

Demand-Responsive Transportation in Ann Arbor: Planning and Administration

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Since its formation in 1968, the Ann Arbor Transportation Authority (AATA) has made significant strides in shifting the emphasis from private automobiles to public transportation. This paper details the implementation of a system that has grown from ground zero in 1968 to 1 600 000 riders in fiscal year 1974-75. The attendant growth of AATA's capital equipment and annual operating budget is similarly impressive. Funding has been derived from federal and state grants and a local property tax adopted by the voters in 1973. The local funding support is important because it demonstrates a high level of community support for the transit system and furnishes the required matching funds for larger state and federal grants. The AATA system is truly demand responsive since it includes planning and service revisions as well as the dial-a-ride service. It is anticipated that the respective importance of dial-a-ride and line-haul service will shift as the system matures and ridership reaches a much higher level. Long-range growth can be ensured only because AATA continues to monitor public response to its service and to implement required changes.

Ann Arbor is a unique and exciting community in many ways. Concern for social justice and attention to the quality of our environment dominate many policies and programs. It is natural then that we are leaders in the development and implementation of a new public transportation system that is helping to shape our future.

A major advance toward this new public transportation system came with a 2.5-mill property tax earmarked for public transit that, when passed in 1973, amounted to \$1.5 million. Since that time, the Ann Arbor Transportation Authority (AATA) has been progressing steadily toward high-quality personalized transit. AATA's 1975-76 operating budget of \$3.8 million gives some idea of its growth.

HISTORY

The AATA is a young organization, chartered by the city of Ann Arbor in July 1968, under a public act of the state of Michigan. This act enabled municipal transit authorities to operate service within the city of incorporation

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and some distance beyond its boundaries. The original limit of 3.2 km (2 miles) was changed to 16.1 km (10 miles) in 1970 through special state legislation to allow the AATA service area to better conform to the service needs of the urbanized area.

The AATA was created when the city recognized that operation of a transit system could no longer be undertaken at a profit by private enterprise (the last of a series of private operators stopped service in May 1968). After several months with no bus service and a brief unsatisfactory experience with an outside contracting firm, publicly operated service commenced with four minibuses in Spring 1969. Later that year, used transit coaches were purchased and regular fixed-route service was restored with 30-min headways on three main routes.

The AATA purchased 16 new transit buses in 1970 with the assistance of the U.S. Department of Transportation Capital Grant Program. This enabled further expansion of line-haul service to six different routes covering most of the city. Half-hour service was offered during peak periods and hourly service at midday. The lines operated Monday through Friday, with a 35-cent cash (adult) fare and free transfers. This basic line-haul bus system restored public transit to Ann Arbor and provided the foundation for subsequent expansion and improvement of service.

PILOT DIAL-A-RIDE

The AATA wanted to go beyond providing bare bones transportation. In April 1971, the AATA adopted a far-reaching statement of goals and objectives that called for

1. A diversified, coordinated public transportation system for the urbanized area that permits any individual to make any desired trip quickly, safely, conveniently, and economically and
2. A public transportation system of a size and influence to reduce the automobile population of Ann Arbor to one car per family and to maintain that level.

To meet these goals, service improvements were mandatory. In September 1971, the dial-a-ride pilot program was launched with a demonstration grant of

\$56 000 from the Michigan Bureau of Transportation, technical services and a vehicle donated by the Ford Motor Company, and a special appropriation of \$10 000 from the Ann Arbor City Council.

The objective was to field-test door-to-door public transportation, measuring both public response and operating feasibility, and to determine whether such demand-responsive service could help the AATA fulfill its stated goals. The program was small; it involved only three vehicles and served approximately 15 percent of the city's population. The one-year test period produced several important findings.

1. The total number of transit trips from the target neighborhood was more than double the previous line-haul bus ridership in the same area.

2. Dial-a-ride lured many passengers from their automobiles. According to surveys in January and June 1972, 50 percent of the users had been automobile drivers or passengers before dial-a-ride became available.

3. Dial-a-ride reached many people who did not use public transit regularly. In a typical month, approximately 70 percent of those who traveled on the test system rode less than once a week. Surveys verified that this was not due to dissatisfaction with the service but rather to the feeling that dial-a-ride was a backup or auxiliary transportation system. This suggested that occasional users might ride more regularly if door-to-door public transportation became permanent.

4. The service delivered was excellent. The average waiting time (telephone call to doorstep pickup) was 10 min and the average riding time (pickup to drop-off) was 13 min. All four surveys conducted during the project indicated that the public in the test service area was pleased with dial-a-ride. A home interview survey also showed widespread citizen support for expansion of the system, which would require a tax increase.

5. Dial-a-ride proved operationally feasible under Ann Arbor's conditions but relatively more costly than traditional line-haul service. Direct operating costs during the test year came to \$1.74 per ride for the three-vehicle system. The cost per ride for a larger system could not be directly extrapolated from this figure, but it was likely to be somewhat lower.

