handicapped simply cannot be provided so that total system costs are equivalent to revenues. The more important question, which has yet to be answered, is whether a coordination mechanism, which itself initially requires the expenditure of additional resources, in the long run either lowers the cost or increases the quality of most transportation services delivered in a community. The staffs of both Metrolift and ACCESS believe this question will eventually be answered in the affirmative.

It does appear that most agencies in both cities are receiving better service for their clients than they did before. In addition, many agencies find it easier to deal with the broker than to deal with local transportation providers directly or to own vans and provide services themselves. However, there is some self-selection involved; in both communities, agencies that already provided or received high levels or even satisfactory levels of transportation services were far less likely to purchase service from the broker. Both systems may well have attracted those agencies that were already very unhappy with their current arrangements.

Appropriateness of Specialized Services as Response to Needs of Handicapped and Elderly

Neither Pittsburgh nor Houston has provided fixed-route, accessible bus service with which to compare the specialized services provided. Yet both cities have experienced fairly high ridership among a variety of both the handicapped and the elderly. In general, the handicapped groups in both cities are pleased enough with this service not to expect fixed-route, accessible service; in Houston there has been little demand that the city actually operate the lifts on its 326 lift-equipped buses. In addition to meeting the needs each week of a larger number of travelers than have ever been accommodated by the accessibility features on any fixed-route, accessible service, both of these specialized services, delivered through a brokerage, are meeting the needs of ever more financially strapped social- and human-welfare agencies.

It is not clear whether the specialized systems in Houston and Pittsburgh are a more appropriate response; it is clear that they are meeting the real transportation needs of a large number of citizens. There are some complaints, difficulties, and problems, but the citizens of each community seem relatively committed to the idea of specialized transit service delivered to the elderly and the handicapped through a broker. That community support seems to be the ultimate test of the appropriateness of a service.

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Data on the Pittsburgh ACCESS system were obtained from an on-site visit, from ACCESS and PAT staff, and from published and unpublished documents. Gratitude and appreciation are extended to Bill Millar, Tom Letky, Ervin Roszner, and David Alschuler, who were generous with their time and insights but who also bear no responsibility for the opinions stated here or for the use to which their data were put.

Charging Human Service Agencies for Public Transportation Services in Rural Areas

JOHN COLLURA, JAPHET H. NKONGE, DALE F. COPE, AND AYODELE MOBOLURIN

Seven procedures that could be used to charge human service agencies for public transportation services in rural areas are presented and evaluated. These procedures consist of two general types: (a) population based and (b) use based. A population-based procedure charges each agency on the basis of the number of clients, whereas use-based procedures charge agencies according to the amount of service consumed in terms of passenger trips, passenger miles, vehicle hours, and/or vehicle miles. The procedures are evaluated in terms of their ability to satisfy objectives of simplicity, cost, efficiency, and equity as well as their applicability to different types of public transportation services (i.e., shared-ride versus exclusive-ride services). In addition, the constraints of funding sources, the demands of accountability, and costing methods are examined. This presentation of the procedures will be of importance to public transportation providers and administrators of human service agencies who are negotiating contracts for the provision of public transportation services to agency clients. The evaluation of the procedures will be useful in determining the most appropriate procedure for use in particular circumstances. Finally, it is expected that the presentation and evaluation of procedures will aid in the task of simplifying and standardizing accounting, reporting, and billing methods for use in rural public transportation programs as mandated in the White House Rural Development Initiatives of June 1979.

One of the major actions to improve local rural public transportation outlined in the White House Rural Development Initiatives of June 1979 was to "improve the delivery and effectiveness of local transportation programs through better coordination and simplification of administrative procedures" (1). Under the terms of this mandate, a task force composed of representatives from the then U.S. Department of Health, Education, and Welfare; the U.S. Department of Transportation; the Office of Management and Budget; and seven of the states was to be established to develop simplified and standardized accounting, reporting, and billing procedures for use in social service/public transportation programs (1). These directives, together with the impetus toward coordination of social-service-agency transportation services embodied in Federal Highway Administration (FHWA) Section 18 guidelines (Urban Mass Transportation Act of 1964, as amended), have increased the incentive for agencies to ensure that the transportation provided to their clients is efficient and service effective.

