34%</td>
<td>✓ ✓ ✓</td>
<td>companies, associations, cooperatives</td>
<td>High to Medium</td>
<td>Average (Metrobús is subsidized)</td>
</tr>
<tr>
<td></td>
<td>Jeeps</td>
<td>5,000</td>
<td>8-12</td>
<td>autobús,</td>
<td>14%</td>
<td>✓ ✓ ✓</td>
<td>unions, corporations</td>
<td>Medium to High</td>
<td>Medium</td>
</tr>
<tr>
<td>Buenos Aires(^2)</td>
<td>Collectivos</td>
<td>-</td>
<td>21-40</td>
<td>subway,</td>
<td>43%</td>
<td>✓ ✓ ✓</td>
<td>Medium</td>
<td>Medium to High</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Jeepneys</td>
<td>28,000</td>
<td>14-20</td>
<td>MMT(bus)</td>
<td>77%(^4)</td>
<td>✓ ✓ ✓</td>
<td>LRT alignment</td>
<td>Low</td>
<td>Very Low</td>
</tr>
<tr>
<td>Hong Kong(^6)</td>
<td>PLB (red)</td>
<td>2,530</td>
<td>16</td>
<td>Franchise bus,</td>
<td>11.8%(^7)</td>
<td>✓ ✓ ✓</td>
<td>Bus</td>
<td>Very</td>
<td>Average</td>
</tr>
<tr>
<td></td>
<td>PLB (green)</td>
<td>1,820</td>
<td>16</td>
<td>LRT, KCR, tram</td>
<td>8.9%(^8)</td>
<td>✓ ✓ ✓</td>
<td>Corridors</td>
<td>Very</td>
<td>High</td>
</tr>
<tr>
<td>Kuala Lumpur(^9)</td>
<td>Minibus</td>
<td>400</td>
<td>16</td>
<td>Franchise bus, LRT</td>
<td>26%(^10)</td>
<td>✓ ✓ ✓</td>
<td>-</td>
<td>Very</td>
<td>Average</td>
</tr>
<tr>
<td>Miami(^11)</td>
<td>Jitneys</td>
<td>400</td>
<td>12-16</td>
<td>Metrobus,</td>
<td>-</td>
<td>✓ ✓ ✓</td>
<td>Bus</td>
<td>Average to Low</td>
<td>Subsidized</td>
</tr>
<tr>
<td>New York City(^12)</td>
<td>Commuter Vans</td>
<td>448</td>
<td>14-20</td>
<td>NYCTA bus, private bus,</td>
<td>-</td>
<td>✓ ✓ ✓</td>
<td>Bus</td>
<td>Average to High</td>
<td>Subsidized</td>
</tr>
<tr>
<td></td>
<td>Dollar Vans</td>
<td>-</td>
<td>50-60</td>
<td>subway, LIRR</td>
<td>-</td>
<td>✓ ✓ ✓</td>
<td>-</td>
<td>Low</td>
<td>Subsidized</td>
</tr>
</tbody>
</table>

2 Larocca, 1996.
3 Motero and Ishida, 1985; Rimmer, 1986; Midgley, 1993; Ebata et al, 1996.
4 Ebata et al, 1996.
5 Profitability is high for vehicle owners and assemblers but low for drivers.
7 Hong Kong Government, Information & Public Relations Unit, October 1996.
8 Ibid...
12 MTA, 1992; Boyle, 1994.
Chapter 4

ALTERNATIVE STRATEGIES FOR IMPROVING
THE PÚBLICO SYSTEM

Based on the existing conditions of the público system described in chapter 2, this chapter will first present público service improvement goals and objectives. Second, it will discuss the likely outcomes of the “do-nothing” scenario - that is, what would likely happen if no new initiatives are taken to improve the current conditions of the públicos. Third, an evaluation of alternative strategies for service improvements will be presented. Alternative options for service improvement will be discussed first, followed by a description of four categories of público routes that the proposed options can be implemented at. Finally, an analysis of applying the alternative options to each of the route categories will be presented by proposing the best possible course of action at different stages in time.

4.1 Público Service Improvement Goals and Objectives

4.1.1 Goals

The goals for improving the público system are: (1) to improve and restructure the current público system as a viable public transport mode, (2) to improve the overall accessibility and connectivity of the San Juan public transportation system (PTS) by providing complimentary and feeder service to Tren Urbano, and (3) to develop strategies that would reduce the necessary level of public expenditure on public transport in the SJMA. The first goal can be achieved from a “modal” perspective which focuses on strategies that directly benefit público operators and riders. The second goal can be achieved from a “system” perspective through better integration of services across all public modes, allowing users to conveniently transfer from one mode to another. From a
public policy perspective, the second goal should be the government’s political objective. In a period of tight budget constraints and increasing pressures for governments to reduce the level of subsidy for public transport, the third goal is critical if the públicos are to remain as a financially viable mode of public transport. It implies that público operation should be cost-effective, duplicated services should be cut, and strategies that produce cost-efficiency gains should be pursued. One attraction of the público system is that it requires no direct operating subsidy. The dilemma, however, is that as public money for transport becomes more scarce, público operators are instead looking to the government for solutions to their problems. This concern compels the government to develop alternative strategies that would both improve operating conditions as well as minimize the level of public expenditure.

4.1.2 Objectives

It is important to recognize that although there may be common goals for an integrated public transport system, there are also differences between “system” and “modal” objectives. The objective of improving mobility by maximizing, for example, ridership may be different. From a “modal” perspective, improving access to públicos can help the industry to increase its ridership and revenue. However, from a “system” perspective, increasing the number of potential riders (to increase consumer surplus, or utility to the entire traveling public, for example) may result in government policies that would favor one mode over the other. Since many jitney systems have often been found to negatively impact formal public transport operation (especially buses) and contribute to congestion in downtown areas, governments often restrict jitneys from operating as part of an integrated system. Such spatial or temporal restrictions, which often restrict access to the most profitable markets for jitneys, will likely affect their profitability. What this example illustrates is that government objectives are complex and often political in nature. System-specific objectives may occasionally conflict with modal objectives. As a result, it is important to formulate several main objectives applicable across all modes, while there should also be modal objectives applicable only to the specified mode.
4.1.2.1 San Juan Public Transportation System Improvement Objectives

Since one purpose of building Tren Urbano and restructuring San Juan’s PTS is to provide greater access to public transportation in the face of present and future traffic congestion problems in the SJMA (PRHTA. FEIS, 1995), it is important and necessary that there be a political as well as policy objective to provide alternatives for private auto trips. A grade-separated rail rapid transit system such as Tren Urbano, provides the speed and comfort necessary to attract some choice riders. Thus, it would be in the government’s interest to achieve its political objective by increasing Tren Urbano ridership. Providing handicap access is another important objective. The 1990 U.S. Census shows that there is a higher percentage (14.2 percent versus 9.7 percent for the island average) of elderly persons over 65 years of age living in the SJMA (PRHTA. FEIS, 1995). With the federal mandate to meet ADA requirements, this is an important systemwide objective that can potentially affect future federal funding for public transportation projects in Puerto Rico. Another “system” objective is to ensure acess to Tren Urbano by creating a viable feeder network.

4.1.2.2 Público Service Improvement Objectives

It would be in the interest of the government to ensure that “modal” objectives are met as long as they do not conflict with “system” objectives. Thus, the modal-specific objective for San Juan is to improve público service quality and reliability, and in turn, ridership and profitability. Clean and well maintained vehicles, matching hours of operation, and providing scheduled services would reduce the need for the government to supplement services. This reduces the level of public expenditure required to improve public transport. Historical data has shown that as personal income rises and the private automobile becomes more available, público ridership tends to decline as riders seek other alternatives, notably the automobile. Since revenue is dependent on the fares collected, increases in público service quality and ridership can also help the industry to remain profitable. The second “modal” objective is to improve público operating efficiency. As the number of daily person trips in the metropolitan area is expected to increase by approximately 45 percent between 1990 and 2010 (from 3.3 million to approximately 4.7 million trips) (PRHTA. FEIS, 1995), traffic congestion will reduce público operating speed and efficiency. Thus, there is a need to provide públicos with
operating privileges in order for them to compete effectively and reduce the negative impacts of congestion.

