U.S. Department of Transportation
**Urban Mass Transportation Administration**

# *UNSUBSIDIZED TRANSIT SERVICES*

## *Potential to Meet Public Needs And Reduce Subsidy Requirements*

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*Prepared for:*
*Office of Budget and Policy*
*Urban Mass Transportation Administration*

*December 1985*

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*Prepared for:*

*Office of Budget and Policy*
*Urban Mass Transportation Administration*

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## Executive Summary

An analysis of private bus operations in seven metropolitan areas indicates that there may be significant opportunities for converting certain types of publicly operated transit services into unsubsidized operations. The analysis indicates that such conversions could result in a saving of over $27 million annually in public subsidies. Nationally, it is estimated that service turn-overs could save the public nearly $70 million in annual operating subsidies.

Contrary to common belief, transit services that require little or no public subsidies are functioning in at least ten metropolitan areas. A majority of unsubsidized services involve express commuter buses, operating only during peak periods. Service is typically provided between suburban park-and-ride lots and central business districts. Operations of this type can be found in New York, Northern New Jersey, Connecticut, Boston, Baltimore, Pittsburgh, Norfolk, Chicago, Dallas, Los Angeles and San Francisco. Brief descriptions of selected operations follow:

* In the **New York** metropolitan area, private subscription buses bring over 50,000 passengers daily into Manhattan from destinations in Westchester County, Long Island and Northern New Jersey. Some 1250 privately owned buses enter mid-Manhattan during every morning rush hour, according to a survey carried out by the New York City Transportation Department in the winter of 1984.

* In **Chicago**, seven private bus companies, operating a total of 236 buses, provide commuter services directly to individual riders through the so-called "bus clubs" or through arrangements with private corporate employers. These buses operate on 116 separate

routes and carry 20,700 daily passengers.

* In **Los Angeles**, a dozen private carriers currently provide 80 unsubsidized commuter services throughout the region. In addition, several private employers sponsor bus service for their employees at no cost to the public.

* In **Boston**, about 200 private buses, operated by 15 companies, provide commuter service from the suburbs into Boston. Some of the carriers operate all day, while others provide service only during commuting hours. Approximately 12,000-15,000 commuters in the Boston region use the private buses, none of which receive public subsidies. In the most heavily traveled corridors, private buses carry nearly 5 percent of all commuters.

* In **Norfolk**, VA, as many as 100 private buses, or "employee haulers" as they are known locally, serve three large employment centers - the Norfolk Naval Base (40,000 workers), Norfolk Naval Shipyard at Portsmouth (12,000 employees), and Newport News Shipbuilding and Dry Dock (25,000 employees). In contrast to most private commuter bus operations, which offer high quality service, those in the Tidewater region are a low-cost no-frills service.

For purposes of this analysis, it was assumed that only peak period "closed-door" express bus services are potentially capable of being self-supporting. Using data obtained from metropolitan transit authorities, a survey was made of public transit operations in seven major metropolitan areas to identify publicly provided express bus services. The urban areas selected for study were New York City, Chicago, Philadelphia, Los Angeles, Orange County, Washington D.C., and Houston. Only those services strictly meeting the criteria of "peak period express bus" were considered. Thus, express services operating all day, or peak period services operating only partly in express mode, were not included in the analysis.

The survey disclosed that peak period express bus service represents from less than one percent to nearly six percent of total service in individual study areas. In order to determine express bus service subsidy requirements, cost allocation models were developed for each metropolitan area's express services, based on 1984 data obtained from individual transit authorities. Using these models, annual operating costs and subsidies were calculated.

The analysis has indicated that over $27 million in public subsidies could be saved annually through private take-overs of peak period services in the seven jurisdictions under study. The subsidy savings could be nearly doubled if all express bus service (peak period as well as all-day) were to be assumed by private operators.

While no accurate national estimates can be derived from the seven area sample, a rough indication of the potential impact of service turn-over can be obtained by extrapolating the results of the analysis to the next 17 largest areas. Such a projection indicates that an annual saving of nearly $70 million could be achieved nationwide through private take-overs.

While private unsubsidized transit services are potentially viable in many urban areas, the study has found that there are major institutional obstacles to private service take-overs. Foremost among them is the resistance of public transit authorities. Transit agencies do not view private commuter services as a less costly substitute for peak period transit; on the contrary, many transit officials believe that by taking over peak period services, private operators would "skim" the most profitable routes. In reality, there is no cream to skim. Indeed, research indicates that peak period operations are among the most costly services to operate. A General Accounting Office study has found that it cost 250 percent more to provide a passenger with express service tha local service. The subsidy required for the express rider was even higher: nearly 4 times as high as for the local rider (General Accounting Office, Report to Congress, February 26, 1981). This is so, because peak period service involves extra equipment and drivers that are not productively utilized during the rest of the day.

Institutional resistance to service turn-overs is particularly pronounced when a regional transit agency itself is the regulatory body within its its service district. To overcome this resistance, it is recommended that:

(1) UMTA should vigorously enforce compliance with the provisions of Sections 8(e) and 9(f) of the Urban Mass Transportation Act as amended, and the implementing policy statement on Private Enterprise Participation in the Urban Mass Transportation Program (49 FR 41310, October 22, 1984). These requirements stipulate that private providers should be given an early opportunity to participate in the development of projects that involve new or restructured mass transit services. By becoming active participants in the shaping of local transit programs, private operators stand a better opportunity to stake out and lay claim to services that they believe can be effectively operated by the private sector.

(2) UMTA should use its discretionary grant-making authority to reward those jurisdictions that encourage private service take-overs. For example, UMTA could announce that jurisdictions which are willing to turn peak period commuter services over to the private sector (or which have attained a certain ratio of subsidized to unsubsidized services) will have a priority claim on any available discretionary Section 3 resources.

(3) UMTA should establish a speedy process for the review and adjudication of private operator complaints concerning impediments to competition and transit agency non-compliance with UMTA's Policy on Private Enterprise Paerticipation in the Urban Mass Transportation Program.

(4) UMTA should provide incentives to private carriers to expand unsubsidized services. Such incentives might involve provison of planning grants (through the MPOs or local governments) to assess the fiscal feasibility of such services.

# UNSUBSIDIZED TRANSIT SERVICES: POTENTIAL TO MEET PUBLIC NEEDS AND REDUCE SUBSIDY REQUIREMENTS

## Introduction

In recent years the urban transportation sector has been characterized by a growing private sector involvement. Evidence of this involvement is visible on several fronts. Local government, with active encouragement from the Urban Mass Transportation Administration, has stepped up contracting with private providers. The private transportation industry, sensing a more favorable climate for competition, has become more aggressive in pursuing opportunities in the urban transportation market. Finally, the business community -- employers, developers, and business associations -- have felt obliged to assume greater responsibility for providing transportation service, especially in suburban areas where traditional public transit is either unavailable or inadequate.

Private sector involvement in transportation service provision has assumed three forms:

- By far the most prevalent form is Service Contracting, where the day-to-day operation of the transit system is turned over to one or more private providers but overall policy control remains with a public body. While contracting requires public subsidies, the subsidy needs are much lower. A recent study for the Urban Mass Transportation Administration has found private contract costs to be 30-60% less expensive than the cost of public transit operations.

- In some jurisdictions private carriers have developed their own markets and provide entirely unsubsidized services or services that requires only a modest level of public subsidy. In this case, the responsibility for service delivery rests entirely with the private sector, and the cost to the public is only the amount of subsidy that the carrier may receive from state or local sources. A variation on

this type of involvement is service substitution. Here, selected transit services are replaced by or turned over to private for-profit operators, so that public subsidies are eliminated or substantially reduced. So far, there have been no recorded instances of service substitution, although such an approach has been advocated in some jurisdictions.

- Finally there are numerous examples of Privately Sponsored Services, supported by other than public funds. Here, service is subsidized, but the burden of the subsidies falls on the private sector. Examples include subscription buses and ridesharing programs sponsored by private employers, shuttle buses operated by office parks, residential subdivisions, and merchants associations, and specialized services contracted and paid for by private associations.

The extent and potential of service contracting is already being explored in a related UMTA-sponsored investigation by the University of California (Roger Teal, Principal Investigator), and will not be further examined in the present report. The aim of this study is to focus on private involvement that requires little or no public subsidies. Part I of the report considers independent bus services operated by private carriers. Part II examines privately sponsored services which do not require public subsidies (although they may involve private subsidies). Each type of private involvement is evaluated in terms of its potential to meet public transit needs and its implications for public financing.

SECTION I

## PRIVATELY OPERATED COMMUTER SERVICES

Independent commuter bus services, operated by private for-profit transportation carriers, and requiring little or no public subsidies, are functioning in at least ten metropolitan areas. The majority of these services are express commuter buses operating during peak periods only in a "closed door" (i.e. non-stop) mode between suburban park-and-ride lots and central business districts. Services of this type can be found in New York, Northern New Jersey, Connecticut, Boston, Baltimore, Pittsburgh, Norfolk, Chicago, Dallas, Los Angeles and San Francisco. Brief descriptions of selected operations follow:

* In the New York metropolitan area, private subscription buses bring over 50,000 passengers daily into Manhattan from destinations in Westchester County, Long Island and Northern New Jersey. Some 1250 privately owned buses enter mid-Manhattan during every morning rush hour, according to a survey carried out by the New York City Transportation Department in the winter of 1984. (1)

* In **Chicago**, seven private bus companies, operating a total of 236 buses, provide commuter services directly to individual riders through the so-called "bus clubs" or through arrangements with private corporate employers. These buses operate on 116 separate routes and carry 20,700 daily trips.