Administrators of human service agencies who are interested in purchasing transportation services

from a provider are faced with a myriad of billing, accounting, and reporting procedures for which they are responsible (2). In addition, in the process of seeking the optimum coordination scheme among agencies and providers, the agency administrator will be concerned with the charges made by the transportation provider for services delivered to clients.

This paper presents and evaluates seven procedures that can be used to arrive at charges for services made available to agency clients on a demand-responsive basis, either under a shared-ride system or an exclusive-use arrangement. The constraints of funding sources, accountability, simplicity, cost of use, and equity of the various procedures are examined and discussed. It is hoped that the delineation of specific variables to be incorporated in such allocation procedures will aid in the effort to simplify billing and accounting methods as well as demonstrate to agency administrators the possibility for encouraging efficient and cost-effective service under the application of a particular charging procedure.

ALTERNATIVE PROCEDURES

Regardless of the source of revenues, or the presence of user-side or provider-side subsidies, costs incurred by the transportation provider in the delivery of service to clients of human service agencies will be charged in some fashion to the agency. The question that must be addressed by the provider and the agency administrator during negotiations is how to determine these charges and on what basis. Accountability requirements dictate conditions that must be discussed by the agency administrator and the provider during planning for service. The number of eligible clients involved, allowable trip purposes, methods for identifying the sponsorship of the client and/or the trip, and the potential costs for service must be delineated. Simplified billing procedures, under which the transportation provider will be able to receive payment for a specific amount of service delivered to an agency over a specified time period, will also be aided by the procedures discussed here.

The procedures presented in this paper are of two types. One type of charging method is based simply on the number of clients to be served and uses client population as the base variable in the procedure. The other type of procedure uses variables that measure the amount of service consumed. Examples of such variables include passenger trips, passenger miles, and vehicle hours.

Charging Agencies on Basis of Number of Clients

A client-based procedure will charge each agency served by the transportation provider on the basis of the number of clients affiliated with each. The procedure will be simple and easy to understand and requires no ridership data for implementation. It is appropriate for use in a shared-ride service that operates on a demand-responsive basis because each client of each agency has equal access to the transportation services that are available.

In order to determine charges to agencies under a client-based procedure, the following calculations will be made (3):

1. Calculate the percentage of all clients affiliated with agency A,
2. Determine the total costs of service provided to all clients, and
3. Multiply the total costs of service by the percentage of agency A clients.

The formulation of this single-variable procedure is

$$C_A = (CL_A/CL_T) \times TC \quad (1)$$

where

C_A = charge to agency A,
CL_A = number of clients affiliated with agency A,
CL_T = total number of clients in all agencies, and
TC = total costs of service.

Thus, if 10 percent of the total regional client population is affiliated with Agency A, then agency A will be charged for 10 percent of the total costs of service. It is recognized that an agency might have more than one funding source and that there will be a need to distinguish between clients eligible under each funding source. If such a situation exists, it is likely that a use-based procedure will be employed.

In cases where another level of government is partly subsidizing the transportation services, the allocation of costs obtained above would be multiplied by the percentage of costs that must be covered by the human service agencies. The formulation would incorporate this percentage as follows:

$$C_A = (d/100)(CL_A/CL_T) \times TC \quad (2)$$

where d is the percentage of total costs to be charged to agencies.

It may also be the case that an amount of revenue is obtained by the provider either directly or indirectly in support of clients' transportation. In that instance, the procedure would be modified to subtract those revenues from an agency's charges so that the agency is credited with the revenues generated for its support. The formula would then be

$$C_A = (d/100)\{[(CL_A/CL_T) \times TC] - R_A\} \quad (3)$$

where R_A is revenues received in support of transportation for clients of agency A.