Finally, as a result of Tren Urbano, the government has two stakes in the current público system. First, since the público is the “backbone” of the San Juan public transportation system, it would be in the government’s interest to slow or reverse the declining ridership trend so that a steady public transit ridership base will exist when Tren Urbano becomes operational. Second, it is essential that a reliable feeder mode exists to serve Tren Urbano. Paradoxically, the government might be tempted to reduce público competition with Tren Urbano in order to minimize operating subsidy for Tren Urbano. The pursuit of such an objective could lead públicos to view Tren Urbano as a threat. However, roadway congestion is rising in the metropolitan area, and públicos are not likely to be able to compete with Tren Urbano. Since only three routes were identified to be directly affected by Tren Urbano, competition is expected to be minimal (PRHTA. FEIS, 1995). Therefore, instead of viewing públicos as a potential threat, the government can concentrate on developing more aggressive strategies to help improve the system, which is in accordance with its primary objective.

4.2 Conceptualization of Outcomes for the “Do-Nothing” Scenario

The “do-nothing” scenario assumes that the government will take no new initiatives with respect to the públicos. The públicos are left to operate and evolve “as is.” They will continue to serve traditional markets such as low-income, working class, captive riders. Services will be concentrated in peak periods along high demand routes. Little off-peak and weekend service will be provided. The current aging fleet will continue to be used for service. Fares, licenses, and routes would continue to be regulated by the PSC.

4.2.1 Potential Benefits/Positive Outcomes

Since the PSC has exercised a “hands-off” approach to most facets of público operation, a potential benefit of the “do-nothing” scenario is that there would be continued regulated competition and minimal need for government intervention and oversight. From the operators’ perspective, the services can be terminated at their own discretion. They can continue to pocket the revenue they receive and wait at terminals
until the vehicles are full. These practices, however, would cause ridership to decline in the long run. As a result of rising customer expectation, the lack of guaranteed hours of service, fixed schedule, and long waiting times at terminals will result in a perceived decline of service reliability and continued loss of ridership. The lack of effective government oversight of services will also lead to the deterioration of industry order and discipline as operators continue to operate “as they see fit.”

Since públicos receive no direct operating subsidy, leaving the system “as is” would avoid government commitment to public subsidy. Savings from financial and human resources and enforcement efforts can be devoted to other sectors of the transport system. On the other hand, there might be market inducements that would cause existing público operators, or individual, profit-motivated entrepreneurs to venture into new markets such as short-haul feeder services to transit stations and hubs (of trunk bus routes). Evidence from Manila seem to support this hypothesis. In the absence of strong government efforts to integrate the jeepneys or force them to provide feeder services to the LRT, new jeepney routes were created voluntarily (Moriero and Ishida, 1985). A survey also found that jeepney terminals at three locations in Manila were relocated closer to LRT stations (Moriero and Ishida, 1985). In Hong Kong and New York City, red public light buses and illegal dollar vans, respectively, were found to provide feeder services to rail stations without any government incentives, programs, or policies that required them to do so. If the Government of Puerto Rico decides to incorporate público staging areas at Tren Urbano stations, some profit-seeking operators, without government invitation, might decide to provide service if the customers request to be dropped off there. Thus, the “do-nothing” scenario is likely to be the least expensive option for the government in the short run.

4.2.2 Potential Risks/Negative Outcomes

Since jitterys tend only to serve peak period demand, unless there are incentives or regulations that require providing services for guaranteed hours of the day, públicos will likely provide feeder services in the peak and not in the off-peak. Depending on the final outcome, it may be costly in the long run if no viable feeder service exists throughout the day when Tren Urbano becomes operational. The absence of government intervention to mandate improvements to services will likely cause público service quality and reliability to continue to deteriorate over time before Tren Urbano begins service. As the fleet ages,
a significant number of vehicles will likely become unsafe and poorly maintained. As a result, the total fleet will decrease as the number of vehicles that are beyond their useful life increase without replacement. A recent survey of the island-wide público fleet found the average age of a público vehicle to be 13.6 years (MTCG, 1996). The resulting study cited the aging fleet to be a major factor in contributing to declining service quality and reliability.

As personal income rises and congestion worsens, the lack of initiative to give públicos a speed advantage in congested roadways will cause them to lose their competitive edge and ridership base. Although the majority of current riders are captive, the rise in discretionary income will likely cause many of them to choose the private auto. Those who are left with no choice but to ride the públicos will suffer as a result of poor service quality and reliability. This declining trend will most certainly reduce mobility for low income and captive riders. Services will continue to be provided separately from the rest of the public transport system. The lack of service integration may have negative impacts on existing ridership and hamper the growth of potential new ridership. Potential users would be deterred from using the system due to the lack of integration and service connectivity with other modes. This continuing trend will likely mean that públicos will not be in a favorable position to provide effective feeder service to Tren Urbano. As a result, this outcome will have a significant impact on Tren Urbano ridership as riders are unable to access the stations.

Long term decline in ridership and profitability may also force some operators to eventually leave the business. Although this may lead to less competition for operators who are left to continue services, from the government’s perspective, the eventual disappearance of an essential public transport mode will likely result in additional services and expenditure that will have to be provided by conventional public transit. Since públicos provide a vital public service without the need for ongoing public subsidy, their decline will likely result in additional expenditure for public transportation in order to compensate for the loss of services previously provided by públicos. Furthermore, because service is provided by private operators with smaller vehicles, públicos are able to provide service at a lower cost than if it was provided by publicly operated, full-size buses. As a result, it will almost certainly be more expensive for the government to replace them with publicly operated services and lose the cost advantage of using privately operated, smaller vehicles. Although surveys can be done to track the amount
of service provided, PSC’s passive role in monitoring público activities will require additional cost and manpower to monitor público license holders who had left the business. Furthermore, it may be possible for some of these operators who had left the business to purposefully hold their license for a later more “opportune” moment or try to sell their licenses for a profit. In that case, it will be very difficult for the government to force operators who had left the business to turn in their licenses.

Although it may be possible for a small group of adventurous and profit-motivated entrepreneurs to take the risk of entering into new markets (for example, providing feeder service to *Tren Urbano*), potential opposition and political pressures from existing operators may make it very difficult for them to survive. Given the strong ties of the operators to industry organizations and to political influences, it would be difficult for new entrants to overpower well organized associations and unions. On numerous occasions, the público industry has even threatened strikes or walkouts. Since públicos carry two-thirds of all public transport trips in the SJMA and is considered the back-bone of the metropolitan area’s public transportation system, as well as the entire Island, the consequences of an industry-wide strike could be serious. The risk of alienation and antagonism with público operators as a result of perceived government indifference to help the industry is a consequence the government will have to seriously consider.