* In **Los Angeles**, 80 private unsubsidized commuter services are currently operating through a dozen private bus companies, of which the largest are Commuter Bus Lines, Inc. (49 routes), Antellope Valley Bus, Inc. (31 buses), Aztec Bus Lines, Inc., and California Charter Bus. In addition, several private employers, notably Arco and Hughes Aircraft Co. sponsor bus service for their employees requiring no public subsidies. (2)

* In **San Francisco,** Guiton Bus Co. of Oakland operates express routes from the Walnut Creek/Concord area (7 buses daily) and Vallejo (4 buses) to downtown San Francisco without public subsidies.

* In **Boston**, about 200 private buses, operated by 15 companies, provide

commuter service from the suburbs into Boston. Some of the carriers operate all day while others provide service only during commuting hours. Approximately 12,000-15,000 commuters in the Boston region use the private buses, none of which receive public subsidies. In the most heavily traveled corridors, the private buses carry nearly 5 percent of all commuters.

* In **Hartford**, a local bus company, Collins Bus Company, runs an express commuter service without public subsidies. The service got started at the request of the mayor of a suburban town after ConnDOT refused to initiate it.

* In **Baltimore**, 14 private bus companies provide bus service from Annapolis, Columbia, Aberdeen, Washington D.C. and smaller suburban communities into Baltimore. The private bus fleet includes 161 coaches.

* In **Norfolk**, VA, as many as 100 private buses, or "employee haulers" as they are known locally, serve three large employment centers - the Norfolk Naval Base (40,000 workers), Norfolk Naval Shipyard at Portsmouth (12,000 employees), and Newport News Shipbuilding and Dry Dock (25,000 employees). In contrast to most private commuter bus services which offer a high quality of service, those in the Tidewater region are a low-cost no-frills service. Fares are typically $6 to $12 per week. Routes are tailored to the locations of the riders and the buses are routed as close to the riders' residences as practicable. Because of numerous pick-up points along the route, much of the bus run is not in an express mode.

* In **Pittsburgh**, four bus companies provide unsubsidized express service from the suburbs into the central business district.

* In **Dallas**, a private carrier, Transportation Enterprises, Inc., operates service between Arlington and downtown Dallas. The City of Arlington operates and maintains a city-owned park-and-ride lot and passenger shelter at no charge to the company. (3)

# ESTIMATING THE MARKET FOR UNSUBSIDIZED COMMUTER TRANSPORTATION

## Market Potential

Only certain types of services lend themselves to profitable operation. The following market conditions favor unsubsidized operation:

- There is a sufficient demand for service to maintain full or nearly full buses; generally this means a load factor of 80% or higher.
- The demand has little short-term fluctuation, enabling the operator to anticipate capacity requirements in advance. In many cases users are willing to subscribe to the service or enter into a charter agreement, thus reducing the risk to the operator even further.
- Operations involve long-haul runs (an average of 15-20 miles in each direction) with few if any intermediate stops. (However, the Norfolk "work buses" [see Case Studies, below] have demonstrated the profitability of non-express service.)
- There exists a high concentration of trip destinations, such as a central business district or a large suburban employment center.
- Service is offered only in peak periods and is aimed at the affluent commuter who is willing to pay extra fare for premium service. (However, Norfolk and certain of the Southern California services [See Case Studies below] demonstratrate the economic feasibility of "no frill" service catering to the blue collar workers.)
- Because demand is pre-determined, and often backed by subscription revenue, it is possible to serve medium-to-low density residential areas that otherwise have insufficient population density to support regular bus service.

## Estimating the Market for Unsubsidized Commuter Services

For purposes of this analysis, it was assumed that only peak period "closed-door" express bus services have characteristics that would make them potentially self-supporting. Using data obtained from metropolitan transit authorities, a survey was made of public transit operations in seven major

metropolitan areas to identify publicly provided express bus services. Only those services strictly meeting the criteria of peak period express buses were selected. Thus, express services operating all day, and peak period services operating only partly in express mode, were not included in the analysis.

Like their private counterparts, publicly operated peak period express bus services typically pick up riders at one or two locations (usually park-and-ride lots) and then travel non-stop ("closed-door") to their downtown destination, as "freeway flyers," i.e. utilizing freeways for most of their journey. Service is provided only during a few hours of the day, with a limited number of runs on each route, and an average route length as high as 10-15 miles (longer in the West). Often, the commuter express routes offer higher quality service, such as more comfortable over-the-road coaches. However, unlike the private services which often are offered by subscription (thus guaranteeing reserved seats to the riders and a guaranteed level of revenue to the operator), the publicly operated express buses accept occasional riders, and do not guarantee reserved seating.

The survey has disclosed that peak period express bus service represents from less than one percent to nearly six percent of total service in the seven study areas (see Table 1 below). The wide variation in the amount of publicly provided peak period express service can be explained by the fact that in some of the study areas, such as New York, Northern New Jersey and Philadelphia, extensive private commuter bus services and/or commuter rail have reduced the need for public provision of express bus service.

In order to determine the express bus service subsidy requirements, cost allocation models were developed for each metropolitan area's express services, based on 1984 data obtained from individual transit authorities. The models use three variables, i.e. they allocate unit costs to vehicle hours (VH), vehicle miles (VM), and revenue vehicles used in the am/pm peak period (PV). Using these models, annual operating costs of individual express routes were calculated. Revenue was estimated using 1984 ridership data, and the resulting difference between allocated cost and revenue, represents the

subsidy requirement (deficit). The individual route results were then aggregated to produce totals for each metropolitan area, as shown in Table 2. (For detailed calculations see Appendix A).

The analysis shows that $27.2 million in public subsidies were spent to support peak period express commuter services in the seven metropolitan areas. As discussed earlier, bus services of this type are being operated profitably by private firms in several metropolitan areas. If the above services were to be turned over to private carriers, a savings of over $ 27 million in public funds could be achieved.

It should be noted that these are highly conservative estimates. First, the allocated costs have been calculated with simple three-variable models that do not take into account the higher marginal cost of peak period labor. Secondly, only peak period express bus services were assumed to be of interest to private operators, and any service that could not rigorously meet that test was eliminated from consideration.

For example, in Chicago, eight additional lines, requiring 184 peak hour buses, provide express service, but because these lines operate well into the midday period, they were excluded from analysis. Similarly, in New York City, 6 bus lines requiring 178 peak buses were excluded from consideration because they did not meet the criterion of "peak only" service. Had those lines been included, the subsidy savings would have been more than doubled, since the hours and miles of service on those five other routes are more than double those of the 15 routes retained in the analysis. In Houston 7 express bus lines utilizing 92 peak buses were excluded from analysis for the same reason, as were four bus routes (72 peak buses) in Washington D.C. It is estimated that, if all-day express routes were to be included in the analysis, a doubling in subsidy savings could be realized annually in the seven metropolitan areas. (see Appendix B).

TABLE 1

EXPRESS COMMUTER BUS SERVICES IN SEVEN METROPOLITAN AREAS

| Metropolitan Area | Total Service | | Express Service | | % |
|---|---|---|---|---|---|
| | Veh-miles | Veh-hrs | Veh-miles | Veh-hrs | |
| New York City | 105,055,900 | 13,314,900 | 2,170,684 | 134,112 | 1.0% |
| Houston | 27,055,000 | 1,813,700 | 2,634,480 | 124,146 | 4.7% |
| Washington D.C. | 51,521.700 | 4,073,900 | 4,805,640 | 239,148 | 5.8% |
| Chicago | 73,756,386 | 7,343,276 | 1,934,940 | 121,824 | 1.6% |
| Philadelphia | 37,832,878 | 3,739,585 | 259,452 | 7,255 | 0.2% |
| Los Angeles | 102,940,100 | 7,314,800 | 3,448,700 | 162,367 | 2.2% |
| Orange County | 18,466,018 | 1,180,382 | 255,173 | 10,513 | 0.9% |

TABLE 2

ANNUAL OPERATING COST OF EXPRESS COMMUTER BUS SERVICES
IN SEVEN METROPOLITAN AREAS

| Metropolitan Area | No. of Routes | Allocated Costs | Farebox Recovery | Subsidy |
|---|---|---|---|---|
| New York City | 15 | 12,209,315 | 71.5% | 3,478,319 |
| Houston | 11 | 9,130,985 | 32.5% | 5,284,302 |
| Washington D.C. | 24 | 17,859,602 | 40.9% | 10,541,232 |
| Chicago | 8 | 9,322,924 | 91.0% | 806,102 |
| Philadelphia | 4 | 1,399,154 | 22.1% | 1,088,554 |
| Los Angeles* | 17 | 9,621,820 | 58.0% | 4,745,407 |
| Orange County | 4 | 1,322,309 | 3.9% | 1,270,535 |
| | TOTAL: | | 60,866,109 | 27,214,451 |

**National Estimates**

Detailed data on express commuter bus operations have been obtained only for seven metropolitan areas. However, a more comprehensive picture of potential subsidy savings can be derived if one assumes that the seven areas are typical as a group of other metropolitan areas as regards unit costs and the proportion of express bus service to total service. The data for the seven metropolitan areas are shown in Table 3:

TABLE 3

| | Proportion of express service to total service | Allocated cost per vehicle-hour | Subsidy |
|---|---|---|---|
| New York City | 1.0% | $91.00 | $25.90 |
| Houston | 4.7% | 73.60 | 42.50 |
| Washington D.C. | 5.8% | 74.70 | 44.10 |
| Chicago | 1.6% | 76.40 | 6.60 |
| Philadelphia | 0.2% | 192.80 | 155.00 |
| Los Angeles | 2.2% | 59.30 | 29.20 |
| Orange County | 0.9% | 125.70 | 120.90 |
| AVERAGE | 2.3% | 99.00 | 60.60 |

Applying the average factors of 2.3% and $60.60 subsidy/vehicle hour to the next 17 largest metropolitan areas produces the following results:

| Metropolitan Area | Total Service(*) Annual veh-hrs | Express service Annual veh-hrs | Subsidy ($) |
|---|---|---|---|
| TOTAL: | 30,585,000 | 703,500 | $42,630,000 |

(*) 1984 Section 15 data

Conclusion

An annual savings of over $27 million could be realized by turning over publicly operated peak period express bus service to private carriers in 7 large metropolitan areas. These subsidy savings could be nearly doubled if all express bus service (peak period as well as midday) were to be turned over.