These test findings confirmed the AATA's initial hope that the public would find dial-a-ride more attractive than conventional service and would therefore encourage use of public transit rather than automobile travel. The cost findings indicated that a new source of funding would be required if dial-a-ride service were to be made available to Ann Arbor's citizens citywide.

FROM PILOT TO COMMUNITY SERVICE

On the basis of the pilot program and the experiences of other communities, the AATA established that any significant switch from private automobiles to public transit would require a system with doorstep pickup and drop-off; an absolute minimum of transfer difficulty; telephone requests for service, with little or no requirement for public knowledge of schedules and route maps; fare at present levels or lower; and ability to shift the type of service according to the time of day and travel demand.

The final plan was developed in fall 1972, a combined effort of the AATA board, its consultants, and other interested citizens. Key decisions, such as levels of fares, were the result of direct input from citizens' groups that met to review and discuss the plans being prepared.

The system, which is largely based on the dial-a-ride experience, consists of

1. Neighborhood dial-a-ride services with doorstep pickup and drop-off by telephone request that provide point-to-point service within a given zone and also act as feeders to express buses that connect major trip attracters and other zones;

2. Express trunk-line services that connect major shopping centers, employment areas, all senior high schools, the University of Michigan, a community college, hospitals, and other major trip-generating points;

3. Coordinated no-wait transfers between neighborhood dial-a-ride vehicles and express buses; and

4. Regular subscription service for daily work and school trips, with doorstep pickup and drop-off at the same time every day, serving locations that have adequate demand to justify dedicating a bus to that run.

In early summer 1973, the AATA began to implement the system in incremental phases. An entirely new organization was built. A full-time professional management team was hired. The number of drivers and dispatchers increased from 25 to 125, the maintenance staff increased from 3 to 15, and the bus fleet grew from 21 to 78 vehicles.

As new services were implemented, ridership in fiscal year 1974-75 continued to grow at a rapid rate. On a typical day the AATA services transported more than 7000 passengers—4000 passengers on regular line-haul and express routes, 1500 passengers on school subscription service, 1300 passengers on daytime dial-a-ride, 500 passengers on citywide evening dial-a-ride, and 25 passengers on the service for the handicapped. This represents a level of more than 1.5 million passengers a year, up approximately 50 percent from the previous year and nearly three times the ridership in fiscal year 1971-72 (582 240). The projected ridership for fiscal year 1975-76 is 2 100 000. When the system was being planned in January 1973, the projected ridership for the first full year of operation under the new system was 1 300 000. That estimate was conservative and was easily surpassed while we were still phasing in the daytime demand-responsive service.

CAPITAL PROGRAMS

The AATA has been extremely successful during fiscal year 1974-75 in multiplying local dollars with state and federal grants for the purchase of capital equipment. With \$288 060 raised locally, AATA attracted \$807 645 from the state of Michigan and \$3 606 576 from the U.S. Department of Transportation.

These allocations cover the transit fleet, buildings, automated coin-handling systems, maintenance items, and construction. Among the new hardware items are

1. A 46 700-m² (52 600-ft²) building for administration and vehicle services located between heavy transit points in downtown Ann Arbor and Ypsilanti (cost: \$1.3 million, equipment included);

2. Nine \$8000 transfer-point shelters for passengers moving between dial-a-ride and fixed-route vehicles;

3. Three-channel communications gear that provides for all dial-a-ride vans automatic readout of passenger addresses, voice verification facilities, and silent-alarm devices, all coordinated by a new dispatching center (cost: \$497 900); and

4. Eighty-three new automatic fare boxes to mesh with a vacuum-operated coin-handling system. The combination virtually eliminates security problems between the time a passenger puts his fare in the box and its ultimate delivery to the contracting commercial bank.

The armored strongbox feeds automatically into a massive

vault at AATA headquarters. Special equipment then takes the unopened box to the bank (cost of the system: \$249 500).

RELATIONS BETWEEN AATA AND CITY GOVERNMENT

Because financial resources derived both from the special 2.5-mill transportation levy and from governmental funding sources outside the city permitted expansion of the AATA, complex and unique questions emerged concerning the relationship between AATA and the city. The fundamental issue was AATA's independence.

AATA has a number of the characteristics of an independent agency. Under the state enabling legislation, the AATA exercises full corporate powers as well as certain rights of eminent domain and bonding. Moreover, AATA has a financial base derived from the 2.5-mill property tax and is the designated agency for receiving state and federal financial assistance, both for capital programs and for operations. On the other hand, the mayor and City Council have power of appointment and removal over members of the AATA's board, and the transportation millage is collected by the city rather than by AATA.

After several months of discussions and negotiations, an agreement was ratified by the City Council and AATA's board that defined in detail the relationship between the two entities. The city recognized AATA as the operating agency to provide mass transportation service to the public and designated AATA as the contracting agency for the use of the 2.5-mill tax levy designated by the charter for transportation purposes. The AATA agreed to pay the city 1 percent of the annual transportation millage in recognition of provision by the city of certain essential services, such as tax assessment and collection, review of public transit plans, and the processing of AATA materials for review by the City Council. The AATA and the city further agreed to determine annually whether any additional city services will be provided to and paid for by AATA. The AATA agreed that its budget will be submitted to the City Council each year for recommendations and comments and that the council will be informed when major AATA policy decisions are to be reached so that it can provide advice.