### 4.3 Alternative Strategies for Improving Públicos

In light of *Tren Urbano* and government efforts to restructure public transport in the SJMA, there are three potential options for improving the current público system: (1) improvements within the current model, (2) movement to a hybrid service model, and (3) movement to a contracted service model. In considering how to help strengthen the system, however, it is important to recognize the primary advantages of públicos as mentioned in chapter 2.
4.3.1 Alternative Options for Improving Públicos

4.3.1.1 Improvements within the Current Model

The current público system can be characterized as regulated competition. Fares, routes, and entry into the system, are regulated by the government. Vehicle ownership, operation, and maintenance are solely the responsibility of the private operator. Subsidies are seldom available except for special circumstances such as the building of terminals or stops. Capital and operation planning is done solely by operators under the constraints of government regulations. Under the current model, públicos serve distinct markets, mainly low-income, captive riders. They operate out of major terminals or staging areas in city and town centers. In addition, the government has the option to exercise varying degrees of control, including the regulation of the level of service, driver employment standards, and performance monitoring. Due to the lack of effective oversight, the government, to date, has exercised minimal control over the industry. Improvements within the current model assume that any new initiatives to improve público services would be made within the current structure. That is, the government would take action(s) to improve conditions for the públicos without fundamental changes to the current “regulated competition” environment. An example of some of the strategies within this model include:

1. Build new sheltered stops
2. Provide head-of-the-line privileges and signal pre-emption at key intersections
3. Require scheduled service from terminals
4. Require stricter annual público vehicle inspection
5. Allow owners to hire multiple drivers
6. Centralize público regulatory functions under one agency
7. Provide assistance on vehicle insurance
8. Provide vehicle replacement assistance through broker
9. Provide discounted transfers to Metrobus, AMA, Tren Urbano

The first three strategies attempt to improve público service quality and reliability. Providing sheltered stops can improve passenger waiting conditions. Head-of-the-line

---

privileges and signal pre-emption at key intersections can increase público operating speeds and avoid congestion. Requiring scheduled service from terminals would prohibit operators from waiting until their vehicles are filled to leave the terminal. This can improve service reliability along the route and reduce passenger waiting time at terminals. Strategies four through six involve changes to current público regulations. Stricter annual vehicle inspections can ensure a safe and well-maintained fleet. Allowing owners to hire drivers for shifts can increase vehicle utilization, potentially improving profitability and possibly facilitate off-peak services. Centralizing regulatory functions under one agency can provide more effective oversight of público operation. Finally, the last three improvement strategies involve a greater degree of commitment as well as risks to the government. Providing financial assistance to operators to purchase vehicles and insurance can help improve the condition of the fleet and help operators reduce the burden of paying for high insurance costs. Providing transfer discounts can help improve service integration and make it convenient for passengers to transfer onto other modes. Compared to the other strategies, the latter three are perhaps the most difficult and costly to implement.

4.3.1.2 Movement to a Hybrid Service Model

A hybrid service model is a “transitional” model between improvements with the current model and a contracted service model. If improvements within the current model do not produce the desired outcome, the government can choose to negotiate or contract out poorly-served routes or time periods to existing público operators. Contracts can be negotiated with associations, terminals, or a sub-set of operators on a route. During peak periods, operators are allowed to conduct traditional público services. There are three potential types of “hybrid” arrangements:

- Competitively contracted evening and weekend services with small vehicles provided by contracted companies, coexisting with traditional públicos during the day
- Negotiated contract for off-peak público service, provided by a subset of público operators
- Contracted or negotiated público driver services to operate publicly-owned minibus “base” service throughout the week, complemented by traditional públicos during peak periods

104
These strategies allow the government to retain well-performing público services and only intervene on poorly-served routes and time periods. It allows continued regulated competition on all other routes and time periods unaffected by government intervention. Also, público operators can retain the markets they serve without having to forfeit their rights to operate traditional público services.

Compared to implementing improvements within the current conditions, the hybrid service model has the potential to achieve more effective results. Operators are under formal agreements to provide a certain level of service and operate a scheduled service which can greatly improve reliability. It has the potential to inject some level of competition on poorly served routes and time periods. Moreover, service can be closely monitored by the government through the use of an AVL system to ensure service quality and reliability. This model is also more flexible, since operators are allowed to operate traditional services during peak periods. It also permits them to retain individual ownership of their vehicles and from the government’s point of view, reduce the cost of providing services by having operators maintain their own vehicles.

Contracting for driver services with publicly-owned minibuses can potentially increase vehicle utilization while allowing the government to stipulate vehicle color, configuration, and maintenance standards. The vehicles can be used during the day for regular publicly-operated services while at night and on weekends, público drivers can be hired. In the short term, this arrangement can potentially reduce the need to upgrade the entire público fleet. It allows the government to contract off-peak services on a need basis. However, since the vehicles are used by different operators, it is necessary to assign responsibility for vehicle maintenance and upkeep. The worst scenario is that the government will lose the advantage of having público operators maintain the vehicles they drive and be forced to assume responsibility for maintenance.

4.3.1.3 Movement to a Contracted Service Model

This model is a “pure” contracting model in which services are competitively tendered to companies to operate a “base” or separate service. In light of government efforts to restructure the public transit system and to build Tren Urbano, there are three possible types of competitively contracted services:
• Contracted público/minibus service on poorly-served público routes (during all periods of the day and comparable to the "hybrid" model mentioned previously)
• Contracted minibus service on poorly-served bus routes
• Exclusive *Tren Urbano* feeder service

From the government's perspective, competitive contracts have the potential to improve control of various aspects of service standards and yet allow the government to retain cost efficiency. Since privately operated services have a lower cost structure, they are more competitive in reducing costs. Second, a competitive bidding process used to solicit and evaluate potential bidders contribute to cost efficiency. In order to compete for a contract, contractors have the incentive to keep bid prices down, while maintaining an acceptable level of service. Moreover, well-structured subsidies that are provided on unprofitable routes or time periods can provide incentives for contractors to provide reliable services. Profits received during peak periods can also be used to subsidize services during the off-peak.

Contracting allows the government to stipulate the conditions and provides performance measures for service evaluation. The government can decide on specific terms such as fares, schedules, vehicle requirements, service quality, safety, and maintenance standards. The drawback, however, is that the government loses the advantage of having operators maintain their own vehicles (under the regulated competition model). Furthermore, depending on the length of the contract, contractors tend to have a “short view” of making improvements to the service. Contracting does not provide incentives for operators to engage in long term planning, since they cannot be certain whether they will continue to provide service. Nevertheless, this strategy can be implemented on a few existing público "test" routes to determine whether the desired outcome(s) can be achieved. Depending on the success of the strategy, it can be gradually applied to other routes.

4.3.2 *Types of Público Routes*

There are four types of público routes in which alternative options can be implemented: (1) “weak” público routes with infrequent bus service; (2) routes impacted
by *Tren Urbano*; (3) potential feeder routes to *Tren Urbano*, and (4) all other routes that are not impacted by *Tren Urbano*.

"Weak" público routes are those with inadequate público and bus service throughout the day. The fact that público service is scarce implies that the market is weak and that públicos are unable to maintain a profit. However, low demand for service may also result from poor service quality and reliability while improvements to service may attractive riders to patronize transit service. On these routes, the government can effectively intervene to improve services by either replacing or supplementing the poor bus service that remains.

*Impacted routes* are público routes that operate along the *Tren Urbano* alignment and are likely to be displaced by its operation. Since the government is obligated to mitigate the damages to the operators on these routes, this situation provides an enormous opportunity to experiment with strategies of greater risk. Since they are expected to be directly impacted by *Tren Urbano*, there is a legal requirement to help them. While their services can potentially be improved, the government can also learn from this experience and determine which strategies can be applied to other routes and markets.

*Potential feeder routes* are público routes that are likely candidates to provide feeder service to *Tren Urbano*. The government can implement strategies that would help develop a feeder network to *Tren Urbano* before it is operational. This allows públicos to serve new markets while at the same time improve their current conditions. Experiments can be developed to test whether the current system can be improved to provide reliable feeder service. As a last resort, the government can also grant a franchise to Siemens, the operator for *Tren Urbano*, to provide or contract out an exclusive feeder service on routes where públicos are unable to provide reliable service.

