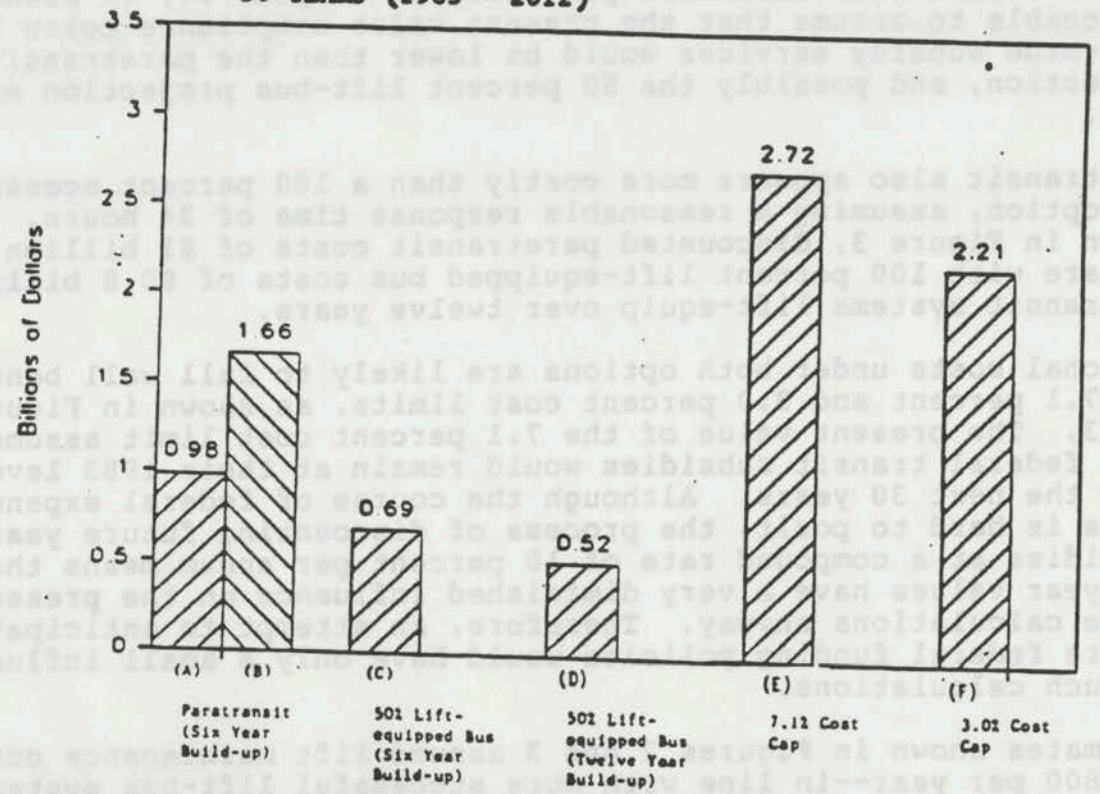
FIGURE 2 PARATRANSIT VERSUS 50% LIFT-EQUIPPAGE OF TRANSIT BUSES: NATIONAL COSTS — PRESENT VALUE AT 10% DISCOUNT OVER 30 YEARS (1983 - 2012)



NOTES: The chart reflects the following assumptions:

Column (a): NPRM minimum criteria with restricted eligibility and 24-hour advance reservation. Costs are $23.00 per vehicle-hour. Full capacity is reached in six years.

Column (b): As column (a) with no advance reservation required.

Column (c): Lifts cost $10,000 and last 12 years. Lift maintenance is $800.00 per year. No fleet expansion is included. Fleets achieve 50% lift-equippage in six years.

Column (d): As column (c), but fleets build up to 50% lift-equippage over 12 years.

Column (e): UMTA 1983 outlays of $3.7 billion are held constant over 30 years and discounted to their present value.

Column (f): UMTA Section 15 FY 1982 total transit operating costs $7.2 billion are held constant over 30 years and discounted to their present value.

reasonable advance reservation time. Nationally, however, the 30-year present value of 50 percent lift-equipped bus costs across all cities is $0.7 billion if transit systems lift-equip over six years, and $0.5 billion if they equip over 12 years--in either case substantially less than the paratransit costs. The consultant's study did not calculate a 30-year present value of national costs for the user-side subsidy option. However, based on the annual cost estimates presented in Chapter IV, it seems reasonable to assume that the present value compliance costs for user-side subsidy services would be lower than the paratransit projection, and possibly the 50 percent lift-bus projection as well.

Paratransit also appears more costly than a 100 percent accessible bus option, assuming a reasonable response time of 24 hours. As shown in Figure 3, discounted paratransit costs of $1 billion compare with 100 percent lift-equipped bus costs of $0.8 billion if transit systems lift-equip over twelve years.

National costs under both options are likely to fall well beneath the 7.1 percent and 3.0 percent cost limits, as shown in Figures 2 and 3. The present value of the 7.1 percent cost limit assumes that federal transit subsidies would remain at their 1983 level over the next 30 years. Although the course of federal expenditures is hard to posit, the process of discounting future year's subsidies at a compound rate of 10 percent per annum means that out-year values have a very diminished influence on the present value calculations anyway. Therefore, an attempt to anticipate future federal funding policies would have only a small influence on such calculations.

Estimates shown in Figures 2 and 3 assume lift maintenance costs of $800 per year--in line with more successful lift-bus systems but much lower than experience in other systems. If about $2,000 per year were assumed instead,[2] then 50 percent lift-bus costs would appear about the same as the paratransit costs (about $1 billion in present value), as shown in Figure 4. However, over 30 years it seems likely that lift-bus costs would fall beneath this level, as systems gain more maintenance experience, as Seattle has done.

II. COST-EFFECTIVENESS

The preceding discussion concerns only the overall costs to recipients of adopting various approaches to this regulation. This section concerns the cost-effectiveness of the major

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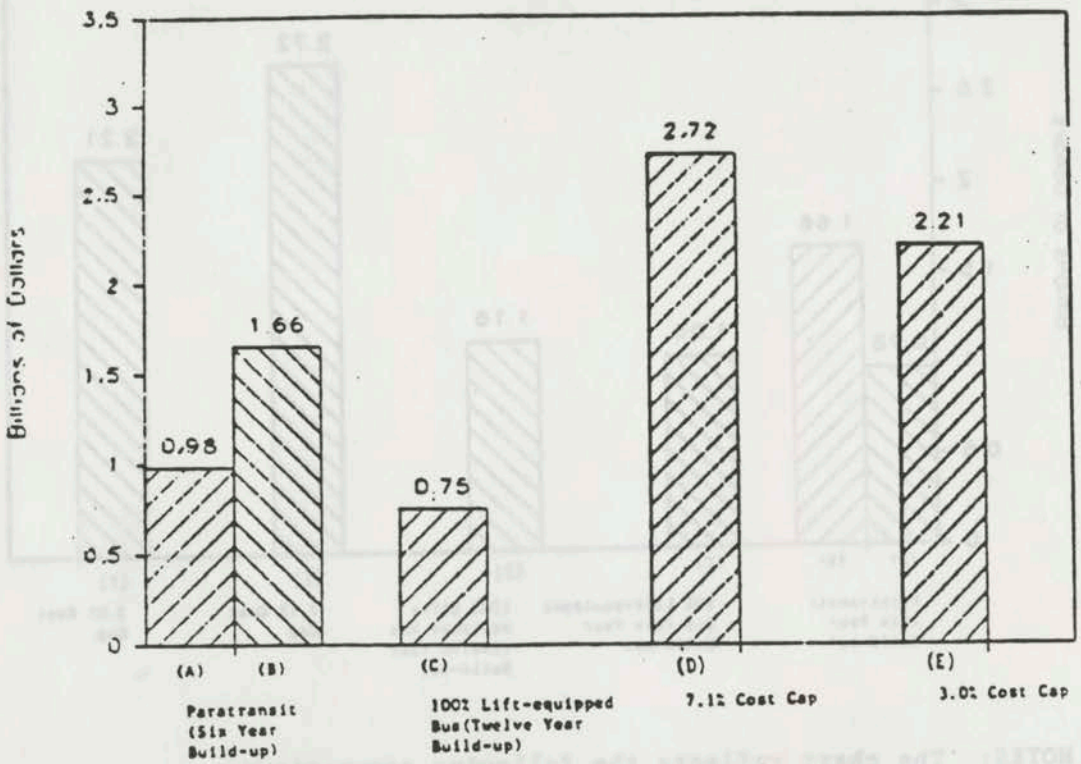
[2] This is the high estimate for lift-bus maintenance cost in the NCHRP report. National Cooperative Highway Research Program Report, Planning Transportation Services for Handicapped Persons, National Research Council, Washington, D.C., September 1983.

FIGURE 3 PARATRANSIT VERSUS 100% LIFT-EQUIPPAGE OF TRANSIT BUSES: NATIONAL COSTS — PRESENT VALUE AT 10% DISCOUNT OVER 30 YEARS (1983-2012)



NOTES: The chart reflects the following assumptions:

Column (a): NPRM minimum criteria with restricted eligibility and 24-hour advance reservation. Costs are $23.00 per vehicle-hour. Full capacity is reached in six years.

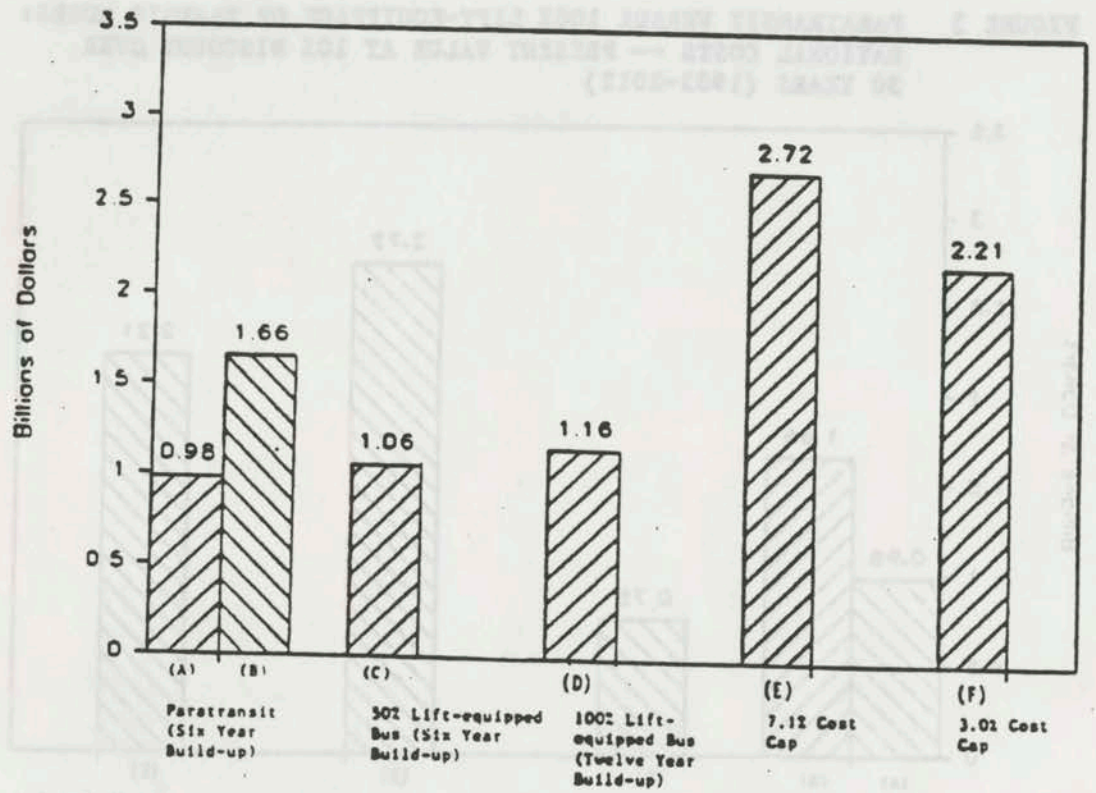
Column (b): As column (a) with no advance reservation required.

Column (c): Lifts cost $10,000 and last 12 years. Lift maintenance is $800.00 per year. No fleet expansion is included. Fleets achieve 50% lift-equippage in six years.

Column (d): UMTA 1983 outlays of $3.7 billion are held constant over 30 years and discounted to their present value.

Column (e): UMTA Section 15 FY 1982 total transit operating costs of $7.2 billion are held constant over 30 years and discounted to their present value.

FIGURE 4. PARATRANSIT VERSUS 50% AND 100% LIFT-EQUIPPAGE OF TRANSIT BUSES WITH HIGH MAINTENANCE COSTS: NATIONAL COSTS — PRESENT VALUE AT 10% DISCOUNT OVER 30 YEARS (1983-2012)



NOTES: The chart reflects the following assumptions:

Column (a): NPRM minimum criteria with restricted eligibility and 24-hour advance reservation. Costs are $23.00 per vehicle-hour. Full capacity is reached in six years.

Column (b): As column (a) with no advance reservation required.

Column (c): Lift maintenance costs assumed to be $2000 per year. No fleet expansion included.

Column (d): Lift maintenance costs assumed to be $2000 per year. No fleet expansion included.

Column (e): UMTA 1983 outlays of $3.7 billion are held constant over 30 years and discounted to their present value.

Column (f): FY 1982 total transit operating costs of $7.2 billion are held constant ocver 30 years and discounted to their present value.

alternatives. For transit services for handicapped persons, the basic measure of cost-effectiveness is the number of trips provided to handicapped persons for the money spent on the service.

It should be noted that measuring cost-effectiveness by cost-per-trip does not fully capture the benefits of providing transportation services to handicapped persons. These benefits are likely to include a reduced demand for other social service expenditures and increased tax payments by handicapped persons able to be employed as the result of better transportation, as well as more intangible benefits for the increased well being of handicapped persons due to enhanced mobility. However, the Department does not have any data that would permit us to incorporate what quantifiable benefits of this kind there may be into the computations.

Based upon paratransit demand estimates developed with the consultant's model and lift-equipped bus demand estimates developed by the National Cooperative Highway Research Program, this section displays the present value of cost-per-trip associated with the alternatives. The following paragraphs examine lift-equipped bus and paratransit demand estimates. Cost per trip comparisons are then discussed. A survey conducted for the National Cooperative Highway Research Program (NCHRP) of the National Research Council published in 1983 reviewed the use of both lift-equipped buses and specialized transportation services in cities around the country.[3] The study indicates that door-to-door paratransit or user-side subsidy services attract more disabled persons than lift-equipped buses.

A. Use of Lift-Equipped Buses

Among the 47 cities offering lift-equipped service that were surveyed by the NCHRP, lift-boardings per day per lift-equipped bus averaged 0.17 (from Table 18). The typical range of usage among these cities in the summer of 1982 was zero lift-boardings per day per bus (14 cities) to 1.33 (1 city--Hot Springs, Arkansas). A random sample of ten of the systems, undertaken by James F. Hickling, Ltd., in July of 1984, indicates no change in this pattern of use. Seattle, Washington, which has achieved by far the greatest total number of lift boardings per day, was serving 0.31 boardings per day per bus at the time of the NCHRP survey, and is presently serving about 0.42 boardings per day per bus.

