

MATCHING PROVIDER INTEREST WITH MARKETS TO PRIVATIZE TRANSIT SERVICES

Snehamay KHASNABIS
Professor, Civil Engineering
Director, Urban Transportation Institute
Wayne State University
Detroit - U.S.A.

Bharat B. CHAUDHRY
Graduate Fellow
Civil Engineering
Wayne State University
Detroit - U.S.A.

Neva A. NAHAN
Research Associate
Wayne State University
Detroit - U.S.A.

Mark E. NEITHERCUT
Research Associate
Wayne State University
Detroit - U.S.A.

1. INTRODUCTION

During the last two decades the mass transportation industry in the U.S. has undergone dramatic changes, many brought about by the nation's changing demographics, continued suburbanization and gradual decentralization of urban activities. While the relative prominence of the Central Business District (CBD) as an employment center continued, changing land use patterns were instrumental in the development of major focal points of activities in the suburbs. As a result, our urban travel patterns changed from what used to be primarily radial desire lines to widely dispersed movements between many suburban centers to the extent that conventional transit services became ineffective in meeting our travel needs.

The widely diverse travel patterns in our metropolitan centers, along with continued increase in operating expenses has posed serious financial problems to our public transportation agencies. Transit agencies in the U.S. have been hard pressed to meet the travel demands oriented to the central city, with little resources available to address the emerging travel needs between suburban communities. Privatization is considered by many as a viable tool for improving suburban mobility; however, there are not very many examples of successful implementation of such programs in the U.S. today (2, 4, 5).

The broad purpose of the study from which this paper is derived was to test the feasibility of using a marketing approach for privatizing transit services between suburban communities in the Detroit metropolitan area (2,3). The study is characterized by two issues that have been identified in the literature as major impediments towards privatization. These are:

- How to identify markets for privatization within a large metropolitan area?
and
- How to develop plans for privatization that are compatible with the markets and that match the interest of local service providers?

The focus of this paper is on the latter issue identified above, i.e., on the question of developing plans compatible with identified markets and provider interest.

2. RESEARCH METHODOLOGY

The prerequisite for a successful transportation program is the identification of specific markets; matching the market, the provider and specific type of service; and ensuring appropriate service standards. The above research approach has four major elements as follows:

- Market identification
- Assessing the Degree of Interest Among Providers
- Matching Markets with Providers
- Development of Operating Plans

In conformance with the focus of this paper, procedures used to address the last three elements stated above are discussed below.

A key ingredient to successful private participation is the ability of the transit agency to match the potential transit demands with interested private providers. First, a demand-based approach for identifying markets for transit privatization for suburban travel was developed in the study from which this paper is derived (2) (not reported in the paper). Since the study was not concerned with transit demand within the central city, the zonal framework developed for market analysis was carefully designed to exclude the central city. The procedure, when applied in the Detroit metropolitan area, resulted in the identification of a number of potential suburban markets.

Next, in an effort to assess the degree of interest in participating in privatization efforts, a two-stage telephone survey was conducted among private transportation providers in Southeast Michigan. Stage I of the survey was directed toward the development of a data base of potential providers and understanding their capabilities, preferences and perceptions. Stage II was conducted only among a small subsample of respondents from the first survey and was directed toward obtaining route-specific information. These two surveys are discussed in greater detail in the next section.

The purpose of the provider surveys was to obtain information on the degree of interest and expertise that local providers may have in the privatization of suburban transit services. Totally independent of and parallel to this effort was the process of market identification based upon current and projected travel demands and a number of other explanatory variables. The markets thus identified were compared with provider interest in these markets. This procedure resulted in a subset of the prioritized markets with greater potentials for success due to provider interest. Operating plans for a number of the viable "market-provider" combinations were developed including projected ridership, fares, routes, schedules and fleet size.

3. RESULTS

The Detroit metropolitan area was chosen for applying the above methodology because it typifies in many ways the changes in land use and travel patterns that characterize today's growing metropolis in the U.S. Further, concerted efforts are currently underway by the regional planning agency, the Southeast Michigan Council of Governments (SEMCOG) as well as the regional transit agency Suburban Mobility

Authority for Regional Transportation (SMART) to plan and operate public transportation services on a selective basis through private contractors.

3.1. Background

A set of areal units termed as P-zones (abbreviated from Privatization Zones) were specifically created for the study area to take advantage of the available journey to work census data contained in the Urban Transportation Planning Package (UTPP) files. The market identification process resulted in a total of 53 zone-pairs that were later narrowed down to 14 by two independent priority ranking procedures (3). These 14 markets were then merged in various combinations to provide a total of ten possible sectors where privatization appears feasible.