The last group of público routes are those that are not impacted by *Tren Urbano* but may complement the public transportation system in San Juan. These routes include those that provide service into and out-of the metropolitan area, maintaining an important link. Since públicos are the only source of public transportation outside of the SJMA, it is critical that the government does not neglect their importance.
4.3.3 Proposed Strategies for Improving the Público System

An evaluation of options for each type of público route is presented hereafter. A list of the proposed strategies will be presented first, followed by an analysis of the strengths and weaknesses of each option. A framework for the proposed strategies is presented in Exhibit 4.1. The different types of público routes are shown on the left-most column. The horizontal axis represents a schedule of when the strategies should be implemented or operational. The introduction of time recognizes that there are uncertainties that can affect strategies to improve existing conditions of the público system. This framework allows the government to develop appropriate intervention strategies at critical points in time in order to maximize the desired outcomes. For each type of route, there are corresponding “boxes” which represent improvement options and recommended strategies. The length of each box represents the duration at which each option should be implemented. The proposed strategies are grouped into logical “packages” that attempt to maximize the prescribed goals and objectives stated in section 4.1. Each box can be viewed as “experiments” to test the potential outcomes of different groups of strategies.

4.3.3.1 “Weak” Público Routes with Poorly-Served Bus Routes

Option: Contracted Minibus Service with Companies

“Weak” público routes are those that have inadequate público and bus service throughout the day. These routes have largely been neglected by existing público operators as a result of poor demand. Consequently, the government can intervene to improve services by either replacing or supplementing the poor bus service that remains. The most appropriate option for these routes is to contract services to companies for an all-day scheduled minibus service. This option can be implemented in the immediate term to improve the level of service. Out of the 34 “key” público routes identified in the Transit Center Plan, there are three intercity público routes that currently have poor bus service and can potentially be replaced with contracted minibus service:

<table>
<thead>
<tr>
<th>Público Route</th>
<th>Transit Centers Served</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-11-70 (Bayamón - Stop 18)</td>
<td>Bayamón, San Patricio, Stop 18</td>
</tr>
<tr>
<td>I-11-17 (Catano - Bayamón)</td>
<td>Catano, Bayamón</td>
</tr>
<tr>
<td>I-62-16 (Río Piedras - Carolina)</td>
<td>Carolina, Plaza Carolina, Río Piedras</td>
</tr>
</tbody>
</table>
The first route will not be provided with buses under the Transit Center Plan, while the second will be provided only very indirectly through services in Toa Baja. The third route currently has infrequent bus service. These routes are especially attractive because they connect two or more transit centers, allowing operators to "simulate" feeder service to *Tren Urbano* by feeding transit centers. It also permits the government to monitor services at both ends of the route at these transit centers.

In addition to the three intercity routes, there are three local público routes that currently have infrequent bus service and are planned to be eliminated under the Transit Center Plan. They provide service from público terminals in Río Piedras. These routes are potential test routes for a local feeder service. They are:

- L-62-03 (Río Piedras - Bario Camarones)
- L-62-07 (Río Piedras - Cupey Bajo)
- L-62-10 (Río Piedras - La Muda)

All the above público routes are reported to provide high frequency peak but unreliable off-peak service. The government can potentially contract a "base" minibus service with headways that would offer a reliable all-day service. A summary of the plan is as follows:

- Determine the minimum level of service needed for each route as well as potential new routes
- Identify "weak" routes for competitive bidding to qualified operating groups or companies
- Purchase minibuses to serve contracted route service
- Encourage individual operators to form operating groups or companies with 10 to 20 vehicles and/or solicit existing local or outside bus contractor to bid for services
- Disclose all information to potential contractors and divide each contract into at least two or more clearly definable pieces of "work." Award contract to operating groups that requires the lowest subsidy through a competitive bidding process
- During the initial stage, contract with *gross cost* contracts to obtain information about demand, cost of providing services, etc. After enough time has lapsed, if the government has enough information about demand and cost of providing service on a route, go to *net cost* contracts, so that contractors have maximum incentive to build ridership.
- Provide or help contractors purchase air conditioned, handicap accessible minibuses through broker. Assist contractors with vehicle insurance (assume liability or subsidize).
- Require contractors to provide an all-day scheduled service.
- Install AVL system for monitoring services.
- Provide sheltered stops along the route with pay phone, service information on transit services and alternative transfer options.
- Provide minibus time-to-arrival display at stops.

*Strengths and Weaknesses*

Contracted services on “weak” público routes can bring improvements to the entire route. The advantage of implementing such a strategy at the route level is that it allows for a more significant impact on service image. Passengers and potential patrons are able to see a new fleet of público/minibuses on the entire route or corridor as opposed to a few new vehicles scattered on different routes. This helps to improve service quality for the entire route or corridor. Implementing this option at the route or corridor level also allows the government to target marginal or poorly performing routes as opposed to implementing a program on the entire network. As a result, only the unprofitable routes can be contracted out while retaining a different structure for other routes. It allows the more profitable and high demand routes to be left “as is,” without any need for government intervention.

To reduce the potential for problems and complexity, it would be advantageous for the government to contract with a group of operators who are organized into operating units or companies or with preexisting local or “off-island” bus companies. This significantly reduces the number of contracts. An operating unit or company can be comprised of anywhere from ten to twenty individual operators. The operating units would allow operators to retain individual ownership of their vehicles while operating as a company for the purpose of the contract. Second, it would be advantageous for the
### Exhibit 4.1: Potential Público Improvement Strategies

<table>
<thead>
<tr>
<th><strong>Experimental Period</strong></th>
<th><strong>Implementation of Successful Strategies</strong></th>
<th><strong>Tren Urbano Opening Year</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>“Weak” Público Routes</strong></td>
<td>Contracted Minibus Service with Companies</td>
<td></td>
</tr>
<tr>
<td><strong>Impacted Routes</strong></td>
<td>Contracted Service with Públicos</td>
<td></td>
</tr>
<tr>
<td><strong>Potential Feeder Routes</strong></td>
<td>Improvements within Current Conditions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Negotiated or Contracted Público Service</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Hybrid Model)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Contracted Minibus Service</td>
<td></td>
</tr>
<tr>
<td><strong>Non-Impacted Routes</strong></td>
<td>Improvements within Current Conditions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Contracted Service</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hybrid Público Service</td>
<td></td>
</tr>
</tbody>
</table>

**Exclusive Feeder Service**
government to contract with multiple operating units or companies on the same route or time period. The purpose is to provide some degree of competition that would help maintain service quality and reliability. Also, it provides a way for the government to measure contractor performance against each other on the same route. If a contractor begins to operate poorly or default on the contract, another company on the same route can take over to fill the gap. However, service improvements in a single corridor without commensurate strategies to improve services on other feeder routes will do little to improve service quality and reliability for passengers transferring from other routes. As mentioned earlier, contracting loses the advantage of having operators maintain their own vehicles. The government would potentially need to negotiate the terms for vehicle maintenance, especially if publicly-owned minibuses are used. Furthermore, contracting does not provide incentives for operators to engage in long term planning, since they cannot be certain whether they will exist to provide service.

