

LATE-NIGHT TAXI FEEDER SERVICES

TO METRORAIL

IN NORTHERN VIRGINIA

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ABSTRACT

Late-Night Taxi Feeder Services
To Metrorail
In Northern Virginia

The Northern Virginia Transportation Commission designed and implemented a demonstration of taxi feeder services to Metrorail to explore cost-effective transit strategies during periods of low demand. The Subway Shuttle Taxi (SST) service operated in two suburban communities with different operating procedures and subsidy requirements. The SST proved to be an effective technique for increasing mobility during non-peak hours without incurring major subsidy costs. This paper describes the advantages and disadvantages of the two approaches to taxi feeder services. The economics, operations and management of the SST project are reviewed including the authors' observations on publicly contracted private transit services.

Figure 1 Alexandria SST Fare Zone System

Figure 2 Alexandria Subway Shuttle Taxi
Passenger-Trips Per Month

Figure 3 Arlington Subway Shuttle Taxi
Passenger-Trips Per Month

Introduction

Expansion of the Washington Metropolitan area's Metrorail service into Northern Virginia has required extensive bus routing changes to eliminate duplicate transit services and provide feeder service to the rail system. The introduction of Metrorail service also increased transit subsidy requirements and several suburban communities in the area have sought low cost alternatives to Metrobus to provide Metrorail access. Late-night and weekend travel to Metrorail are two suburban travel markets that may not be large enough in some areas to warrant fixed-route bus service. Infrequent bus service on weeknights reflects lower demand during this time period but poses major problems for commuters who work late. Some commuters reject Metrorail as a travel option because of the limited late-night feeder bus service.

The Northern Virginia Transportation Commission (NVTC) undertook a demonstration of taxi feeder services during 1985 and 1986 to explore alternative ways to provide connections to Metrorail. The Northern Virginia taxicab industry has excess capacity on weeknights and the purpose of the project was to foster the use of taxicabs as a means of accessing Metrorail. The objectives of the demonstration included:

- 1) To increase urban mobility in a cost-effective manner;
- 2) To encourage Metrorail ridership during periods of excess capacity; and,
- 3) To strengthen the private taxicab industry's role in an integrated transportation network.

The taxi feeder service, known as the Subway Shuttle Taxi (SST), provided on-call service throughout the City of Alexandria to and from three Metrorail Stations. The Alexandria SST sought to contain transit costs by only subsidizing actual passenger trips. In Arlington, the SST was used on a fixed route (with doorstep service provided on request) to explore the potential demand for weeknight and Saturday transit service to and from a major Metrorail station. NVTC reimbursed the Arlington taxi firm for each SST vehicle trip.

Northern Virginia's experience with taxicabs as transit feeder services illustrates some of the advantages and disadvantages of publicly contracted/private managed transit services. In particular, the contractual arrangements between NVTC and the taxicab companies directly affected the project outcome. As discussed below, trade-offs were made between the subsidy level and the degree of control that NVTC exercised and a different contractual approach was used in Alexandria versus Arlington. This paper describes the operations, economics and transportation impacts of the two experimental taxi feeder services.

Alexandria Subway Shuttle Taxi

The Alexandria SST began operations on June 3, 1985. Prior to start up, several institutional issues were resolved that had seriously threatened service initiation. For example, Alexandria's original taxicab ordinance required exclusive-ride service with metered fares. The SST was

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designed as a shared-ride, zone fare system and the Alexandria Traffic and Parking Board opposed the SST because of fears that drivers would overcharge patrons unfamiliar with the zone boundaries. After protracted discussions, the Board authorized the SST zone fare system. At the same time, the City of Alexandria negotiated an agreement with Metrorail to allow taxicabs to wait closer to station entrances. The new locations provide much better visibility for the taxicabs and are located between the bus platforms and the public parking area.

Alexandria has aggressively sought to control its public transit subsidies and initiated its own city-owned bus service in 1984 (known as DASH) in reaction to escalating Metrobus costs. The SST was viewed by City officials as a potential means to provide late-night transit feeder service at a lower cost than fixed-route bus service. Other benefits that were anticipated included a larger service area than the bus network could provide and greater convenience for patrons.