The statistics in Table 18 indicate that smaller systems (those with 25 or fewer lift-equipped buses) experience greater lift-usage per bus than larger systems. Among the 28 smaller systems that were surveyed, boardings per lift-equipped bus per day

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[3] Op. cit., NCHRP Report, 1983.

TABLE 18

UTILIZATION OF LIFTS ON ACCESSIBLE FIXED-ROUTE BUS SYSTEM

	Date of Lift Usage Data	Buses	Lift-Equipped Buses	Peak Period Buses	Peak Period Lift-Equipped Buses	Lift Boardings Per Day	Lift Boardings Per Day Per Lift-Equipped Bus	Lift Boardings per Day per Peak Lift-Equipped Bus
Newport, Ore.[1]	Summer 82	2	2	1[d]	1	0.7	0.350	0.700
Red Wing, Minn.[3]	Summer 84	2	2	1[d]	1	12.0	6.000	12.000
Hutchinson, Minn.[1]	Summer 82	3	3	2[d]	2	0.1	0.033	0.050
Corvalis, Ore.[1]	Summer 82	3	3	2[d]	2	2.5	0.833	1.250
Jim Thorpe, Penn.[1]	Summer 82	4	2	N.A	N.A	0.0	0.000	0.000
Muscatine, Iowa[1]	Summer 82	4	2	4[d]	4	2.0	1.000	1.000
Frankfort, Ky[1]	Summer 82	4	3	N.A	N.A	0.0	0.000	0.000
Manitowoc, Wis.[1]	Summer 82	5	3	5[d]	3	0.0	0.000	0.000
Paducah, Ky.[1]	Summer 82	5	5	5[d]	5	2.0	0.400	0.400
Harrisonburg, Va.[1]	Summer 82	5	2	N.A	N.A	0.0	0.000	0.000
Moncks Corner, S.C.[1]	Summer 82	6	4	N.A	N.A	2.0	0.500	N.A.
Eureka, Calif.[3]	Summer 84	6	5	4	4	0.3	0.060	0.075
Mt. Pleasant, Mich.[1]	Summer 82	7	6	6[d]	6	0.0	0.000	0.000
Zanesville, Ohio[1]	Summer 82	7	3	N.A	N.A	0.0	0.000	0.000
Fort Collins, Colo.[1]	Summer 82	8	2	6[d]	2	0.0	0.000	0.000
Medford, Ore.[1]	Summer 82	8	3	N.A	N.A	1.0	0.333	N.A.
Winona, Minn.[1]	Summer 82	9	2	N.A	N.A	1.0	0.500	N.A.
Clinton, Iowa[1]	Summer 82	10	2	N.A	N.A	0.0	0.000	0.000
Hot Springs, Ark.[1]	Summer 82	10	6	N.A	N.A	8.0	1.333	N.A.
S. Lake Tahoe, Nev.[1]	Summer 82	10	8	N.A	N.A	2.0	0.250	N.A.
Monroe, Mich.[1]	Summer 82	10	2	N.A	N.A	0.0	0.000	0.000
Quincy, Ill.[3]	Summer 84	11	8	7	7	0.0	0.000	0.000
Cumberland, Md.[1]	Summer 82	12	4	10[d]	4	0.5	0.125	0.125
Steamboat Springs, Colo.[1]	Summer 82	12	7	N.A	N.A	0.0	0.000	0.000
Johnson City, Tenn.[3]	Summer 84	11	3	5	1	0.0	0.000	0.00000
Janesville, Wis.[1]	Summer 82	22	10	N.A	N.A	2.0	0.200	N.A.
Stamford, Conn.[2]	Fall 80	36[b]	25	28	24	1.2	0.048	0.050
Chapel Hill, N.C.[3]	Summer 84	35	18	27	14	0.3	0.017	0.021
Wichita, Kan.[2]	Fall 80	48[b]	31	46	31	2.0	0.065	0.065
Champaign-Urbana, Ill.[2]	Fall 80	66[b]	40	33	11	1.7	0.043	0.155
Palm Beach Country Fla.[2]	Fall 80	68[b]	67	50	50	3.9	0.058	0.078
Newport, Ky.[1]	Summer 82	91	10	N.A	N.A	0.0	0.000	0.000
Bridgeport, Conn.[3]	Summer 84	57	39	40	20	0.7	0.018	0.035
Santa Monica, Calif.	Fall 80	124[b]	47	100	35	1.3	0.028	0.037
New Haven, Conn.	Fall 80	165[b]	100	109	82	5.9	0.059	0.072
San Diego, Calif.[1]	Summer 82	279	65	N.A	N.A	4.0	0.062	N.A.
Louisville, Ky.[1]	Summer 82	318	31	N.A	N.A	0.0	0.000	0.000
Hartford, Conn.	Fall 80	382	155	238	152	5.2	0.034	0.034
Buffalo, N.Y.[3]	Summer 84	473	134	390	100	5.2	0.039	0.051
Orange County, Calif.	Fall 80	497	175	333	100	17.0	0.097	0.170
Dallas, Tex.[1]	Summer 82	560	85	N.A	N.A	0.4	0.005	N.A.
Milwaukee, Wis.	Fall 80	585	250	522	141	2.1	0.008	0.015
Seattle, Wash.	Fall 80	915[b]	163	818	90	54.0	0.331	0.600
	Summer 82	1,026	338	N.A	N.A	105.0	0.311	N.A.
St. Louis, Mo.	Fall 80	1,058[b]	157[c]	800	40	1.0	0.006	0.025
Detroit, Mich, SEMTA	Fall 80	1,361[b]	111	318	70	2.1	0.019	0.030
Washington, D.C.	Fall 80	2,082[b]	150	1,700	102	5.7	0.038	0.056
	Summer 84	1,600	225	N.A.	64	1.0	0.004	0.016
Los Angeles, Calif.	Fall 80	2,732[b]	430[c]	1,988	159	5.0	0.012	0.031
	Summer 82	2,463	1,370	N.A	N.A	13.0	0.009	N.A.

SOURCE: Telephone survey by James F. Hickling Management Consultants ltd, July 1984, and National Cooperative Highway Research Program, Cost-Effectiveness of Transportation Services for Handicapped Persons, National Research Council, September 1983.

1 Mail survey of fixed-route, fixed-schedule bus operators for NCHRP Project 8-27.

2 Casey, R. F., "The Accessible Fixed-Route Bus Service Experience." Report No. UMTA-MA-06-0049-81-7, Washington, D. C.: U.S. Department of Transportation, Urban Mass Transportation Administration (May 1981).

3 Telephone Survey, James F. Hickling Management Consultants Ltd., July 1984.

a A Directory of Regularly Scheduled, Fixed-Route, Local Rural Public Transportation Services Washington, D.C.: U.S. Department of Transportation, Urban Mass Transportation Administration, February 1981.

b National Urban Mass Transportation Statistics: Second Annual Report -- Section 15 Reporting System. Transit financial and operating data reported for fiscal years ending between July 1, 1979, and June 30, 1980. Washington, D.C.: U.S. Department of Transportation, Urban Mass Transportation Administration, June 1982.

c Not all of the lift-equipped buses were being operated in accessible fixed-route bus service.

d More than 70 of the peak period buses were lift-equipped, but only 70 were being operated in accessible fixed-route bus service.

averaged 0.24. Among the larger systems, however, daily lift-assisted boardings averaged only 0.04 per bus (apart from Seattle, which stands out at 0.42--more than ten times the national average). Based upon the averages for small and large systems, a nationwide fleet of lift-equipped buses (including the six largest UMTA recipients) would result in just under one million trips annually. If, however, the Seattle rate of lift-assisted boardings were used for the larger systems, then lift-assisted boardings nationwide would number 4.4 million. It is reasonable to project that a city with a more complete lift-equipped bus system with a management committed to success, as appears to be the case in Seattle, can realize higher usage rates.

B. Use of Paratransit

Even compared with the projected use of lift-equipped buses based on Seattle ridership, however, paratransit is likely to generate greater demand. Based upon the model, total paratransit ridership under the service criteria would total about 10.1 million trips a year for all urbanized areas. Projections based on the findings of the NCHRP Report discussed above are somewhat higher at about 12 to 20 million annual trips. Thus, available studies support the intuitive finding that paratransit would generate greater ridership than lift-equipped buses.

Table 19 presents the cost per trip estimates for the various alternatives. Paratransit cost per trip estimates are based on the consultant's model. The lift-equipped bus per trip costs are based upon Seattle's boarding rate in order to avoid underestimation. It should also be noted that lift-equipped bus results are based upon 100 percent lift-equippage since there is no evidence one way or another that cost per trip would differ for 50 percent lift-equippage.

TABLE 19
AVERAGE COST PER TRIP 1983-2012
AT A DISCOUNT RATE OF 10%

Service Level	National Average
Paratransit under Minimum Service Criteria (24 hour) Advance Reservation	11.56
50% Lift-Equipped Bus	25.33

At a discounted cost-per-trip of $25.00 (see Table 19), lift-equipped buses are clearly less cost-effective than paratransit services ($11.56 per trip) and are estimated to serve considerably

fewer persons as well. Only small systems, with small numbers of buses, might find cost per trip for lift-equipped buses to fall beneath cost per trip for paratransit. This is simply because, with only a few buses to equip, lift-assisted boardings of one or two per day are sufficient to bring cost per trip down to about $10.00.

III. CONCLUSIONS

This analysis suggests that the 30-year present value aggregate compliance costs to the transit industry for either transit-operated paratransit, user-side subsidized taxis, or 50 percent accessible bus is far less than the maximum expenditure amounts generated by the cost limits. Of course, the analysis is premised on the assumption that all recipients choose one mode or another which makes the total nationwide compliance costs predictable. In all likelihood, the actual overall compliance cost will involve a mix of services. However, if recipients choose a mix of the less costly alternatives of accessible-bus and user-side subsidy taxi services, it is probable that the actual compliance cost nationwide would be about the same as the 50 percent accessible-bus projection, or $0.7 billion.

In the Department's view, this amount of money, over the long term, should buy adequate transportation service for disabled persons, although this cost is far less than the maximum expenditure levels which would be generated by the cost limit. However, the transit industry comments contended that many transit authorities would have to increase expenditures five to tenfold above the levels suggested by the 1981 interim final rule now in force. (The industry calculated this increase by contrasting the amounts generated by the NPRM 7.1 and 3.0 percent cost limits to the 3.5 percent of Section 5 funding level suggested for special services by the 1981 interim final rule.)

The industry calculations did not take account of the actual expenditures incurred by transit authorities (often substantially more than the 3.5 percent level), nor ways of providing service, like accessible bus and user-side subsidy, that would permit compliance for less than the cost limits. If it is assumed that under the interim rule, all recipients spent 3.5 percent of total UMTA 1983 Section 5 assistance on accessible handicapped services, the total cost to the industry would be $42 million.[4]

The consultant's estimates in Table 17 indicate that the potential annual compliance cost to the industry to provide 50 percent lift-bus service (assuming a six-year phase-in period) would be approximately $63 million (in undiscounted 1983 dollars). This

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[4] 3.5% of $1.2 billion in Section 5 assistance for 1983 = $42M.

estimate also could be expected to reasonably approximate the annual compliance cost of providing user-side subsidy taxi services (see previous discussion this Chapter). Therefore, the potential annual cost to the transit industry of the final rule is not on the order of the five to tenfold increase that the industry contends, but it is admittedly higher than the potential present cost of the interim rule. This is permitted by the language and legislative history of section 317(c) and court interpretation of section 504, and is necessary to ensure the improvements in service that Congress clearly sought.

The final rule will permit up to a six-year phase-in period to full performance level. This will prevent recipients from having to abruptly increase their expenditures and help avoid unreasonably high start-up costs, which are of major concern to the transit industry. Finally, it is important to recognize that the national cost projections for the final rule are far lower than those of the Department's 1979 rule, which the Court, in APTA v. Lewis, determined to impose financial burdens on the transit industry. Exclusive of commuter rail costs, the 30-year present value costs are as follows:

1979 rule (DOT estimate)	$3.99 billion
1985 rule, paratransit alternative	$.98 billion
1985 rule, 50% lift-bus alternative	$.69 billion
1985 cost limit (7.1% of total UMTA aid)	$2.72 billion
1985 cost limit (3.0% of total industry operating expenses)	$2.37 billion

All costs are expressed in 1983 dollars.

APPENDIX A

IMPACTS ON OTHER PARTIES

As discussed in Chapter I, the Regulatory Impact Analysis required by Executive Order 12991 in connection with this rulemaking is to include evaluation of alternative transportation approaches to achieve the regulatory goal; assessments of the potential national benefits and costs of the rule; identification of those likely to receive the benefits or bear the costs; and analysis of the potential impacts on small entities, as required by the Regulatory Flexibility Act.

The foregoing chapters have discussed the costs and cost-effectiveness of implementing alternative approaches to transit service for disabled persons. That discussion considered at some length the impacts of the rule on transit authorities and handicapped persons. However, several other groups will be affected, though not directly, by the rule. The following material on these groups is derived from the Preliminary Regulatory Impact Analysis published in 1983 in support of the Department's NPRM.

Identification of Impacted Groups

1. Non-Handicapped Transit Users. If transit authorities adopt the bus accessibility approach to meet the regulation, impacts on transit operations which result from the accessibility modifications would affect current transit users. For example, if buses were equipped with wheelchair lifts, passengers on the bus when a wheelchair user boarded or left the bus would experience a somewhat longer dwell time at that bus stop. Also, there might be fewer seats on the buses due to wheelchair tie-down positions, and fares for the general public might be increased to meet the costs of accessibility on transit.

2. Taxi Operators. Taxi operators are likely to be affected by the regulation since a significant portion of their passengers are transportation handicapped and might switch to other modes if the regulation led to accessible transit or to increased door-to-door van service. On the other hand, if the regulation led to an increase in user-side subsidies or contract taxicab-paratransit service, the patronage of taxicabs would increase. If the regulation were to result in significantly increased usage of taxi services by handicapped people, it might also lead to the purchase by taxi operators of more vehicles with the capability of carrying passengers in motorized wheelchairs.

3. Paratransit Operators. Providers of paratransit service, such as door-to-door van service, are also likely to be affected by the regulation in varying degrees depending on the service option selected. This group would include both private providers and social service agency providers. If the bus accessibility approach were adopted to meet the regulation, there would likely be some reduction in demand for paratransit service. But, as

described above for taxi operators, to the extent that the regulation led to an increase in paratransit service and if most transit operators did not choose to provide that service themselves, the demand for paratransit service by these providers would likely increase.

4. Bus and Other Vehicle Manufacturers. In recent years, there has been a decline in the number of transit buses produced for delivery in the United States. No doubt there are a number of reasons for this, but it has been suggested that the earlier requirement for lifts on new buses, and the possibility that that requirement would be rescinded, helped hold down bus purchases. To the extent that this suggestion may be true, the adoption of the accessible bus approach under the final rule might lead to some acceleration in bus orders.

If transit authorities adopt the paratransit service option to satisfy the regulation, the purchase of vans and other paratransit vehicles would likely increase.