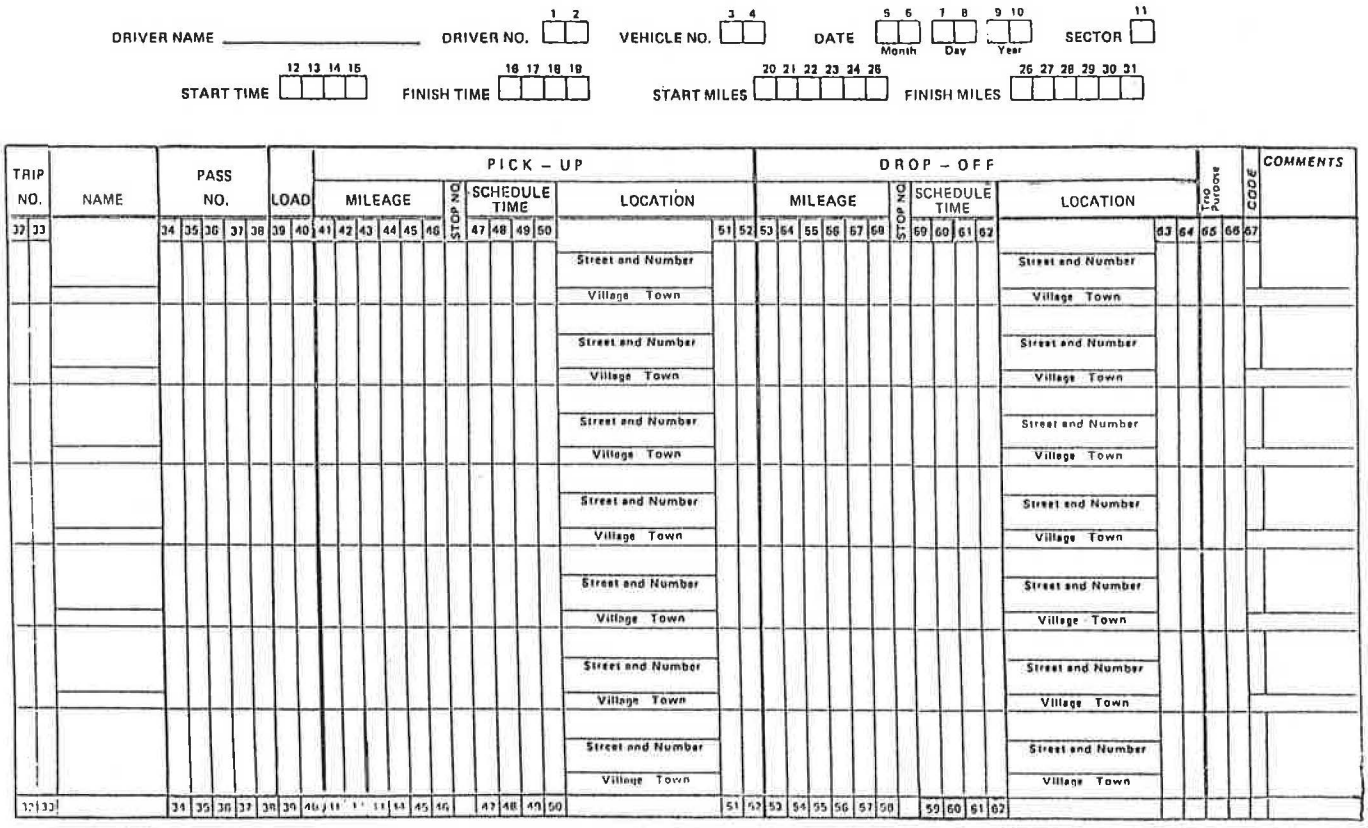
Equation 3 would be used, for example, if Section 18 funds and state assistance were available and the agency had "restricted funds" available, which could only be applied as a revenue (R_A). If $R_A < (CL_A/CL_T) \times TC$, then a charge to agency A would result. If $R_A \geq (CL_A/CL_T) \times TC$, then no additional charge would be made to agency A.

Charging Agencies on Basis of Use

Client-based procedures will often be rejected when charges to human service agencies are determined in favor of procedures that embody (a) a use variable and (b) an operating cost factor, or unit cost, to which all or part of the use can be attributed. Within this format, a wide range of possibilities, from simple to complex, still exists. In fact, innumerable formulas can be created by recombining use variables and the methods of attributing costs to them. For the purposes of this paper, six sample use-based procedures are presented and evaluated to provide guidance to agency administrators and transportation providers.