Figure 1 presents the SST fare zone system. The service operates between 8:00 p.m. and 12:30 a.m. weeknights only. Patrons pay \$1.00 per zone and the maximum fare is \$4.00 for zone 4. The driver starts the meter at the beginning of the trip and the taxi firm reimburses the taxicab operator for the difference between the metered fare and the zone fare. NVTC repays the firm. The drivers are encouraged to seek multiple riders which has the dual benefit of potentially increasing driver revenue beyond the metered fare and eliminating the public subsidy requirement.

However, the relatively small numbers of Metrorail patrons using the Alexandria stations in late evening hours generally precludes shared-ride opportunities. For example, a total of 230 patrons or an average of 12 persons per train debarked from Metrorail at the King Street station between 8:00 P.M. and midnight on May 20, 1985.

For the first year of the project the drivers were responsible for recording SST trips on a trip manifest that included trip endpoints, mileage, and time. The drivers were also instructed to request the patrons' names and daytime telephone numbers to facilitate performance monitoring. Although some drivers were able to successfully record all of the desired information, the uneven quality of the manifests and the refusal of some patrons to provide their names and telephone numbers eventually lead to a change in these policies. The recordkeeping process was revised as a result of these problems and now requires the taxi company to record the trip through its dispatcher and to provide a unified statement of trips to NVTC for reimbursement. Although passenger names are no longer collected, the companies play a greater role in verifying each trip's authenticity and the radio communication maintains better control over the drivers.

The Alexandria SST was promoted through advertising in the local media and by posters and brochures at the Metrorail stations. Ridership was slow to develop initially and began to increase markedly in the Fall. Summer operations in 1985 were characterized by some patron confusion as

not all of the drivers in the companies listed in the information brochure and on signs at the stations elected to participate. Although one major participating taxi company required driver participation in the SST project as a condition of employment, they found it difficult to enforce as the drivers are independent contractors. NVTC also elected to offer drivers a \$1.00 bonus per trip to induce more drivers to participate. The results of these two initiatives can be seen in the ridership growth plotted in Figure 2.

