Demonstration of Potential for Improved User-Oriented Transit to Major Trip Generator

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Momentum is growing throughout the United States to revitalize and restructure public transit systems serving urban and rural areas. Many transit systems face a bright future of new equipment and expanded services where only a few years ago they were near collapse. The function of transit used to be defined as providing service within the constraints of fare box revenues; it now includes providing service to meet the mobility needs of large segments of the population. Transit is seen in many places as a way to reduce congestion and air pollution, save energy, provide mobility for those without an automobile, and increase the vitality of the central city and the livability of suburban and rural areas.

To meet these goals requires new concepts for transit systems that provide attractive, user-oriented service that can effectively compete with the automobile. One area in which there is a potential of high payoff from transit improvement is improved access to major trip generators, such as an industrial area, airport, medical center, or university that provides a large concentration of trip-making activity around which specialized transit service can be centralized. Specialized transit services to major trip generators can be tailored to a particular need and provide a level of service much higher than would be found with conventional service, which can compete more effectively with the automobile. A further advantage is that specialized transit can be more easily marketed than conventional service because the service can be aimed at a particular group. Specialized services, however, will tend to cost more than a conventional service, and the impact of the specialized service on the base levels of conventional service may be of concern. If the specialized service, rather than the automobile, diverts a large portion of its riders away from the conventional service, the financial workability of both the regular and specialized services may be threatened. This paper will document the results of a demonstration project, the UBUS, which provided a direct user-oriented service to a major trip generator, the campus of the University of Wisconsin—Milwaukee (UWM).

The UWM campus is located in Milwaukee County on the east side of the city of Milwaukee approximately 4.8 km (3 miles) north of the Milwaukee central business district. The total enrollment is about 25,000, most of whom are commuters, and there are 4000 members of the faculty and staff. This gives the university a total population of nearly 30,000 persons and makes it the second largest generator of trips in southeastern Wisconsin next to the Milwaukee CBD. Because of the small size of the campus, 34 ha (85 acres), only 1900 parking spaces can be provided on campus for the 10,000 automobiles that are driven to the campus each day; as a result, over 8000 automobiles must be parked on the surrounding streets. Thus, the UWM campus has all the characteristics of a major trip generator: a lot of trip-making activity, congested local streets, and severe limits on parking supply.

PROJECT DESCRIPTION

The demonstration project provided modified urban bus service direct to a major trip generator along a set of bus routes serving a large portion of the Milwaukee metropolitan area and included inducements to potential riders, such as direct, no-transfer service; convenient schedules; minimum travel times; reduced fares; easily accessible off-street parking; convenient route locations; and a homogeneous rider group. During the course of the project, a series of alterations were made in these routes to determine the effects of these changes on the users. Two general types of services were provided: integrated services, in which existing local bus routes were extended to the campus, and exclusive services, in which new special routes were developed and operated for the use of only university students, faculty, and staff. In addition to these, the routes differed in the provision of park-and-ride facilities, partial or full express service, and hours of operation and the general routing patterns.

During the fall 1974 semester, four routes (Capitol Drive as an integrated route and Silver Spring Drive,
Oklahoma Avenue, and North Avenue as exclusive routes) were operated and a $0.25 fare was charged. For the spring 1975 semester, the fare was increased to $0.35, evening service was added on two of the routes, and a special express service (the Oklahoma Streaker) was added from the end of Oklahoma Avenue to the campus. Later the North Avenue route, which had previously operated as an exclusive route, was dropped, and two new integrated routes that involved the extension of existing bus routes to the campus began operations (North Avenue and Burleigh Street integrated routes). Table 1 gives the features of each of the seven routes of the demonstration project operated from September 1974 to May 1975. The project concerned three major categories: the operation of the service, marketing efforts connected with the service, and technical studies associated with the service. The service was operated by the Milwaukee Suburban Transport Corporation, the local private transit operator. Further details on the project are available elsewhere (1).