While no accurate national estimates can be derived from this sample, a rough indication of the potential impact can be obtained by extrapolating the results to the next 17 largest urban areas. Such a projection indicates that an annual savings of nearly $70 million could be achieved nationwide by turning express bus services over to the private sector.

## UNDERSTANDING THE ECONOMICS OF PRIVATE BUS OPERATIONS

Although there is little data available on the cost of private commuter operations, because of the reluctance of private operators to disclose proprietary information, some insight into the economics of private bus operations can be obtained by examining data from contract operations.

Several transit agencies are currently contracting with private bus companies for express commuter service. The largest such operations are those in Dallas and Houston. Other significant examples of peak period service contracting can be found in the San Francisco Bay Area (Golden Gate Transit), Yolo County, the City of Los Angeles and San Diego.

The Dallas Area Regional Transit Authority (DART) contracts with Trailways Inc. for the operation of a 103-bus 10-route commuter express system from suburban park-and-ride lots to the central business district. A second contract provides for the operation of a 204-bus 52-route suburb-to-suburb service.

In Houston, the Metropolitan Transit Authority contracts for service involving 75 buses on 6 routes.

The City of Los Angeles has recently contracted with a private operator to run a commuter service from Encino to downtown Los Angeles.

Contract commuter bus operations tend to have similar features as private unsubsidized services. They usually operate from suburban park-and-ride lots to central business districts, traveling non-stop between the two points. Service is typically provided only during peak hours, with a limited number of runs on each route, sometimes as few as two per peak period. Contractors are predominantly charter bus operators who are almost always required to furnish the vehicles used for the service.

The Houston MTA Contract Bus Program *

The Metropolitan Transit Authority of Harris County has since 1981 contracted with private bus companies to provide a substantial portion of its express bus service into downtown Houston. The service is of a park-and-ride nature from suburban areas, mostly in northern Houston, which are accessible to the I-45 High Occupany (HOV) lane.

Initially, the contract operation involved 120 buses on 12 routes with 430 bus runs daily. Five private operators were involved in providing service. The tranbsit agency has recently absorbed some of the contract service, and now only 75 buses are involved, operated by two private carriers. Routes vary in length from 15 to 25 miles, and essentially all service is provided during the peak periods. Table 4 provides a summary of operating statistics for the contract operation as of 1982, when it was at its height.

Three aspects of the Houston contract operation tend to inflate the operating cost. The first is that few of the buses acquired for contract purposes are put to alternative uses during the day. As a result, operators charge most or all of the capital costs solely to the contract operation. Moreover, the contracts are only for two years, so the capital costs must be written off quickly, which adds to the contract cost.

The second factor is that the MTA requires the use of over-the-road coaches or vehicles with a similar ride quality, and has a strong preference for new vehicles. These requirements result in the vehicles being relatively expensive, on the order of $75,000 to $150,000 new. The average vehicle age is about 7 years, and the average vehicle value is in excess of $75,000.

Third, cost per hour is high because the contractors operate only during the peak hour but charge rates approaching those for all day charter service. MTA saves little more than mileage charges over daily charter rates. Even though there are only about four hours of revenue service per bus per day, this time is spread over two peak periods, and there is not enough midday

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* Adapted from Roger F. Teal, "Developing a Cost Model for Privately Contracted Commuter Bus Service, August 1985

charter work for the drivers to schedule them for more than one piece of work per "dispatch." The contractors thus pay eight hours of driver labor per bus per day, the equivalent of two driver dispatches. (Drivers receive a minimum of four hours of pay per dispatch). Thus, as in public agency operations, there is a relatively inefficient use of driver labor.

TABLE 4

OPERATING STATISTICS FOR HOUSTON CONTRACT OPERATIONS

| Route | Buses | Total Daily Rev. Miles | Deadhead Miles | Cost/Rev Veh Hr. |
|---|---|---|---|---|
| 224 | 8 | 777 | 148 | 67.02 |
| 112 | 6 | 643 | 119 | 72.08 |
| 142 | 10 | 1078 | 199 | 83.50 |
| 263 | 7 | 438 | 106 | 87.50 |
| 201 | 13 | 1078 | 130 | 75.00 |
| 132 | 8 | 642 | 159 | 87.50 |
| 204 | 10 | 1268 | 213 | 88.00 |
| 202 | 13 | 2315 | 231 | 77.81 |
| 107 | 8 | 808 | 165 | 88.00 |
| 221 | 4 | 532 | 100 | 99.02 |
| 270 | 7 | 514 | 89 | 61.16 |
| 205 | 13 | 1296 | 344 | 96.79 |

Source: Houston Metro Contract Service Reports, May-December 1982

The Dallas DART Turnkey Contracts with Trailways Commuter Transit Inc.

The Dallas Area Transit Authority has entered into two turnkey contracts with Trailways Commuter Transit, Inc. (TCT) to provide (1) commuter express service between Dallas suburbs and the central business district, and (2) crosstown, suburb-to-suburb service. Under the contracts, Trailways furnishes the vehicles, drivers, supervises the operation, dispatches the buses, provides maintenance (through Ryder Truck Rental), cleaning, and handles fare collection and reporting requirements. Penalties are assessed when schedule adherence falls below a certain performance standard, and incentives are provided for on-time performance.

The commuter express contract calls for a total of 98 coaches operating on 11 routes, for a daily total of 6,218 revenue miles and 286 revenue hours of service (annual totals of 1,583,703 and 73,037 respectively). The total cost of the operating base contract is $5,510,000 for the first year, $4,969,000 for the second year, and $5,108,000 for the third year, for a total of $15.5 million. Due to increased demand for service, the contract was expanded to include two supplemental agreements totaling $1,213,000 the first year, $1,159,000 the second year, and $1,198,000 the third year. Thus, the total express commuter contract cost is about $21 million.

The suburb-to suburb contract calls for the operation of 204 buses on 52 routes, at a cost of $103.5 million over five years. The service was designed to be phased in over a period of six months, with the first phase beginning operation in September 1985, starting with 96 buses; and the second phase, which adds 108 more buses to the operation, will begin in March 1986.

Ridership on the suburban express routes has nearly tripled - from 3400 passengers per day when the service began in September 1984 to nearly 10,000 passengers per day in November 1985.

Unit cost of service averages $3.52 per vehicle revenue mile during the first year (which includes start-up costs) and $3.21 per vehicle revenue mile during the second year of the contract operation. Variable cost of service (i.e. cost of additional service above base level as stipulated in the contracts) is $1.10 per revenue mile and $22.90 per revenue hour. By contrast, the express commuter services operated by the Golden Gate Transportation District cost $3.70 per vehicle revenue mile (1983 Section 15 data). Since the public costs do not include bus capitalization, full cost accounting would probably show the Golden Gate operating cost to be in the neighborhood of $5.20 per vehicle revenue mile, or more than 60% higher than the Trailway costs.

The Trailways unit operating cost has been estimated to consist of the following component costs:

| | | |
|---|---|---|
| Driver wages and benefits (based on $7.50 hourly wage rate, fringe benefits of 13.05%, 241 annual days worked per driver and 24 miles/hour average speed; assumes peak-only service with full time drivers) | 31.2% | $1.00/revenue mile |
| Fuel Cost: | 5.5% | $0.178/revenue mile |
| Vehicle cost (peak-only service): | 48.3% | $1.55/revenue mile |
| G & A | 5% | $0.16/revenue mile |
| Profit | 10% | $0.32/revenue mile |

## Cost of Private Commuter Bus Operations

The cost of private commuter bus operations is a function of six major component costs: vehicle capital cost; driver salaries; maintenance costs; fuel and oil; insurance; and administrative and overhead costs. The following cost estimate is based on an analysis of private commuter bus costs carried out by Roger F. Teal of the University of California in a paper entitled "Developing a Cost Model for Privately Contracted Commuter Bus Service" (August 1985).

* Vehicle Capital Costs. These are likely to range from 90,000 to 160,000 for new vehicles, with the upper range representing over-the-road coaches designed for freeway operations. Daily vehicle costs are estimated at $121 to $152 per day, depending on the contract term available for capital recovery (2, 3 or 5-years). A residual value of 67% of the original cost was used for 2 year lease periods, 60% for 3 year lease periods, and 50% for 5 year lease periods.

* Driver costs. Hourly wages for bus drivers used in private operations in Houston and San Francisco vary from $6.00 to $8.50 per hour, with most operators paying $7 per hour. Driver cost for a typical 8 hour pay guarantee, including benefits, averages about $75 per day. It is possible but difficult to lower driver costs below this level. While drivers for private operators do not enjoy the same generous work rules and benefits as do transit drivers, they usually are guaranteed a minimum of four hours of work per dispatch. Since peak hour service almost always requires two dispatches, a full day's wage is usually paid. This cost can be offset to some extent by using the drivers for other work during the peak periods. In practice, however, it is difficult to generate charter business which requires the buses only during the time between peak period contract runs.

* Maintenance Costs. These are estimated at $0.21 per mile, based on a survey of its 40 members by UBOA (United Bus Owners of America). UBOA members own an average of 30 vehicles, with an average fleet age of eight years. Maintenance costs for older fleets would be higher.