3.2. Provider Survey

The purpose of the survey was to assess the interest among providers of transportation in privatization projects. The population under study included any "for-profit" providers in transportation in the seven counties in Southeast Michigan. The study included two separate surveys which were administered as Phase I and Phase II.

Phase I Survey Method & Results: The objective in Phase I survey was to describe the project to the transportation providers and determine their level of interest in private contracting to provide public transportation services between suburbs. The list of companies was initially acquired from the "1988 Michigan Business Directory" and the current Yellow Pages Telephone Books for the seven counties in southeast Michigan. These were found under the following listings: taxicab companies, airport transportation services, limousine services, bus charters, and bus rentals. A total of 292 companies were found and interviewed on the telephone and up to five attempts were made to conduct the interview. A business would be included if it was a for-profit, main office of a transportation provider in southeast Michigan.

Of the initial 292 companies, 78 did not fit this criteria (48 were branch offices, eight were non-profit firms and 28 had gone out of business since the directory was published). Telephone interviews were conducted with 113 out of the 214 firms for a cooperation rate of 53 percent. Of the remaining 101 firms, 56 refused to participate and 45 were unavailable after five attempts (passive refusal).

Of the 113 companies that were interviewed in this phase, 86 (76 percent) were interested in providing public transportation services under contract with a public agency. The results presented in Table 1 are based only on those firms that indicated an interest. The interested firms provide a variety of services, with charters and demand-response service as the most common. The majority of these firms also provide airport and other scheduled services as well as vacation and travel tours. The firms that expressed interest in the prospect of a privately-operated public route vary in fleet size ranging from 1 to 131, with 27 being the average number. The most common vehicle is a coach, followed by van buses and taxis.

A variety of options was presented to determine what might make the bidding process even more attractive to all of the firms, including those who initially expressed a disinterest. Not surprisingly, most firms would be more interested if they were guaranteed a minimum payment (90 percent) and if outside revenue was provided (89 percent). More than half of the companies (58 percent) indicated that priority bus lanes would also make the service more attractive. To summarize the results in the Phase I survey, it was found that private operators are generally interested in working with public agencies on contractual transit services; that these operators have at their disposal underutilized vehicular fleet and that with proper incentives, the private enterprise can be attracted to the field of public transportation.

Phase II Survey Method & Results — The objective for Phase II was to target specific markets for the specific suppliers. Twenty companies from Phase I were identified that had the resources and interest in contractual services with the public transportation agency. Each company included in Phase II had to have at least four coaches, vans or buses in their fleet and they must have expressed an interest in providing the type of service described by the interviewer. The same procedures employed in Phase I (i.e., telephone interviews, up to five attempts to contact, etc.) were used in this phase. These final 20 companies were provided with ten potentially high travel demand routes to determine interest in providing services on them. The market analysis completed later resulted in a total of 14 markets for privatization. Of the ten routes specified in Phase II survey, six were among the 14 markets ultimately identified.

The Phase II survey was designed to provide more specific information to those that had expressed an interest in proposed routes. The twenty companies that were interviewed in Phase II were provided with a list of potential routes and asked if they would be interested in providing service along them. Table 2 presents the routes and the percentage of firms who expressed interest. Overall, the majority of the firms were interested in providing services along most of the proposed routes. The major findings of Phase II survey are summarized below.

The companies were asked if they would use their own vehicles or ones provided by the contracting agency. All but one of the firms could use their own vehicles for this service. The majority (55 percent) were flexible and could use either their own or the agency's vehicles.

Not surprisingly, companies are willing to accept a smaller "dollar per hour" rate if the agency provides the vehicle. Almost all of the firms (95 percent) liked the idea of an "incentive clause" which would encourage providers to give better service. Ninety-five percent of the firms favored incentives for a high degree of service, and 90 percent thought it is desirable to reward providers that carry a greater number of passengers than the expected minimum.

A majority of firms (60 percent) also agree that a penalty clause which attaches fines and penalties in order to correct and discipline substandard services would be effective. Almost all of the companies (80 percent) agreed that penalty clauses would be effective in assuring prompt service, as well in maintaining a standard in vehicle maintenance. The survey showed that a majority of the providers were highly interested in the six

routes that were ultimately identified as viable for privatization following the market analysis process.

The Phase II survey confirmed the findings of the earlier survey, with the additional stipulation that given route-specific information, private operators are more likely to provide definitive answers on their role in public transportation. Further, as the following section shows, the preference and interest expressed by the private sector can be used to develop transit operating plans.