The six example procedures use the following use variables and combinations of variables: (a) passenger trips, (b) passenger miles, (c) passenger trips and passenger miles, (d) vehicle miles, (e) vehicle hours, and (f) vehicle miles and vehicle hours. Each procedure is described in terms of the use measures incorporated in it, and the application of each procedure to a particular service type is examined.

Figure 1. Sample driver log form.



Passenger Trips

In order to apply the passenger-trip procedure to charging human service agencies for transportation, a systemwide unit cost per passenger trip would be calculated by dividing the total costs of service by the total passenger trips delivered to all agencies. All costs of service are attributed, in this case, to the single variable, passenger trips. This procedure will be most appropriate for agencies that participate in a shared-ride service, since each agency will be charged the cost per passenger trip for only those trips made by its own clients.

A trip-based procedure is simple, and its implementation does not incur high costs. The agency affiliations of various riders must be determined, of course; these data will be collected by the dispatcher and verified, possibly through a driver log form (see Figure 1) or an identification pass (4).

The calculations that must be performed include the following:

1. Determine the total costs of service over a specified time period.
2. Determine the total number of passenger trips provided over the period.
3. Divide the total costs of service by the total number of passenger trips to arrive at an average systemwide cost per passenger trip.
4. Identify the number of eligible trips made by clients of each agency.
5. Multiply the number of eligible trips made by clients of each agency by the average systemwide cost per passenger trip.

The formulation of the procedure would be as follows:

$$C_A = PT_A(TC/PT_T) \quad (4)$$

where PT_A is passenger trips by clients of agency A and PT_T is total passenger trips provided.

As in the case of the client-based procedure, percentages of the total costs to be paid by agencies could be represented by d/100, and revenues generated in support of agency clients could be deducted through the use of R_A. As previously suggested, an agency with multiple funding sources may require the provider to disaggregate the total number of passenger trips by funding source.

In the passenger-trips-based procedure, all use of the system is credited to the single variable. It should be noted, however, that number of passenger trips represents only one component of total use; trip length is the other component. The disadvantages to using passenger trips as the sole variable stem from the fact that trip distance is not a factor in the procedure. Thus, a penalty may be imposed on those agencies whose clients are centrally located and may take many short trips. This agency may end up subsidizing other agencies' clients who are dispersed geographically and may be taking a small number of long trips.

Passenger Miles

In a passenger-miles-based procedure, as in the passenger-trips-based formula, all costs of service are attributed to the single variable. An average systemwide cost per passenger mile is arrived at by dividing total system costs by total passenger miles of service. Each agency's passenger miles are determined by calculating the length of trips taken by its clients from their origins to their destinations.

The use of the variable, passenger miles, in a

procedure may require the recording of "on and off" odometer readings by the driver of the vehicle; the processing of these data would increase the cost of using this procedure. However, in a demand-responsive system, the "shortest distance" between various typical origins and destinations can be predetermined from a trip matrix and recorded by the dispatcher, which eliminates the need to process odometer readings.

If it is decided to charge agencies on the basis of passenger miles, then the procedure would be formulated as follows:

$$C_A = PM_A(TC/PM_T) \quad (5)$$

where PM_A is passenger miles traveled by clients of agency A and PM_T is total passenger miles traveled by clients of all agencies.

As in the case of the passenger-trips-based procedure, revenues may be deducted and/or percentages of total costs allocated to agencies modified by the use of R_A and/or d/100. It should be noted here that deadhead mileage (that time when a vehicle is running without passengers) is accounted for in these procedures through the calculation of the average systemwide unit cost per passenger trip or mile. The disadvantage to using passenger miles as the sole variable is the converse of that noted under passenger trips; i.e., a miles-based procedure will tend to impose a penalty on agencies whose clients are located on the periphery of a service area.