* Insurance. Currently liability costs are approximately $2,000 to $3,000 per year per bus, assuming a relatively high level of self insurance. Coverage for vehicle damage is $3,000 to $4,000 per year per bus. A composite annual insurance cost is estimated at $4,000 per bus for high value vehicle and $2,000 for a low value vehicle, or from $16 to $8 per day per bus.

* Direct Opearting (fuel and oil) Costs. These are estimated at $0.20

per mile

* Administrative Costs. Using data from San Francisco and Houston operators and the survey data of UBOA members, this cost component is estimated at $9,700 per year per bus, or $38 per day per bus. This includes the cost of facilities rental, clerical assistance, project management, supplies and general overhead. In addition, miscellaneous expenses for supervision, operating taxes and licenses and contract maintenance labor add another $0.14 per mile.

The daily and mileage-related costs are summarized below:

| Daily fixed costs | $/ bus |
|---|---|
| Vehicle capital cost | $121-152 |
| Driver cost | $ 75 |
| Insurance | $ 8-16 |
| Administrative | $ 38 |
| Total daily cost per bus: | $242-281 |

| Mileage-related costs | cents/vehicle mile |
|---|---|
| Maintenance | 21 cents |
| Fuel and Oil | 20 cents |
| Miscellaneous | 14 cents |
| Total cost per vehicle mile: | 55 cents |

## IMPEDIMENTS TO PRIVATELY PROVIDED BUS SERVICE

While private unsubsidized transit services are potentially viable in many urban areas, major institutional obstacles stand in the way of private service turn-overs. Foremost among them is the resistance of public transit authorities. Private commuter bus services in most metropolitan areas are subject to local public utility commissions and must obtain a certificate of public convenience and necessity in order to initiate new service. Transit agencies often object to private entrants, °even when new services do not directly threaten their own routes. Transit officials do not view private commuter bus services as a less costly substitute for peak period transit; many still believe that by taking over peak period services, private operators are "skimming" the most profitable routes. In reality, there is no cream to skim. Indeed, research indicates that peak period operations are among the most costly services to operate. A General Accounting Office study has found that it cost 250 percent more to provide a passenger with express service tha local service. The subsidy required for the express rider was even higher: nearly 4 times as high as for the local rider (General Accounting Office, Report to Congress, February 26, 1981). This is so, because peak period service involves extra equipment and drivers that are not productively utilized during the rest of the day.

Many regulatory commissions tend to favor the status quo, and opposition from the transit agency may be successful even though the actual competitive impacts would be minor. This is not to say that there are no exceptions. For example, in New York and California public utility commissions have been generally sympathetic toward private entry and have granted approvals to private carriers in spite of vociferous opposition from regional transit agencies.

The difficulty of obtaining the necessary regulatory approvals, however,

becomes almost insurmountable when the regulatory body is the regional transit agency itself. In such cases, a private bus operator wishing to offer competing service has little chance to gain approval.

**Recommendations for Policy**

To overcome this institutional resistance, UMTA should:

(1) Vigorously enforce compliance with the provisions of Section 8(e) and 9(f) of the Urban Mass Transportation Act as amended, and the implementing policy statement on Private Enterprise Participation in the Urban Mass Transportation Program (49FR41310, October 22, 1984). These requirements stipulate that private providers should be given an early opportunity to participate in the development of projects that involve new or restructured mass transit services. By becoming active participants in the development of local transit programs, private operators will have a better opportunity to stake out and lay claim to services which they believe can be operated at a lower cost by the private sector.

(2) Use its discretionary grant-making authority to reward those jurisdictions that encourage private service turn-overs. For example, UMTA could announce that jurisdictions which are willing to turn peak period commuter services over to the private sector (or which have attained a certain ratio of subsidized to unsubsidized services) will have a priority claim on any available discretionary Section 3 resources;

(3) Establish a speedy process for the review and adjudication of private operator complaints concerning impediments to competition and transit agency non-compliance with UMTA's Policy on Private Enterprise Paerticipation in the Urban Mass Transportation Program.

(4) Provide incentives to private carriers to expand unsubsidized services. Such incentives might involve provison of start-up funds to launch

unsubsidized services, or planning grants to assess the fiscal feasibility of such services.

# CASE STUDIES

## THE CHICAGO CLUB BUSES

The potential of private bus operation is illustrated forcefully in the Chicago metropolitan region. A multitude of private charter bus operators have initiated transit service in the last five years between the suburbs and the city's Loop district. These services, known as "club buses" or "subscription buses" now handle over 20,000 daily trips, using 236 buses on 116 routes. (1)

The private bus services sprung up in 1981, following two major fare hikes of nearly 100 percent on the Regional Transit Authority's commuter rail system. Alternative services began to be organized during spring and summer that year, primarily from low and moderate income suburbs to the south and west of the city. Typically, a group of suburban residents would charter a bus to take them to their jobs in downtown Chicago. In some cases, a bus company would take the initiative and enter into weekly or monthly subscription agreements with individual commuters. The cost of the charter would be divided equally among the riders, resulting in a typical fare of $1.15 per trip. By contrast, the cost of a commuter rail trip, after the fare hikes was $1.80-2.50, depending on the fare zone.

By the end of the Summer of 1981 a fleet of of over 100 buses was providing service to dozens of suburbs south and west of the city. Since then, private subscription bus service has gained ridership and carved out for itself a respectable niche in the suburbs-to-the-Loop commuter market. Today, 144 buses on 34 routes carry a total of 7550 daily trips. Another 92 buses on 82 routes carry 13,150 daily trips under contract to private employers. Thus, a total of approximately 10,000 passengers commute to the city on private unsubsidized buses.

A 1982 study of the private commuter buses in the Chicago region gives the following reasons for the success of these services:

* The operations are small. The company providing the most service employs 55 buses for its subscription routes. This small scale allows a great deal of attention to detail, and encourages economic operation

* The routes are tailored to the user groups. Unlike public transit which designs routes that will attract maximum ridership, subscription bus service has its client group concentrated in a relatively small area. The pick-up points can be located at locations convenient to the riders.

* The service does not require high residential density to be cost-effective. Many suburban areas are unsuitable to conventional public transit because of the low density of development. This is often aggravated by the scattered destinations of suburban work trips. NIPC has recently estimated that a density of 4,000 residents and jobs combined per square mile is necessary to support all-day fixed-route bus service that runs once an hour. Subscription service, however, requires only that 40-45 persons who work in the central business district agre on a few convenient pick-up points.

* The operations are highly flexible. Community groups and bus companies have almost unlimited flexibility to make service adjustments mutully agreeable to them. The ability to make frequent minor adjustments to pick-up and drop-off points and times allow the route to remain tailored to its user group. This is critical to retaining high occupancy and preserving low cost.

(Sources: Nina C. Gitz, "Another Way to Go: Private Commuter Buses in the Chicago Area, The Metropolitan Housing and Planning Council, August 1982; see also, Robt. Paaswell et al., "Subscription Commuter Bus Service: An Overview," Urban Transportation Center, University of Illinois at Chicago, May 1984; Joseph P. Schwieterman, "Competition in Mass Transit: A Case Study in the Chicago Subscription Bus Phenomenon," The Transportation Center, Northwestern University, November 1983)

## THE SOUTHERN CALIFORNIA PRIVATE COMMUTER BUS SERVICES

In Southern California nearly a dozen private bus companies operate commuter services oriented on major employment concentrations in Los Angeles and Orange Counties. Two of the largest private bus operators are Commuter Bus Lines (CBL) and Antellope Valley Bus Lines, Inc.

Commuter Bus Lines was established in 1977. The company now operates 31 club buses and 3 subscription buses in the Los Angeles area (it also is active in the Sacramento area, where it operates 4 club buses). About 45 percent of the company's revenues come from its private commuter services, the remainder from contract and charter operations.

Antelope Valley Bus entered the private subscription bus field at the request of employees who wanted commuter bus service. Most of its routes serve Lockheed Aircraft facilities and Edward Air Force Base in the Palmdale area, and provide service from the Antellope Valley, a lengthy commute to Los Angeles. Currently, about 30 percent of the company's revenues are derived from private commuter operations, the remainder from contract and charter operations.

Both CBL and Antellope Valley Bus use essentially the same method to initiate and operate private subscription services. They market their services at large employment sites, typically aerospace facilities containing several thousand workers. The companies are interested only in long haul service, with routes at least 25 miles in length from the first pick-up point to the work site. Most routes are 30-50 miles in length. Buses typically have 2 or 3 pick-up points (which may be park-and-ride lots), and travel in express mode for most of the distance. Some routes serve more than one company at the destination end, but in most cases the bus serves a single work site. A new bus is started only when a sufficient number of workers (usually 20) have

agreed to use the service and one member of the group has agreed to serve as the driver. Once the service has started, the driver and passengers are encouraged to recruit other riders, as they are informed that a certain load factor must be maintained to continue the service. If ridership stablizes at 25-30 daily users, the buspool is typically viable.

Both BBL and Antellope Valley utilize intercity coaches. Although the vehicles are old, a stringent preventive maintenance program keeps them in top condition. Operating costs are low, averaging about $1.25 per vehicle-mile (1981 costs). The efficient use of drivers, who are paid only for time spent at the wheel, is an important reason for the low cost. Payments to drivers represent only 11 percent of the total cost of the buspool service. In addition, both companies pay their buspool drivers a percentage of of the fare revenues, thereby tying their income directly to the productivity of their bus.

In 1982-83 CBL grossed approximately $1.1 million from its buspool services, making a small profit. The fares remain quite modest, ranging from $16 per week for a 25-mile trip, to $24 per week for a 50 mile trip, or approximately 5-6 cents/mile. The companies can apparently make a profit at load factors of 60-70 percent, which they are managing to maintain so far.