5. Lift Manufacturers. Issuance of the Department's interim final rule in July 1981 has resulted in a reduction in the number of orders being placed for lift-equipped transit buses, and a concomitant reduction in the number of orders placed by bus manufacturers with lift producers. The Department examined the degree to which rescission of the lift mandate has adversely affected those lift manufacturers competing in the U.S. bus lift market as of July 1981. The primary finding was that subsequent to issuance of the interim final rule, two of the six lift manufacturers stopped producing bus lifts.

The following discussion summarizes the impact of the interim final rule on the six lift manufacturers as of July 1982.

General Motors Truck and Coach Division (GMC). GMC is the only bus manufacturer that also produces bus lifts, which are built in GMC's own plants rather than by a specialized subcontractor. Approximately 40 percent of all lifts sold in the U.S. are made by GMC, making it the largest of the lift manufacturer.

GMC indicated that it plans to continue its own lift production for GMC buses ordered with lifts. Although it anticipates that lift orders might decrease under the final rule, the overall impact on GMC should be minimal, since lift production is a very small component of the company's manufacturing operations.

Environmental Equipment Corporation (EEC). EEC is the second largest producer of bus lifts, and currently makes no other product. EEC, therefore, expects to be significantly affected by the 1979 rule's rescission, and laid off 100 of its employees--over half of its work force--late in 1981. (EEC points out that unusually high sales in 1981 were attributable to delivery of a large order to AC Transit in Oakland, California, and should not be considered indicative of an increasing growth rate.) Because of the reduced market for lifts, EEC may diversify into other transit-related fields.

Transportation Design and Technology (TDT). TDT enjoys the third largest share of the lift market, producing lifts for small and medium sized Gillig and Transportation Manufacturing Corporation (T.M.C.) buses as well as full-sized transit buses. Although TDT performs bus rehabilitation work in addition to lift production, about 80 percent of its revenues in 1981 were from the sale of lifts. TDT has also been seriously affected by the sudden drop in new lift orders, causing it to lay off about one-third of its work force late in 1981. Like EEC, TDT is contemplating a move into other types of manufacturing operations, possibly including non-transit related fields.

Lift-U, Inc. Lift-U has a small but growing share of the lift market, and makes no other type of equipment. Lift-U currently produces lifts for buses as well as a recently developed platform-mounted lift for the rail transit system under construction in Portland, Oregon. Unlike other lift manufacturers, Lift-U does not have its own plant assembly; its lifts are manufactured to its specifications by Transco Northwest, a large metal fabricating company in Portland. Although new lift orders have decreased since July 1981, employment impacts on Lift-U and Transco Northwest have not occurred.

Vapor Corporation. This Chicago-based corporation began producing lifts in 1977, adding the product to its extensive line of transit equipment and components (which include heating, air conditioning, and electrical systems). By 1981, Vapor had obtained a substantial share of the lift market, producing several hundred annually for use in Canada Flyer, Neoplan and M.A.N. (articulated) buses in U.S. service. Soon after the interim final rule was issued, however, Vapor withdrew from further competition in the lift market, explaining that the cost of maintaining its lift production line was no longer justified on the basis of expected sales. The company will, however, fill pending orders and maintain a parts stock for lifts already in use. Because lift sales accounted for only about 5 percent of Vapor's revenues, cessation of lift production should not have a major impact on the company.

Transilift Equipment, Ltd. This Canadian company claimed a small percentage of the U.S. lift market at the time the interim final rule was issued, making lifts for Canada Flyer and M.A.N. buses. In September 1981, Transilift went out of business. Company officials could not be located, and it is unknown whether rescission of the lift requirement was a factor in the shut-down of Transilift.

Summary of Impacts. By mid-1981, six companies competed in the U.S. bus lift market, all of which began production of lifts in the late 1970s in anticipation of the federal mandate. Two of the companies stopped producing lifts after the requirement was rescinded. All four remaining companies will continue to produce lifts in the foreseeable future, and the three producers that make only lifts will most likely expand into other products. Of the four producers, only GMC has not been significantly affected by reduced lift orders. Impacts of the regulatory change cannot be

fully assessed at this time, however, since many recent deliveries of lifts were in response to orders placed in 1980 or 1981, before the interim final rule was issued, and it is not clear at what level lift purchases would stabilize if the final regulation resembled the interim final rule with regard to the issue of lifts on buses. All four manufacturers reported a lower rate of new orders than expected before the rule was changed, as well as cancellations of pending orders (or requests for cancellations which could not be honored) soon after the interim rule went into effect.

The table below summarizes the current production levels and other characteristics of the manufacturers currently in the U.S. bus lift market. (Although the table shows lift sales increasing from 1980 to 1981, manufacturers emphasized that the increase was attributable to deliveries of orders placed prior to issuance of the interim rule, and that based on current orders, sales would decline in 1982.)

Additional impacts of the final rule on lift production are as follows:

Price of Lifts. The price of lifts has remained largely unchanged since issuance of the interim final rule. Improved production methods and rapidly increased sales volumes between 1979 and 1981 worked to reduce the average lift price from that of first general models; current lift prices are approximately 20 percent below the estimate made by the Department during development of the 1979 accessibility rule. However, several lift manufacturers predict that the cost of lifts will begin to rise in excess of the rate of inflation if demand remains depressed, due to lower volumes produced for the same fixed overhead costs.

Research and Development. All of the lift producers made substantial R&D investments during the 1970s to enter the lift business in anticipation of the federal mandate. Second or third generation models now in use represent substantially modified versions of the lifts introduced in the late 1970s. Several of the manufacturers indicated that, in an uncertain market, further research and innovation in lift technology were unlikely.

Geographic Distribution of Lift-Equipped Bus Services. Following issuance of the July 1981 rule, a number of cities canceled pending orders for lifts where production was not yet begun. Since then, a large percentage of the new lift orders have been placed by transit authorities in California and Michigan, where State laws require new transit vehicles to be accessible to wheelchair users, and in cities which had already begun to implement accessible mainline services before the rule was amended. The largest single order (for 837 lift-equipped buses) was placed by the New York City Transit Authority late in 1981. In general, most cities not required by State law to purchase equipment, or which had not previously purchased accessible buses before the rule was revised, have not requested lifts or bus orders placed since July 1981.

	Buses Supplied	Number of Lifts Sold 1980	Number of Lifts Sold 1981	Revenues From Lift Sales (in millions) 1980	Revenues From Lift Sales (in millions) 1981	Number of Employees 1980	Number of Employees 1981	Average Current Lift Price
GMC Detroit, MI	GM RTS-11	1495	1912	N/A(1)	N/A	N/A(1)	N/A	$8000
EEC San Leandro, CA	GM of Canada Gillig Grumman-Flxible	605	1291(2)	$4.8	$13.0	180	80	$8400
TDT San Diego, CA	Canada Flyer GM RTS-11 (retrofit) Neoplan Gillig, TMC	550	700	$4.0	$5.6	130	85	$7300
Lift-U, Inc.	Canada Flyer BM RTS-11 (retrofit) Flxible Gillig, MAN	363	600	$2.1	$4.6	6(3)	11	$7500

(1) Because lift production is not separate from bus production, the number of employees and amount of revenues related to lift production is unknown.

(2) Figure is for first 6 months of 1981.

(3) Employees are administrative/management only. Production workers employed by Transco Northwest (Portland, OR).

5. Construction Industry. The only significant impact on the construction industry would occur if transit systems operating commuter rail routes choose to comply with the rule by making their rail systems accessible. In that case, some construction work would be required to retrofit rail transit stations to make them accessible.

6. State and Local Governments. Finally, the regulation could affect State and local governments since they provide financial assistance to transit operators and the level of assistance needed by transit operations would likely be affected by the cost of the services required by the regulation. Generally, the greater the costs associated with the regulation's requirements on mass transit, the greater will be the pressure on State and local governments to increase the amounts of their transit assistance, especially because federal operating assistance has been reduced.

7. Impact on Small Entities. Transit systems in rural areas and cities under 50,000 population are not significantly affected by this regulation. These recipients of section 18 funds are subject to a special provision for small recipients, which imposes requirement less stringent and more flexible than those applying to larger cities. The small recipients will have no more substantive requirements to meet than under present regulations. They will have small additional reporting burdens, though these too are less burdensome than the reporting requirements with which larger systems must comply.

Proportionately speaking, the rule will create the heaviest burdens in cities between 50-200 thousand population. That is, systems in these cities will have the most difficult time meeting the rule's service criteria for relatively low costs. The rule's limit on required expenditures is designed to prevent such systems from incurring undue financial burdens, by limiting expenditure requirements to 3.0 percent of the recipient's operating costs, as reflected in the section 15 report to UMTA. This "cost limit" device allows recipients to scale down service to those they can provide with a reasonable expenditure of resources.

The rule is likely to have a favorable impact on a number of small businesses, such as lift manufacturers, shops that customize small vehicles for use by handicapped persons, and private providers of transit services to handicapped persons (e.g., taxicab companies, firms that operate specialized vans). The rule, by requiring more and better transportation for disabled persons, will increase the market for the products and service these businesses provide.

APPENDIX B

CASE STUDIES OF ACCESSIBLE TRANSPORTATION SERVICES

The seven case studies presented in this appendix were prepared by staff of the Department of Transportation during 1983-84, with assistance from the COMSIS Corporation on three of the seven cases.

Material for the case studies was gathered from a variety of sources including independent research and secondary data sources. The majority of the material comes from in-depth interviews and consultation with transit authority personnel responsible for the management and operation of accessible services in the case study cities.

CLEVELAND SPECIAL TRANSPORTATION SERVICES FOR ELDERLY AND HANDICAPPED INDIVIDUALS

The Greater Cleveland Regional Transit Authority (GCRTA) operates three separate demand-responsive paratransit services for elderly and handicapped residents of Cuyahoga County, a 456 square-mile area with a population of approximately 1.5 million. The special services include: (1) Community Responsive Transit (CRT), (2) Extra-Lift, and (3) Cross County Medical.

Community Responsive Transit: The CRT service provides door-to-door, intra-neighborhood, off-peak transportation for senior citizens 65 years of age or over, and all handicapped persons. Candidates applying for CRT service must present some proof of age or disability, e.g., a social security card or V.A. card. The total CRT service area covers the 456 square mile area of Cuyahoga County served by the fixed-route system. However, the CRT service area has been divided into 18 service zones whose boundaries approximate neighborhood areas within Cuyahoga County. Within each neighborhood zone, CRT provides service for all trip purposes and all demand is served. No CRT travel is permitted between zones, but some persons use the service to connect with regular transit services. The service operates from Monday through Friday between 9:00 a.m. and 5:00 p.m., and on Sunday from 8:30 a.m. to 2:30 p.m. Passengers must book their reservations on CRT by 4:00 p.m. the day before they want to travel.

Extra-Lift: This service provides door-to-door, county-wide, peak-period subscription trips to work and school. Eligibility for the service is limited to handicapped persons certified by a doctor as unable to use regular line-haul service because they cannot: negotiate bus steps; walk more than 100 feet with ambulation aids; stand more than 10 minutes outdoors during moderate weather, or cannot sustain temperatures of 20 degrees Fahrenheit whether sitting or standing; reside more than 1500 feet from a bus line; plus those persons with visual or mental impairments. The Extra-Lift service is operated between 6:30 a.m. and 5:30 p.m., Monday through Friday. Patrons book their trips on a subscription basis, and no advance reservations are required. The service provides approximately 20,000 annual trips, and has a waiting list of approximately 200 persons. Recent efforts to add patrons to the Extra-Lift service have shown that only about 20 percent of wait-listed persons are actually ready to use the service when offered trips.

Cross County Medical: This service provides door-to-door, county-wide travel to twelve major medical centers for all elderly and handicapped persons. However, most patrons who use the service are unable to use regular transit services. The service operates on Monday through Friday from 6:30 a.m. to 5:30 p.m. Service is

provided on a subscription basis for radiation, chemotherapy, or dialysis treatments. All other medical trips must be reserved by 4:00 p.m. one day in advance.

The Cross County Medical service was established in response to a need for transportation to major medical facilities that were located outside of the neighborhood zones served by the CRT system.

A general fare structure for the three services was established in 1982, with an off-peak fare of 25 cents and a peak-hour fare of 40 cents. Prior to that time, the CRT and medical services operated free of charge, and the Extra-Lift fare was set at one-half the amount of the base transit fare. In comparison, the GCRTA basic adult transit fare was raised in 1982 from 60 to 85 cents and the express fare increased from 75 cents to $1.00

The three services are targeted at unaffiliated elderly and handicapped users. Most of the trips are taken by individuals, although groups are also transported. Most service is shared rides in mini-buses and taxis. GCRTA operates the service directly with a fleet of 70 mini-buses (all of which are lift-equipped), and handles all dispatching. Most of the CRT service in suburban areas is contracted out to the Yellow Cab Company. The CRT neighborhood service is operated at comparatively low operating costs due to an innovative labor agreement which stipulates lower rates for paratransit drivers than GCRTA's regular transit drivers.

Service Criteria: The Cleveland paratransit system satisfies many of the service criteria requirements in the Department's regulations for the provision of special transportation service to handicapped persons.

- There is a liberal eligibility policy for the CRT neighborhood and Cross County Medical services which serve all elderly over 65 years of age and all disabled persons. This policy exceeds the eligibility requirement of the final rule, which would limit special service provision to persons who are physically incapable of using the existing fixed-route bus service . Eligibility for the Extra-Lift service, while more limited than that for the CRT neighborhood and medical services, includes both physically and mentally handicapped persons which exceeds the Federal guidelines. Also, Extra-Lift regards handicapped persons as eligible if they reside more than 1500 feet from a bus line. This policy results in handicapped persons getting service on a different basis than the general public.

- Special service fares are 60 to 70 percent less than those paid by the general public for fixed-route transit service.

The final rule requires that fares charged for the special service should be comparable, although not necessarily equal, to those charged the general public for fixed-route trips of similar length, or at similar times of day.

- Paratransit service must be reserved by 4:00 p.m. on the day before travel, except for work, school, and recurring medical trips which are served on a subscription basis. The final rule would limit the waiting period to a maximum of 24 hours.

- Paratransit service is provided throughout the same 456 square mile area of Cuyahoga County served by the fixed-route system; however, trip purposes are limited to medical, work, and school travel. All trip purposes are served within neighborhood zones. The regulations require that the special service be available throughout the same general service area served by the fixed-route system, and restrictions or prioritizations on trip purposes are prohibited.

- No special service is provided in the evenings or on Saturdays. Limited service is provided on Sundays and all holidays except Christmas. In comparison, the fixed-route bus service operates seven days a week and 24 hours a day, although evening and night service is limited. The final rule requires that special service be available on the same days and hours as regular bus service.

- The Extra-Lift service for school and work trips has a waiting list. The regulation states that recipients must provide service to all eligible handicapped persons which would preclude the use of a waiting list.

The Cleveland paratransit program is providing more service in two areas than is necessary to satisfy the final rule's service criteria requirements. First, in terms of program eligibility, the Cleveland system is serving a much broader elderly and handicapped population than is required under the regulations.

Second, the fares for the special service could be raised to levels which are comparable to those charged the general public for the fixed-route bus service.

