Dial-a-Bus Implementation: A Living Example

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The process undertaken to transfer a demand-responsive dial-a-bus service from federally funded, experimental-demonstration status to permanent-operation status is described. The particular project described suffered from a local financial condition that was insufficient to support dial-a-bus services, technical difficulties, and problems in perceived attitudes toward the project. The strategy developed included an independent assessment of the program, consultant recommendations modified by local staff, expansion of the service to two additional areas, area-wide service to the handicapped and elderly, attempts to negotiate the labor clearances necessary to permit competitive solicitation of service vendors, and approval of an extended demonstration by the Urban Mass Transportation Administration.

Implementation is the most difficult phase of any research, development, or demonstration project—perhaps that is why the term was, until recently, only rarely mentioned. To be sure, any particular project included implementation for the duration of the particular test or as long as the agreed-on combination of federal and local funding lasted. But discussions of permanent implementation are conspicuously absent from the voluminous texts of government contracts. Even when unwritten commitments to implement have been made, events and budgets have often altered even the best of intentions. Recently, acknowledging the problem, the Urban Mass Transportation Administration (UMTA) renamed its Research and Development Program the Technology Development and Deployment Program, in an attempt to establish the essential link between the development of a new concept and its delivery to the public as a permanent part of an improved transportation system.

An examination of the dial-a-bus project in the Rochester, New York, area illustrates the difficulties inherent in permanently implementing a project based on a new technology. The project had its beginnings in October 1971, when three small buses were placed in demand-responsive service in Batavia. The Batavia Bus Service, or B-line, had been acquired by the Rochester-Genesee Regional Transportation Authority (R-GRTA) in June of that year. A very limited fixed-route service was operated until the transition to dial-a-bus. The dial-a-bus mode was adopted in an attempt to expand transit service to as many residents as possible by using the then-new and innovative technology of demand-responsive service.

R-GRTA had submitted an application to the Urban Mass Transportation Administration (UMTA) for demonstration funds to operate a dial-a-bus in the city of Rochester. But UMTA had determined, under Congressional pressure, that only one dial-a-bus project would be federally supported until such time as success was ascertained. The location of this project was Haddonfield, New Jersey, which was selected after the New Jersey State Department of Transportation committed itself to using its commuter operating authority to assist the project, as well as for reasons of size, density, and traffic potential.

In Rochester, a demand-responsive service was eventually established in the suburban community of Greece by using local resources. The service was named PERT (for PERsonal Transit) and offered door-to-door transportation within the service area and feeder service to fixed-route buses.

In 1974, R-GRTA commissioned a short-range improvement program study. A principal finding of the study report (1) was that PERT services should be expanded to include all suburban areas contiguous to the city of Rochester.

The report projected an annual operating cost, including rationalization of the fixed-route services, of $1.2 million for the entire suburban service. The substitution of PERT for the majority of the urban fixed routes on Sundays and at night was further projected to produce a saving in operating costs. The entire plan was based on the assumption that all of the operating assistance funds available under section 5 of the Urban Mass Transportation Act of 1964 could be drawn down by R-GRTA. Because of insufficient local share, this proved not to be the case.

In part because of the initiative Rochester had taken in implementing the dial-a-bus services in Batavia and Greece and developing an area-wide dial-a-bus plan and in part because UMTA was seeking an expanded site for testing computer dispatching software, in March 1975, Rochester was awarded a demonstration grant to develop an integrated adaptable metropolitan transit service program. The Massachusetts Institute of Technology (MIT)...
was designated as the principal subcontractor to R-GRTA and assumed a major role in the management of the project.

Among the stated objectives of the project were:

1. To demonstrate the potential of dial-a-bus service in a major metropolitan area in which regular transit is available,
2. To provide an improved level of transit service for all members of the community and in particular to provide a more convenient service for the elderly and other special-need groups, and
3. To test the ability of a dial-a-bus service to augment and complement a transit system composed of fixed-route, express, and park-and-ride bus services, i.e., system integration.