3.3. Business Plans

The business plan presented in this paper is based upon a modest market capture of 5 percent of the travel demand for express bus service with no intermittent stop between the P-zones. Table 3 provides data on expected ridership (based upon a 5 percent market capture) and individual segment lengths for each sector. Further, six of the ten routes in which the providers expressed interest are all contained in the nine sectors presented in Table 3. A review of Table 3 indicates that ridership on sectors 1, 2, 3, 5 and 7 is reasonably balanced between different segments (P-zone pairs) of these sectors. In sectors 4, 8 and 9, on the other hand, there is a much greater lack of balance in ridership between different segments. Sector 6 is the only sector based upon a singular market in one direction with negligible ridership in the reverse direction.

Fleet Size, Headway and Cycle Time: The computation of bus-fleet size is based upon the ridership at the maximum loading section (MLS). A lack of balance in ridership between different segments is likely to reduce the cost-effectiveness of the system, because of large vacancy rate or small fare-box revenue likely to be collected at the low-ridership segments. Thus, efforts to develop business plans for this project was limited to 1, 2, 3, 5 and 7 only.

Using methodologies followed by transit agencies and suggested in textbooks, the fleet size, headway and cycle times for each of the five sectors was computed (6). It was also assumed that during the off-peak hours the demand would be reduced by 50 percent. Thus, 50 percent of the fleet size of that computed for peak-hour operation would be required for off-peak operation at twice the headway. Lastly the most important assumption was that express, non-stop service will be provided between the P-zone pairs with an effort to maintain an average speed between 20 mph to 25 mph. The basic operating data compiled for the five sectors are presented in Table 4. The data in Table 4 was used to estimate operating cost and fare-box revenue.

Operating Cost and Revenue Data: Operating cost and revenue were compiled for privatized transit operation for the following scenario using the fleet and headway data presented in Table 6.

Peak hours services are to be provided during AM 2 hours (7:00 - 9:00 AM) and PM 2 hours (4:00 - 6:00 PM). Off-peak hours services are to be provided for 7 hours (9:00 - 4:00 PM) at twice the peak-hour headway with a 50 percent fleet size. The private contractor will have the complete responsibility of providing larger buses (seating capacity 50), operating and maintaining (including vehicle storage) services for contractual rate of \$70/bus hour. The transit agency will have

the responsibility of monitoring the contract, collecting fare-box revenue, ensuring proper service level, developing and enforcing quality standards for a 20 percent overhead. The effective hourly rate for providing services would thus amount to \$84/hour (including overhead). Although fleet size is computed using 100 percent vehicle occupancy at the MLS, a conservative estimate of 70 percent vehicle occupancy was used for computing fare-box revenue. A bus fare ranging from \$.75 to \$1.50/ride was assumed. Services are to be provided for 255 working days per year. Fare-box revenue was computed for four peak hours using the peak-hour ridership data. For seven hours of off-peak operation, fare-box revenue was estimated as 50 percent of peak-period revenue.

Independently of the privatization approach, the cost of the operating services were also derived by the Fully Allocated Cost (FAC) method, a technique increasingly applied by transit agencies when all the cost elements are apportioned into different variables (1). The FAC model developed for large buses for the regional transit agency SMART was used to compile operating cost data:

SMART Model:

$$\text{FAC} = \$1.025X + \$21.03Y + \$80,516Z$$

where:

FAC = Annually Fully Allocated Cost

X = Annual total vehicle miles

Y = Annual total vehicle hours

Z = Number of hours required to provide peak service

The data compiled on operating cost and revenue are presented in Table 5. The annual operating cost derived by the FAC method in all the five cases analyzed is somewhat higher than the cost of privatized operations as computed under the appropriations stated above. In all the cases analyzed deficits are incurred because of a shortfall between operating cost and fare-box revenue. The analysis presented above appears to indicate privatization may help reduce the deficit somewhat. Whether or not this will happen in real life can be determined after such privatization projects have been implemented and been in operation for an sustained period.

4. CONCLUSIONS

A procedure for matching the interest among local private providers with potential transit markets to develop a business plan for privatization has been presented in this paper. A two phase survey was conducted with the broad purpose of determining if there is enough interest among private providers in the Detroit metropolitan area in the public transportation field and secondly if those providers who expressed an interest, have necessary resources (primarily vehicle fleet) for such purposes. The survey demonstrated that local private providers are interested in working with public agencies on contractual transit services, that these operators have underutilized vehicular fleet and with proper incentive, private operators can be attracted to the field of public transportation. Also, the private sector appears to approve the concept of a penalty

clause to ensure proper service quality.

The responses obtained from the local providers were used in conjunction with a demand-based market analysis (not reported in this paper) to develop a set of viable business plans for transit privatization. This procedure resulted in a total of five sectors in the Detroit metropolitan area where privatization appears feasible.