The following paragraph of the agreement characterizes the manner in which the two agencies expect to resolve any further questions that may arise:

Both the City and the AATA recognize and covenant their obligation as public bodies to exist harmoniously for the public good. Disputes or conflicting interpretations of this agreement are to be resolved amicably to the extent possible through discussions and negotiations by the two bodies with efficient and equitable service to the public being the uppermost objective of both.

The AATA is deeply concerned with long-range transportation planning for the entire urban area beyond the 16.1-km (10-mile) service radius that we are empowered to serve. Our current activities in planning include

1. Membership and active participation at all levels in the Ann Arbor-Ypsilanti Urban Area Transportation Study Committee (UATS), a regional entity charged with coordinating transportation planning in the area;
2. Participation in UATS's long-range regional transportation planning effort to determine how public transit fits into the region's overall development plans;
3. Participation in the comprehensive traffic study for Ann Arbor's central area;
4. Representation on the Transportation Task Force of the Southeast Michigan Council of Governments;

5. Participation in the study program now being conducted by the Southeastern Michigan Transportation Authority for rail service between Ann Arbor and Detroit; and

6. Representation on the Transportation Research Board.

The AATA staff recently completed a fiscal year 1976-77 plan for submission to the Michigan State Department of Highways and Transportation, and longer range (5-year) capital program development plans are being finalized. This work is funded by a \$25 000 planning grant through the Urban Mass Transportation Administration.

It is only proper that such an extensive effort at planning is underway at AATA. Our belief is that public transit can help shape our future in significant ways if we wish it to. One of the most basic elements of the AATA system is its flexibility and consequent capacity to learn how to improve from previous performance.

AATA's learning should improve significantly under the terms of a new \$100 000 federal-local program to monitor transit attitudes and behavior of households in the ridership areas. This survey will cover people who do not become customers, as well as those who do. It is hoped that this one-year renewable exercise will become an integral part of the system's development through building on its experience.

Ultimately, what is learned may have some surprising effects. Since AATA will be using dial-a-ride ridership data to chart new fixed routes (which, under heavy use, are more cost effective), there may be a partial de-emphasis of door-to-door dial-a-ride service in some areas. As dial-a-ride and the new survey point out more fixed-route bus runs, the number of dial-a-ride vans will probably remain constant, instead of growing, with their services being diverted to more specialized uses.

CUSTOMER RELATIONS

As a public entity, AATA must depend for support on its ridership constituency. The latest sampling reveals that, while there are some problems of the sort that can be expected in a highly innovative system, the majority of present users are satisfied with their service, and an encouraging growth potential seems to be built into the exercise.

In general, it has been established that AATA services reach all citizen groups in Ann Arbor—young, old, automobile owners and drivers, and those who do not own or drive an automobile. The most serious bias in our ridership is that, while the general population is about evenly divided between females and males, our user population is approximately 60 percent female (the proportion of females is typically even higher in other cities).

AATA riders usually make the same kind of trips that automobile users do. We provide for much more than just work and school trips. We find that dial-a-ride—including evening and weekend service—serves proportionately more shopping, personal business, and social or recreational trips than does line-haul bus service. For all AATA services, traveling to or from work is still the most important trip purpose—38 percent for line-haul bus and 30 percent for dial-a-ride (school trips account for approximately 15 percent, not including school subscription service; university or college, 13 percent; shopping, 12 percent; personal business, 12 percent; social-recreational, 9 percent; and other, 4 percent).

Most of our riders are regular customers who ride by choice or for convenience; more than half ride at least once a day. However, it is also significant that on a typical day approximately 7 percent of the riders on all

our services are riding for the first time. This indicates a good growth potential and the need for a comprehensive ongoing information program.

Overall, 76 percent of our riders seem to be satisfied with AATA service; the remainder of our customers have specific complaints. The most common specific complaints (30 percent) have to do with time-related variations and irregularities in service; these variations have been the target of a major quality-control program. The customer criticism that dial-a-ride telephones are too busy (about 8 percent of our dial-a-ride gripes had to do with telephones) has been largely addressed by the purchase of automatic telephone-answering equipment. An important finding is that riders feel safe aboard AATA vehicles and have little difficulty with each other or with AATA personnel.

Recently the Ann Arbor Planning Department commissioned a survey of the attitudes of a sample of the city's registered voters toward community services and issues. AATA's ratings proved highly satisfying. Sixty percent of those asked said that AATA's service had improved significantly in the preceding year. Even more encouraging—and basic—was the finding regarding the public's willingness to continue the experiment. The survey indicated that fully 80 percent would continue to support the special tax levy that makes the system possible. Since that is a considerably higher proportion than approved the original levy, it is a good harbinger for the future of the system.