4.3.3.2 Impacted Routes

**Option: Contracted Service with Públicos**

There are three routes identified in the Final Environmental Impact Statement (FEIS) that would be displaced by Tren Urbano: 1-62-11 (Río Piedras - Bayamón), L-11-02 (Bayamón - Centro Médico), and L-62-06 (Río Piedras - Centro Médico) (PRHTA. FEIS, 1995). These routes are along the east-west spine of the proposed Tren Urbano alignment with services to and from major destinations in Bayamón, Río Piedras, and Centro Médico. These limited number of routes provide a good opportunity for the government to test more aggressive strategies for improving público services. The proposed plan is to negotiate a 4 year contract (leading up to Tren Urbano opening year) with operators on the three routes to provide an all-day scheduled service. A summary of the plan is as follows:

- Identify feeder routes serving Bayamón, Río Piedras, and Centro Médico
- Allow owners to hire multiple drivers to operate new feeder services
- Provide new vehicles to operators
- Assist operators with vehicle insurance
- Install AVL system to monitor services
- Require operators to incorporate Metrobús & transit centers as stops along the route
• Sell discounted transfers to operators
• Provide signal pre-emption, head-of-the-line privileges at key traffic intersections

**Strengths and Weaknesses**

This model allows the government to aggressively test a few strategies that are otherwise considered risky if they were implemented under different circumstances. Selling discounted transfers to público operators would directly benefit riders, reducing their total cost of travel. However, if the operators are not willing or do not see the benefit of selling transfers, the government may need to provide free transfers as an incentive and suffer revenue loss. Nevertheless, since transfers are only provided to operators on the three routes, the revenue loss is likely to be minimal. Since the contract is expected to end when *Tren Urbano* begins service, the government can choose not to extend it if the results are not favorable.

By relaxing regulations and allowing owners to hire extra drivers, this strategy would permit owners to better utilize their vehicles. In Hong Kong, regulations that allowed public light bus owners to hire drivers for a second shift have resulted in better utilization of the vehicles and permitted them to remain profitable (Rimmer, 1986). Caracas and Buenos Aires have similar arrangements which allow owners to hire drivers. As a result, operators on the three proposed routes provide a good “controlled” group to determine whether this strategy can be applied to other routes and markets. The risk is that the strategies may not work. The operators might resist any attempts to make them change their current operation or are simply unable to meet government operating standards. If the outcome is positive, the government can gain valuable information about potential strategies, while allowing it to help the affected operators to improve their services.

4.3.3.3 Potential Feeder Routes

Potential feeder routes include those that serve Centro Médico and those that operate out of terminals in Bayamón and Río Piedras. The 1994 Section 15 data show that there are at least 38 routes that fit this criteria (Multisystems, 1994). Currently, most of these routes are also included in the short-range Transit Center Plan to be integrated.
with transit centers. Under the plan, there are 34 “key” público routes that were identified. These routes were chosen because they have the potential to provide effective feeder service to *Tren Urbano*. Services are frequent during peak periods, with headways less than 10 minutes (Multisystems, 1996), but they need to be supplemented with reliable off-peak service.

There are four potential options for developing a viable feeder network for *Tren Urbano*: (1) improvements within the current model, (2) upgrade to a “hybrid” público service, (3) a contracted minibus service and (4) an exclusive *Tren Urbano* feeder service.

The first is a contracted minibus service on “poorly” performing AMA or público routes. This type of contracted service can be implemented within the next few years to develop a reliable “base” service on potential feeder routes. A “fall-back” strategy, if all other options fail, is to allow Siemens, the operator for *Tren Urbano*, to contract an exclusive feeder service to *Tren Urbano*.

4.3.3.3a **Option 1: Improvements within the Current Model**

There are a number of service improvements that can be implemented within the existing público system to improve its attractiveness as a potential feeder service. This option assumes that immediate improvements can be made within the current público system. Given that there are a large number of routes that need to be improved, this “base” option attempts to provide minimal service improvements that does not require the government to over commit its resources. They can be implemented in stages or selectively on a few “test routes” to evaluate whether it is worthwhile to expand to other routes. The strategies are as follows:

- Improve waiting conditions by building new sheltered stops
- Provide head-of-the-line privileges for públicos at key intersections
- Prohibit the practice of waiting at terminals for vehicle operators and require públicos to leave terminal at regular intervals
- Require annual público vehicle inspection (as part of regular annual vehicle inspection) to ensure minimum compliance of público safety and maintenance standards
• Centralize público licensing, regulation, enforcement and planning into one public agency (either PSC, PRHTA, or new público regulatory agency) to oversee all público management, operation and enforcement efforts
• Assist operators with vehicle insurance
• Provide vehicle replacement assistance through a government-backed brokerage
• Provide transfer privileges

Strengths and Weaknesses

The first three strategies attempt to improve público service quality and reliability. Building new sheltered stops can improve passenger waiting conditions and provide protection from the sun and rain. Providing funds to build new stops is a one-time intervention strategy that does not require major financial commitment. Granting públicos head-of-the-line privileges at traffic intersections can improve operating speed and cost efficiency as they are able to avoid congestion on roadways leading into terminals. The government can also requires públicos to leave terminals at regular intervals, thus reducing waiting time for passenger waiting at terminals.

The advantage of implementing improvements within the current model is that it has the potential to provide operators with incentives to improve services while allowing the government to avoid committing to ongoing subsidies. There are strong incentive for operators to reduce costs and, thus, improve efficiency. Because operators are competing against each other for passengers, it may lead them to be more sensitive to customers and service quality issues. However, a major drawback for improvements within a regulated competition environment is that it is difficult to change undesirable operating practices. Since públicos only operate when there is sufficient demand, it would require strict government regulation to force them to operate during unprofitable routes and time periods.

Government strategies to enforce regular headways can potentially be implemented at público terminals. Terminal management typically has broad powers over day-to-day aspects of público operation. There are often strict rules that govern operator work hours, operating hours, vehicle queuing, etc. Unless the government is willing to hire inspectors, it will have to rely on terminal management to enforce new
operating rules. Since operators are used to waiting until a certain number of passengers have boarded, thus guaranteeing their revenue for the trip, the government might have to provide more incentives in order to change this operating practice. The process could become political and potentially confrontational as terms are negotiated with operators and terminal management.

Implementing a stricter annual público inspection program ensures that operators who do not meet minimum safety and maintenance standards are not permitted to operate services. It aims to strengthen current público regulations and can be administered as part of the regular annual vehicle inspection. This protects the public from having poorly maintained vehicles provide service. However, since a majority of the existing vehicles are old, many may not pass a stricter annual inspection. Without commensurate policies to help operators improve the condition of the existing fleet, the strategy will likely force some operators out of business. Thus, the tradeoff is that the government can get poorly maintained vehicles off the streets, but the public will ultimately be hurt by reductions in the number of vehicles for service. A more appropriate strategy is for the government to immediately tighten público safety regulations while slowly tightening maintenance requirements as the fleet is gradually replaced with newer vehicles. If the government is to contemplate any form of vehicle upgrade program, a new and stricter vehicle safety and maintenance program must be instituted to ensure that vehicles are properly maintained and regularly inspected.

Creating a centralized regulatory agency can alleviate the problem of ineffective government oversight of público operations. The potential benefits are: (1) a more centralized management structure, (2) more effective 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) reduced service duplication. The current framework is decentralized with all público management activities under different government agencies such as the PSC, the Driver Services Directorate of the Department of Transportation and Public Works and the Puerto Rico Highway and Transportation Authority. A centralized público regulatory agency has the potential to reduce communication problems that previously existed when the licensing and fare regulation function belonged to the PSC and the planning function belonged to the highway authority. However, the new agency must be given broad powers to plan as well as
enforce government rules that govern público operation. Without it, this strategy would potentially be ineffective.

In return for improving their services, operators can enroll in a vehicle replacement program with a government-backed brokerage. Vehicle loan and lease payments would be paid directly to the broker. The program attempts to provide operators with a low-interest loan to purchase a new vehicle. This strategy can improve service quality as the new vehicles are cleaner and more comfortable. It also allows for bulk vehicle purchases by brokers and has the potential to reduce costs. The arrangement to use an intermediate financial institution such as a brokerage can minimize government exposure to risks. Government assistance for low interest loans, or the direct purchase of vehicles can potentially put the government into direct conflict with público operators. If the government is forced to repossess the new vehicle as a result of an operator not meeting government terms, it runs the risk of being portrayed as unfair and unsympathetic. Instead, the broker can be responsible for enforcement or repossession of vehicles, allowing the government to avoid dealing with direct payment transactions and enforcement of loan or lease contracts.