5. ACKNOWLEDGEMENTS

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The authors are totally responsible for the contents of the paper. The opinions and comments are those of the authors and do not necessarily reflect the official policies of any one of the agencies mentioned above.

6. REFERENCES

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Table 1
Services Offered by the Providers Interviewed
 (n=86)

Type of Service	% Providing
Charters	81
Demand-response service	74
Scheduled airport service	62
Regular scheduled services	55
Travel or vacation tours	52
Taxi service	42
Fixed route service	39
Specialized disabled transit	36
Rideshare for profit	23
Other types of service	19

Table 2
Provider Interest in the Proposed Routes
(n=20)

Routes	% Firms Interested
Livonia-Southfield	85
Dearborn Heights-Southfield	85
Ferndale-Southfield	80
Troy-Southfield	80
Sterling Heights-Warren	75
Sterling Heights-Troy	75
Troy-Warren	75
Mt. Clemens-Warren	70
Warren-Troy	70
Mt. Clemens-Sterling Heights	70

Table 3
Expected Ridership Data By P-Zone Pairs for Nine Sectors
Based Upon a 5% Market Capture Rate

Sector	P-Zone	Demand (Peak Hour Ridership)	Distance (miles)	P-Zone	Demand (Peak-Hour Ridership)	Distance (miles)	P-Zone
*1	14-Mt. Clemens	592	9.44	13-Sterling Hts.	531	7.03	21-Warren
	21-Warren	274	7.03	13-Sterling Hts.	104	9.44	14-Mt. Clemens
*2	14-Mt. Clemens	696	8.25	22-East Detroit	454	5.38	21-Warren
	21-Warren	268	5.38	22-East Detroit	134	8.25	14-Mt. Clemens
*3	13-Sterling Hts.	356	7.42	12-Troy	148	11.75	21-Warren
	21-Warren	197	7.03	13-Sterling Hts.			
4	20-Madison Hts.	69	3.69	18-Royal Oak	428	7.17	12-Troy
*5	18-Royal Oak	176	3.44	19-Ferndale	277	6.28	17-Southfield
	17-Southfield	116	6.28	19-Ferndale	166	3.44	18-Royal Oak
6	25-Livonia	671	6.79	16-Farmington	274	6.92	17-Southfield
*7	38-Grosse Ile	919	8.6	36-Southgate	320	6.44	37-River Rouge
	37-River Rouge	215	8.32	33-Dearborn			
	33-Dearborn	31	8.32	37-River Rouge	252	6.44	36-Southgate
	36-Southgate	174	8.6	38-Grosse Ile			
	36-Southgate	541	8.26	33-Dearborn			
8	33-Dearborn	495	7.88	32-Dearborn Hts.	70	7.88	33-Dearborn
9	2-Waterford	729	6.25	3-Pontiac	42	6.25	2-Waterford

* Selected for Developing Business Plans

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Table 4
Basic Operating Data for Five Proposed Sectors

Sector	Peak/Off Peak	Dp (Passengers/Hour)	MLS (i-j pair)	Headway (II) (minutes)	Cycle Time (Q) (minutes)	Fleet Size (# of buses)	Av. Speed (mph)
1	P	472	13-21	6	96-100	16	20.0
	O	236	13-21	12	84	7	23.5
2	P	433	22-21	6	66-70	11	23.5
	O	217	22-21	12	60	5	27.3
3	P	178	13-12	12	60-70	5	22.5
	O	89	13-12	30	60	3	26.2
5	P	139	19-17	15	60-70	4	16.5
	O	70	19-17	40	60	2	19.5
7	P	503	26-27	5	100	17	28.1
	O	252	36-37	10	80-85	8	33.0

Table 5

Comparison of Fare-Box Revenue and Operating Cost

Sector	Fleet Size Peak/Off-Peak	Annual Operating Cost		Annual Fare-box Revenue (70% occupancy)	% Profit (Deficit)	
		Hourly Rate Method \$84/hour	Fully Allocated Cost Method		Hourly Rate Method \$84/hour	Fully Allocated Cost Method
1	P - 16	\$2,420,460	\$2,746,595	\$934,715.25	(61.4%)	(66.0%)
	O - 7					
2	P - 11	\$1,692,180	\$1,872,206.9	\$989,068.50	(41.6%)	(47.2%)
	O - 5					
3	P - 5	\$728,280	\$817,742.95	\$375,385.50	(48.5%)	(54.1%)
	O - 2					
5	P - 4	\$642,600	\$635,377.4	\$347,807.25	(45.9%)	(45.3%)
	O - 2					
7	P - 17	\$2,656,080	\$3,612,311	\$1,255,212	(52.7%)	(65.3%)
	O - 8					

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