Passenger Trips and Passenger Miles

The combination of the use variables, passenger trips and passenger miles, in one procedure presents some complications in terms of cost accounting and data collection but would probably be deemed more equitable by agencies that are charged because of the lack of penalties associated with the use of either passenger trips or passenger miles as the sole variable. The use of this two-variable procedure requires a preliminary breakdown of total system costs into two categories: (a) costs associated with passenger trips and (b) those costs directly attributable to trip length. The issues of identification of passenger affiliation, collection of necessary data, and the method of breaking down the total costs into the two categories should be addressed by the agency administrator and the transportation provider at the time of negotiation.

The procedure is formulated as follows:

$$C_A = [\alpha_1(PT_A/PT_T) + \alpha_2(PM_A/PM_T)] \quad (6)$$

where

α_1 = costs associated with trip volume,
α_2 = costs associated with trip length, and
$\alpha_1 + \alpha_2$ = total costs of service.

The determination of those costs that should be associated with trip volume (number of trips), represented as α_1, and those costs that should be attributed to trip length, represented as α_2, will be made by participants. Usually, fuel and oil expenses, along with maintenance costs, are charged to passenger miles. Driver wages and the costs of dispatching, office personnel, expenses, and supervisory personnel are assigned to passenger trips. A sample breakdown of the two cost categories is given below:

Cost Element	Cost Assignment: Trips	Cost Assignment: Miles
Wages		
Driver	X	
Dispatcher	X	
Fringe benefits	X	
Fuel and oil		X
Tubes and tires		X
Vehicle		
Insurance	X	
Lease	X	
Licenses and registration	X	
Storage	X	
Maintenance		X
Utilities	X	
Salary		
Administrator/manager	X	
Secretary/bookkeeper	X	
Materials and supplies	X	
Telephone	X	
Office rental and equipment	X	

By using this two-variable procedure, systemwide unit costs per passenger trip and per passenger mile are calculated and agencies are charged on the basis of the percentages of passenger trips and miles delivered to their clients. Once again, revenues may be deducted from the charge to the agency, and other government subsidies may be accounted for.

Vehicle Miles

Whereas the previous three procedures are most useful in a shared-ride arrangement because of the fact that passenger use is identified by agency affiliation when clients of several agencies are sharing a vehicle, the use of vehicle-related variables is more appropriate in the exclusive-use arrangement, where a particular vehicle or vehicles are "dedicated" to serving a specific agency for a specified period of time. The following three procedures assign all costs of service to a variable or combination of variables that examine vehicle availability and/or use by the particular agency during the time of dedication.

The use of the single variable, vehicle miles, assigns all costs of service to that measure. A systemwide unit cost per vehicle mile is established by dividing the total costs of service by the total vehicle miles delivered, and each agency is charged on the basis of the number of vehicle miles consumed by its clients. In the case where a particular agency receives exclusive use of a vehicle for a specified period, odometer readings taken at the beginning and the end of the period will reveal the number of agency vehicle miles to be charged.

The vehicle-miles-based procedure would be formulated as follows:

$$C_A = VM_A(TC/VM_T) \quad (7)$$

where VM_A is vehicle miles traveled in service to agency A and VM_T is total vehicle miles traveled in service to all agencies.

It should be noted that it is possible to use a vehicle-miles-based procedure to allocate the costs of service among the agencies participating in a shared-ride service. Data requirements would include identification of clients by agency and vehicle miles traveled by each rider. Therefore, a record would have to be kept of the "on and off" odometer readings at the time of boarding and disembarking for each passenger. The processing of these data would be expensive. For example, if seven passengers are on a bus that travels 1 mile and four of the passengers are affiliated with

agency A, then agency A would be charged for four-sevenths of a vehicle mile. The complications are obvious. However, the use of a vehicle-miles-based procedure would have the advantage of encouraging group ridership in a shared-ride system, since any single agency will pay only once for each vehicle mile delivered to one or more of its clients. This encouragement toward group riding is also operative under the application of the vehicle-miles-based procedure in a dedicated service. It will be to the agency's advantage to encourage several of its clients to ride together.

Vehicle Hours

The procedure for charging agencies based on vehicle hours of service available to clients on an exclusive-use basis differs from the use of vehicle miles in that the procedure may not measure actual use but the potential for use. For example, if agency A has one vehicle dedicated to the exclusive use of its clients from 11:00 a.m. to 1:00 p.m. every weekday, then agency A will pay for 10 vehicle-h of service each week.