PROJECT OBJECTIVES

The overall goal of the UBUS project was to evaluate the effectiveness of high-quality, user-oriented transit service (UBUS) to a major trip generator (the campus of the UWM). User-oriented transit can be defined as transit service developed to meet the particular transit needs of a select segment of travelers. Such service should provide a direct link between the user’s origin and destination at times convenient to the user and at a cost to the user that is competitive with that of the automobile. The aims of the project were to determine to what degree such a service could attract new riders away from their automobiles and at the same time minimize the adverse effects on existing transit service. The specific project objectives were

1. To reduce the number of urban vehicles,
2. To reduce the urban highway and parking facility requirements in the UWM area,
3. To attract enough students, faculty, and staff from areas of concentration to make these routes worthy of integration into the regular bus service so that general public transit service could be facilitated,
4. To provide an efficient and reliable transit service as an alternative to the private automobile and to improve the overall campus-community environment by easing local traffic and parking congestion, and
5. To develop procedures for future demonstration projects and service experiments.

In effect, the success of the UBUS program largely depended on the sources of its ridership. If the users of the service included many people who otherwise might have driven a private automobile rather than those who would normally use transit, the program would successfully meet its objectives. If the reverse was true, the objectives would not be met. Thus the UBUS service had to be oriented to the needs of its users.

PROJECT RESULTS

To determine how well the UBUS project met its objectives, a series of technical studies were undertaken. These studies included on-board surveys of UBUS users, overall travel surveys of all persons traveling to the university, and analyses of parking and community impact. Only limited results of these studies are given here; more detailed results are available elsewhere (1).

Ridership

The average daily ridership on the four UBUS routes was 4382 one-way trips per day during the fall semester and 4079 one-way trips per day on the five routes in the spring semester. During the 31 weeks of UBUS operation, 644 288 trips were estimated to have been made on UBUS routes. This daily ridership rate on the UBUS was higher than that on 19 of the 21 urban transit systems in Wisconsin and was only exceeded by that on the systems in Milwaukee and Madison. The 40 percent fare increase (from $0.25 to $0.35), which occurred at the beginning of the spring semester, did not appear to have a major impact on ridership. Ridership appeared to fluctuate with student enrollment, and a large number of people tried out the service for a short time early in each semester.

Origins of UBUS Users

UBUS drew its ridership from a variety of points in the Milwaukee metropolitan area. These origins differed from those of the UWM population as a whole. Although large concentrations of students were found in the immediate vicinity of UWM, these people generally walked, bicycled, or hitchhiked to campus. With the exception of the Oklahoma Avenue exclusive route, the special Oklahoma Streaker express service, and, to some extent, the Silver Spring Drive exclusive route, each of the routes drew riders from those areas immediately adjacent to [not more than 0.6 km (1 mile) from] their right-of-way. The Oklahoma Avenue, the Oklahoma Streaker, and the Silver Spring Drive exclusive routes drew riders from wider geographic areas. In the case of the Oklahoma routes, this was due to their relative separation from the other four routes by Milwaukee’s industrial valley. The larger draw of both the Oklahoma and Silver Spring routes was also due to their locations on the southern and northern boundaries of the UBS system, which ran east and west.

Table 1. Characteristics of UBUS routes.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Oklahoma Avenue</th>
<th>Oklahoma Streaker</th>
<th>Silver Spring Drive</th>
<th>North Avenue</th>
<th>Capitol Drive</th>
<th>North Integrated</th>
<th>Burleigh Street</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclusive use</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Integrated service</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Park-and-ride</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<td>x</td>
<td>x</td>
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<tr>
<td>Partial express</td>
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<td>x</td>
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<td>Full express</td>
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<tr>
<td>Fare change</td>
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<td></td>
<td>x</td>
<td>x</td>
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<tr>
<td>Evening service</td>
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<td>Routing change</td>
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<tr>
<td>Added service</td>
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<tr>
<td>No transfer service</td>
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<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

The operation of the service, marketing efforts connected with the service, and technical studies associated with the service. The specific project objectives were

In effect, the success of the UBUS program largely depended on the sources of its ridership. If the users of the service included many people who otherwise might have driven a private automobile rather than...
Major shifts have occurred in the mode of access to UWM since the advent of the UBUS program. Automobile access to the university has dropped from 70.1 percent to 61.0 percent of all trips. This decrease in automobile use has been matched by an increase of total bus use from 12.3 to 21.3 percent. Thus, automobile use has dropped by about one-seventh, and transit use has nearly doubled; about 1700 persons have switched from automobile use to transit use since the advent of the UBUS program.