Significantly absent were any stated objectives relating to cost of service (in terms of affordability by the community) or permanence beyond the conclusion of the demonstration.

By October 1976, the subject of dial-a-bus was touchy indeed at R-GRTA. The main computer (located in Waltham, Massachusetts) had suffered a serious fire, and thus the use of a manual dispatching system was required for more than 7 months. Despite earlier use of a manual dispatching system by R-GRTA personnel, after the project had begun to operate under federal auspices and MIT assumed a stronger role, the development of an improved manual dispatching system had been relegated to a secondary role, essentially for backup use only.

The other major service problem was caused by vehicles that proved to be unsatisfactory. The unsatisfactory nature of the mixed fleet of small buses may be due to design deficiencies in these vehicles, or it may be due to the difficulties inherent in having the operator of a large diesel fleet [Regional Transit Service (RTS), R-GRTA's main operating arm] also maintain a diversity of small gasoline-powered vehicles, or it may be due to a combination of these factors. One of the unwritten objectives of the project was to evaluate various small buses and determine the type or types best suited to demand-responsive service. Thus, 7 different types of vehicles were being operated in the 29-vehicle fleet. All of them were unsuitable—as many as 20 were unusable on certain especially bad winter days.

The restoration of the computer dispatching capability and a changeover to modified throwaway vans rather than small buses considerably improved the service, as well as public confidence in it. The passing of the worst winter in a century also eased service problems. However, as the service improved, the time for conclusion of the project approached.

Despite all of the technical problems, the major factor influencing R-GRTA toward discontinuing the service was its very high cost. Under the terms of the demonstration project, the dial-a-bus was being operated by RTS. The employees, as members of the Amalgamated Transit Union, were paid at the same rates as the fixed-route employees. Thus, the dial-a-bus and fixed-route services had nearly identical operating costs, i.e., $29/vehicle. When cost can be substantially offset from fixed routes, particularly during peak hours, but at a productivity of 5 passengers/vehicle-h and an average fare of $0.85, the recovery rate is much too low to sustain demand-responsive services.

R-GRTA's decision about what was obviously a high-cost and certainly experimental operation was definitely affected by a serious financial constraint. That constraint was the increasing inability to generate sufficient local matching funds within the community to draw available federal funds to support the basic fixed-route services. Both state and county appropriations had been frozen at 1974 levels, and the RTS operating costs had continued to climb. The inevitable result was the prospect of reduction of basic services, a situation totally incompatible with providing dial-a-bus subsidies.

Severe limitations on the R-GRTA staff resources and time prevented a thorough in-house exploration of the possible alternatives for the future of the dial-a-bus. The staff itself was not unanimously convinced that the service should be continued. Regardless of the degree of skepticism, however, a decision had to be reached quickly, and the basis for that decision had to be firm.

During the course of the project, a number of changes had been made in attempts to adapt to the rapidly changing conditions. As it became clear that the projected financial situation would not be realized, plans to add a new service in Henrietta were dropped. Services in Greece were restructured several times, as were the late evening urban services. However, the project, it seemed, was suffering from a number of potentially fatal illnesses, although there was a late improvement in service reliability. These illnesses included the lengthy computer malfunction and endless vehicle problems. There was also a notable lack of management attention from all quarters. The R-GRTA staff had been too thinly spread for some time, with primary reliance on MIT for management. R-GRTA had been operating without an executive director for nearly a year. The dial-a-bus had received a great deal of attention from him, and his departure had left a significant void, particularly in the area of project management. MIT, while conscientious, was an absentee manager and should not have been expected to replace R-GRTA as primary manager. Although MIT did have personnel on site, additional resources were needed. RTS, never enthusiastic about the project, remained neutral, at best. UMTA, for its part, was a willing participant in frequent meetings, but did not insist that the participants rectify the management difficulties.

Thus, with UMTA encouragement and staff consensus, in January 1977, R-GRTA hired the California-based firm of Systan, Incorporated, to undertake an in-depth, albeit brief, assessment of the project to date with the objective of defining alternatives for permanent implementation.