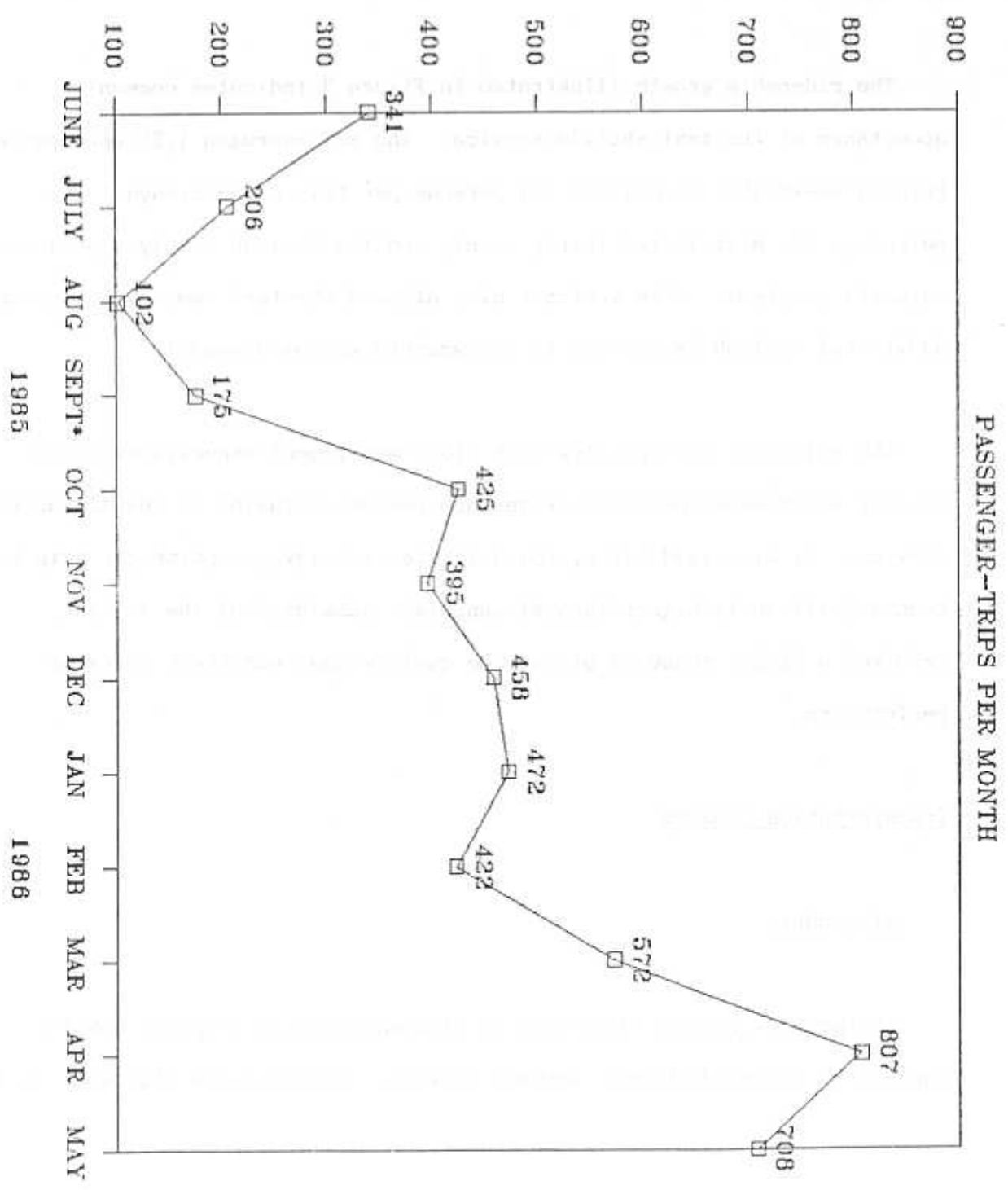
Arlington SST

A companion taxi feeder service was initiated in Arlington County in November 1985 to serve the Ballston Metrorail station. The Arlington SST operates on a fixed schedule on weeknights and all day Saturday. The SST follows the same route as a daytime Metrobus and provides doorstep service upon request at no extra charge. The fare is \$.80 and is based upon the Metrobus base boarding fee. Metrobus transfers are honored on the SST for a \$.35 discount. The service operates from 9 p.m. to 12:30 a.m. weeknights and 7 a.m. to 12:20 a.m. Saturdays on a 20-minute frequency using two taxis.