The improvements to the fleet, however, is a short term “fix” to the problem. The fleet will likely age and need to be replaced in 4 to 6 years. Although ridership may increase in the short-run, it will likely decline in the long-run as the fleet condition begins to deteriorate. From the operators’ perspective, there may be additional hurdles to financing a new vehicle such as high insurance cost. A survey has found that the majority of público operators do not have full insurance (Barton-Aschman Associates, 1992). Government assistance with vehicle insurance can reduce the financial burden of operators, while protecting public safety as operators are able to be properly insured. It can either subsidize part of the insurance cost or assume some of the liability.

Since many público operators not only use their vehicle(s) for transport services but for personal and family use, any government assistance in the purchase of a new vehicle will have to consider the issue of vehicle ownership and use. There needs to be a monitoring mechanism that ensures that the new vehicles are used to provide 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
Before implementing any vehicle upgrade program, the government will have to determine who would own the new vehicles, who is responsible for maintenance and upkeep, insurance, licensing and other fees. Also, the definition of what constitutes “public use,” in the case of providing services for a fee and “personal use,” in the case of family or private use during non-revenue hours, will have to been clearly defined. Since most público owners treat their vehicles as their own personal property, any attempts to “depersonalize” the vehicles may be met with resistance. Strategies such as integrating the vehicle fleet by having a consistent color and logo scheme, or specifying the vehicle type and equipment required for service may be seen as attempts by the government to exert control over their personal business.

4.3.3.3b Option 2: Movement to a Hybrid Model (Negotiated or Contracted Público Service)

Service can be negotiated or competitively contracted to existing público operators. This option assumes that service during peak periods will be supplemented by traditional públicos. The purpose is to develop a reliable off-peak or “base” feeder service, utilizing existing público operators and vehicles. The recommended strategies are as follows:

- Determine the minimum level of service needed for each route
- Identify poorly-performing routes for competitive bidding to qualified operating groups or companies
- Encourage individual operators to bid on individual contracts to provide services
- Disclose all information to potential contractors and divide each contract into multiple clearly definable pieces of “work.” Award contract to operating groups that requires the lowest subsidy through a competitive bidding process
- During the initial stage, contract with gross cost contracts to obtain information about demand, cost of providing services, etc. After enough time has lapsed, if the government has enough information about demand and cost of providing service on a route, go to net cost contracts
- Provide or help contractors purchase new vehicles

Information obtained from Carmen Gonzalez, Tren Urbano Office and Esteban Rodriguez, Public Service Commission.
• Assist contractors with vehicle insurance (assume liability or subsidize)
• Install AVL system for monitoring services
• Provide signal pre-emption and head-of-the-line privileges at key intersections
• Provide sheltered stops along the route with service information on transit services and alternative transfer options
• Provide transfer privileges at transit centers

Strengths and Weaknesses

The strengths and weaknesses of a hybrid model was presented earlier in section 4.3.1.2.

4.3.3.3c Option 3: Contracted Minibus Service with Companies

This option attempts to identify poorly-performing bus routes which connect to important transfer points in the network and replace them with contracted minibuses. The purpose is to allow AMA to “free-up” buses and resources to improve services on other routes. It assumes that during peak periods, additional services would be supplemented by traditional públicos. Moreover, this option allows the government to experiment with a “base” scheduled service that mimics a reliable feeder service to Tren Urbano. The identified routes mentioned previously (4.3.3.1 “Weak” Público Routes with Poorly-Served Bus Routes) are potential candidates for this type of service. A summary of the recommended plan is as follows:

• Determine the minimum level of service needed for each route as well as potential new routes
• Identify poorly-performing bus routes for competitive bidding to qualified operating groups or companies
• Encourage individual operators to form operating groups or companies with 10 to 20 vehicles and local or “off-island” companies to bid as well
• Disclose all information to potential contractors and divide each contract into at least two or more clearly definable pieces of “work.” Award contract to operating groups that requires the lowest subsidy through a competitive bidding process
During the initial stage, contract with *gross cost* contracts to obtain information about demand, cost of providing services, etc. After enough time has lapsed, if the government has enough information about demand and cost of providing service on a route, go to *net cost* contracts.

- Provide or help contractors purchase handicap accessible minibuses
- Assist contractors with vehicle insurance (assume liability or subsidize)
- Require contractors to provide feeder service to transit centers (and later, *Tren Urbano* stations)
- Require contractor to match Metrobús hours of service (and later, *Tren Urbano*)
- Integrate fares with Metrobús (and later, *Tren Urbano*)
- Install AVL system for monitoring services
- Provide signal pre-emption and head-of-the-line privileges at key intersections
- Provide sheltered stops along the route with service information on transit services and alternative transfer options
- Provide minibus time-to-arrival display at stops

*Strengths and Weaknesses*

Contracting with operating groups or companies, as opposed to individual operators, can potentially reduce the level of complexity related to contracting. Reduction in the number of contracts cuts down on the amount of paperwork and negotiations needed. It also reduces the complexity involved in managing multiple contracts. Furthermore, contracting can potentially reduce the cost for the government than if it were to operate a separate service or system. The contractors can provide their labor as drivers, as well as maintain the vehicles they drive. This reduces the level of investment and responsibility for the government. The drawback, however, is that contractors, compared to traditional público operators who have a stake in the routes they serve, may not have the incentive to “build” the market. Since there are uncertainties about contract renewals, there would be more of an incentive to “hold back” services by providing the minimum level of service required by the contract. For this reason, a negotiated contract might be more appropriate to reduce the level of uncertainty inherent in competitive contracts and allow público operators a period of time to develop the market.
Dividing a contract into multiple pieces of “work” may be a good transitional strategy that provides replacement in case of a default on contract or a contractor not meeting performance standards. The government has the option of having another contractor on the same route step in to replace services. This arrangement has the potential to provide some level of competition. It would also help to improve cost efficiency by allowing contractors to compete against each other. However, if there is little interest on bidding for the contracted service, the government might have to resort to contracting with a single operating group and forsake the advantages of competition among multiple operating groups.

In terms of contract types, cost contracts provide the government a greater degree of control over revenue from fares because contractors are required to turn them in. Since público operators are used to collecting and bringing home the daily revenue they receive from fares, cost contracts would not be easily agreeable to them. Instead, revenue contracts would be more acceptable. The tradeoff is that revenue contracts are less complex, and contractors are allowed to take home the revenue they receive on a daily basis. Cost contracts give the government greater control over revenue allocation, while it creates the added responsibility of distributing and allocating revenue among different contractors. For revenue contracts, the government loses the knowledge about operating costs and how much the contractors are receiving in fares. The absence of this knowledge makes it difficult to determine the expected losses as well as the appropriate contract price for contractors operating on an unprofitable route.

If the service is over-subsidized, the contractor may be less attentive to customer needs. However, the government can build into the contract incentives or penalties that would require them to be sensitive to customer needs. Second, contracts require strict monitoring and enforcement in order to be effective. New technology, however, such as automated vehicle location (AVL) systems, automated vehicle identification (AVI) systems, global positioning satellite (GPS) systems and other advanced technology make close contract monitoring more feasible. Many of these systems are already being deployed in various transit applications; however, the costs are still high. In some cases, the savings gained from contracting out services may be offset by the high costs of contract monitoring and administration. This is an issue that the government must consider before expanding the contracted minibus service.
Finally, the risks of providing a handicap accessible service is that liability may become a critical issue especially if existing público operators begin to provide services. The government would need to be very careful and strict in choosing drivers for the service. It may be risky for the government to assume the burden in case of accidents or improper handling of handicap passengers by untrained drivers. Since this is a new type of service, a lot of resources would need to be devoted to driver training, purchasing equipment and educating hired drivers about the handling of handicapped passengers.