The Cleveland program does not fully satisfy three of the service criteria with regard to trip purpose, days and hours of operation, and use of a waiting list. In order to meet the eligibility requirement of the rule, the GCRTA would have to eliminate the waiting list for Extra-Lift service. Also, the GCRTA might have to expand it's county-wide paratransit service for eligible handicapped patrons, if it could do so without exceeding the limit on required expenditures, to: (1) include all trip purposes and (2) initiate Saturday and evening service. If not, then these factors would be important in deciding service criteria trade-offs which

the GCRTA would have to negotiate with handicapped persons and their organizations through the public participation process. Alternatively, the GCRTA might elect to supplement the special service with some accessible lift-bus service and modify transit vehicles, facilities, and operations as necessary to accommodate eligible handicapped persons throughout the same general service area provided for the general public. In Cleveland, some accommodations have been made in the fixed-route bus system for such individuals. The GCRTA has replaced 40 percent of its fleet with buses which include slip-resistant floor coverings, additional grab rails/stanchions, public address systems, and touch-tone passenger signals. However, kneelers which were included on 80 percent of the new buses have been removed due to maintenance problems. To accommodate patrons who have difficulty negotiating the steps on regular buses, the GCRTA is working to improve coordination between it's paratransit and fixed-route buses by scheduling the interfaces between paratransit vehicles and buses at high curb stops. However, there are no plans to purchase lift-equipped buses.

Demand: The Cleveland program is one of the most heavily utilized of its kind in the country, although ridership has dropped over 9 percent since 1982 when a fare structure was instituted, and service was restructured to lower the budget and reflect a remote garage location. In 1982, the system carried approximately 32,000 passengers per month, or a total of 384,000 annual trips. The GCRTA estimated that approximately 75 percent of the total 1982 trips were made by wheelchair and semi-ambulatory patrons and elderly handicapped patrons who qualified for CRT and medical services on the basis of age, but who also could be recertified as eligible handicapped. (The GCRTA estimate is based on physical or mental inability to use existing transit).[1]

Market Penetration: The target elderly and handicapped population of Cuyahoga County was estimated at roughly 160,000 in 1979.[2] In terms of market penetration, the program has 12,646 registrants and is serving approximately 8 percent of the eligible E&H population. The GCRTA estimates that their special service is providing approximately one-third of the E&H transportation available in the Cleveland area, with various social service agencies supplying the other two-thirds.

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[1] NOTE: In an abbreviated GCRTA survey of the paratransit ridership, approximately 50 percent of patrons reported that they would not be able to use a lift-equipped, line-haul service regularly.

[2] Systan, Inc., Paratransit Handbook, prepared for U.S./DOT/TSC, Cambridge, Mass., February 1979

Program Cost: Paratransit program costs in both 1981 and 1982 escalated significantly and are considered atypical by the GCRTA.[3] The detailed program costs for 1983 were not available, therefore, the 1982 costs are used.

The total operating cost for the Cleveland program was approximately $2.6 million in 1982. The total program cost, including an estimated annual capital expense of $1.3 million, was then approximately $3.9 million in 1982.[4] Of this amount, the GCRTA estimated that approximately $3.1 million, or 80 percent, was spent for the transportation of handicapped patrons.[5]

The average total cost per trip for the CRT neighborhood service was $6.47 per trip, while the average cost per trip for the Cross County Medical and Extra-Lift services ranged from $35.00 to $43.77 per trip. The present cost per trip for the Extra-Lift and Cross County Medical services is estimated by the GCRTA at $28.00 to $30.00 per trip.

In order to satisfy the final rule's service criteria requirements for special service provision of handicapped transportation, the GCRTA has indicated it might restructure it's Extra-Lift and medical paratransit services which currently provide service throughout Cuyahoga County for work, school, and medical trips, and provide these trips as part of an expanded CRT neighborhood service. Users desiring to travel outside of their neighborhood zones to other points within the county would transfer at

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[3] Cost increases were primarily due to the temporary garaging of vehicles in a remote country location which increased deadhead time and operating cost. Also, the Extra-Lift cost increased because of vehicle breakdowns, and a new service -- Cross-County Medical -- was introduced in 1981 and added approximately 20,000 new trips.

[4] Operating cost estimate from Appendix B, GCRTA Annual Transportation Improvement Program submission to the U.S. Department of Transportation, 1982. NOTE: Capital cost estimate by DOT includes all expenses dating back to the Department's 1979 Accessibility Rule; annualized at 10 percent over an assumed life of 10 years for vehicles with a capital cost recovery factor of .163; 10 percent for land purchase; and 10 percent over 20 years for equipment and construction, with a capital cost recovery factor of .118.

[5] The operating and capital costs supporting handicapped travel are based on GCRTA's estimate of 56 percent of total CRT and medical trips by wheelchair and semi-ambulatory patrons, 100 percent of the Extra-Lift trips, and GCRTA assumes 17 percent of the total CRT/medical trips by 38 percent of elderly patrons who are transportation handicapped.

terminals (to be established at major hospitals and downtown locations) onto other GCRTA vehicles which would serve all trip purposes and destinations throughout Cuyahoga County. Only handicapped persons unable to use the fixed-route system would be eligible for the county-wide service, which covers the same geographic area served by the fixed-route system. However, the GCRTA would continue to provide CRT neighborhood service for non-disabled senior citizens, although these persons would not be eligible for special service under the final rule.

If the GCRTA chose to restructure its service in this way, it should result in improved system efficiency by eliminating deadhead trips on the Extra-Lift and medical services, and by grouping more rides with existing traffic to reduce cost. However, for the user, it would probably mean extended travel times which more closely approximate local bus service, although travel would be expanded to more destinations and trip purposes.

The GCRTA assumes that roughly 75 percent of total trips on the restructured service would be made by persons who are physically or mentally incapable of using regular transit services. (This estimate includes 38 percent of elderly users, who currently qualify for service on the basis of age, but could be recertified by GCRTA as eligible handicapped.) Based on the 1982 ridership of 384,410 trips, 75 percent of total trips represent roughly 288,000 potentially eligible handicapped trips on the restructured service. In addition, the GCRTA indicated that it would continue to provide CRT neighborhood service for non-disabled elderly persons, who account for about 92,500 neighborhood trips. The projected trips on the restructured service would then include 288,000 eligible handicapped trips, plus 92,500 non-disabled elderly neighborhood trips, or approximately 380,500 total trips.

In addition to these trips, the GCRTA estimates that the restructured service could potentially serve an additional 15 to 20 percent cross-county trips by eligible handicapped persons. A 20 percent increase in the 41,362 cross-county trips provided by the Extra-Lift and Medical services in 1982 would represent 8,272 new cross-county trips. Projected total ridership on the special service would then be approximately 388,800 trips, which the GCRTA

estimates it could serve at a total program cost of $4.5 million.[6] However, even with the assumed increases in ridership and cost, the restructured service might not be able to accommodate all demand for cross-county trips. Also, the service would continue to operate on a prior day advance notice basis, and no Saturday or evening service would be provided.

To comply with the regulations governing these service factors, the GCRTA would probably have to make further adjustments in its special service. Under the final rule, the GCRTA could claim only the program cost supporting the trips of handicapped patrons who are physically incapable of using regular bus service. If the GCRTA limited program eligibility in accordance with the regulatory requirement, it could potentially eliminate 92,500 neighborhood trips by non-disabled elderly patrons. The GCRTA estimates that the elimination of non-disabled elderly trips would reduce it's annual program cost by approximately 20 percent, or roughly $0.9 million. This would reduce the total cost from $4.5 million to $3.6 million, and the annual ridership on the special service would decline from 388,800 to roughly 296,300 trips. The estimated total cost per handicapped trip would then be 12.15.

In addition to eliminating elderly trips, the GCRTA could probably also reduce the number of existing handicapped trips by limiting eligibility in accordance with the rule to persons who are physically incapable of using regular bus service . Currently, the GCRTA serves mobile and immobile handicapped patrons, including those with mental and visual impairments. Many of these patrons are certified as eligible on the basis of a V.A. card; others are certified if they reside more than 1500 feet from a bus line. Some patrons certified in this manner may not be physically incapable of using regular bus service. Still others, such as the mentally retarded, would not be eligible under the final rule unless they have physical disabilities which would independently qualify them for special service.

Ridership data provided by the GCRTA are insufficiently detailed to estimate the number of current handicapped users who might not qualify for special service based on the eligibility requirement of the rule. Estimates obtained from the Kansas City case study, various UMTA special service demonstrations and other studies indicate that the average use rates for mentally retarded persons

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[6] This estimate is based on 1983 program operating cost of $3.2 million, plus an annualized capital expense estimated by the DOT at $1.3 million for 1979-82. (This assumes that all paratransit capital acquisitions dating back to the DOT 1979 Accessibility Rule would be considered eligible expenses under the final rule.) This estimate does not include utility cost for the special service facility, or the cost of improving or constructing transfer terminals which the GCRTA assumes would be borne by hospitals or other facilities housing transfer points.

alone range from 10-33 percent of total handicapped ridership on existing special services (see full discussion of ridership data and assumptions in Chapter II, pg. II-41). For purposes of this analysis, it is assumed that 25 percent of current handicapped users on GCRTA's special services might not qualify for special service, if GCRTA limited program eligibility in accordance with the rule to persons physically incapable of using regular bus service. This would potentially reduce the projected total handicapped ridership from 296,300 trips to about 222,200 trips, and the total program cost supporting handicapped trips would decline from $3.6 million to $2.7 million.

In order for the Cleveland system to meet the service criterion requirement for comparable days and hours of service, the GCRTA would have to provide 5,564 additional paratransit service hours per year to equal the 24 hours of daily service provided by the fixed-route bus system. Based on the Department's estimate, the potential cost to provide 5,564 additional service hours per year and 33,500 new trips per year at a total average cost per trip of $12.15 is approximately $407,000. (See Appendix for details of cost and service assumptions.) This would increase the adjusted total program cost from $2.7 million to $3.1 million. Total trips on the restructured service would increase from 222,200 to 256,000 trips.

In addition, the Cleveland system currently maintains a wait list of 200 persons for the Extra-Lift cross-county service. This practice would be prohibited by the eligibility requirement of the rule which requires recipients to serve all handicapped persons who qualify for service. If Cleveland eliminates the wait list, the GCRTA estimates that approximately 20 percent of wait list applicants, or 40 persons, are ready to use Extra-Lift, (based on an informal 1983 telephone poll conducted by GCRTA). Elimination of the wait list is estimated to increase the total trips from approximately 256,000 to 257,000 trips, and the adjusted total program cost of $3,107,000 would increase by approximately $12,000, or $3,119,000. (See appendix for details on service and cost assumptions.)

In summary, if the Cleveland transit authority elects to restructure its paratransit service to fully comply with the service criteria and eligibility requirements of the final rule, the Department estimates that it could potentially do so at an adjusted total program cost of approximately $3.1 million.

The total amount of Federal transit assistance to the GCRTA is presented below:

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY UMTA-APPROVED GRANTS[7]
(in Millions of Dollars)

	FY 1980	FY 1981	FY 1982
Section 5	20.7	21.4	18.4
Section 3	55.8	40.0	25.3
Total	76.5	61.4	43.7

The average total annual Federal transit assistance provided to Cleveland for the three years was $60.5 million. The total cost of Cleveland's special paratransit program for elderly and handicapped persons was approximately $3.9 million in 1982, or 6.4 percent of the average total annual Federal assistance for the years 1980-82. The estimated cost to restructure Cleveland's service to meet the service criteria requirements of the final rule is $3.1 million, or approximately 5.1 percent of GCRTA's average annual Federal transit assistance in 1980-82.

The total operating expenses of the Greater Cleveland Regional Transit System are shown below:

GREATER CLEVELAND TRANSIT SYSTEM
TOTAL OPERATING EXPENSES[8]
(in Millions of Dollars)

CY 1980	CY 1981	CY 1982
101.6	113.9	113.3

The average total annual operating expense of the GCRTA for 1982 and the preceding two years was $109.6 million. The total annual paratransit program cost was $3.9 million in 1982, which represents 3.6 percent of the average total operating expense. The

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[7] Source: Resource Management Division, Office of Grants Management, Urban Mass Transportation Administration, U.S. Department of Transportation. NOTE: Includes Section 5 apportionments in each fiscal year. (The Federal fiscal year runs from October to September.) Grant amounts are those certified by GCRTA to the UMTA Region 5 Office.

[8] NOTE: GCRTA fiscal year is January to December. Calendar year costs are used in lieu of UMTA Section 15 report data which are reported for the average transit fiscal year of July to June. Under Section 15, the GCRTA total operating costs would be reported in the year following actual expenditures.

estimated cost of the restructured service is $3.1 million, or approximately 2.8 percent of the three-year average operating cost.

Based on these results, it appears that Cleveland could provide paratransit service which fully meets the final rule's service criteria for less than the proposed 7.1 percent and 3.0 percent cost limit amounts.

The regulations would permit advance reservations and response times to a reasonable time period up to 24 hours. If, however, Cleveland had to consider eliminating the prior day advance notice requirement to provide response times comparable to general transit schedules, the GCRTA estimated that the current operating cost of $3.2 million would increase by 35-40 percent, or roughly $1.2 million.[9] This would increase the total estimated program cost of $3.1 million to $4.3 million. At this level, Cleveland would have to spend 3.9 percent of it's $109.6 million average annual total operating cost, or 7.1 percent of its $60.5 average annual Federal transit assistance. Thus, the elimination of advance reservations would represent the most costly adjustment in Cleveland (albeit, one not required by the rule) and could result in Cleveland's cost exceeding both of the proposed cost limits.

The analysis may potentially overstate the eligible ridership and demand for the special service because:

1. It assumes GCRTA's 1978 survey estimate that 38 percent of total elderly patrons are handicapped and unable to use regular transit, versus a DOT 1978 survey estimate which identified 21 percent of the Nation's total elderly population as transportation handicapped to some degree in using transit.

2. Actual rates of demand for late night and weekend service hours may be lower than those assumed, based on national estimates of average hourly demand for regular transit service and special transportation services.

3. Also, the Department's capital cost estimate for GCRTA's paratransit program may be overstated since it assumed that the final rule would allow recipients to claim all capital purchases dating back to the DOT's 1979 rule and this may turn out not to be the case. In addition, the vehicle acquisition costs assumed in the DOT estimate are part of a massive program effort undertaken by the GCRTA between 1980 and 1983 to replace it's entire fleet of paratransit buses. The GCRTA anticipates a future year average bus procurement of $450,000, which would reduce the annual capital expense approximately 40 percent below the Department's estimate.

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[9] This estimate includes the cost of acquiring a second radio channel to avoid communications overload on the existing system.

Appendix

1. Total population of Cuyahoga County, Ohio -- 1,498,400 (1980).

2. Elderly and handicapped population of Cuyahoga County, Ohio -- 160,000 (1979).

3. Total elderly and handicapped paratransit service registrants -- 12,646 (1983).

4. Percent elderly and handicapped population served by special service: 8 percent.

5. Total GCRTA Paratransit Program Cost 1982 (in millions of $)

   $2.6 -- Total 1982 operating cost
   1.3 -- annualized capital expense (includes 1979-82 acquisitions)
   $3.9 -- Total 1982 paratransit program cost

6. Estimated 1982 Program Cost Supporting Handicapped Travel

   CRT/Medical Cost Supporting Wheelchair/Semi-Ambulatory Trips
   (in thousands of $)

   $1.855 -- Total CRT/medical operating cost
   X.56 -- Percentage of handicapped CRT/medical trips
   $1.039
   +728 -- Annual capital expense assumed for CRT/medical handicapped support (.56 X $1.3 million)
   $1.767 -- Total 1982 CRT/medical cost supporting handicapped travel

   CRT/Medical Cost Supporting Elderly Handicapped Trips
   (in thousands of $)

   GCRTA assumes 38% of total elderly patrons cannot use fixed route service, and account for 17% of total CRT/Medical trips.