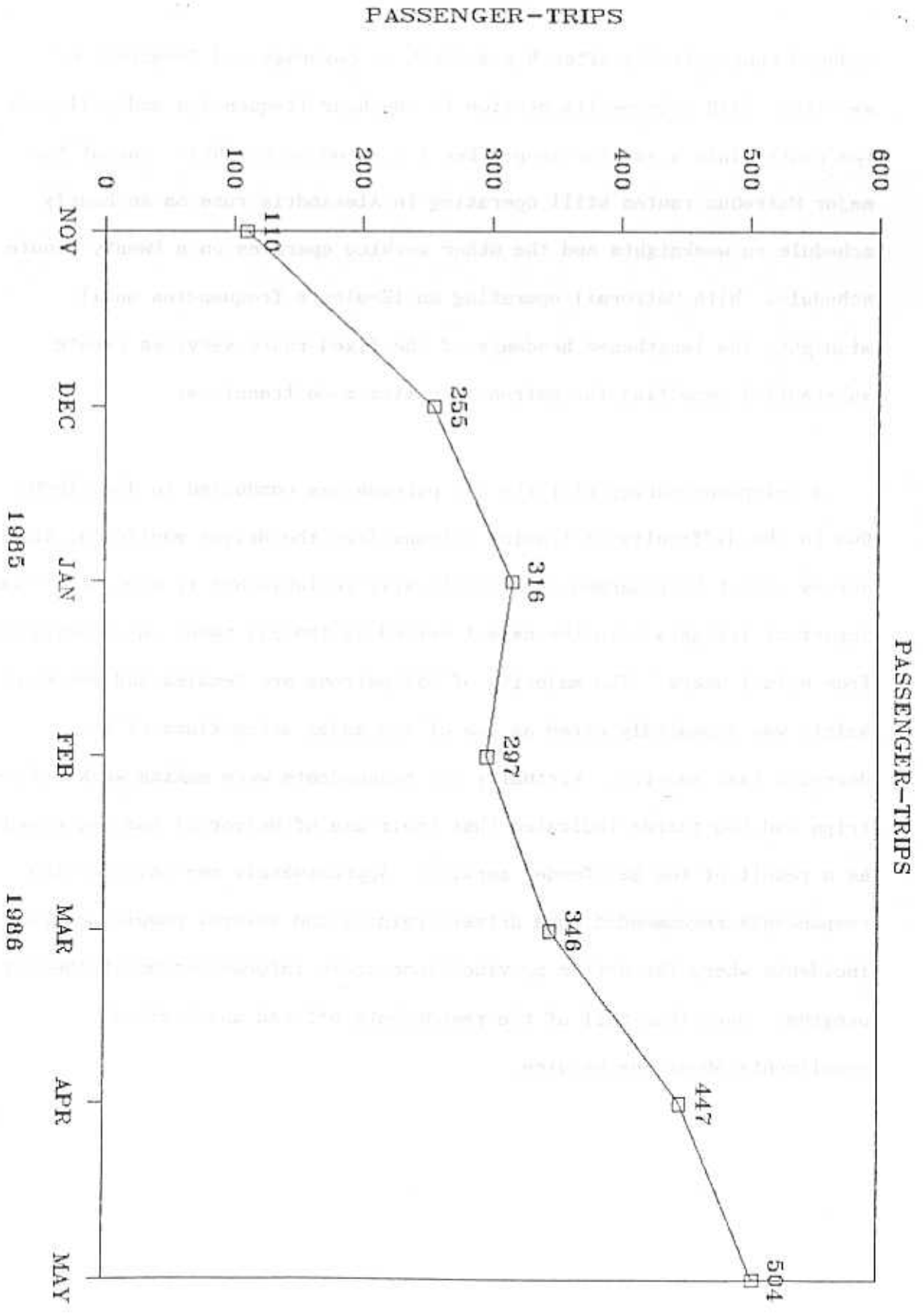
In contrast to the Alexandria SST -- in which participation was open to all taxi firms -- the operating taxi company in Arlington was selected through a competitive bid and the terms are more typical of publicly purchased contract services. The basic objective of the Arlington SST is

ALEXANDRIA SUBWAY SHUTTLE TAXI

PASSENGER - TRIPS



ARLINGTON SUBWAY SHUTTLE TAXI



reduced substantially after 8 p.m. both in coverage and frequency of service. DASH reduces its service to one hour frequencies and collapses two routes into a smaller loop after 7 p.m. on weeknights. One of two major Metrobus routes still operating in Alexandria runs on an hourly schedule on weeknights and the other service operates on a twenty-minute schedule. With Metrorail operating on 12-minute frequencies until midnight, the lengthened headways of the fixed route services create substantial penalties for patrons who miss mode transfers.

A telephone survey of fifty SST patrons was conducted in June 1986. Due to the difficulty of tracing patrons from the driver manifests, the survey cannot be regarded as statistically reliable but it does offer some important insights into the market served by the SST based on observations from actual users. The majority of SST patrons are females and personal safety was repeatedly cited as one of the major attractions of the doorstep taxi service. Virtually all respondents were making work-related trips and two-thirds indicated that their use of Metrorail has increased as a result of the SST feeder service. Approximately one-third of the respondents recommended more driver training and several people described incidents where the driver provided inaccurate information about the SST program. More than half of the respondents offered unsolicited compliments about the service.