Source: Roger F. Teal, Genevieve Giuliano et al., "Private Sector Options for Commuter Transportation," U.S. Department of Transportation, March 1984 , p. A-45; Bus Association of Southern California, interviews and private communications.

## THE TIDEWATER WORK BUSES

The Tidewater region has an unusual amount of private commuter bus service for an urban area of its size. The private "employer haulers", as they are known locally, primarily serve three large employment sites -- the Norfolk Naval Base, with 40,000 workers; the Norfolk Vaval Shipyard, located in Prtsmouth, with 12,000 employees; and Newport Shipbuilding and Dry Dock, cross Hampton Roads in Newport News, with 25,000 employees. The Commuter bus serices began shortly after World War II, and have continued uninterrupted to the present time. Although the precise number of buses is not known, estimates range from 65 to 70 work buses, serving the Naval Base and the Norfolk Naval Shipyard. Anotner 25 to 30 buses serve the Newport News Shipbuilding facility.

In contrast to most private commuter bus services which offer a high quality of service, those in the Tidewater region are a low cost no-frills service. Most operators use school buses, although on some of the longer routes better equipment is utilized. The bus driver is one of the workers, and thus the service constitutes what is typically called a buspool. Fares are low, typically $6-12 per week. The clientele is almost exclusively blue collar workers. Routes are tailored to the location of the riders, and while central gathering points are used as much as practicable, the bus is also routedas close to the riders' residence as possible. Because of numerous pick-up.points along the route, much of the bus run is noty in an express mode. Consequently, travel speeds are relatively low compared to the automobile. For example, one route from Northeast Norfolk to the Naval Shipyard requires 45 minutes to travel a distance of 17 miles.

The commuter bus industry in the region is composed of two different types of bus operators. One type of company is a full service bus operation which does charter work and contract service in addition to its commuter bus service. The other type of operator is an individual entrepreneur which solely

provides commuter bus service. Work transportation services are exempt from economic regulation in Virginia, so any company or individual can enter the commuter bus industry. The majority of commuter bus service in the Tidewater region is provided by individuals. Some individuals operate only 2-3 buses, while the largest, Eddie Upton, now operates 32 buses.

The full service bus companies operate work bus service as an adjunct to their other services. For example, Gallup Bus Lines, the largest of the full service bus companies in the area, owns 25 buses, only 6 of which are used for commuter service.

Organization of the employee hauler services is not formalized, but nonetheless follows definite patterns. The entrepreneurs typically got into the bus business by driving someone else's bus, o by taking over a bus route which an existing operator was anxious to sell. Buses go with routes, and while there has been some tottaly new entry into the industry, most new operators buy another amployee hauler's routes and equipment. When new routes are started, it is usually because an existing bus is overloaded or because a group of workers approaches an operator and requests a new route. The operator usually insists that the interested workers guarantee a minimum number of riders before service is initiated.

All the operators know each other, and a code of conduct has developed which strongly discourages competition. Competing on the basis of either price or service is not viewed favorably, and moving into another operator's territory will engender hard feelings. Even when one operator is providing substandard service which causes riders to approach another operator and request service, the latter is typically reluctant to comply for fear of breaking the unwritten rules. Consequently, there tend to be route monopolies and informal collective price setting. A few years ago a new operator tried to compete aggressively, using new equipment leased from the Tidewater Transit District and operating along routes served by other private haulers. The other operators bitterly complained and made threats, but ultimately his operation ceased because the fares were too high and the breakeven load factor too

great.

Although the commuter bus industry in the Tidewater region has been viable for many years, some of the employee haulers now feel vulnerable to competition from vanpools, particularly TRT-sponsored vanpools. The full service bus companies do not perceive vanpool competition as a problem since they are not solely reliant in revenues from commuter services. But the independent entrepreneurs are concerned and bitterly resent TRT's vanpool program.

Source: Roger F. Teal, "Private Sector Options for Commuter Transportation," March 1984.

## THE HUGHES AIRCRAFT COMMUTER BUS PROGRAM

In November 1982, the Hughes Aircraft Company initiated a novel commuter bus service for the employees of its El Segundo facility. Although a number of companies around the country have established commuter bus service for their employees, it has invariably been for long distance commuters and typically has taken the form of subscription buses or buspools. The hughes bus service differs in two unique ways. First, it was designed to accommodate relatively short trips, those of 15 miles or less. Second, it is a regular route operation in which each route has many stops at which Hughes employees can board the bus. Riders do not have to subscribe to the service.

The decision by Hugnes to develop and subsidize a regular route commuter bus service was the product of the management's concern about traffic problems in the South Bay area of Los Angeles, and the prospect of even worse problems in the future. It is projected that over 140,000 persons will eventually work in the El Segundo area, which will severely overtax the nearby San Diego freeway and the arterial street system.

Instead of buing buses and operating the system directly, Hughes initially contracted with a Aztec Bus Lines, a private charter and contract carrier based in San Diego. Aztec operated the system for 17 months, following which another private carrier, California Charter Buses, took over the operation of the system. Presently, the system has 9 routes and 190 bus stops, and carries approximately 650 daily passengers.

The system costs approximately $600,000 per year to operate. This amount, which is funded by Hughes, is offset by approximately $130,000 in annual fare revenues (The system charges 90 cents per trip or $30 per month) In addition, Hughes gets a $120,000 annual state tax credit (20% of the contract cost). Thus, the company has a net operating cost of approximately $350,000. In addition, the Hughes operates a 160-van program, wherein the company purchases

the vans and recoups the cost out of subscription fares ($52/month). The van system is seen as complementing the bus system, with the vans serving employees outside the 15-mile radius of the bus system.

The cost of the Hughes bus service compares favorably with the cost of SCRTD service:

| | Cost Per Revenue Service Hour |
|---|---|
| SCRTD System average service (excludes capital costs) | $59.00 |
| SCRTD Peak Period service (excludes capital costs) | 120.00 |
| Hughes Commuter Bus Service | |
| Contract Cost | 60.51 |
| Contract cost, incl. Hughes admin. cost | 85.47 |
| Contract cost, incl. Hughes admin. cost and capital cost | 92.69 |
| Total unsubsidized cost, including contract cost, capital cost and Hughes administrative expenses | 117.65 |

Source: Correspondence with Bruce Roberts, Hughes Aircraft Company; Roger F. Teal, "Private Sector Options for Commuter Transportation," March 1984

# SECTION II

# PRIVATELY-SPONSORED SERVICES

## Private Sector Sponsorship of Local Transportation: A Growing Trend

In recent years the private sector has been obliged to assume an increasing responsibility for the provision of transportation services in the suburbs. This is due to the growing inability of public transit to serve suburban mobility needs. So long as the bulk of the jobs were located in the central cities, public transit could still function relatively efficiently by collecting commuters at staging areas, such as park-and-ride lots, and transporting them in high capacity buses and trains to the central business districts.

But in the past several years more and more jobs have migrated to the suburbs. This has created an even more dispersed pattern of travel. A growing number of commute trips not only begin but also end in low density suburbs. Travel origins and destinations are increasingly scattered and only a small fraction of total trips have a downtown destination. Conventional public transit cannot serve this pattern of travel in a cost-effective manner, and has left large areas of the suburbs unserved.

The private sector has attempted to serve suburban travel needs in several ways. First, many large corporations support employee ridesharing programs, ranging from appointment of in-house "ridesharing coordinators" to provision of low interest loans for vans and subsidized employee buses. Second, office parks and residential developments operate shuttle services to train stations and suburban centers for their residents and tenants. In some suburban

centers, merchants support local circulation services. Finally, there has emerged a growing number of private transportation management associations, providing customized transportation services to their members. Selected examples of privately-sponsored services follow:

* In **Chicago**, private bus companies utilizing 92 buses, carry 6,500 passengers daily under contract to 38 private employers.

* Hughes Aircraft Corp. in **El Segundo, CA**, has set up its own transit system to help its 25,000 employees get to work. The system has 9 regular routes and an annual operating budget of $650,000. Hughes contracts with a private company, California Charter Buses, for the service at an average cost of $85.45/bus-hour, which is about 30% less than the $120/peak hour cost of public transit service provided by the SCRTD (See Case Studies)

* In **Contra Costa County, CA**, Pacific Bell funds express bus service between BART's Lafayette station and its main facility at Bishop Ranch in San Ramon. Since service was initiated in February 1985, ridership on the shuttle has climbed more than 400%, from 550 passengers to 3,000 riders in July 1985. The bus service is run under contract by the local transit agency, the Central Costa Transit Authority. There are four morning and afternoon runs, but service will be expanded when Pacific Bell moves a total of 7,000 employees to its facility at Bishop Ranch.

* In **Alameda County, CA**, Hacienda Business Park, a $1 billion development located near the intersection of Interstates 580 and 680, operates a shuttle system that offers non-stop service between the business park and a BART station at rush hour, a free lunchtime shuttle to nearby shopping centers, and continuous internal circulation service for employees between buildings.

* In **Dallas**, the Atlantic Richfield Company operates a subscription bus service for its employees. Twelve routes link nine suburban park-and-ride lots with ARCO headquarters in downtown Dallas. The routes have one or two stops at their origin in the morning and operate express inbound. Employees make a single montly payment for a guaranteed seat. Surveys are made twice a year to determine interest in new routes. If 25 people make a commitment by signing payroll deduction forms, a new bus is started. Conversely, if daily ridership on a bus consistently falls below 20, that run is considered for elimination.

* In **Ventura County, CA**, an organization of private employers, in cooperation with the County, contracts with a private bus operator to provide subscription bus service to employees.