   $1.855 -- Total 1982 CRT/medical operating cost
   X.17 -- Percentage of total trips by 38% elderly handicapped
   0.315
   +0.221 -- Annual capital expense for elderly handicapped support (.17 X $1.3 million)
   $0.536 -- CRT/medical cost support elderly handicapped trips

Extra-Lift Cost Supporting Certified Handicapped Trips
in thousands of $)

$0.795 -- 1982 Extra-Lift program operating cost
+ .026 -- Annual capital expense assumed for Extra-Lift support (.02 X $1.3 million)
$0.821 -- Total 1982 cost in support of Extra-Lift trips

Summary of Total 1982 Program Cost Supporting Handicapped Trips (in thousands of $)

$1.767	CRT/Medical Cost of handicapped trips
.821	Extra-Lift Cost of handicapped trips
.536	CRT/Medical cost elderly handicapped trips
$3.124	Estimated total cost supporting handicapped trips in 1982

7. Estimated Total Cost per trip - CRT/medical service

$1.855 -- 1982 CRT/medical operating cost supporting 95% of total trips
1.235 -- Annual capital cost (.95 X $1.3 million)
$3.090 -- Total CRT/Medical Cost
-.895 -- Medical service cost estimated by GCRTA at $35 per trip X 25,545 trips
$2.195 -- Total CRT cost ÷ 339,216 trips =
$6.47 -- Average total cost/ trip of CRT E&H service 1982

8. Estimated Total Cost per trip -- Extra-Lift

$ 0.795 -- 1982 Extra-Lift operating cost @ 5 percent of total trips
.065 -- Annual capital expense supporting Extra-Lift (0.5 X $1.3 million annual capital cost
$ .860 -- Total Extra-Lift cost ÷ by 19,649 trips =
$43.77 -- Average total cost/ trip on Extra Lift in 1982

9. Total Trips 1982

339,216 -- CRT trips by E&H
25,545 -- Cross-County medical trips by E&H
19,649 -- Extra-Lift Trips by H only
384,410 -- Total 1982 trips

9A. Composition of Medical Service Trips 1982

25,545 -- Total medical trips
-21,713 -- 85% handicapped medical trips (GCRTA assumes 56% handicapped trips + 29% elderly handicapped trips)
3,832 -- 15% non-disabled elderly medical trips

9B. Composition of CRT Neighborhood Service Trips 1982

339,216 -- Total CRT trips
-189,962 -- 56% CRT handicapped trips
149,254 -- 44% CRT elderly trips
-56,717 -- GCRTA estimates that 38% of 149,255 total elderly CRT trips are made by elderly handicapped patrons who are unable to use transit
92,537 -- Non-disabled elderly CRT trips

10. Projected Total Ridership on GCRTA's Restructured Service

- Handicapped Trips

19,649 -- 100% H trips on Extra-Lift cross-county service
+21,713 -- 85% H trips on medical cross-county service
41,362 -- Existing H trips on cross-county services
+8,272 -- GCRTA estimates of a 20% increase in cross-county H trips on the restructured service
49,634 -- Potential cross-county H trips on restructured service
+246,679 -- CRT neighborhood H trips (189,962 H trips + 56,717 elderly H trips)
296,313 -- Total projected H trips on restructured service

- Non-Disabled Elderly Trips

96,369 -- Non-disabled elderly CRT/Medical trips
-3,832 -- Non-disabled cross-county medical trips to be eliminated by GCRTA
92,537 -- Potential non-disabled CRT neighborhood trips that GCRTA would continue to serve on restructured service

- Total Ridership

296,313 -- Total projected H trips
+92,537 -- Total projected non-disabled trips
388,850 -- Potential total ridership on restructured service

11. Program Cost Adjustment -- Restructured Service (in millions of $)

$3.2 -- GCRTA estimated operating cost of restructured service supporting 75% handicapped trips and 25% non-disabled elderly trips
±1.3 -- DOT estimate of annualized capital expenses (1979-82)
$4.5 -- Total estimated cost of restructured service serving E&H trips

12. Program Adjustment - Elimination of Non-Disabled Elderly CRT Neighborhood Trips

a. GCRTA estimates a 15 - 20% reduction in the cost of the restructured service, if non-disabled elderly trips are eliminated.

b. $4.5 million total program cost X .20 = $0.9 million reduction in program cost if non-disabled trips eliminated.

c. $4.5 million total program cost - $0.9 million program savings = $3.6 million adjusted program cost if non-disabled elderly trips are eliminated.

d. 388,850 projected total trips on restructured service - (minus) 92,537 non-disabled elderly neighborhood trips = 296,313 adjusted H ridership on restructured service.

e. $3.6 million program cost ÷ 296,313 adjusted H trips = $12.15 cost per trip.

13. Program Adjustment - Reduced Program Eligibility Under 504 Regulation

a. Applicants for CRT neighborhood service and the Cross-County Medical service are required to present some proof of disability, such as a V.A. card. Doctors' certifications that these disabilities prohibit use of fixed-route bus service are not required. It is possible that some of these persons may be capable of using regular transit and would not be eligible for special service under the rule.

b. GCRTA's eligibility policy for the CRT, medical and Extra-Lift services includes persons with mental or visual impairments and handicapped persons who reside more than 1,500 feet from a bus line. Many of these persons would not qualify as eligible for special service under the rule which limits eligibility to persons who are physically incapable of using the existing bus service.

c. Assume that if the GCRTA limited eligibility for its services in accordance with the requirements of the new rule, it could potentially eliminate 25 percent of current handicapped trips (see assumptions, pg. 7).

d. 296,313 total H trips X .25 trip reduction = 74,079 trips ineligible for service under the final rule.

e. 296,313 total H trips - 74,079 trips = 222,236 adjusted H trips potentially eligible for special service.

f. Eliminate 74,079 H trips X $12.15 cost/trip = $900,060 reduction in program cost if eligibility is limited to physically disabled persons who cannot use existing bus service.

g. $3.6 million adjusted program cost - $0.9 million = $2.7 million adjusted program cost if program eligibility is restricted to handicapped persons in accordance with the requirements.

h. $2.7 million adjusted program cost ÷ 222,236 adjusted H trips = $12.15 total average cost per H trip on restructured service.

14. Program Adjustment - Increase Days and Hours of Special Service to Match Those of Fixed-Route Service

a. Assume 168.0 fixed-route weekly full-service hours (24 hours, 7 days/week) minus 61 special service weekly hours = 107 additional special service hours needed weekly or 5,564 additional hours per year.

b. Number of trips/hour:

222,236 H trips/year - 52 weeks = 4,274 trips/week
4,274 trips/week - 61 service hours = 70 H trips/hour

c. Add Saturday Service

1. Assume 9 hours of service (9 a.m. - 6 p.m.) X 52 Saturdays = 468 hours per year.

2. Assume Saturday trips at one-half the rate of 70 H weekday trips per hour (since weekend tripmaking is typically lower) = 35 trips/hour

3. 35 trips/hour X 468 hours/year = 16,380 new trips
16,380 Saturday trips X $12.15 average cost/trip = $199,000 additional cost to provide Saturday service 9 a.m. - 6 p.m.

d. Add Evening Service

1. Assume 6.5 additional hours of service (5:30 p.m. - midnight) on 5 weekdays = 32.5 additional hours of service per week X 52 weeks = 1690 hours per year

2. Assume evening trips at one-tenth of the weekday rate of 70 H trips per hour = 7 trips/hour

3. 7 trips/hour X 1690 hours/year = 11,830 new trips

4. 11,830 evening trips X $12.15 average cost/trip = $143,735 additional cost to provide 5 evenings of service 5:30 p.m. to midnight.

e. Add Weekend Early Morning and Evening Service to Achieve Comparability to Fixed-Route Service Hours

1. 8.5 -- add Saturday hours (6:30 a.m. - 9:00 a.m. and 6:00 p.m. to midnight)
+11.5 -- add Sunday hours (6:30 a.m. - 8:30 a.m. and 2:30 p.m. - midnight)
20.0 -- hours/week X 52 weeks = 1040 hours/year

2. Assume early morning/evening weekend trips at one-tenth the Saturday daily rate of 35 trips/hour = 3.5 trips/hour.

3. Assume 3.5 trips/hour X 1040 hours/year X $12.15 cost/trip = $44,226 additional cost per/year to serve 3,640 additional trips on weekends in early morning and evening.

f. Add Late Night Hours (Midnight to 6:30 a.m.)

1. Assume 6.5 additional hours of service (midnight to 6:30 a.m.) on 7 days = 45.5 additional hours of service per week X 52 weeks = 2,366 hours/year.

2. Assume night trips at one percent of weekday rate of 70 H trips/hour = 0.7 trips/hour.

3. 2,366 additional hours/year X 0.7 trips/hour X $12.15 cost/trip = $20,120 additional cost/year to serve 1,656 new trips (midnight to 6:30 a.m.).

15. Total Cost And Service Adjustment for Increased Days and Hours of Service

5,564 -- additional service hours/year

33,506 -- additional trips per year

$407,080 -- additional cost/year to increase days and hours of service comparable to fixed-route system

a. 222,236 adjusted H trips + 33,506 additional H trips due to increased service hours = 255,742 total adjusted H trips on restructured service.

b. $2.7 million adjusted program cost of limiting program eligibility + $0.4 million program cost increase to extend service hours = $3.1 million adjusted program cost.

16. Program Adjustment - Elimination of Waiting List

a. GCRTA has approximately 200 persons wait listed for Extra-Lift cross-county service.

b. GCRTA estimates that approximately 20% of the 200 wait listed persons, or 40 persons are ready to use the Extra-Lift service, based on an informal survey of wait-listed persons.

c. Assume 40 additional Extra-Lift registrants make 0.07 trips per eligible user per day,[10] or 2.8 daily trips X 365 days/year = 1022 additional trips/year.

d. Assume 1,022 additional trips X $12.15 total average cost per trip for restructured service = $12,000 additional program cost of new Extra-Lift trips/year.

e. $3,107,080 adjusted program cost + $12,000 cost increase to eliminate wait list = $3,119,080 total estimated cost for the GCRTA to fully meet the final rule's service criteria.

17. Net Cost Estimate

a. Assume 50% of 256,764 total handicapped trips occur in peak-hours and 50% in off-peak.

b. 128,382 trips X .40 peak-hour fare = $51,353 revenue

c. 128,382 trips X .25 off-peak fare = $32,098 revenue

d. $51,353 + $32,098 = $83,449 current estimated revenue of handicapped trips.

e. $3.1 million total adjusted program cost of restuctured service - $0.1 million fare revenue = $3.0 million net program cost.

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[10] This is the average daily severely handicapped persons demand rate estimated for wheelchair users only by the National Cooperative Highway Research Program, Cost-Effectiveness of Transportation Services for Handicapped Persons, NCHRP Report 262, pages 16-17.

18. GCRTA Total Operating Cost and Federal Assistance

	Operating Cost[11]		Federal Assistance[12]
CY 1979	$ 89.4	FY 1979	$45.9
CY 1980	101.6	FY 1980	76.5
CY 1981	113.9	FY 1981	61.4
CY 1982	106.3	FY 1982	43.7

19. GCRTA Capital Expense for Paratransit Service (assumes all acquisitions dating back to the DOT 1979 Accessibility Rule are eligible expenses).

1979 Capital Expense

Land purchased CRT building $1,025,000
Estimated annual expense $1.025 X .10[13] $102,500

1980 Capital Expense

Vehicle purchase $1,050,000
Estimated annual expense $1.050 X .163[14] 171,000

1981 Capital Expense

Architectural engineering	$ 178,032
Equipment cost	250,000
Construction cost	2,407,852
Total	$2,835,884

Estimated annual expense $2.836 X .118[15] 334,634

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[11] GCRTA fiscal year corresponds to calendar year.

[12] Includes Section 3 and Section 5 capital funds and Section 5 apportionments. Federal fiscal year runs from October to September.

[13] Annualization is figured at 10% and infinite life.

[14] Annualization is figured at 10% over 10 years resulting in an annual cost recovery factor of .163.

[15] Annualization is figured at 10% for 20 years with a capital cost recovery factor of .118.

1982 Capital Expense

Demolition $170,877	
Upgrade computer system $4,300,000	
GCRTA claims that some part of $3.5 million construction loan progress payment in 1983 should be credited to 1982. Assume 50 percent or $1.7 million applies to 1982.	
Estimated annual expense $6.171 X .118	728,180
Total Annual Capital Expense (1979-82)	$1,336,314

PITTSBURGH'S PARATRANSIT BROKERAGE PROGRAM FOR ELDERLY AND HANDICAPPED PERSONS

The Port Authority of Allegheny County (PAT) provides coordinated paratransit service to all residents of Allegheny County through a coordinated brokerage system. The paratransit service operates throughout Allegheny County, a 727 square-mile area with a population of approximately 1.5 million. PAT provides a user-side subsidy program for persons physically unable to use its fixed-route system; however, anyone can use the paratransit system by paying the full fare. A private firm, ACCESS, operates as the central broker under contract to PAT, and subcontracts for service with profit and non-profit carriers which supplied an average daily fleet of 130 vehicles in ACCESS service in FY 1983.[1] The ACCESS program was initiated under an UMTA demonstration from 1979 to 1982. It was designed to test the feasibility of coordinating paratransit services to improve the cost-effectiveness and level of service of specialized transportation for elderly and handicapped persons.

ACCESS offers county-wide door-to-door service, seven days a week, and 18 hours daily, 6 a.m. to midnight. The system accommodates all demand in dedicated vehicles or metered taxis, and serves the same geographic area as the fixed-route service. There are no limitations or prioritizations on trip purposes. Reservations for most ACCESS trips require one-day advance notice for guaranteed. Beginning in 1981, ACCESS provided service on a two-hour advance reservation basis for all users, which is subject to available capacity.

Same day trips account for about 5 percent of the reservation requests. ACCESS also provides special arrangements for handicapped persons from out of town and temporarily disabled persons to use the service. All trips are scheduled on a demand-response basis, and no subscription service is provided.

ACCESS markets its services to human service agencies, which accounted for approximately 34 percent of total trips, excluding escorts, in FY 1983. Non-agency users are also served by ACCESS, and account for the remainder of trips. The Port Authority offers a user-side subsidy on ACCESS service to individuals unable to physically board a bus. The user-side subsidy was set at 75 percent of the cost of ACCESS service from 1979-81, and was raised to 88.75 percent in 1982 when ACCESS fares increased. Applicants for the discount must appear at the Easter Seals Society, which is under contract to ACCESS to screen applicants. The Society administers a physical test using a mock-up of the

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[1] FY 1983 = July 1, 1982 - June 30, 1983.

front end of a regular bus; individuals unable to use the steps are certified as eligible for the subsidized fare. Currently, approximately 20 percent of PAT subsidy trips are taken by wheelchair users. Semi-ambulatory persons who have difficulty getting to a bus stop, but can board a bus, are not eligible for the PAT subsidy but may use ACCESS at the full fare. Also, persons with visual or mental impairments are ineligible for the subsidy, unless they cannot ambulate.