Their report validated the principal obstacle to dial-a-bus implementation, i.e., that the financial condition of the Rochester Genesee Regional Transportation Authority (R-GRTA) has changed dramatically since the comprehensive program calling for an areawide system of demand-responsive Personalized Transit (PERT) services was developed. Unless cost-effective successors to the present PERT service can be found, demand-responsive services may be discontinued. The far-reaching transit objectives called for in the comprehensive program of 1974 seem to be financially infeasible. Moreover, the experience of the demonstration project suggests that demand-responsive transit must play a more limited role than that originally foreseen.

R-GRTA had asked that Systan evaluate a number of specific alternatives including:

1. Continuation of the demonstration program beyond its scheduled termination date if additional experimentation was required to enable an orderly changeover to permanent services;
2. Implementation of modified fixed-route services to replace the services available under the demonstration program;
3. Continuation of all or certain demonstration services under the auspices of RTS;
4. Continuation of all or certain demonstration ser-
vices by other vendors in coordination with RTS; and
5. The use of demonstration resources to provide an areawide special service to the elderly and handicapped, either by RTS or through another vendor.

The Systan evaluation identified 12 general conclusions. These were categorized as to demand (numbers 1 through 5), level of service (numbers 6 and 7), productivity and cost (numbers 8 and 9), system integration and route rationalization (numbers 10 and 11), and computerized dispatching (number 12).

1. Demand for most PERT services did not reach anticipated levels, yet PERT clearly served a market not otherwise served.
2. Although the dial-a-bus users were predominantly female and transit dependent in the sense that they do not drive, dial-a-bus also attracted a diversity of users in terms of age, employment status, and trip purpose.
3. A large part of the dial-a-bus demand could be served by a system of fixed routes at approximately equivalent service levels, productivities, and costs.
4. During the steady-state period, the dial-a-bus service achieved slightly lower, but not significantly different, market penetration than comparable many-to-many demand-responsive services in other cities.
5. Work subscription services attracted a market that would rarely use transit otherwise.
6. The travel reliability of the dial-a-bus service, as measured by the ability of users to predict the timing of their trips, was lower than that of the fixed-route service but improved after the computerized dispatching system was repaired and vehicle reliability increased.
7. As measured by demand and attitudes, dial-a-bus, group trips, and special services for the handicapped are of great value to the transit dependent.
8. The productivities of all the PERT services except group trips resulted in costs that were higher than those that would have resulted if the service had been offered by taxis at prevailing rates.
9. During the steady-state period, dial-a-bus productivities in Greece were slightly lower, but not statistically different, than the productivities of similar demand-responsive systems in other cities.
10. The strategy of route rationalization in Greece (i.e., the substitution of dial-a-bus for curtailed fixed routes) resulted in an increase in travel times, a decrease in transit ridership, a shift of trips to the peak period, an increase in the vehicle-hours of service required and, hence, a higher total cost of service. The dial-a-bus does not seem to be an adequate substitute for fixed routes that have been operating in a radial fashion for many years.
11. Efforts to coordinate dial-a-bus vehicles and fixed-route buses did not appreciably reduce transit times.
12. There are still insufficient data to determine whether computerized dispatching operates more cost-effectively, yields greater productivities, or offers higher service levels than manual dispatching.

Although many of these conclusions are negative, the continuation of several specific types of demand-responsive services might be worthwhile if they could be structured on an affordable basis. Systan made eight recommendations—four short range and four long range.

The short-range recommendations all involved accounting changes and immediate service modifications intended to reduce operating costs. With the exception of some specific modifications, principally in the area of revised federal-local share ratio, the R-GRTA staff concurred with these, and they were implemented.

The long-range recommendations (summarized below) all dealt with preserving the many-to-many dial-a-bus service on a more economical basis.