The vehicle-hours-based procedure may be formulated as follows:

$$C_A = VH_A(TC/VH_T) \quad (8)$$

where VH_A is vehicle hours of service available to clients of agency A and VH_T is total vehicle hours of service available to all agencies.

As in the case of other single-variable procedures, all costs of service are assigned to the variable and a unit cost per vehicle hour is established by dividing total costs of service by total vehicle hours. Then each agency is charged on the basis of the number of vehicle hours available to its clients.

Vehicle Miles and Vehicle Hours

The procedure that combines vehicle miles and vehicle hours incorporates measures of actual use and availability into one formula. A cost breakdown is required. The total systemwide costs of service will be broken down into two categories: (a) costs that vary with the number of vehicle miles traveled and (b) costs associated with mere availability of service. Fixed costs of service will often be assigned to vehicle hours whereas variable costs of service are assigned to vehicle miles.

The formulation of this two-variable procedure would be

$$C_A = \left\{[\alpha_1(VM_A/VM_T)] + [\alpha_2(VH_A/VH_T)]\right\} \quad (9)$$

where

α_1 = costs associated with vehicle miles,
α_2 = costs associated with vehicle hours, and
$\alpha_1 + \alpha_2$ = total cost of service.

This two-variable procedure is most appropriate when service is provided on an exclusive-use basis. The complexity and costs of data collection and processing for the use of vehicle miles and vehicle hours are high when the service is provided on a shared-ride basis; however, this procedure does provide an incentive for agencies to encourage their clients to group ride, since the agency will be charged for the same number of miles and hours regardless of the number of clients riding the vehicle at the same time.

COMPARATIVE EVALUATION OF PROCEDURES

The single client-based procedure and the six service-related procedures described in this paper can be evaluated in terms of the criteria of simplicity, cost of use, and equity. In addition, the suitability of particular procedures for specific types of service provided on a demand-responsive basis to human service agencies can be analyzed. Procedures may also be evaluated on the basis of their ability to satisfy objectives of cost-efficiency and service-effectiveness, including the incentive provided for group ridership.

The criteria of simplicity, cost of use, and equity are often cited as major issues of concern in the design and selection of a procedure to charge human service agencies for service. Simplicity refers to both the formulation of the procedure and its ease of application and is closely related to cost of use. Generally, the more complex the formulation of a procedure, the more data its implementation requires. Collection and processing costs will rise with the data requirements inherent in the component variables. A simple procedure will usually be inexpensive to use because minimal data are required and computer processing is not necessary. However, a simple procedure, such as that based on number of clients, may be inappropriate when the overriding concern is to institute a charging method that measures relative use by clients of different agencies.

Use-based procedures, which charge agencies on the basis of amounts of service available and/or delivered to clients, will often be deemed more equitable in terms of having each agency pay for the service it receives. Generally, the transportation provider and the agency administrator will be searching for the procedure that, considering the constraints of funding sources, accountability demands, and needs of clients, will be the simplest, least costly, and most equitable method of charging agencies for service.

It should be noted here that the requirements of some funding sources specify collection of some data that may also be used in a charging procedure. For example, if a particular funding source requires an annual report from the provider that includes the total number of passenger trips provided during the year, then the inclusion of the variable, passenger trips, in the charging procedure will not cost any more than the inclusion of the simple variable, number of clients.

The procedures are evaluated here as they were presented earlier in the paper. The client-based procedure may be most appropriate in a service area that has a small number of participating agencies, where the service provided is on a shared-ride arrangement, and where the total costs to be charged to all agencies are relatively low. The procedure does not require any data regarding actual use of the service or a determination of the relative amounts of operating costs incurred by each agency. The lack of relationship to levels of use does, however, provide possible reasons for the rejection of the simple, client-based procedure by some agency administrators.

The two single-variable procedures, based on either passenger miles or passenger trips, have the advantage of relating charges directly to the amount of service consumed by agency clients. However, as this paper has shown, the use of either variable alone has the disadvantage of penalizing agencies whose clients are either centrally located or geographically dispersed. The combination of passenger miles and passenger trips satisfies those objections

Table 1. Methods and costs of processing data to use procedures in selected areas that serve a large rural population.