4.3.3.3d Option 4: Tren Urbano Feeder Service

This option involves using Siemens as an agent for the government to contract out or provide exclusive feeder services for Tren Urbano. It can also take over contract management responsibilities from the government on existing contracted feeder route. The intent is to create a flexible option for the government as a “last resort” if all other options fail. With a five-year contract to operate Tren Urbano and the possibility to extend the contract for another five years, this option assumes that Siemens would potentially be interested in developing a separate feeder network. This is similar to what is being done in Caracas and Kuala Lumpur where the operator for the rail systems operate their own feeder services. Service would commence when Tren Urbano is operational. The option consists of the following strategies:

- Create a separate feeder network and determine the minimum level of service and performance standards required on each route
- Grant franchise to Siemens to contract or operate feeder service to Tren Urbano
- Provide public information at stops, Tren Urbano stations, transit centers
- Promote the new feeder system in conjunction with Tren Urbano with integrated fares, service schedules, matching hours of service, strict safety and maintenance standards
- Install AVL system to monitor services
- Provide time-to-arrival display at stops
- Match Tren Urbano hours of service
- Provide signal pre-emption and head-of-the-line privileges at key intersections into Tren Urbano stations
- Equip vehicles with air conditioning and handicap accessible features
Strengths and Weaknesses

From a management perspective, an exclusive feeder service will ensure more effective oversight. It has the potential for better long-term planning and better service coordination with other public modes. A contracted feeder service under Siemens would ensure that service is integrated with Tren Urbano. It also allows the system to act as a “model” for traditional público services. Using Siemens as a contract agent would permit the government to minimize exposure to contract risks.

This strategy also has the potential to achieve service differentiation. It has the potential to integrate fares with other public modes, as well as experiment with different ITS-related technologies (AVL, AVI, signal preemption, etc.). Furthermore, the provision of public information at Tren Urbano stations and feeder stops can help better educate the traveling public about public transportation options. The disadvantage of this approach is the potential competition with existing public services, contracted minibuses, or hybrid services. Services would need to be negotiated so as not to flood the market with excessive competition. This option is also narrowly focused on a single market, namely feeder trips to Tren Urbano. Since this option is proposed for Tren Urbano opening year, it does not benefit the current público system. Improvements would still need to be made to the existing system. Therefore, this option should be used as a “last resort” to supplement poor feeder routes in which services are either abandoned or poorly served. If all other options to create a reliable feeder network fail, the government can incorporate this option as part of a larger comprehensive plan.

4.3.3.4 Non-Impacted Routes

Público routes that do not operate near the Tren Urbano alignment and are not directly impacted by its operation are included in this category. There are three potential options for improving their operation:

- Improvements within the Current Model
- Movement to a Hybrid Service Model
- Movement to a Contracting Model
These options can be implemented after the experimental period from which lessons can be drawn to help refine potential strategies.

### 4.3.3.4a Option 1: Improvements within the Current Model

This option attempts to “stabilize” services and gradually implement more aggressive strategies as lessons develop from implementing other options. It consists of strategies that attempt to improve regulations, service quality and reliability, as well as público regulatory structure. They can be implemented in stages or selectively on a few “test routes” to evaluate whether it is worthwhile to expand to other routes. The strategies are as follows:

- Improve waiting conditions by building new sheltered stops
- Provide head-of-the-line privileges for públicos at key intersections
- Prohibit the practice of waiting at terminals for vehicle operators and require públicos to leave terminal at regular intervals
- Require annual público vehicle inspection (as part of regular annual vehicle inspection) to ensure minimum compliance of público safety and maintenance standards
- Centralize público licensing, regulation, enforcement and planning into one public agency (either PSC, PRHTA, or new público regulatory agency) to oversee all público management, operation and enforcement efforts
- Assist operators with vehicle insurance
- Provide vehicle replacement assistance through a government-backed brokerage
- Provide transfer privileges to help build ridership

**Strengths and Weaknesses**

For a discussion of the strengths and weaknesses of the proposed strategies, refer to section 4.4.3.3a **Option 1**: Improvements within the Current Model.
4.3.3.4b **Option 2: Contracted Service**

Services can also be competitively contracted to existing público operators. They would have to form operating groups or companies in order to enter into contractual relationship with the government. This model is an extreme scenario in which any attempts to improve services within the regulated competition structure has failed. The recommended strategies are as follows:

- Determine the minimum level of service needed for each route
- Identify poorly-performing routes for competitive bidding to qualified operating groups or companies
- Encourage individual operators to form operating groups or companies with 10 to 20 vehicles
- Disclose all information to potential contractors and divide each contract into at least two or more clearly definable pieces of “work.” Award contract to operating groups that requires the lowest subsidy through a competitive bidding process
- During the initial stage, contract with *gross cost* contracts to obtain information about demand, cost of providing services, etc. After enough time has lapsed, if the government has enough information about demand and cost of providing service on a route, go to *net cost* contracts
- Install AVL system for monitoring services
- Provide signal pre-emption and head-of-the-line privileges at key intersections
- Provide sheltered stops along the route with service information on transit services and alternative transfer options
- Assist contractors with vehicle insurance (assume liability or subsidize)
- Provide or help contractors purchase new vehicles

**Strengths and Weaknesses**

The strengths and weaknesses of a competitive contracting model were presented earlier. To summarize, competitive contracts have the potential to improve cost efficiency, yet still allow the government to retain control of various aspects of service.

---

39 For a more detail discussion, refer to Section 4.3.1.3.
standards. Second, a competitive bidding process used to solicit and evaluate potential bidders contribute to cost efficiency. Moreover, contracting out allows the government to stipulate the conditions for the contract and provides performance measures from which services can be evaluated. The drawback, however, is that the government loses the advantage of having operators maintain their own vehicles (under the regulated competition model). Contracting does not provide incentives for operators to engage in long term planning, since they cannot be certain whether they will exist to provide service. Therefore, it would be hard for the government to encourage them to develop a market niche.

4.3.3.4c **Option 3: Hybrid Público Service**

A hybrid service consists of contracted off-peak services in an attempt to improve service quality and reliability. The hybrid service model is a “transitional” model between the current condition and a “pure” contracted service where it is competitively tendered. It is different from the current condition in that the government has a formal agreement with a sub-set of operators to provide off-peak services. This option is similar to the contracting experience in Miami in which existing jitney services were contracted to supplement bus service in the aftermath of Hurricane Andrew. During peak periods, operators are allowed to operate traditional público services. Contracts are negotiated with existing operators, associations, or terminals. Another strategy is to hire existing público operators as drivers during off-peak periods. The government can purchase minibuses that are used for publicly-operated services during the day and for contracted público/minibuses in the evenings and weekends. Services can be gradually supplemented with contracted públicos. The proposed strategies are:

- Identify minimum level of service on all existing routes
- Contract out off-peak services or hire existing operators as drivers for evening or weekend services with publicly-owned minibuses
- Install AVL system to monitor services
- Improve waiting conditions by building new sheltered stops with phones and public information on transit services
- Prohibit the practice of waiting at terminals and require públicos to leave terminal at regular intervals

39 For a more detail discussion, refer to Section 4.3.1.3.
• Provide scheduled service
• If implemented successfully, can be expanded to other poorly served bus routes
• Provide assistance with vehicle insurance (maybe through broker)
• Provide vehicle replacement assistance through a government-backed brokerage

Strengths and Weakness

Contracting off-peak services with associations can potentially be effective, with less need for direct government involvement. By contracting off-peak period, evening and weekend services, the government can reduce capital and labor costs by using públicos to provide service, instead of publicly-operated full-size buses. Since some route associations are well organized, the government can rely on the self-discipline they impose on their members to enforce new regulations and rules. Since they also provide benefits for their members in the form of cheaper fuel, lubricants, tires, or collective agreements with local garages for major repairs, the government can avoid direct contract with individual operators by allowing the associations to distribute incentives to their members. Another advantage is that associations are smaller than terminal organizations and are usually formed around routes, thus, forming a “natural” operating unit which the government can potentially contract with. However, the risk of contracting with large associations is that they tend to be political. Each may have different policies and objectives which would complicated service improvement plans.