The ACCESS fare system is based on 195 geographical zones, and a uniform fare is charged for intrazone trips. For trips between zones, fares are based on the airline distance between zones. Individuals pay for service with scrip coupons purchased in advance from ACCESS. In 1983, the fare was $3.00 per airline mile with a minimum $4.00 fare. The minimum charge to user-side subsidy patrons was 50 cents. In 1983, the average fare for was estimated at $11.50 for an average trip length of 5 miles.[2] The user-side subsidy paid by PAT was 88.75 percent of the $11.50 fare or $10.21; therefore, the average user cost to PAT subsidy patrons was approximately $1.29. In comparison, the base fare for fixed-route transit in 1983 was $1.00, with zone fares ranging up to $2.65.

ACCESS became the designated provider for the Commonwealth of Pennsylvania's reduced-fare program for elderly users (65 years old and older) of paratransit services when that program began in mid-1983. The State pays 75 percent of the fare of ACCESS trips taken by elderly patrons, who represented 56 percent of ACCESS revenue trips in 1983. Also, the State reimburses PAT for 75 percent of the subsidy cost for eligible elderly handicapped patrons, who account for 30 percent of total PAT subsidized ACCESS trips.

PAT appears to satisfy all of the service criteria, except the eligibility requirement, for the provision of specialized handicapped transportation services under the new rule:

1. Eligibility for PAT's user-side subsidy program is limited to persons who are unable to negotiate bus steps. Other handicapped persons, such as those who are blind, are currently ineligible for the subsidy, unless they cannot ambulate. Some of these persons may need to be regarded as eligible for accessible service under the rule if they are physically unable to use the bus system for the general public.

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[2] (5 mile average trip length) divided by (1.3 mile per airline mile) x $3.00 mile) = $11.50 per trip.

2. The special service operates over the same geographic area served by the fixed-route system.

3. There are no limitations or prioritizations on trip purposes or destinations.

4. The service is operated on the same days and hours as the fixed-route system.

5. All demand is served, and there is no waiting list.

6. All users may book trips two hours to one day in advance of service.

7. The average user cost to PAT subsidy patrons was approximately $1.29 in FY 1983, compared to transit fares, ranging from $1.00 to $2.65 dependent on the length of the trip.

The final rule requires that the cost of a trip on the special service should be comparable, although not necessarily identical, to the fare charged for a trip of similar length, or at a similar time of day on the fixed-route bus service. Comparability is to be determined through the local participation process. As determined by the Southwestern Pennsylvania Regional Planning Commission's (SPRPC) Elderly and Handicapped Transportation Advisory Committee during the planning of the ACCESS system, paratransit fares should be comparable to fixed route fares. "Comparability" was defined by the Committee as approximately two-times the base fare, or $2.00. (Note, also, the fares for fixed-route transit range from $1.00 to $2.65, dependent on the number of zones.) Therefore, the $1.29 average user fare for PAT user-side subsidy patrons is assumed to be comparable for analytical purposes.

The Federal eligibility requirement limits special service provision to persons who are physically incapable of using the existing fixed-route bus system. PAT's eligibility criteria for the user-side subsidy program, based on inability to board a bus, is different from that of other case study systems.

If eligibility for the user-side subsidy program is limited as in Pittsburgh to those unable to negotiate steps, then the transit operator might comply with the final rule by equipping its buses and facilities with accessible devices to accommodate the needs of other handicapped subgroups such as blind persons who are physically unable to use the regular bus system. PAT undertook a program beginning in 1977 to improve the public transit system for disabled riders. Improvements include: kneelers, handrails, improved signage, and lighting in stairwells and on all new buses; assignment of new or modified buses to routes with high concentrations of elderly and handicapped; a training program to

sensitize bus drivers to specific difficulties of disabled riders; and a program to educate elderly and disabled persons in the proper use of the transit system and vehicles designed for their needs.

If PAT provides mobility training to educate blind persons in the use of regular bus service, or if such persons are trained by organizations such as the Easter Seals Society (which administers PAT's eligibility tests), then those who are successfully trained would not be eligible for special service under the rule.

Alternatively, PAT might have to consider providing user-side subsidies for blind persons on the ACCESS system in order to meet the eligibility requirement of the rule. The number of blind persons in Allegheny County who potentially would qualify to receive special service cannot be reliably estimated. Data from the case study of Kansas City, Missouri, which provides user-side subsidy service with operating characteristics quite similar to PAT's ACCESS service, indicates that blind patrons account for approximately 19 percent of total trips. Therefore, for purposes of estimating the costs for PAT to meet the eligibility requirement of the rule, the use rate for blind persons is assumed to be 19 percent. Assuming that the cost per trip for blind users would be the same as for other severely disabled users, the increase in PAT's costs from including blind persons in the user-side subsidy program would be 19 percent.

Demand: In FY 1983,[3] ACCESS served 233,620 total trips excluding escorts, of which approximately 60 percent, or 139,655 trips were made by PAT subsidy patrons. The ACCESS system has realized a 49 percent increase in ridership between FY 1981 and FY 1983, primarily due to the introduction of medical assistance trips sponsored by a County block grant in October 1983. Also, the initiation of the State subsidy program for elderly patrons, and the increased recognition of ACCESS by the public have contributed to general growth in the subsidy program.

Market Penetration: No recent data are available on the handicapped population of Allegheny County targeted for the PAT user-side subsidy. The program had 2,500 registrants eligible for the PAT subsidy in June 1981. Currently, the program has 5,900 PAT subsidy registrants.

Program Costs: The total expense for the ACCESS service was $2,792,661 in FY 1983, of which approximately $1.3 million was spent by PAT to subsidize the trips of eligible user-side subsidized patrons.

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[3] FY 1983 = July 1, 1982 - June 30, 1983.

The total amount of Federal transit assistance to the Port Authority is presented below:

PORT AUTHORITY OF ALLEGHENY COUNTY
UMTA-APPROVED GRANTS[4]
(in Millions of Dollars)

	FY 1981	FY 1982	FY 1983
Section 5	20.6	18.1	15.2
Section 3	110.7	95.0	75.3
Total	131.3	113.1	90.5

The average total annual Federal transit assistance provided to the Port Authority for FY 1981-83 was $111.6 million. The total cost of the ACCESS program was about $2.8 million in FY 1983, or 2.5 percent of the average annual Federal assistance provided PAT in FY 1981-83. Of this amount, PAT's actual subsidy costs in support of trips by user-side subsidy patrons was approximately $1.3 million in FY 1983, or 1.2 percent of the average total annual Federal assistance for FY 1981-83.

The total operating expenses of the Port Authority are shown below:

PORT AUTHORITY OF ALLEGHENY COUNTY
TOTAL OPERATING EXPENSES[5]
(in Millions of Dollars)

FY 1981	FY 1982	FY 1983[6]
110.4	122.3	136.4

The average total annual operating expense of the Port Authority for FY 1983 and the preceding two years was $123.0 million. The total ACCESS program cost of $2.8 million represents 2.3 percent of the average total operating expense. PAT's actual subsidy cost

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[4] Source: Resource Management Division, Office of Grants Management, Urban Mass Transportation Administration, U.S. Department of Transportation. NOTE: The grant amounts are those certified by the recipient to the UMTA regional office. The Section 5 grants represent apportionments in each fiscal year.

[5] National Urban Mass Transportation Statistics, Section 15 Reporting System, U.S. Department of Transportation, FY 1979-81.

[6] Estimate assumes annual increase in expenses at 1.15 percent.

in support of user-side subsidy patrons was $1.3 million in FY 1983. This represents 1.3 percent of the average total operating expenses for FY 1981-83.

However, certain aspects of PAT's funding system for ACCESS are unique to Allegheny County and its participants. A majority of the trips taken by elderly and handicapped persons are subsidized partially or totally by special State and local programs. To use Pittsburgh's ACCESS service as an example from which to draw national conclusions about the potential compliance costs of the rule, some or all of these subsidies should be assumed not to exist. For example, ACCESS provided 40 percent of total trips to social service agency clients in FY 1983 at an estimated total cost of approximately $700,000. The agencies subsequently reimbursed PAT for the full cost of these trips. Since the transit authority is the provider of the trips, and the 504 regulations entitle recipients to claim the total eligible cost of special services without subtracting revenues or other reimbursements, PAT could claim that proportion of the $700,000 agency cost supporting handicapped clients who are physically incapable of using regular bus service.

In addition to the social service agency cost, a proportion of the subsidy which PAT receives from the Pennsylvania State fare program for elderly users also should be considered as an eligible PAT expense. The State program began in mid-1983, and reimbursed PAT for 75 percent of the trip costs for elderly handicapped user-side subsidy patrons. Without the reimbursements from the State program and the social service agencies, PAT estimated that 80.5 percent of total ACCESS revenue riders would have been eligible[7] for the PAT subsidy in FY 1983, at a total cost of $2.248 million.[8]

At this level of spending, PAT's service meets all of the service criteria of the rule except for the eligibility requirement. If PAT provides travel training programs to educate blind persons to successfully use its existing fixed-route bus service, or sponsors such training through the Easter Seals Society or other organizations, then PAT would not be required to provide special service to such persons.

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[7] Trip estimate is based on 100 percent of user-side subsidy patrons' trips and 51.5 percent of the trips provided to social service handicapped agency clients, who otherwise would have been eligible for the PAT subsidy based on inability to board a bus.

[8] Cost estimate is based on 80.5 percent of the total ACCESS expense of $2.793 million in FY 1983. See Appendix for detailed assumptions on cost estimate.

Alternatively, PAT might choose to provide user-side subsidy service to blind persons to comply with the eligibility requirement of the rule. Based on the eligibility discussion in the previous section and assumptions about the use rates of blind persons, it is estimated that their inclusion in PAT's subsidy program would increase current costs by 19 percent, or from $2.2 million to $2.7 million.

Thus, if the Port Authority claimed the total cost of providing ACCESS trips to eligible handicapped users in FY 1983 (without adjustments for State subsidies and agency reimbursements), and if PAT chose to provide user-side subsidies for blind persons, the potential total cost would be $2.7 million. This would represent approximately 2.4 percent of $111.6 million average annual Federal Assistance received by PAT in FY 1981-83, or 2.2 percent of PAT's average total operating expenses of $123.0 million for FY 1981-83.

At this level, the Port Authority would receive full credit for all eligible handicapped trips provided by its ACCESS system; it would satisfy all of the final rule's service criteria; and the total adjusted cost of providing these services would not exceed the proposed cost limits of 7.1 percent of Federal transit assistance and 3.0 percent of total operating expenses.

Appendix

ACCESS SYSTEM STATISTICS

		FY 1981	FY 1983
1.	TOTAL RIDERSHIP[9]	156,652	233,620
	o PAT Subsidized Trips (%)	69,578 (44%)	139,655 (40%)
	o NON-PAT Subsidized Trips (%)	87,074 (56%)	93,965 (40%)
2.	Fare per Airline Mile	$ 1.25	$ 3.00
3.	Average Trip Length	5 miles	5 miles
4.	Average Fare[10]	$ 4.80	$11.50
5.	Percent Subsidy for PAT Subsidized Trips	75%	88.75%
6.	Average User Cost for PAT Subsidized Trips	$ 1.20	$ 1.29
7.	PAT Base Fare	$ .75	$ 1.00
8.	Comparable Fare[11]	$ 1.50	$ 2.00
9.	Number of Handicapped Persons Registered for PAT Subsidy	2,500[12]	4,900[13]
10.	EXPENSES:		
	o Brokerage	$318,017	$410,136
	o Transportation	$1,538,704	$2,382,525
	Total Expenses:	$1,856,721	$2,792,661
11.	REVENUE:		
	o Revenue Paid by PAT Subsidized Riders	$86,251	$152,510
	o PaDOT 203 Program	N/A	$673,669
	o AS/AAA	N/A	$578,219
	o Other/Agency	$586,576	$126,384
	o PAT Subsidy	$1,183,894	$1,261,879
	Total Revenue:	$1,856,721	$2,792,661

Footnotes:

[9] Excludes escorts who ride at no charge

[10] Average Fare = [(Average Trip Length) - (1.3 mile/Airline Mile)] x (Fare/Airline mile).

[11] Based upon definition used by S.P.R.P.C. Elderly & Handicapped Transportation Advisory Committee.

[12] June 1981 figure.

[13] June 1983 figure. Note that this figure has grown to 5,900 as of March 1984.

ADJUSTMENT OF FY 1983 ACCESS EXPENSES AND REVENUES SUPPORTING HANDICAPPED TRAVEL*

Projected Expenses:

$2,792,661	Total ACCESS expense in FY 1983
X 80.5	% of total ACCESS FY 1983 ridership potentially eligible for the PAT subsidy
$2,248,092	ACCESS expense supporting total handicapped trips in FY 1983

* NOTE: PAT estimate includes 100% of subsidy patrons' trips, and 51.5% of non-PAT subsidized trips or 188,047 total trips by handicapped persons who would be eligible for the PAT subsidy if State 203 program and agency programs did not exist.

Projected Revenues:

$2,248,092	ACCESS expense supporting handicapped trips in FY 1983
X 11.25	percent user cost of ACCESS service
$ 252,910	Potential revenue paid by handicapped patrons if State and agency subsidies did not exist
1,995,182	PAT subsidy payment (based on 88.75% subsidy X $2,248,092 ACCESS expense)
$2,248,092	Total potential revenue from handicapped trips in FY 1983

SEATTLE METRO'S ELDERLY AND HANDICAPPED TRANSPORTATION PROGRAMS

The municipality of metropolitan Seattle (Metro) operates a wide range of transportation services for elderly and disabled persons in King County, Washington, a 2128 square mile area with a 1.3 million population. Committed to an eventual 100 percent lift-equipped bus system, Metro provided lift service on approximately 52 percent of its coaches, and 53 percent of its routes in 1983. In addition to its regular bus service, Metro provides lift service to the general public on fourteen fixed route/fixed schedule paratransit van routes (contracted to private for-profit providers) in areas where regular bus service cannot be justified or physically operated with full size vehicles.

As a supplement to its mainline accessible transit services, Metro has established a user-side subsidy program and a subsidized van transportation service for low-income elderly and disabled persons. Under its Special Transportation Services Program (STSP), Metro operates a user-side subsidy taxi scrip program, based on the sale of discounted taxi scrip to eligible individuals for use on participating taxi services. Metro also provides trips through a non-profit agency Rural Area Van Program for persons eligible for taxi scrip, but who reside in areas where taxi services are limited or non-existent.