1. Talks should be initiated with contract paratransit management firms, taxi companies, and union representatives concerning paratransit services to determine the possible terms under which they would offer these services.
2. On the basis of the information obtained in the discussions with possible suppliers, costs should be re-estimated and terms of reference for bidding and negotiation should be determined.
3. Because the demonstration project is the least risky way to proceed to an areawide dial-a-bus service, it should be extended to September, 1978, provided that UMTA agrees to a 50/50 cost sharing through September, 1977, and an 80/20 cost sharing thereafter.
4. On the basis of the demand observed in Greece and Irondequoit (a community that had been added to the demonstration project in 1975), the original projection of a fleet of 100 vehicles should be scaled down to a fleet of 29 vehicles equipped with lifts. These can provide both service to the handicapped and elderly and general dial-a-bus service. (The local share of a 1-year demonstration extension on this scale was projected at $292,000, with an eventual annual cost to R-GRTA of $342,000 (these cost estimates were based on the ability either to establish lower wage-rate classifications with RTS and its union or to solicit private vendors on a competitive basis).)

However, the R-GRTA staff had serious reservations about these recommendations. The prospect of a 29-vehicle areawide dial-a-bus and service to the handicapped and elderly was undeniably appealing and also a bargain if the $342,000 annual local-share projection proved accurate. However, an overriding problem was the inability to finance the project on a continuing basis, even at the $342,000 level.
The staff also believed that, in keeping with the changes in UMTA policy regarding paratransit services and private operators and to ensure fairness in expanding the service, it was appropriate to introduce an element of competition. Finally, they questioned the technical feasibility of instituting an areawide general dial-a-bus service in a 1-year time frame.

Another factor had a strong effect on the staff modifications to the Systan recommendations. R-GRTA has always been proud of the active role it has played in providing transportation for the handicapped and elderly. In addition to reduced fares for the elderly and a commitment to purchase kneeling buses for the fixed-route service, the dial-a-bus project has pioneered in door-to-door transportation for handicapped and elderly passengers on lift-equipped vehicles. The Greece and Irondequoit services were seen as pilot projects that would lead to an eventual areawide service to the handicapped and elderly.

As with both the fixed-route service and expansion of the general dial-a-bus service, the constraint has been inadequate funding. Nevertheless, R-GRTA acted in part on the belief that some affirmative action was required by law and in part on the expectation that general dial-a-bus service would disappear. An appropriation of $150,000 of scarce local funds was made to be used as local matching for a $300,000 limited areawide service to the handicapped and elderly. This commitment was to exist whether or not general dial-a-bus service continued.
Thus, the R-GRTA staff modified the Systan recommendations for a 29-vehicle area-wide service as follows:

1. Systan recommendations: (a) 29-vehicle area-wide dial-a-bus service, including service to the handicapped and elderly; (b) private operation; (c) implement through UMTA demonstration until September 1978; (d) approximate local share for the demonstration of $292,000; and (e) approximate annual operating deficit after the demonstration of $342,000 versus 2.

2. Staff recommendations: (a) continue federally assisted demonstration through March 1979; (b) maximum R-GRTA local share (matching funds for service to the elderly and handicapped) of $150,000 each in FY 1977/1978 and FY 1978/1979; (c) continue Greece and Irondequoit under RTS operation for the duration of the demonstration; (d) add two additional service areas (8 to 10 vehicles); (e) select operator by competitive bidding (private or RTS); (f) service-area selection criteria to include commitment by towns that, if demonstration meets agreed-on criteria, will pay 50 percent local-share (25 percent if New York State participates) subsidy for continued operation; and (g) no continuing financial burden on R-GRTA.

Intensive discussions with UMTA officials were encouraging regarding the new strategy.

The key features of the plan as it developed included a somewhat longer demonstration program structured to permit several months of preparation and 1 year of service, which would coincide with the R-GRTA fiscal year.

In addition, the maximum local-share commitment was to be local annual $150,000 appropriation made for service to handicapped and elderly persons and matched by funding under section 5 of the Urban Mass Transportation Act of 1964 (with UMTA’s concurrence these funds were tentatively earmarked for services to the handicapped and elderly). The remainder of the approximately $1.2 million project was to be funded from the federal demonstration program.