* In **Kansas City**, a group of downtown businessmen has launched a shuttle

bus service linking the downtown area with Crown Center, a mixed-use complex on the edge of the central city, comprising a shopping mall, hotels and office towers. The shuttle is funded through the Kansas City Trolley Corporation, a private non-profit organization formed by the businesses solely for the purpose of operating the shuttle service. The shuttle is run by a private operator under contract to the Trolley Corporation.

* In **Sacramento, CA, Indianapolis, IN,** and **Lexington, KY,** local merchants and businesses have raised money to operate downtown circulators and shuttles to low-cost fringe parking areas, utilizing rubber-tired "vintage trolleys". The service is financed through private non-profit corporations which provide a local match for a federal operating grant.

* In **Johnstown, PA,** the Westwood Plaza Merchants Asoociation, a group of suburban businesses situated in a shopping mall, finance transit service to their mall through a purchase of service agreement with the local transit system.

## Transportation Management Associations

Transportation Management Associations have been formed in many areas throughout the country, especially in rapidly growing suburban centers and newly urbanized areas which are poorly served by public transit systems.

Transportation Management Associations are voluntary organizations formed by corporate employers, developers, merchants, and private institutions to support transportation activities that respond specifically to the needs of their members. The intent of the associations is to provide an organizational framework for private sector involvement and to serve as a unified voice of the business community in local transportation decision-making.

More than twenty TMAs are already in existence. They differ from one another in terms of their goals, membership, structure, program activities and the type of objectives they pursue. For instance, some are organized around a single activity center (a suburban corporate park or an in-town institutional complex, such as a medical center), while others are areawide in scope. Some TMAs are single-purpose organizations formed specifically to deal with transportation concerns; others are parts of broader, multi-purpose

organizations which provide a spectrum of services to their members.

While most TMAs are membership organizations, some are composed of key corporate decisionmakers, and some are broadly based, involving the business, professional and institutional communities. They may be structured as nonprofit 501(c)(3) organizations, donations to which qualify as tax-deductible contributions but whose source of business income and lobbying activities are restricted. Or they may be 501(c)(6) nonprofit business leagues whose legislative activities are less restricted. A few are organized as for-profit corporations. Regardless of initial structure, many TMAs later seek to establish for-profit subsidiaries to facilitate particular types of projects or activities or to obtain funding support not available to the parent group.

Transportation Management Associations can be divided into three categories of program emphasis: policy leadership and advocacy, demand management, and service provision. The first type is dominated by top level business executives interested in improving transportation and traffic conditions as part of a general economic strategy. Their major activities are overall strategy development, advocacy, lobbying for local and state support of capital improvements, and serving as forums for the discussion of important transportation issues. The second type of TMAs is more operationally oriented, and engages in various demand management activities, such as coordinating and marketing cooperatively-sponsored programs of carpooling and vanpooling, staggered work hours, shared parking, and transit promotion. Finally, the third type of TMAs engage in actual operation (either directly or through contract) of common transportation services deemed of benefit to their members, such as internal circulators, park-and-shuttle systems, shuttle buses to rail stations, on-site car rental services and subscription commuter buses.

## NOTES

1. Most private operators in the New York metropolitan area receive modest state-level operating assistance (STOA). For example, Rockland Transit Corporation, which provides commuter service from Rockland County, N.Y., received $$2.1 million in STOA during 1983, which amounted to 14.5% of its 1983 operating budget of $14.4 million. Hudson Transit Corporation, which provides commuter service from Orange and Rockland counties in New York State, received $3.0 million in STOA, or 15% of 1983 operating expenses of $19.8 million. New York Bus Company, providing service from the Bronx, received $0.4 million in STOA, or 2.5% of 1983 expenses of $15.6 million. Liberty Lines Commuter Services, which operates services from the Bronx and Westchester County received $0.4 million in STOA, or 2.7% of 1983 expenses of $14.5 million.

2. A recent study by the Southern California Association of Governments (SCAG) concluded, after evaluating 22 public bus lines, that 15 of those routes could be turned over directly to the private sector without subsidies, at a savings of $4.5 million. The remaining 7 routes could be operated by private providers under contract at a savings of over $1.2 million, with required subsidies decreasing from $1.875 million to $650,000. The overall result would be a $4.85 million reduction in public subsidy.

3. Sources: **New York**: State of New York Department of Transportation, 1983 Transit Indicators of STOA Participants, 1984; Bus Association of New York State, private communication, April 1985; **Chicago**: Metropolitan Transportation Association, private communication, May 1985; **Los Angeles**: Bus Association of Southern California, private communication, April 1985; **Boston**: American Bus Association survey, June 1985; **Hartford**: Roger Teal, "Private Sector Options for Commuter Transportation;" **Pittsburg**: American Bus Association survey, June 1985. **Dallas**: North Central Texas Council of Governments, "Private Sector Provision of Commuter Bus Service," June 1984.

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NEW YORK CITY TRANSIT AUTHORITY

NEW YORK, NEW YORK

Operates 15 peak hour only express routes:

| Route | From | To |
|---|---|---|
| X 8 | Richmond Ave (S.I.) | Adams-Fulton Sts (Brooklyn) |
| X 12 | South Ave-Goethels Rd (S.I.) | Worth St/W. 57th St (Man) |
| X 14 | Castleton Ave-Jewett Ave (S.I.) | Worth St/W. 57th St (Man) |
| X 15 | Center St-St Patricks Pl (S.I.) | Church St/Pearl St (Man) |
| X 16 | Castleton Ave-Jewett Ave (S.I.) | Worth St/Broadway (Man) |
| X 18(S.I.) | Targee St-Dekalb St (S.I.) | Church St/Pearl St (Man) |
| X 18(Q) | Hillside Ave-268 St (Queens) | 59th St/23rd St (Manhattan) |
| X 20(S.I.) | Sand La-Fr Capodanno Blvd (S.I.) | Bridge St-State St (Man) |
| X 20(Q) | 149 Ave-253 St (Queens) | 23rd St-I Ave (Manhattan) |
| X 23 | 91st St-York Ave (Manhattan) | Water St-Broad St (Man) |
| X 24 | Linden Blvd-235 St (Queens) | 23rd SDt-I Ave (Manhattan) |
| X 25 | 42nd St-Vanderbilt Ave (Man) | Battery Pl-Greenwich St (Man) |
| X 29 | Surf Ave- W. 37 St (Brooklyn) | Madison Ave-E. 57 St (Man) |
| X 32 | 81 St-Northern Blvd (Queens) | 5 Ave-25 St (Manhattan) |
| X 61 | 262 St-Broadway (Bronx) | Peck Slip-Water St (Man) |

NYCTA also operates 6 other express route combinations which extend into the midday period (as well as limited evening and Saturday service on some routes).

NEW YORK CITY TRANSIT AUTHORITY

EXPRESS BUS ANNUAL OPERATING STATISTICS

| Route | Hours | Miles | Peak Vehicles |
|---|---|---|---|
| X 8 | 1,016 | 15,748 | 1 |
| X 12 | 18,288 | 348,742 | 12 |
| X 14 | 14,224 | 267,462 | 10 |
| X 15 | 13,462 | 273,812 | 9 |
| X 16 | 4,826 | 97,282 | 4 |
| X 18 (S.I.) | 12,700 | 183,134 | 9 |
| X 18 (Q) | 5,080 | 102,362 | 3 |
| X 20 (S.I.) | 6,858 | 104,648 | 5 |
| X 20 (Q) | 7,620 | 148,590 | 4 |
| X 23 | 24,384 | 261,874 | 30 |
| X 24 | 3,810 | 58,420 | 3 |
| X 25 | (a) | (a) | (a) |
| X 29 | 14,224 | 177,038 | 14 |
| X 32 | 3,556 | 51,562 | 3 |
| X 61 | 4,064 | 80,010 | 4 |
| Total | 134,112 | 2,170,684 | 111 |

(a) run as trips off the X 29

COST ALLOCATION MODEL

$$C = \$34.19VH + \$2.17VM + \$26,249PV$$

Developed from 1984 Section 15 data, Motor Bus Statistics and Costs

NEW YORK CITY TRANSIT AUTHORITY

EXPRESS BUS FINANCIAL STATISTICS

| Route | Allocated Costs | Estimated Annual Passengers | Estimated Annual Revenue | Subsidy |
|---|---|---|---|---|
| X 8 | $ 95,159 | 16,510 | $ 49,530 | $ 45,629 |
| X 12 | 1,697,025 | 362,204 | 1,086,612 | 610,413 |
| X 14 | 1,329,202 | 260,096 | 780,288 | 548,914 |
| X 15 | 1,290,679 | 309,372 | 928,116 | 362,563 |
| X 16 | 481,099 | 105,918 | 317,754 | 163,345 |
| X 18 (S.I.) | 1,067,855 | 259,080 | 777,240 | 290,615 |
| X 18 (Q) | 474,558 | 113,538 | 340,614 | 133,944 |
| X 20 (S.I.) | 592,806 | 117,602 | 352,806 | 240,000 |
| X 20 (Q) | 687,964 | 145,542 | 436,626 | 251,338 |
| X 23 | 2,189,426 | 638,556 | 1,915,668 | 273,758 |
| X 24 | 335,782 | 69,596 | 208,788 | 126,994 |
| X 25 | (a) | (a) | (a) | (a) |
| X 29 | 1,237,977 | 358,648 | 1,075,944 | 162,033 |
| X 32 | 312,217 | 90,170 | 270,510 | 41,707 |
| X 61 | 417,566 | 63,500 | 190,500 | 227,066 |
| Total | $12,209,315 | 2,910,332 | $8,730,996 | $3,478,319 |

(a) included in X 29 statistics.