In addition to the survey findings, four hundred trip manifests were inspected for trip origins and destinations. Virtually all SST users lived in areas that are well served by public transit during daytime hours. It appears that the SST is accomplishing one of its primary objectives by making transit a viable travel choice throughout the day and evening. The SST patrons are assured of a safe, reasonably-priced trip home in the late evening and therefore are more willing to use transit in the morning.

Boardings and alightings at the Alexandria Metrorail stations were recorded before and during the SST project and both measures increased markedly. However, attempts to measure the SST's effect on Metrorail patronage were inconclusive because the daily variations in passenger activity at the Alexandria stations often exceeded the daily SST ridership. Another factor which obscures the SST's effect on Metrorail is the significant ridership growth which has occurred on this relatively new facility. The Metrorail Yellow Line to Alexandria opened in December 1983 and it will be several more years before the system achieves a stable ridership base.

Arlington

The Arlington SST operates in a smaller service area than the Alexandria SST and it is difficult to distinguish any effect it may have on travel behavior from other factors influencing travel. The service

area includes 15,360 households representing approximately 21 per cent of the County's total population. Arlington bus transit service is the most comprehensive in Northern Virginia and many people along the SST route have alternative bus service from selected points. The average weeknight SST ridership of 12.5 persons is comparable to the Metrobus ridership between 6:30 P.M. and 9:00 P.M. which totalled 36 persons in March 1985. A patron survey conducted in June 1986 revealed that Arlington SST users were similar to Alexandria SST patrons. Most passengers were making work-related trips although significant minorities used the service for shopping and recreation. Surprisingly, the majority of respondents did not request doorstep service and most patrons were using the service more than three times per week. About half of the respondents indicated they used Metrorail more frequently as a result of the SST. Virtually all respondents gave the drivers high marks for courtesy and performance although few felt it had increased their use of full fare taxi cab service during non-SST hours. Respondents were almost unanimous in rating the SST as better than Metrobus service.

Subsidy Requirements for Feeder Services

The recent fiscal pressures experienced throughout the transit industry have heightened interest in cost-effective transit service options. An important SST objective is to provide transit services that require less public subsidy than traditional fixed-route bus services.

The SST has proved to be a cost-effective public transit service for time periods when traditional transit ridership is particularly low. The subsidy per passenger trip on the Alexandria SST averaged \$ 3.02 as of May 1986. (This figure includes a \$1.00 per trip driver bonus which will be discontinued in the Fall.)

An analysis of late-night fixed route transit services in Alexandria indicates that the SST subsidy is generally lower on a person-trip basis. The comparison below illustrates the estimated subsidy per passenger-trip for Metrobus and DASH services operating after 8 p.m. The Metrobus and DASH subsidy calculations are based on operating costs only; no provision is made for capital depreciation. The SST subsidy, on the other hand, represents the full public costs of providing the service including depreciation and a reasonable profit for the taxi operator.

Public Subsidy per Passenger-Trip
by Transit Service in Alexandria

Alexandria Metrobus 28A-B	\$6.10
Alexandria DASH ATC-2,3,5	\$3.01
Alexandria SST	\$3.03 (\$2.03 excluding driver bonus)

Metrobus 28 A-B, is a long, inter-jurisdictional route serving low density areas on a one-hour frequency after 8 P.M. Low ridership on the 28 A-B accounts for the higher subsidy per passenger trip. Alexandria's DASH service has a relatively low cost basis due to the use of non-union drivers and a reduced level of service in the evening.

The Arlington SST subsidy per passenger trip on weeknights is significantly higher than the Alexandria experience because the Arlington SST operates on a fixed schedule, while in Alexandria, only passenger-trips actually taken are eligible for subsidy. The Arlington weeknight SST subsidy averaged \$5.67 per passenger-trip in May 1986. If the Metrobus 22 service was extended into the evening on the same schedule, the subsidy per passenger-trip would be approximately \$21.00 based on current SST ridership.