It was agreed that services to Greece and Irondequoit would remain unchanged for the duration of the extended project and that RTS would continue to operate the services at applicable wage rates. Thus, residents of those communities would be assured of service continuity at least for the demonstration period.

In addition, two more service areas would be added to the project. Service to the two new areas would be sought competitively from private vendors or from RTS and its union at new wage scales along the lines established in other cities for community transit services. The two additional areas would be selected from among the towns, other than Greece and Irondequoit, that are contiguous to the city of Rochester. The principal criteria for selection was set as willingness to participate on the following basis: For the duration of the demonstration, there will be no cost to a participating town, but on criteria of success to be defined mutually by the town and R-GRTA, the town must agree that if the project is successful, the town (rather than R-GRTA) will fund the local share of future operating deficits.

The opinion of the Monroe County Legislature with respect to the dial-a-bus question was a particularly sensitive issue. This sensitivity arose because initially, R-GRTA had been so enthusiastic about the concept, claiming dial-a-bus to be virtually economically self-sufficient. In the ensuing years, that enthusiasm had been tempered by the losses not only of the dial-a-bus service, but also of the fixed-route service. Some legislators believed that scarce dollars being used to fund the costly dial-a-bus service should have been channeled to reduce the increasing deficits of the fixed-route service.

Furthermore, there was a measure of support for expanding services to the handicapped and elderly but little public reaction either for or against general dial-a-bus service.

In an attempt to update and inform the legislators, as well as to assess their opinions, the R-GRTA staff met with key leaders of the legislature and explained the projected program. Their attitude could be characterized as receptive and neutral on the premise that, as long as the legislature was not being asked for additional funds, there would be no outright objection or opposition. Some legislators were enthusiastic about the possibilities of introducing a new basis for union operation and competition for service vendors.

Finally, at an R-GRTA meeting on April 26, 1977, resolutions (3) embodying the staff recommendations were approved by a vote of 10 to 6. The favorable vote, although not overwhelming, was certainly both gratifying and surprising to the staff. Many advocates of expansion of the dial-a-bus service were indeed surprised by the number of statements made by commissioners and county legislators in favor of this.

After a meeting with the editorial board of the Gannett newspapers, at which the program and its risks and benefits were explained, a lengthy and favorable editorial appeared in the Rochester Democrat and Chronicle of May 17, 1977 (4). The press has since taken an active interest in reporting new developments.

A draft application was prepared and submitted to UMTA in June.

The next step was a series of information meetings held with representatives of the eight suburban towns contiguous to the city. After those meetings and local presentations in some of the communities, two towns, Brighton and Henrietta, expressed by written resolutions a desire to participate in the project, two declined and, by fall, discussions were under way in two others.

The implementation process is complex, lengthy, and often frustrating. The pressure of time will determine a solution—perhaps permanently. In mid-1977, R-GRTA was facing a series of problems. The available funds would support the services only through October. By early October, approval of the grant application would have to be obtained from UMTA or discontinuance notices posted for the Greece and Irondequoit services. Similarly, if the demonstration would not be extended, a decision would have to be made and implemented about the area-wide services to the handicapped and elderly.

There were many encouraging signs to indicate that perhaps the locally devised and tailored implementation strategy would ensure permanence to the dial-a-bus service, but there remained significant hurdles.

One hurdle was to obtain the certification required by section 13c of the Urban Mass Transportation Act from the transit union regarding project extension. Nationally, such certifications were being obtained, but the local situation was uncertain. It was difficult for the union to accept the concept of a private vendor performing transit services. On the other hand, the union employees were assured of not only the Greece and Irondequoit services but also the opportunity to compete for the two new service areas.