METROPOLITAN TRANSIT AUTHORITY

HOUSTON, TEXAS

Metro operates 11 peak hour only express bus routes:

| | |
|---|---|
| 19 | Wilcrest Express |
| 41 | Garden Villas Express |
| 59 | Southwest Freeway P&R |
| 201 | North Shepherd Park & Ride |
| 206 | Eastex Park & Ride |
| 221 | Katy-Mason Park & Ride |
| 228 | Addicks Park & Ride |
| 245 | Edgebrook Park & Ride |
| 261 | West Look Park & Ride |
| 263 | Alief Park & Ride |
| 284 | Spring-West Lake Park & Ride |

Metro's other express and limited routes operating all day as well as those operated by contract carriers are excluded from the analysis.

HOUSTON METRO

EXPRESS BUS ROUTES

ANNUAL OPERATING STATISTICS

| Route | Hours | Miles | Peak Vehicles |
|---|---|---|---|
| 19 | 12,492 | 245,120 | 6 |
| 41 | 9,525 | 166,263 | 4 |
| 59 | 3,594 | 79,898 | 3 |
| 201 | 16,967 | 256,294 | 14 |
| 206 | 13,335 | 207,569 | 7 |
| 221 | 11,240 | 327,436 | 8 |
| 228 | 12,466 | 319,969 | 8 |
| 245 | 15,875 | 323,606 | 11 |
| 261 | 10,389 | 268,788 | 7 |
| 263 | 12,421 | 272,410 | 9 |
| 284 | 5,842 | 167,127 | 4 |
| | 124,146 | 2,634,480 | 81 |

COST ALLOCATION MODEL

C = $17.50VH + $1.30VM + $43,625PV

Developed from 1984 Section 15 data

HOUSTON METRO

EXPRESS BUS ROUTES

ANNUAL FINANCIAL DATA

| Route | Allocated Costs | Estimated Passengers | Estimated Revenue | Subsidy |
|---|---|---|---|---|
| 19 | $799,011 | N.A. | N.A. | --- |
| 41 | 557,329 | 195,326 | $132,822 | $424,507 |
| 59 | 297,639 | 96,520 | 120,650 | 176,989 |
| 201 | 1,240,857 | 265,684 | 332,105 | 908,752 |
| 206 | 808,577 | 154,432 | 239,370 | 569,207 |
| 221 | 971,359 | 121,158 | 272,606 | 698,753 |
| 228 | 983,120 | 174,752 | 323,291 | 659,829 |
| 245 | 1,178,375 | 394,462 | 493,078 | 685,297 |
| 261 | 836,600 | 294,640 | 279,908 | 556,692 |
| 263 | 964,118 | 232,156 | 359,842 | 604,276 |
| 284 | 494,000 | N.A. | N.A. | --- |
| | $9,130,985 | | | |
| w/o routes 19 + 284 | $7,837,974 | 1,929,130 | $2,553,672 | $5,284,302 |

Note: Ridership information not available for routes 19 and 284.

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
WASHINGTON, D.C.

EXPRESS BUS ROUTES

WMATA operates the following 24 peak hour only, closed-door express bus routes:

| Route Number | Title |
|---|---|
| 23 X | Great Falls Line (bet. Great Falls and Ballston Metro Stn. |
| 29 Z | Greenbriar Line (to Ballston and Pentagon Metro Stns.) |
| 5 Y | Herndon Express Line (to Farragut Metro) |
| 2 W,V,X | Washington Boulevard Line / Tysons Corner-Oakton Express Line (to Ballston and Pentagon Metro Stns.) |
| 5 Z | Tysons Corner Express Line (to Farragut West Metro Stn.) |
| 5 A,B,C,D, | Reston North & South Service |
| 5H5,5G5,5A5 | Reston-Crystal City Service |
| 5 E,F,G,H | Reston North & South Service |
| P 5,9 | South Capitol St. Parking Lot Line |
| A 9 | South Capitol Street Line |
| V 1,9 | Douglass Bridge Line/11th Street Bridge Line |
| P 17 | Oxon Hill-Fort Washington Line |
| T 17,19 | John Hanson Hwy. Express Line (to New Carrollton Metro Stn.) |
| P 13 | Eastover-Pentagon Express Line |
| C 11 | Clinton Express Line |
| R 11,15 | Greenbelt Express Line (to New Carrollton Metro Stn.) |
| 27 Z | Saratoga Line (to Pengaton Metro Stn.) |
| 8 X,W,Z | Foxchase-Seminary Valley Line (to Pentagon Metro Stn.) |

WMATA Express Bus Routes, Continued

| | |
|---|---|
| 27 B,G,H | Franconia-Pentagon Line/Hayfield-Pentagon Line/Hayfield-Huntington Line |
| 21 A,B,F | Landmark Express Line (to Pentagon Metro Stn.) |
| 29 B-H,X | Annandale Line (to Pentagon Metro Stn.) |
| N 7,9,11<br>F 7 | Montgomery Suburban Express Line |
| C 7 | Twinbrook-Silver Spring line (bet. Silver Spring and Twinbrook Metro Stns.) |
| X 9 | East Capitol Street Line |

In addition, WMATA operates another four routes which continue operating throughout the midday period.

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

EXPRESS ROUTES

OPERATING STATISTICS

| Route | Annual Hours | Annual Miles | Peak Vehicles |
|---|---|---|---|
| 23 X | 1,764 | 38,808 | 2 |
| 29 Z | 5,544 | 162,792 | 6 |
| 5 Y | 3,780 | 98,532 | 4 |
| 2 W,V,X | 10,080 | 241,668 | 5 |
| 5 Z | 6,300 | 126,504 | 5 |
| 5 A,B,C,D | 13,860 | 340,704 | 12 |
| 5H5,5G5,5A5 | 1,764 | 54,936 | 3 |
| 5 E,F,G,H | 23,436 | 585,648 | 22 |
| P 5,9 | 2,268 | 28,224 | 2 |
| A 9 | 16,884 | 265,356 | 13 |
| V 1,9 | 31,248 | 413,280 | 25 |
| P 17 | 5,292 | 78,372 | 4 |
| T 17,19 | 8,316 | 191,016 | 6 |
| P 13 | 2,520 | 40,824 | 2 |
| C 11 | 5,292 | 81,648 | 4 |
| R 11,15 | 3,780 | 84,924 | 3 |
| 27 Z | 3,528 | 93,744 | 5 |
| 8 X,W,Z | 11,340 | 210,168 | 9 |
| 27 B,G,H | 21,420 | 475,776 | 15 |
| 21 A,B,F | 12,348 | 259,308 | 10 |
| 29 B,H,Z | 23,688 | 524,664 | 16 |
| N 7,9,11,F7 | 17,136 | 291,816 | 15 |
| C 7 | 2,520 | 43,596 | 2 |
| X 9 | 5,040 | 73,332 | 7 |
| Total | 239,148 | 4,805,640 | 197 |

COST ALLOCATION MODEL

C = $29.35VH + $1.45VM + $19,657PV

Developed from Motor Bus Costs presented in 1984 Section 15 report

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

EXPRESS BUS ROUTES

ANNUAL FINANCIAL STATISTICS

| Route | Allocated Costs | Estimated Passengers | Estimated Revenue | Subsidy |
|---|---|---|---|---|
| 23 X | $147,359 | 26,712 | $26,712 | $120,647 |
| 29 Z | 516,706 | 138,096 | 214,029 | 302,657 |
| 5 Y | 332,442 | 37,800 | 86,940 | 245,502 |
| 2 W,V,X | 744,552 | 259,560 | 324,450 | 420,102 |
| 5 Z | 466,621 | 122,724 | 251,584 | 215,037 |
| 5 A,B,C,D | 1,136,696 | 170,352 | 434,398 | 702,298 |
| 5H5,5G5,5A5 | 190,401 | 64,260 | 99,603 | 90,798 |
| 5 E,F,G,H | 1,969,491 | 288,540 | 735,777 | 1,233,714 |
| P 5,9 | 146,805 | 75,600 | 75,600 | 71,205 |
| A 9 | 1,135,852 | 759,780 | 569,835 | 566,017 |
| V 1,9 | 2,007,810 | 948,528 | 711,396 | 1,296,414 |
| P 17 | 347,587 | 190,260 | 256,851 | 90,736 |
| T 17,19 | 638,990 | 98,532 | 73,889 | 565,091 |
| P 13 | 172,471 | 44,604 | 60,215 | 112,256 |
| C 11 | 352,338 | 135,072 | 216,115 | 136,223 |
| R 11,15 | 293,054 | 43,092 | 32,319 | 260,735 |
| 27 Z | 337,761 | 84,672 | 131,242 | 206,519 |
| 8 X,W,Z | 814,486 | 538,524 | 565,450 | 249,036 |
| 27 B,G,H | 1,613,407 | 280,224 | 372,103 | 1,241,304 |
| 21 A,B,F | 934,981 | 554,400 | 582,120 | 352,861 |
| 29 B,H,Z | 1,770,518 | 582,120 | 832,432 | 938,086 |
| N 7,9,11,F7 | 1,220,930 | 229,320 | 481,572 | 739,358 |
| C 7 | 176,490 | 112,140 | 84,105 | 92,385 |
| X 9 | 391,854 | 132,804 | 99,603 | 292,251 |
| Total | $17,859,602 | $5,917,716 | $7,318,370 | $10,541,232 |

CHICAGO TRANSIT AUTHORITY

CHICAGO, ILLINOIS

Operates 8 peak-hour only express bus routes:

| Number | Name |
|---|---|
| 2 | Hyde Park Express |
| 14 | South Lake Shore Express |
| 61 | Archer/Franklin Express |
| 99M | Midway Park-n-Ride |
| 100 | Jeffery Manor Express |
| 135 | Wilson/LaSalle Express |
| 136 | Sheridan/LaSalle Express |
| 162 | Pulaski/Stevenson Express |

Eight other express routes provide all day service. By definition they have been excluded from the analysis.