Public Management of Contract Taxi Services

The SST projects in Arlington and Alexandria differed significantly in the manner in which NVTC was able to control operations and assure the public of a high quality service. The Alexandria approach invited participation by all eligible taxi companies in the City and in practice permitted voluntary participation in the project on a driver-by-driver basis. The Arlington contract, on the other hand, was awarded to one company based upon a competitive bid and included detailed service delivery specifications.

The exclusive contract in Arlington provided much greater control over service delivery and the taxi company (Yellow Cab of Arlington, Inc.) was very responsive to achieving the project goals. The taxi company applied its general operating philosophy that the "customer is always right" to the SST contract and exceeded the contract minimum requirements on several occasions. But one of the costs of this high level of service is a higher subsidy per passenger-trip because of guaranteed payment regardless of usage.

The Arlington SST drivers were especially supportive of the service because their management passed along NVTC's contract payment of \$10.50 per vehicle-hour. This payment was roughly equal to their regular income and was guaranteed. Drivers were active in distributing brochures at the Ballston Metrorail station and encouraging additional patronage.

The voluntary participation approach in Alexandria increased the potential supply of drivers but was more difficult to administer. Some drivers would choose to participate when it suited their needs but would refuse SST patrons on other occasions. (Some drivers seeking long-distance trips would hedge their bets by refusing SST patrons on some occasions and not on others.) This irregular behavior resulted in some patron confusion and was later remedied by a new agreement with the participating companies. The new agreement identifies an exclusive SST stand at the Metrorail station and requires all taxis in the SST queue to offer SST fares. This provision is enforced by the City Hack Inspector.

Another unforeseen development in the Alexandria SST was driver attitude and willingness to participate. NVTC originally expected that the drivers would recognize the increased business opportunity and seek to bolster the fledgling SST project. Although management shared this expectation with NVTC, some drivers did not take a long-run view of the project and objected to what they regarded as a bureaucratic intrusion. NVTC initiated a \$1.00 bonus per trip for participating drivers to provide a short-term, tangible incentive to participate. The bonus, along with the management initiatives at the major participating company, corrected most of the driver attitude problems.

One of the more challenging aspects of publicly contracted services is to ensure that full value is received for public monies spent. In addition to patron surveys and careful review of the trip manifests, NVTC monitored service quality on the two SST services through random observation and by customer reaction. The random observations provided a basic knowledge of operator performance but the principal source of information was patron telephone calls. There were virtually no complaints about the Arlington SST and several patrons telephoned or wrote to express their support for the service. On the other hand, the Alexandria SST service in its early stages prompted several patrons to contact NVTC regarding drivers' attitudes, performance and lack of familiarity with the SST program. This information was invaluable for identifying and correcting shortcomings in the project's design and administration.

Conclusions

In addition to providing high quality transit service for a reasonable subsidy cost, the experimental use of taxi operators in Arlington and Alexandria to improve Metrorail access during periods of low patronage illustrates some of the problems that can arise in publicly managed private services. The contracting agency must maintain a high level of involvement in the development and operation of such services to effectively respond to unanticipated problems. In Alexandria, NVTC responded to a public information problem by paying a driver bonus, involving the taxi firms more directly in management, and creating a separate cab stand to segregate SST service from regular taxicab service. These actions illustrate the types of changes which may become necessary once the sponsoring agency acquires some direct experience with the working environment of the private operators. In this case, some Alexandria taxi companies were unable (or unwilling) to effectively educate and discipline their drivers about the SST service. NVTC responded by revising the service to adapt to the conditions of the taxi industry.

Both SST services demonstrate a cost-effective alternative to expanding transit services in periods of low demand. The two communities have different transit policies and these differences are reflected in the different contract arrangements. For example, Arlington's approach permitted more control and the additional cost of providing the service was deemed appropriate to accomplish this goal. In summary, the best elements of the two projects are:

- 1) Increased mobility for late-night transit patrons due to the doorstep service;
- 2) Cost-effective expansion of feeder services to increase use of the major public investment in Metrorail;
- 3) Maximum efficiency for public expenditures in Alexandria as only actual passenger-trips result in public costs; and,
- 4) Better management control over service provider through exclusive contract versus voluntary participation.