Planning for the E&H services began in the mid-1970s when Metro received considerable pressure from the community and the Federal Government to provide transportation for mobility impaired persons. King County and the City of Seattle conducted an E&H transportation study, which recommended a number of actions to improve mobility. Following the study, a Metro Council subcommittee, an E&H citizens transit advisory committee, and staff from local jurisdictions worked with Metro to formulate an E&H transportation policy to (1) equip all new buses with lifts, (2) conduct planning and marketing to ensure the use of the fixed-route system, and (3) to earmark 5 percent of UMTA Section 5 funds to support a special transportation service program (STSP). The concept underlying the policy was to make the entire system accessible by removing as many barriers as possible that prevented its use.

In addition to its participation in the development of Metro's E&H policy, the citizens advisory committee helped develop the STSP, advised on equipment and route selection, and served on Metro's 504 compliance evaluation group. The Metro Council presently appoints a 16 member advisory committee representing various subcategories of handicapped persons and Seattle's Asian population to two year terms. Metro credits the advisory group as

invaluable in making the E&H programs work, and by helping to identify and resolve problems once the programs were in place. The group also serves as a forum for consumer complaints.[1]

In addition to the assistance provided by the local E&H community, Metro also received an UMTA demonstration grant in 1980 to assist in program coordination, develop an accessible trip map of downtown Seattle, evaluate housing relocation of disabled persons along accessible trolley routes, and assess the lift-bus program.

Although conceived as an integrated system, each of Metro's E&H programs operated to a large extent independently, and will be discussed separately.

ACCESSIBLE LIFT-BUS SERVICE

History

There were three reasons underlying Metro's choice of 100 percent accessible mainline service: the local community was solidly in favor of it; the fixed-route system seemed capable of providing more transportation at lower cost over the large and diverse area of King County than a special service could provide; and the direction of Federal DOT policy and court decisions at that time appeared to favor fixed-route accessibility.[2]

Metro's initiation of accessible service suffered a number of problems and delays. When Metro adopted its full accessibility policy in 1978, it had already ordered 109 trolleys and ten diesel buses with TDT lifts. After delivery and testing of the ten diesel buses, the lifts were found unacceptable. Metro established a team consisting of Metro staff and two wheelchair users from the citizens advisory committee to find a workable lift. The team chose the Lift-U lift. However, work on the trolleys had begun, and Metro had to accept 30 trolleys with unusable lifts and the remaining 79 trolleys with temporary steps in the front door until they could be retrofitted. With inoperable lifts on the diesel and trolley buses, Metro delayed implementation of accessible bus service until mid-1979 when 143 Flyer diesel buses equipped with Lift-U lifts were introduced into service.*

Route Selection

Detailed criteria were developed for choosing accessible routes, including the provision of hourly service, preference for high-

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[1] The Elderly and Handicapped Transportation Programs of the Municipality of Metropolitan Seattle. Final draft pending UMTA approval. January 1982, revised August 1983, pages 2-5.

[2] Ibid, August 1983, page 2.

patronage routes, and balance across the service area. As service levels increased, additional policies were adopted, including a 15 percent spare ratio and a requirement that all day base buses, i.e., those operating at noon, on accessible routes would be lift-equipped if possible. Route selection criteria are worked out with the Citizens Advisory Council which recommends the routes to be prioritized. New lift coaches are assigned on the basis of optimal use on routes. At a mimimum, if a route is to be accessible, lift buses are scheduled at hourly intervals, while routes with high patronage and activity center coverage will have every trip accessible.[3]

Bus Zone Improvements

One of Metro's concerns in adopting accessible bus service was that disabled persons would not be able to get to bus stops. While Metro could do little about pedestrian routes, it undertook bus zone improvements including corner curb cuts, paved walkways, loading pads and culvert covers. Metro also conducted negotiations with jurisdictions responsible for street improvements, and contracted for improvements along routes chosen for a pilot project. On other routes, improvements have either been made by local jurisdictions, or Metro has supplied the local match for FAUS funds to pay for improvements. Because of limited funding, it will take years to make all bus zones accessible. However, Metro has ranked types of improvements and zones so that improvements which will make the zone usable, if not fully accessible, are carried out first. People can find out if a zone is usable in advance of a trip by contacting Metro's telephone service.

Driver Training

A driver task force was established, consisting of eight volunteers who met bi-monthly during the first year following the introduction of accessible bus service. The members acted as a liaison between drivers and management and made recommendations on changes to equipment and procedures. Each driver of an accessible run takes a two hour course on lift operations, policies, and procedures and role playing in a wheelchair.

Marketing

Metro did not market its accessible service heavily. However, the service was made visible in the same ways as the regular transit system. Blue accessibility decals are on all sides of buses. Bus stop signs in usable zones and passenger timetables are also marked with accessibility symbols. Metro has conducted outreach

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[3] Op. cit., supra, August 1983, pages 5-7.

events with drivers or marketing representatives providing lift-bus demonstrations at schools, social service agencies, and group homes for disabled persons. With UMTA funding assistance, Metro also produced an accessibility guide map to downtown Seattle, a large part of which is steeply sloped. A team of disabled persons surveyed downtown for curb cuts, accessible telephones and buildings with elevators which could be used to go from one street level to the next. The map is distributed through agencies and Metro's outreach program.[4]

Service Level and Ridership

The accessible service has all the advantages and disadvantages of regular bus service. Metro operates a mixed fleet of vehicles and has added lifts on standard size and articulated buses, and trolley coaches. Service is available at most times; to many locations throughout the county; and users are afforded flexibility and spontaniety in traveling. The user cost is very low; 15¢ regardless of trip length, compared to an off-peak transit fare of 50¢ to 75¢ dependent on zones, and a peak fare of 60¢ - 90¢. Disadvantages include: frequent long waits, multiple transfers between routes and problems in getting to bus stops.[5]

In terms of service level, following the initiation of 149 lift-buses in 1979, accessible service was increased gradually reaching a level of 338 lift-vehicles in 1981. In that year, lift vehicles represented 34 percent of the total bus fleet. By September 1983, Metro had equipped approximately 52 percent of its bus fleet with lifts, and provided accessible service on approximately 53 percent of its routes. Some routes have consistently had very high lift ridership; others virtually none. In general, the Metro routes operating through densely populated areas, and serving several activity centers or housing facilities for disabled have had the highest ridership. Suburban and commuter oriented routes have experienced the lowest rates.

In terms of ridership, the accessible service has experienced high utilization rates since its inception, and it is recognized as one of the most successful lift operations in the country.

In 1983, Metro averaged 193+ daily lift boardings, or approximately 70,500 annual lift boardings with 53 percent of its routes accessible.

In terms of market penetration, elderly and disabled persons use Metro's accessible fixed-route service more than the other special services offered. E & H lift users account for approximately 14

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[4] Op. cit., supra, August 1983, pages 9 and 61.

[5] Op. cit., supra, August 1983, page 61.

percent of total transit ridership. The characteristics of lift users differ from those of Metro's special service programs. In general, lift users are younger--no more than 15 percent are over 65 years old compared to three quarters of taxi scrip and van users. Approximately 90 percent of lift users are in wheelchairs, compared to about three percent of taxi and van patrons. Lift users travel much more frequently; on an average of seven bus trips weekly compared to under two trips a month by patrons using the special services.[6]

In terms of service reliability, lift breakdowns and schedule delays due to lift operations have not been a problem for Metro. Since mid-1980, the lift malfunction rate has stabilized at 1-2 percent of lift boardings. Consequently in 1983, Metro dropped its spare ratio from 15 to 12 percent. If a lift breaks down and another lift-bus is not due within 15 minutes, Metro transports lift patrons to their destinations in accessible vans. The average lift boarding takes two to three minutes, and adjustments of route schedules due to lift delay problems have not been necessary.[7]

Factors identified by Metro as contributing to the success of the program include:

- Equipment that is reliable, easy to operate and maintain. Maintenance staff have been trained by the manufacturer, Lift-U.
- Strong support of Metro management, elected officials and the disabled community.
- Planning with active participation by the disabled community, and flexibility in the first few months of service to change policies on the advice of the driver task force and citizens advisory group.
- External factors include extensive and well utilized transit service; areas of the county with high accessibility features (curb cuts, accessible buildings); and mild weather which does not prohibit lift-use most of the year, and contributes to easy maintenance.

Program Cost

Through September 1983, Metro estimated the total capital cost of lift equipping 549 vehicles representing 52 percent of the total

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[6] Op. cit., supra, August 1983, page 62.

[7] Op. cit., supra, August 1983, page 10.

fleet at approximately $5.5 million. The annual capital cost to equip 259 standard size coaches with lifts at $9,000 per lift in 1979-80 was estimated by Metro at $194,250.[8]

The annual cost to retrofit 88 electric trolley coaches with lifts in 1980-82 at $10,300 per vehicle was $75,533. The annual cost of lift-equipping 202 articulated buses in 1982-83 at $11,000 per lift was $185,167. Thus, the annual capital investment for 549 lift vehicles totalled approximately $455,000 through 1983.

Metro estimated maintenance and repair cost at $542.00 per lift per year, for a total $297,558 annual maintenance expense in 1983. In addition, Metro estimated an annual labor cost for route scheduling, consultant services, marketing and operations control at $101,500. (This estimate is based on salaries for two full-time employees plus 45 percent benefits.)[9] The total capital and operating cost supporting accessible lift-bus service on 53 percent of routes in 1983 was then approximately $5.9 million, and the annual cost was about $854,000. Based on 70,500 lift-boardings in 1983, the annual cost per trip was $12.11.

METRO'S SPECIAL TRANSPORTATION SERVICES

Taxicab Scrip Program:

This user-side subsidy program was established by Metro to enable low income elderly and disabled persons to use an existing transportation network that is well suited to their needs except in terms of cost. Residents of King County with an annual income at or below 70 percent of the Washington State median income, and at least 65 years of age or disabled are eligible for the program. Registrants pay a one-time registration fee of $1.00, and must show some proof of age or disability, e.g., a birth certificate, signed physician's statement or VA card. Eligibility under the income restriction is based entirely on self-declaration (varies by household size and is adjusted annually).

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[8] Annualized costs are based on 12 years depreciation and assume that the lift should last as long as the bus (the standard useful life for a bus for life cycle costing purposes is 12 years).

[9] This cost does not include miscellaneous expenses, e.g., accessible decals and zone signs, and the cost of lift training for drivers which Metro has incorporated into the standard driver training program. Also, start-up costs incurred in the first year or two of operation for planning, development of a driver training program and outreach programs, labor cost for lift selection, and trouble shooting are not included.

The scrip program is served by three major taxi companies and approximately 20 small companies which provide 24-hour service, seven days a week to most areas of King County. All demand is served, and there is no waiting list. The service provides exclusive and group rides with metered fares, and there are no restrictions on trip purposes or trip lengths. Scrip users request taxi service in the same way as other customers, and can group themselves paying between zero and 50 cents per extra rider.

METRO provides all eligible handicapped and elderly registrants with a 50 percent discount on booklets of taxi scrip worth $10.00 each. The amount of the subsidy (and hence the price of the booklets) has changed twice since the program began in 1978 originally set at 40 percent, the subsidy was increased to 60 percent in June 1980 and reduced to 50 percent in September 1981. There was no limit on scrip purchases until May 1981 when METRO established limits of 25 booklets per purchase and 200 booklets per year per person (worth $2,000), in response to program abuse by some registrants who were fraudently selling scrip to taxi operators for profit.

The limit on scrip purchases appears to have had a minimum impact on most users. The median purchase of scrip in 1981 was 3.1 booklets per registrant. In January 1982, in response to a $200,000 scrip budget overrun, a 25 book (per person, per year) limit was placed on scrip purchases. Those persons who required the use of more expensive, lift-equipped taxis were allowed 30 books per year. In 1983, all scrip purchasers were permitted to purchase an additional 10 books above the 25/30 book limit if needed. The current 25/30 book limitation (or 35/40 books if needed) does not appear to be a significant burden on active participants in the taxi scrip program. In 1983, only 4.4 percent of scrip users requested additional books, while the overall average number of books purchased per user was 9-10.

Since 1979, taxi companies have been deregulated and have set their own fares. The majority charge $1.00 - 1.20 per drop plus a similar amount per mile. In 1983, the average total taxi scrip fare was $6.46, with an average user cost of $3.23 per trip.[10] In comparison, peak period bus fares were $0.60 to $0.90, and $.50 to $.75 in off-peak periods and weekends, dependent on zone.

Ridership on the taxi scrip service dropped from approximately 130,000 trips in 1981, to 73,172 trips in 1983. A 1981 survey of scrip registrants found that there was more demand for transit on average than taxi service. The relatively expensive taxi service

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[10] The City of Seattle permits taxi operators to offer shared-ride service at reduced fares based on a zone structure.

was used comparatively infrequently, primarily for emergencies, medical travel and trips for which no other practical mode was available. The median age of taxi scrip users was about 72 years. Approximately 44 percent of scrip registrants are disabled, and only 11 percent had a drivers license and access to a vehicle.

From April 1980 until September 1981, disabled persons were not subject to the income test which restricts service to those with annual incomes below the State's median income. The temporary removal of the income test appeared to have no immediate effect on increasing registration and demand. Approximately six percent of all registrants reported incomes above the median income level. In fact, based on the survey of registrants, it appeared that the percentage of registrants with income above the cutoff points may have actually decreased slightly following removal of the income test.

Non-Profit Agency Rural Van Program:

Metro contracts with two non-profit social service agencies to provide van services for individuals eligible for the taxi scrip program, in rural and suburban areas of King County without effective taxi service. Many parts of these areas also are without fixed-route service.[11] The van program provides curb-to-curb or door-to-door service on Mondays through Fridays, from 8:30 a.m. to approximately 5:00 p.m. The agencies register eligible persons for the van program, and registrants call the agencies directly to schedule rides. Advance reservations are required (48 hours notice is desired). No frequency of use limitations are placed on the use of the van service, however, trips to areas outside the agencies' normal service area must be scheduled by appointment on specific days of the week. Metro imposes trip purpose restrictions on which trips it subsidizes. Metro reimburses the agencies only for trips made by persons eligible for taxi scrip, excluding trips associated with agency sponsored activities or programs. Passengers are encouraged but not required to contribute to the cost of their trips, with suggested donations varying according to trip length. The donations are retained by the agencies to further support of their transportation program. Metro's total cost is fixed by contract, but generally varies with the service level.[12] Most rides are shared, which helps to keep the average cost per trip low. In

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[11] The Elderly and Handicapped Transportation Programs of the Municipality of Seattle, Final Draft Pending UMTA Approval, January 1982, Revised August 1983, page 57.

[12] Ibid, page 62.

1983, the cost per trip to Metro was $4.00 per trip for 27,374 van trips, or approximately $109,545 in total program costs.

Service Criteria: Seattle Metro more than satisfies the proposed service criteria stated in the proposed 504 regulations for the provision of handicapped transportation.

- Metro provided accessible bus service on 53 percent of routes in 1983. The current service level exceeds the proposed regulation which requires accessible service on 50 percent of fixed-routes.

- Lift patrons pay a fare of 15 cents regardless of trip length, or $2.00 per month for unlimited travel. These fares are substantially lower than the peak and off-peak zone transit fares charged the general public.

- In addition to regular bus service, Metro provides lift service on 14 fixed-route paratransit van routes in areas where regular bus service could not be justified economically or physically operated. This service exceeds the Federal standard.