Transportation Provider	Variable in Procedure	Processing of Data		Approximate No. of Passenger Trips per Month	Source of Funds
		Method	Cost ($)		
Eastern Task Force on Aging, Bangor, ME	Passenger miles	Computer	13 126[a,b]	4 737	Title III and local funds
Mount Grace Regional Transportation Corporation, Erving, MA	On-board vehicle miles	Computer	8200[a,b]	6 500	Titles III, VII, XIX, XX, and local funds
Regional Transportation Program, Inc., Portland, ME	Passenger miles	Manual	8000-9000[c]	3 500	Title III and local funds
DAST, Dover, DE	Trip length based on zonal system	Manual	18 000[c,d]	13 000	Titles XIX and XX
Cape Cod Regional Transit Authority, Barnstable, MA	Passenger miles, passenger trips	Computer	18 300[e]	11 000	Titles III and XX and local funds

[a] Includes only recurring costs and excludes initial programming costs. In the case of Mount Grace, initial programming costs were approximately $2300.
[b] 1979.
[c] One full-time person.
[d] One full-time person, two half-time.
[e] Includes recurring and initial costs annualized over a five-year period, after which only recurring costs will be charged.

and also divides total costs of service into those costs related to passenger trips and those related to trip length. The procedure that combines passenger trips and passenger miles is most appropriate for implementation in a shared-ride, demand-responsive system where clients from several agencies may be riding on the same vehicle at the same time. In the application of this two-variable procedure, agencies are charged for the services actually consumed by their clients, plus a certain percentage of the total deadhead mileage costs, covered by the assignment of total system costs to the two variables. There is not, however, any incentive for group ridership inherent in the application of this procedure.

The two procedures that incorporate the single variables, vehicle miles and vehicle hours, may be most suitable for application to a demand-responsive system that provides dedicated, or exclusive, service to particular agencies at specified times. Vehicle hours represents the potential for use by clients of the specific agency being serviced at that time, whereas vehicle miles represents the actualization of that potential and provides a measurement of actual use by the clients served. The use of the single variable, vehicle miles, is most suitable when long wait times are not incurred during the provision of exclusive-use service. For example, when long wait times are incurred by a vehicle that transports clients to a site where meals are provided and remains stationary while the clients have their meals, a procedure that uses vehicle hours alone or in combination with vehicle miles will be more appropriate.

The data collection and processing required for the use of vehicle miles in a procedure to charge agencies that share a vehicle are complicated, time consuming, and more expensive than the use of passenger miles in a shared-ride allocation procedure but do provide an incentive for agencies to group their riders on a particular vehicle. In view of the existence of this incentive, the use of vehicle miles for application to shared-ride systems should not be dismissed.

The procedure based on the two variables, vehicle miles and vehicle hours, with its corresponding cost breakdown, is simple, inexpensive, and equitable for implementation in an exclusive-ride arrangement. Agencies will be encouraged to group their clients on vehicles, which will increase the efficient use of the service. Each agency served will pay a charge in proportion to the amount of service consumed by its clients. It should be noted, however, that the procedure that incorporates vehicle miles and vehicle hours will not reflect total vehicle use unless deadhead is also accounted for in some way. The calculation of deadhead miles and hours is not complicated, but the apportionment of these amounts among the agencies receiving service is a complex issue, since no agency clients are using the vehicle during deadhead miles or hours. In the procedures presented here, deadhead has been allocated among agencies as though it were a fixed cost of service by assigning all costs to the specific variables under consideration. Deadhead mileage may also be allocated among agencies by assigning those miles to the rider(s) before or after a deadhead segment or by assigning those miles among the riders on the bus during a vehicle trip.