## CHICAGO TRANSIT AUTHORITY

| Route | Round Trip Route Miles | Annual Miles | Annual Hours | Peak Vehicles |
|---|---|---|---|---|
| 2 Hyde Park | 16.8 | 63,730 | 4,934 | 8 |
| 14 South Lake Shore | 28.4 | 805,290 | 36,863 | 44 |
| 61 Archer/Franklin | 24.2 | 216,750 | 20,153 | 29 |
| 99M Midway P&R | 25.9 | 114,750 | 5,671 | 11 |
| 100 Jeffery Manor | 7.3 | 69,105 | 4,827 | 4 |
| 135 Wilson/LaSalle | 16.3 | 220,320 | 16,221 | 28 |
| 136 Sheridan/LaSalle | 19.0 | 112,200 | 7,558 | 16 |
| 162 Pulaski/Stevenson | 29.0 | 332,775 | 25,597 | 14 |
| Express Route Total | | 1,934,940 | 121,824 | 154 |
| CTA Total (Surface) | | 73,756,386 | 7,343,276 | 1,868 |

Source: "Operating Facts, Winter 1983-84", weekday statistics annualized.

## COST ALLOCATION MODEL

$C = \$15.20VH + \$1.15VM + \$34,065PV$

Developed from 1984 Section 15 data

CHICAGO TRANSIT AUTHORITY

| Route | | Allocated Cost[a] | Estimated Ridership[b] | Projected Revenue[c] | Subsidy |
|---|---|---|---|---|---|
| 2 | Hyde Park | $420,829 | 456,705 | $502,376 | ($81,547) |
| 14 | South Lake Shore | 2,985,262 | 2,930,970 | 3,224,067 | (238,805) |
| 61 | Archer/Franklin | 1,543,474 | 1,240,320 | 1,364,352 | 179,122 |
| 99M | Midway P&R | 592,877 | 333,285 | 366,614 | 226,263 |
| 100 | Jeffery Manor | 289,101 | 485,520 | 534,072 | (244,971) |
| 135 | Wilson/LaSalle | 1,453,747 | 1,045,755 | 1,150,331 | 303,416 |
| 136 | Sheridan/Lasalle | 788,959 | 415,950 | 457,495 | 331,464 |
| 162 | Pulaski/Stevenson | 1,248,675 | 834,105 | 917,515 | 331,160 |
| Express Route Total | | $9,322,924 | 7,742,565 | $8,516,822 | $806,102[a] |

(a) developed by applying cost allocation model

(b) annualized from one-day ridership counts on each route

(c) assumes equal $1.10 fare from all passengers

(d) total CTA Federal operating assistance = $40,560,429; express route subsidy = 2% of total

SOUTHEASTERN PENNSYLVANIA TRANSPORTATION AUTHORITY

PHILADELPHIA PENNSYLVANIA

SEPTA operates four routes which meet the definition of "commuter express":

4 - Olney Terminal to Fort Washington (northern subway station to suburban industrial park)

20 - Frankford Terminal in Brookwood and Parkwood Manor (northern elevated station to far northeast residential areas via I-95)

61 - Center City to Manayunk and Roxborough (from northwest neighborhoods to downtown)

84 - Frankford Terminal to Somerton (northern elevated station to far northeast residential areas via I-95)

The last three reflect express trips during peak hours on all day local routes. Beyond the express portion of the route they provide extensive line haul service. Any other SEPTA express routes operate all day long. Though they utilize an expressway, this is only one segment of the route.

SOUTHEASTERN PENNSYLVANIA TRANSPORTATION AUTHORITY

EXPRESS BUS ROUTES

OPERATING STATISTICS

| Route | Annual Hours | Annual Miles | Peak Vehicles[a] |
|---|---|---|---|
| 4 | 331.5 | 5,686 | 1 |
| 20 | 4794 | 166,617 | 27 |
| 61 | 850 | 28,815 | 5 |
| 84 | 1279 | 58,334 | 7 |
| Express Total | 7254.5 | 259,452 | 40 |
| SEPTA Total (Motor Bus) | 3,739,585 | 37,832,878 | 1,076 |

COST ALLOCATION MODEL

C = $19.75VH + $1.29VM + $23,030PV

Developed from 1984 Section 15 data, Motor Bus only statistics and costs

(a) Represents total route requirement for routes 20, 61 and 84. Buses operate both local and express trips during peak. No buses are assigned exclusively to express service.

SOUTHEASTERN PENNSYLVANIA TRANSPORTATION AUTHORITY

EXPRESS BUS ROUTES

FINANCIAL STATISTICS

| Route | Allocated Costs | Estimated Annual Passengers | Estimated Revenue[a] | Subsidy |
|---|---|---|---|---|
| 4 | $ 36,912 | 22,950 | $ 16,050 | $ 20,862 |
| 20 | 931,417 | 306,000 | 214,200 | 717,217 |
| 61 | 169,107 | 44,625 | 31,250 | 137,857 |
| 84 | 261,718 | 70,125 | 49,100 | 212,618 |
| Express Total | $1,399,154 | 443,700 | $310,600 | $1,088,554[b] |

(a) based on systemwide average fare of 70¢

(b) total operating assistance (Section 519) for all modes = $46,000,150

ORANGE COUNTY TRANSIT DISTRICT

GARDEN GROVE, CALIFORNIA

In 1984, OCTD operated four com uter express bus routes:

| | |
|---|---|
| 78 | |
| 87 | |
| 202 | Park & Ride |
| 204 | Park & Ride |

Routes 202 and 204 were discontinued during the year; Route 87 was implemented.

ORANGE COUNTY TRANSIT DISTRICT

EXPRESS BUS ROUTES

OPERATING STATISTICS

| Route | Annual Service Hours | Annual Service Miles | Peak Vehicles |
|---|---|---|---|
| 78 | 8,254 | 197,000 | 7 |
| 87 | 1,504 | 38,293 | 4 |
| 202 | 357 | 11,464 | 1 |
| 204 | 398 | 8,416 | 1 |
| Express Total | 10,513 | 255,173 | 13 |
| OCTD Total | 1,180,382 | 18,466,018 | 327 |

COST ALLOCATION MODEL

C = $28.71VH + $0.68VM + $65,151PV

Deveveloped from 1984 Section 15 data

ORANGE COUNTY TRANSIT DISTRICT

EXPRESS BUS ROUTES

FINANCIAL STATISTICS

| Route | Allocated Cost[a] | Ridership | Revenue[b] | Subsidy |
|---|---|---|---|---|
| 78 | $826,989 | 87,013 | $34,457 | $792,532 |
| 87 | 329,823 | 8,291 | 3,283 | 326,540 |
| 202 | 83,196 | 4,802 | 8,850 | 74,346 |
| 204 | 82,301 | 2,813 | 5,184 | 77,117 |
| Express Total | $1,322,309 | 102,919 | $51,774 | $1,270,535[c] |

(a) developed by applying cost allocation model

(b) based on OCTD average fare statistics; $0.396 for local system routes 78 and 87; $1.843 for expense system routes 202 and 204

(c) Section 5/9 funds received = $10,194,410; express routes subsidy = 1%

# APPENDIX B

## PROCEDURES USED IN SCREENING EXPRESS BUS SERVICES

Services that could potentially be turned over to private for-profit operators were identified by carefully inspecting the route schedules provided by transit agencies. The following definition was used in screening express services that would meet the criteria of non-subsidized service:

> "Express bus services of potential interest to private operators" shall mean commuter services originating in the suburbs and terminating in the CBD or a non-CBD employment center; operating in the a.m. and p.m. peak period only; and providing non-stop, "closed door" service between origin and destination, often over the freeway."

This definition eliminated a number of express routes from analysis, since in the large metropolitan areas there is a significant level of non-stop express bus service which operates beyond the peak hours into the midday and evening periods. The impact of this screening process is described below:

| Route | | Peak Buses |
|---|---|---|
| **Chicago** | | |
| 6 | Jeffrey | 34 |
| 62 | Archer Express | 34 |
| 99 | Stevenson Express | 16 |
| 125 | Water Tower Express | 9 |
| 145 | Wilson/Michigan | 22 |
| 146 | Marine/Michigan | 25 |
| 147 | Outer Drive Express | 33 |
| 164 | Narragansett Express | 11 |
| | Total | 184 |

Boston

| | | |
|---|---|---|
| 21 | Northshore Express | 7 |
| 31 | Memorial Express | 13 |
| 32 | Harwin Express | 16 |
| 202 | Kuykendahl Park-and-Ride | 34 |
| 210 | Katy-W. Belt Park-and-Ride | 6 |
| 214 | Northwest Park-and-Ride | 8 |
| 262 | Westwood Park-and-Ride | 8 |
| | Total | 92 |

New York City

| | | |
|---|---|---|
| X 9/11/13 | Staten Island to Manhattan | 74 |
| X 10 | Staten Island to Manhattan | 17 |
| X 17/19 | Staten Island to Manhattan | 28 |
| X 25/27 | Brooklyn to Manhattan | 25 |
| X 28 | Brooklyn to Manhattan | 23 |
| X 51 | Queens to Manhattan | 11 |
| | Total | 178 |

Washington DC

| | | |
|---|---|---|
| 17 | Kings Park Line | 26 |
| 18 | A,B,C,D,E Springfield Line | 14 |
| 18 | B,C,H,K,P,R Orange Hunt-Burke Ctr Line | 19 |
| 11 | P,T,Y,Z Mount Vernon Line | 13 |
| | Total | 72 |

Thus over 526 peak buses were eliminated from analysis because they did not meet the criterion of "peak hour only." This represents 96% of the 543 peak buses that were included in the analysis.