Another hurdle was the necessity for UMTA approval. Without that, R-GRTA would have no recourse but to terminate the services at the end of October 1977. R-GRTA and the Rochester community had been living with the heritage of a program caught in an unstable world—a world of reality. The project suffered because of lack of leadership during a critical period. It suffered from the financial crisis that has affected the entire New York State transportation program (and virtually all other
aspects of state government. Similarly, the local financial conditions in Monroe County could not fill the gap created when state assistance was frozen at 1974 levels. Instead, the county, never enthusiastic about being mandated by the state to support transit, merely adhered to the unchanged match dictated by the state.

Thus, the situation in 1977 was quite different from that when the project was first proposed as a part of an overall transit expansion program. And it has not proved to be a simple matter to modify such a project in real time to meet changing goals in an unstable environment. Assumptions as to available subsidy, operating costs, demand, and technical readiness were inaccurate. Plans to cope with the institutional problems of transition from exhibit to permanent service were not made.

Nevertheless, significant accomplishments were made in a short time. Service was reliable when the computer was functioning and less temperamental vehicles were used. A detailed assessment of project status and alternatives was conducted. Superfluous services were trimmed to effect economies. Attitudes toward the program generally became positive. A commitment to areawide service to the handicapped and elderly was made. At least two communities indicated a willingness to participate even though they realize that R-GRTA cannot finance the local share of operating deficits at the conclusion of the program.

Only time will show whether the necessary section 13c certification and final UMTA approval can be obtained.

Is it worth it? Speaking for the R-GRTA staff, for MIT, and for our passengers, I must offer an unqualified "yes" response. Dial-a-bus service offers the only potential for transit in low-density suburban areas. The service affords a freedom from a second automobile for housewives and a new mobility for handicapped and elderly persons who have no real alternative. Other potential transit-oriented benefits of large-scale computer dispatching, competitively selected vendors, and fixed-route rationalization remain to be realized.

What have we learned that may be of interest to other communities regarding the relative roles of various public transit options?

Dial-a-bus—paratransit—is not a panacea. Where the volume of patronage is sufficient, obviously fixed-route operation is more economical. Dial-a-bus, on the other hand, is really the only option for low-density areas.

A community should be very sure of the role it wishes the paratransit service to perform. Is it the typical low-density many-to-many service? Is it a more limited service to the handicapped and elderly? Above all, how will such service be financed?

What are the criteria for determining whether an area should be served by fixed-route or paratransit service? The question is not an easy one. We have learned, for example, that if we could economically isolate the outer ends of many of our fixed-route services, their stand-alone economics would be no better than those of dial-a-bus, but methods of allocating costs and subsidies in our community cause such distinctions to become largely academic, at least at present.

Such may not be the case in the future. As transit employees have come to recognize the inherently high cost of such services, they have shown increasing willingness to negotiate less expensive wage and benefit packages and less restrictive work rules in exchange for the prospect of becoming part of the growing rather than the shrinking portion of the industry. If we reach a point at which the marginal costs of extending fixed-route lines carrying few passengers can be traded off against the costs of implementing dial-a-bus services in those areas, then perhaps more rational integration of fixed-route and paratransit services will be possible and result in savings to the operator and better service to the customer.

Negotiating the agreements that are making some of these things happen in a few communities is but one of the early steps in the evolution of paratransit.

Van pools and shared-ride taxi services are other configurations of paratransit service that become possible as community and employee awareness of transit economics increases. Such services, however, should not be established to compete with or further drain the ridership of the basic fixed-route services.

Most of these services must be considered in the light of the particular institutional and financial framework in question. The proper planning for the management of these services is paramount—the technology is a secondary issue.

REFERENCES


Review of Paratransit Activities in Canada

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Canadian experiences with paratransit services—dial-a-bus services in 12 communities and five car- and van-pooling operations—are reviewed. In general, the Canadian operations have differed from those in the United States in the following ways. The Canadian operations are typically more productive and operate at lower costs per rider, and the demonstration projects have been more modest in scale and the use of new technologies. The introduction of computerized routing and scheduling techniques has usually been postponed until the operation has achieved stability. Dial-a-bus operations are usually treated as interim services to be replaced by fixed-route transit as soon as possible, and organized ride-sharing programs have been subordinate to dial-a-bus and mass transit services.