4.4 Summary

While público service quality and reliability have been in decline, they may have the potential to provide effective public transportation in the metropolitan area. With the building of Tren Urbano, proper government initiatives to improve their services can provide them with a new role of providing effective feeder service. There are four types of público routes for which options were proposed and evaluated. In the short run, there are improvements to the entire público system that the government can implement. For routes that are directly affected by Tren Urbano, the government can implement more aggressive strategies to test whether they are effective in producing the desired outcomes. For potential feeder routes to Tren Urbano, the experience with the impacted routes can
provide valuable lessons. Services can be contracted on a few test routes to determine whether they can be expanded to other routes. This reduces the level of initial commitment and exposure to risk for the government. It can reserve the option of using Siemens as an agent to either contract out or provide a separate feeder service to Tren Urbano. As the government implements all four of these options, it can develop good data to make judgments about cost effective strategies to improve público services.
Chapter 5

CONCLUSIONS

This thesis identified the problems and challenges most jitney systems face. Although they operate more efficiently than publicly-operated buses, their unsafe and aggressive driving practices and direct competition with buses has led to increased government regulation on their operation. Most authorities are reluctant to help improve jitney services for fear that it will disrupt normal transit operations. Although they often do not require ongoing public subsidy, evidence suggests that in recent years, the rise in congestion, decline in service quality and reliability, and the increase in operating costs have hurt jitneys’ ability to compete effectively. From the user’s perspective, the lack of reliable off-peak services and public information on fares and routes have reduced their ability to attract new riders. Often, the lack of effective oversight of vehicle safety and maintenance standards have, over time, left the industry with a poorly maintained and aging fleet. The lack of incentives have also made operators reluctant to improve services or replace old vehicles.

Despite the problems and challenges jitneys face, there are potential roles they can play. Because they operate more efficiently than full-size buses, they have the potential to supplement regular transit services. Their ability to vary the level of service according to demand allow them to achieve higher service productivity and efficiency. The use of smaller vehicles permit them to maneuver more effectively in narrow or congested streets, and their better acceleration characteristics and higher operating speeds allow them to compete with the automobile. Their lower cost structure with minimal overhead, without the need to maintain fixed facilities, makes them a viable “low cost” alternative in providing public transport services. Unlike publicly-operated transit services, which are often heavily unionized, contracting out services to a sub-set of jitney operators allows the authorities to solicit transit services at a lower cost. Furthermore, jitneys have the ability to provide service in low density neighborhoods where traditional transit is
more costly and difficult to provide. Jitneys have the potential to provide high quality service in suburban neighborhoods where the market exists for an exclusive type of service. Finally, jitneys have the potential to provide effective feeder service to line-haul transit modes. The evidence from the case studies suggests that a market exists for jitneys to provide feeder service to rail transit.

5.1 Application to the San Juan Públicos

This thesis has developed a set of alternative strategies for improving the público system. From a timing perspective, it recommends that a set of “experimental strategies” be implemented immediately on “weak” público routes, potential feeder routes and on routes that are expected to be directly impacted by Tren Urbano. A minibus service should be contracted out to operating groups or companies to provide a scheduled, all-day service on routes poorly served by públicos and AMA buses. Improvements within the current conditions or a contracted minibus service can be implemented on potential feeder routes to Tren Urbano. The government should also experiment with more aggressive strategies by purchasing new vehicles, implementing fare integration, allowing owners to hire drivers, and providing a limited-term contract (leading up to Tren Urbano opening year) to operators on routes directly affected by Tren Urbano. Services on the above “experimental” routes should be monitored closely and assessed to see whether the same strategies can be applied to other routes and markets. The lessons can be used to help upgrade the remaining público routes. In the event the proposed strategies are not adequate or do not produce the desired results, the government has the option to use Siemens as an agent to operate or contract out a separate feeder service to Tren Urbano.

5.2 Areas for Further Research

The following is a list of potential areas for further research. They are divided into two major categories - those that apply to general jitney operation and those that apply specifically to the públicos.

**Jitney-Related**

**Jitney and rail integration issues**: to date, there is nothing in the literature that examines issues related to jitney and rail integration. There have been a few studies of
impact of jitneys on buses, but there needs to be proper documentation of jitney impact on rail ridership and revenue. Furthermore, there needs to be further understanding concerning the interaction between rail and jitneys in order to implement integration strategies.

**Fare integration:** there is a need to understand the issues involving revenue allocation among multiple operators, the appropriate fare medium, technology, how and when to implement.

**Fare structure and fare regulation:** there is a need to determine the most appropriate fare structure for jitney systems (flat fare, graduated fare, etc.); the pros and cons of fare regulation; the impact fare regulation has on industry profits, subsidy, etc.

**Vehicle size:** as more urban areas are attempting to upgrade jitneys to minibuses, it would be important to examine the consequences of such a strategy to vehicle productivity, efficiency, operating costs, affects on congestion, demand for service, etc.

**Jitney costs:** since little is known about the cost of providing jitney service as well as the likely profits, conducting further research into the capital and operating costs of being in the business would be important to provide the authorities a better picture of jitney operation.

**Institutional issues related to jitney planning, regulation, and enforcement:** in the course of this research, evidence has surfaced that jitney regulation in many urban areas are fragmented. It would be important to examine the appropriate institutional framework for planning, regulating, and enforcing jitney operation.

**Público-Related**

**Público fare integration with public modes:** evaluate the feasibility of implementing fare integration with existing públicos; evaluate the appropriate fare medium, technology, etc.

**Hybrid ADA-Minibus Service:** evaluate the feasibility of a hybrid ADA-minibus service that is both open to the elderly and handicap as well as the general public.
**Público fare, regulation:** analyze the effects of público fare changes; determine the effects of different fare structures to público profitiability and subsidy.

**Público cost study:** since little is known about público financial conditions, it would be important for the government to obtain up-to-date information on público operating costs and revenue in order to make decisions about pricing, subsidy, contracting, etc.

**The effects of operating privileges:** evaluate the effectiveness and benefits of providing operating privileges such as head-of-the-line privileges, signal pre-emption, exclusive use of bus-público lanes, etc., to público operating efficiency and productivity.

**Appropriate institutional framework for managing público operations:** since government oversight of the current público system is split between the PSC and the PRHTA, it would be important to examine the appropriate government agency that should take the responsibility to oversee público planning, operations, and enforcement.

**Feasibility of applying ITS-related technologies to the público system:** determine público operators’ acceptability to advanced technologies; examine the cost of implementation.
References


Hong Kong Government Information Services Department. “Transport in Hong Kong: A Paper for Public Information and Discussion.” Hong Kong, Hong Kong Government Printer, 1974.


Larocca, José. *Some Facts and History About the “Collectivo” Buses and the Experience with Privatization.* 1996.


Roschlau, Michael W.  *Urban Transport in Developing Countries: The Peseros of Mexico City.* Masters Thesis Series. Center for Transportation Studies, University of British Columbia, Vancouver, Canada, 1981.