Of the three major criteria of simplicity, cost of use, and equity, the issue of cost of use often appears to be the main concern of agency administrators and transportation providers. Table 1 gives a summary of the methods and costs of processing data for use in various cost allocation procedures. All transportation services listed in Table 1 are provided on a shared-ride, demand-responsive basis. The processing methods are either computerized or manual. In the case of the Eastern Task Force on Aging and the Mount Grace Regional Transportation Corporation, the processing is done by outside computer firms; the costs shown include only the recurring costs such as keypunching, computer time, and storage and supplies and exclude initial programming costs. The Cape Cod Regional Transit Authority has an in-house computer system that is also used for scheduling and dispatching. It has been estimated that this system will cost $18 000 annually for a five-year period, starting in 1979. This annual cost includes programming, hardware components, monthly maintenance, insurance, computer time, and interest charges. It should also be noted that a number of funding sources are billed for these services, including federal Title III (Older Americans Act) and Titles XIX and XX (Social Security Act) as well as local governments.

CONCLUSIONS

As the variables used in procedures to charge human service agencies for transportation services provided to their clients become more complex, data requirements and cost of implementation may increase. However, the information obtained is likely to lead to more accurate and equitable cost-based allocations and, at the same time, may be necessary, or merely useful, for satisfying other objectives, such as billing and accounting, monitoring and evaluating system performance, and encouraging group ridership.

The pressing need for uniform data reporting and accounting procedures has been noted by officials at many levels of government. In order to serve more than one agency, a transportation provider must frequently comply with distinct accounting and record-keeping procedures for each agency. In addition, billing structures and methods of billing for transportation vary from program to program and agency to agency. These variations may lead to confusion on the part of clients, providers, and agency administrators (5).

Several demonstration programs are currently under way to address these billing and accounting issues (1,5). The presentation of the seven charging procedures described in this paper should aid in the design of model administrative structures that, under the mandate of the demonstration programs "...should be flexible enough to allow transportation providers to report information in formats familiar to the transportation industry, and yet consistent with the mandated regulatory requirements of human service programs" (5).

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Mobility Training for the Retarded: An Issue of Public Transit Accessibility

JANE KAMMERER STARKS

The ability of the retarded to travel independently by public transit, particularly buses, has been demonstrated to have two positive results: (a) Institutions that provide services or custodial care for the retarded can reduce or eliminate the expense of providing special transit services for their clients, and (b) retarded individuals who can travel independently are thereby able to work in the community and become self-supporting, which furthers the national goal of deinstitutionalization. Travel training significantly improves the accessibility of public transit to the retarded. Travel training for the retarded is examined within the context of federal mandates for program and vehicle accessibility with respect to public bus transit. Local transit authorities have not recognized their responsibility to provide travel training in order to remove the barriers to accessibility experienced by the retarded because the retarded have not been recognized at the federal level as a distinct transportation-handicapped group.

The American Association on Mental Deficiency defines retardation as the expression of "significantly subaverage general intellectual functioning existing concurrently with deficits in adaptive behavior and manifested during the developmental period" (1). Retardation is etiologically diverse: More than 200 causes have been identified, although 75 percent of all cases cannot be explained. Retardation can be engendered in the individual by trauma, infectious disease, exposure to toxins, poor maternal and infantile nutrition, chromosomal abnormalities, hereditary and spontaneous metabolic disorders, and emotional deprivation (2). Genetic, metabolic, and environmental factors may function singly or in combination to induce retardation during the gestation, infancy, or early-childhood phases of life.

Persons afflicted with retardation comprise approximately 6 million individuals, or 3 percent of the total population of the United States. Yet, despite their handicap, 5.4 million, or approximately 89 percent, of all the retarded should successfully respond to mobility training (3, p. 14). But current federal policy overlooks the transportation needs of the educable mentally retarded in this country, who constitute a large portion of the travel handicapped.

This paper examines means of addressing the needs of these citizens. First, the paper identifies the cognitive travel barriers experienced by the retarded and explains how mobility training can be a solution to overcoming them. The paper then identifies the system barriers of bus transit modes and explains how appropriate solutions can be fashioned. Finally, the paper discusses the institutional barriers that have prevented federal recognition of the retarded as a transportation-handicapped group.

Congress has sought to rectify the inequalities experienced by the transportation handicapped in the provision of transportation services and facilities by enacting several major statutes. The legislation produced by Congress that has resulted in the most controversy is Section 504 of the Rehabilitation Act of 1973. The Section 504 regulations are designed