One of the key questions for the UBUS project concerned diversion: To what extent does the UBUS attract persons away from the regular city bus lines? The diversion rate, defined as the percentage of riders who would use the regular bus if the UBUS were not available, obtained from the various surveys conducted was 41.3 percent. There was a considerable variation in the diversion rate on the different routes. Those routes that were extensions of regular bus routes had the highest rates of diversion, and outlying routes where transit service to the university by regular bus was difficult had lower diversion rates. The diversion rate on the Oklahoma Streaker express service was the lowest of all the routes surveyed. This route was highly competitive with the automobile on a travel time basis, and its riders were nearly all drawn from areas with little or no bus service.

The UBUS on-board survey asked for student opinions on general transportation characteristics. Effective operations and low cost were the transportation characteristics that were most important to UWM students. Those items that stressed convenience for commuters, such as not having to transfer, and direct home-to-destination operations, ranked in the middle of important characteristics. Only the club bus factor, riding with similar people, was not very important to the student respondents.

Parking Use

Major changes in parking supply and use occurred in the UWM area since UBUS service began. Total parking supply has increased from 7959 spaces to 8866 spaces (11.3 percent); all of the increase occurred in off-street spaces. Total use has dropped from 6855 to 6357 spaces (7.2 percent) during the same period. On-street use dropped by 923 spaces (11.8 percent), and off-street use increased by 425 spaces (20 percent). Of the total decrease in on-street use, most occurred since the beginning of UBUS service in September 1973, and most was recorded during the period of September 1973 to September 1974. The balance of the decrease occurred during the 6-month period from September 1974 to February 1975. A portion of this second decrease can probably be attributed to the addition of off-street parking facilities.

As a result of these changes in supply and use, the availability of parking spaces in the UWM area has increased substantially. In the fall of 1972, before UBUS operations began, a net difference between supply and use of 1104 spaces existed. This difference increased by 80 percent to 1985 spaces by fall of 1974 when UBUS operation was under way and by 127 percent (compared with the fall of 1972) to 2509 spaces in the spring of 1975. Nearly all of this increase has occurred in improved availability of on-street parking spaces. This increase in available parking supply has occurred in spite of an enrollment increase at UWM of over 10 percent in the same period.

CONCLUSIONS

From the preceding information, we concluded that the UBUS successfully met its objectives of reducing urban vehicle travel, reducing urban highway and parking facility requirements, and attracting enough users to make the routes worthy of integration into the regular urban area bus service. It appears that there is a great potential for specialized, user-oriented transit service to major trip generators. Such service can be closely tailored to user needs and carefully marketed to reach its target groups. Accordingly, the following recommendations were made to the project sponsors:

1. The potential of major trip generator-oriented service should be explored in other cities. Such service has a great potential for attracting large numbers of persons away from their automobiles and into transit vehicles. Identification of major trip generators, analysis of travel patterns to the generators, analysis of the adequacy of the present transit service to the generators, and development of a transit service closely related to the needs of the travelers to the generators should be undertaken by each transit operator in conjunction with relevant state and regional planning agencies.

2. An extensive marketing program should be used whenever a new venture in public transit is undertaken and should include identification of potential users and segments of the market; design of a service package to meet user needs; effective communication of information about the service to its users that emphasizes service attributes that the users think are important; and continuing efforts to identify new market segments, monitor the success of the program, and modify it on the basis of feedback from its users.

3. Efforts should be made to operate parking and transit services that complement and enhance each other.

4. Careful technical studies should be undertaken to assist local transit agencies in developing their transit services.

5. Demonstration programs are more useful when appropriate before-and-after analyses are undertaken and the results are disseminated.

ACKNOWLEDGMENTS

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REFERENCE