As a supplement to its accessible mainline transit services, Metro offers a user-side subsidy taxi scrip program, and subsidizes agency rural van services for low income elderly and disabled persons. Under the regulations, Metro would not be required to provide special service, since its accessible mainline service appears to meet the 504 guidelines. However, because the special services satisfy many of the proposed service criteria, comparisons of their service characteristics to the Federal criteria can serve as useful indicators to other recipients considering the implementation of special services.

- The user-side subsidy taxi service serves the same area as the fixed-route system, including rural areas which have limited fixed-route service. The agency van services serve suburban and rural areas without effective taxi service, and parts of many areas without fixed-route service. Trips outside the agencies' service area can be scheduled by appointment. Under the rule, special services would be required to serve the same service area as the fixed-route system.

- The taxi service operates 24 hours daily, while the van service operates Monday through Friday from 8:30 a.m. to 5:00 p.m. However, eligible van patrons also are entitled to use the taxi service daily when traveling in the service area.

- There are no limitations on trips purposes or destinations for the user-side taxi service. On the van services, Metro limits its subsidy to certain trip purposes; excluding trips associated with agency-sponsored programs or activities. This limitation would be acceptable under the regulations.

- There is no advance reservation requirement for taxi service. Reservations for van service are desired two days in advance of the trip. The 504 regulations would limit the waiting period to a reasonable time, to be determined through the public participation process.

- Eligibility on both the taxi and van services is limited to persons with an annual income at or below 70 percent of the State's median income, and 65 years of age or disabled. Under the regulations, a special service would not be allowed to operate with an income restriction. However, in Metro's case, the income requirement is not an issue, since the special services are supplemental to the accessible fixed-route service which appears to meet 504 guidelines. On the other hand, Metro's policy of serving elderly and disabled persons who could use regular transit, and those residing outside the transit service area exceeds the Federal eligibility standard, which would limit special service provision to disabled persons unable to use the fixed-route service.

- In the case of fares, the average user fare on the taxi scrip service in 1983 was more than three times the maximum peak-period transit fare, and four times the maximum off-peak fare. Variable user fares set at two times the peak and three times the off-peak transit fares might be considered comparable under the proposed regulations. However, the higher fares charged by Metro are not at issue, because the taxi scrip program is supplemental to mainline accessible service.

- No fare is required on the van services, although a donation is encouraged to defray the cost of the trip. This policy exceeds the Federal guidelines.

Program Comparisons

Demand: Seattle's accessible lift-bus service is one of the most heavily utilized of its kind in the country. In 1983, with over 50 percent of fixed-routes accessible, Metro provided approximately 70,500 lift-bus boardings, 73,172 trips under the taxi scrip program, and 27,374 trips on the van service.

Demand on the supplementary special services is limited to low income elderly and disabled persons. In 1983, approximately 44

percent of user-side taxi trips and 15 percent of rural van trips, or 36,448 special service trips were estimated to have been made made by handicapped persons.[13] Total handicapped trips on the combined lift-bus and special services, therefore, represented approximately 106,948 trips or about 63 percent of total trips in 1983.

Market Penetration: The population estimated to meet the program's eligibility requirements (income below 70 percent of State median and elderly or handicapped) was 78,000 persons in 1978. The 10,000 registrants for the taxi and van services as of July 1981 represented 13 percent of the eligible population. Market penetration for the lift-bus service cannot be estimated. However, eldery and disabled persons use lift service more frequently than special service, and account for approximately 14 percent of total transit ridership.

Program Cost: Metro's total cost to provide 53 percent lift-bus service over a five year period was approximately $5.9 million. The annual capital and operating expense for the lift-bus operation was estimated at $854,000 in 1983. The combined cost of the supplementary taxi scrip and rural van programs was $363,759 in 1983, of which an estimated 35 percent, or $128,795 was spent in support of handicapped trips in 1983.[14] This amount, combined with the $854,000 annual cost of the lift-bus service cost represented a total annual expense of approximately $1.0 million in support of handicapped travel in 1983.

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[13] This estimate does not include handicapped trips on the lift van service serving 14 fixed-route/fixed schedule paratransit van routes.

[14] Estimate is based on 44.2 percent of the $254,214 taxi program cost, or $112,363, plus 15 percent of the $109,545 van program cost, or $16,432.

The total amount of Federal transit assistance to Seattle Metro is presented below:

SEATTLE METRO TRANSIT SYSTEM
UMTA-CAPITAL GRANTS AND SECTION 5[15]
(in Millions of Dollars)

	FY 1981	FY 1982	FY 1983
Section 5	12.6	12.0	9.2
Section 3	20.0	19.6	7.6
Section 9A	-0-	-0-	9.2
Total	32.6	31.6	26.0

The NPRM proposed that a recipient would not be required to spend more than 7.1 percent of its three year average Federal assistance to provide accessible service in compliance with the regulations. The average annual Federal assistance provided to Seattle Metro in Federal fiscal years 1981-83 was $30.1 million. If Metro claimed the annual program expense of $1.0 million supporting 53 percent accessible lift-bus service and supplementary special services in 1983, this would represent 3.3 percent of its average Federal assistance in FY 1981-83.

The total operating cost of Seattle Metro are shown below:

SEATTLE METRO TRANSIT SYSTEM
TOTAL OPERATING EXPENSES[16]
(in Millions of Dollars)

CY 1981	CY 1982	CY 1983
95.5	103.0	108.0

The NPRM proposed that recipients would be required to spend up to 3.0 percent of their three year average total operating expense on accessible handicapped service to comply with the regulations.

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[15] Source: Resource Management Division, Office of Grants Management, Urban Mass Transportation Administration, U. S. Department of Transportation. Based on grants disbursed in the Federal fiscal year of October to September. Grant amounts are those certified by Seattle Metro to the UMTA Region 10 office.

[16] Source: Seattle Metro Budget Office.
Note: The Metro fiscal year corresponds to the calendar year. Metro's calendar year costs are used in lieu of Section 15 data, which are reported on the basis of the average fiscal year running from July to June. Since Metro's fiscal year extends beyond the transit fiscal year, Metro costs are reported by Section 15 as occurring in the year following actual expenditure.

Metro's average total operating expense for CY 1981-83 was $102.2 million. The annual program expense for accessible lift-bus and special services was $1.0 million in 1983. This represents approximately 1.0 percent of Metro's average total operating expense in CY 1981-83, which is far below the proposed 3.0 percent cost ceiling.

Based on these results, it appears that Seattle Metro could comply with the service criterion covering the lift-bus option, and provide supplementary special service which exceeds the requirements, at a cost which is well below the 7.1 and 3.0 percent cost limit amounts. However, it must be recognized that it took Metro five years to build its fleet to 53 percent accessibility, and lift costs are higher today than they were when Seattle began lift purchases in 1978. In order to use the Metro system as a meaningful example for national purposes, several cost adjustments have been made to determine what it would currently cost Seattle and other large systems, hypothetically, to start a 50 percent lift-equipped bus system from scratch. First, the capital cost of adding a lift to standard size coaches and electric trolleys is assumed at $9,500, and $15,000 for articulated buses, based on an analysis of the bid price differentials for lift and non-lift buses from three lift manufacturers in 1983. Second, Metro's spare ratio has been increased from 12 percent to 20 percent, based on the assumption that other systems, may encounter more problems in keeping their lifts in operation due to bad weather conditions and other factors which are not evidenced by Seattle's maintenance experience. Also, annual maintenance and operating costs have been adjusted to include "start-up" labor costs, e.g., program planning and development, training of lift-bus drivers and mechanics, since these costs are now minimal in Seattle. A detailed description of all assumptions and calculations can be found in the Appendix.

Based on the results of the hypothetical case, the total cost to lift-equip 60 percent of Seattle's coaches and provide accessible service on 50 percent of routes is estimated at approximately $7.3 million (in 1983 dollars). The annual cost is estimated at about $1.2 million. The annual cost represents 3.9 percent of Metro's $30.1 million average annual Federal assistance in 1981-83 and 1.2 percent of its three year average total operating expense.

Therefore, it appears that other transit authorities with vehicle fleet sizes and financial characteristics similar to Seattle's could meet the proposed 50 percent lift-bus accessibility standard at costs which are well below the proposed 7.1 and 3.0 percent cost limits.

The extent to which the financial characteristics of Metro's program are generalizable to other large cities depends on a number of factors:

- The extent to which Federal transit assistance as a percentage of total transit expenses by Seattle Metro is representative of other cities. The average annual Federal transit assistance provided to Metro between FY 1981 and FY 1983 represented 29.5 percent of Metro's average annual operating expense. Nationwide, annual Federal transit assistance under Sections 3, 5, and 9A for FY 1981 to FY 1983 averaged approximately 46 percent of total transit industry operating expenses for FY 1981-83. Therefore, the financial characteristics of the Seattle Metro system are considerably below the nationwide average.

Seattle Metro
Appendix

1. Total population of King County, Washington -- 1.3 million (1980)

2. Total Ridership

70,500 annual lift boardings (1983)
73,172 user side taxi trips by elderly and handicaped
27,172 rural van trips by elderly and handicapped

3. Lift-Bus Program Cost

Total Capital Cost (1978-83)

$2,331,000 (259 diesel coaches)
2,222,000 (202 articulated coaches)
906,400 (88 electric trolley coaches)

$5,459,400

Annual Capital Cost (12 year depreciation)

$194,250 (259 diesel coaches)
185,167 (202 articulated coaches)
75,533 (88 trolley coaches)

$454,950

Maintenance Cost

$297,558 (549 buses at $542/year)

Extra Staff Time

$101,500 (2 people plus 45% benefits for scheduling, consultant services, marketing, operations contarol, transit deveopment)

TOTAL PROGRAM COST $5,585,458

ANNUAL PROGRAM COST $854,008

Cost per Trip

(Based on 70,500 lift boardings in 1983)
Annual Cost per trip $12.11

4. Taxi Scrip Program Cost (1983)

Total Subsidy Cost	$254,214
Total User Cost	$254,214
Value of scrip used	$472,611
Total trips	73,172
Average fare/trip	$6.46
Average cost/trip to Metro	$3.23

5. Rural Area Van Program Cost

Total cost	$109,545
Total trips	27,374
Average cost/trip	$4.00

6. Transit fleet size in September 1983: 1062 vehicles (549 equipped with lifts)

7. Bus Fares 1983

Base	50¢ - 75¢ off-peak
	60¢ - 90¢ peak
E&H	15¢

8. Seattle Metro Total Operating Cost and Federal Assistance (in millions of $)

Operating Cost		Federal Assistance	
CY 1981	$95.5	FY 1981	$32.6
CY 1982	103.0	FY 1982	31.6
CY 1983	108.0	FY 1983	26.0

9. Adjustments to Metro's Lift-Bus Program Costs-Hypothetical Estimate of What it Would Cost Seattle and Similar Sized Transit Systems to Implement 50% Lift-Bus Service at 1983 Price Levels.

Assumptions

1. In 1983, Seattle Metro had 549 of its total 1062 vehicles equipped with lifts and provided accessible service on 53% of routes. (This included 12% spares in operation as part of the daily lift service.)

2. Assume that Seattle's mild climate contributes to high lift reliability, and Metro's maintenance experience is superior compared to what other large transit systems would encounter (at least in the initial years of lift-bus introduction).

3. Assume that other transit systems implementing new lift-bus services to comply with the regulations would have to equip 60% of total vehicles with lifts (includes a 20% speare ratio) in order to maintain 50% on-street service. For purposes of this analysis, assume the total fleet size and mixed fleet composition of Seattle Metro.

4. Assume the current cost of a lift installed on a standard bus or trolley coach is $9,500.[17]

5. Assume the current cost of a lift installed on an articulated bus is $15,000.[18]

Calculations

1. 1062 total vehicles X .50 lift-buses X .20 spares = 637 lift-buses required

2. Assume distribution of 637 lift-buses based on Seattles fleet composition as follows:

303 standard lift-buses
235 articulated lift-buses
99 electric trolley coaches

3. Total Capital Lift-Cost

303 standard buses X $9,500 per lift =	$2,878,500
235 articulated bus X $15,000 per lift =	3,525,000
99 trolley coaches X $9,500 per lift =	940,500
Total Cost	$7,344,000

4. Annual Captial Lift Cost (12 year depreciation)

303 standard lift-buses	$239,875
235 articulated lift-buses	293,750
99 trolley lift-coaches	78,375
Annual Cost	$612,000

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[17] This estimate is based on an analysis of 1983 bid submissions for lift- and non-lift buses by three bus manufacturers. The bid price differential for lift-equipped buses ranged from $8,000-$9,500 per lift installed.

[18] This estimate is based on price quotations obtained in 1984 from three manufacturers which ranged from $14,000-$15,000 per lift. Seattle Metro maintenance staff also estimated the current price of a Lift-U lift installed on an articulated bus at $15,000.

5. Annual Operating Cost

• Lift Maintenance (637 buses at $542 year)	$345,254
• Start-Up Labor Cost (60.5 person months for planning and training development, lift selection. driver training, driver task force, lift trouble shooting, maintenance development , zone marking, out reach, customer relations training, other)	133,000
• Extra Staff Time (2 people plus 45% benefits for scheduling, marketing, operations control, transit development and consultant services	101,500
Subtotal	579,754
Annual Capital Cost	612,000
TOTAL ANNUAL COST	$1,191,754

KANSAS CITY, MISSOURI USER-SIDE PROGRAM FOR ELDERLY AND HANDICAPPED TRANSPORTATION

The Kansas City, Missouri Department of Transportation operates Share A Fare, a user-side subsidy program providing door-to-door transportation for eligible elderly, handicapped and low-income residents of Kansas City, Missouri. This is the central city in the Kansas City, Missouri/Kansas City, Kansas urban region, a seven county area with a population of 1.3 million persons. Share A Fare serves Kansas City, Missouri, a 314 square mile area in portions of Jackson, Clay, and Platte counties with a population of 448,000 persons. The program is totally funded through a 1/2 cent city sales tax earmarked for transportation purposes.

Program eligibility for Share A Fare is determined solely on the basis of age -- 65 or over -- or disability -- persons who require the assistance of wheelchairs, mechanical aids, canes, crutches or escorts to be mobile, plus those who are legally blind or mentally retarded. Eligibility also includes some low-income persons affiliated with social service agencies. The service is available to all eligible persons residing in the SAF service area, which corresponds to the city limits of Kansas City, Missouri, including some persons who reside in areas of the city where transit service is unavailable. Handicapped applicants for SAF service must be certified by a doctor as unable to use the fixed-route bus service, unless they are affiliated with a social service agency. Certifications for retarded persons must specify that mental capability is below the average of a ten year old child, or specifically indicate that a person has difficulty using transit or that transit is not available.

The City DOT, acting as broker, coordinates service between users and providers by enrolling participants, enlisting providers, and scheduling trips. The SAF program serves both agency-affiliated and unaffiliated users through a mix of seven for-profit and non-profit providers, two of which specialize in the transportation of wheelchair and bed-bound patrons. Less than 10 percent of the total 475 vehicle fleet is equipped with lifts.

SAF users can be categorized into two distinct groups: unaffiliated taxicab users and affiliated social service agency clients who are transported in agency vehicles. A third group consists of special riders who require lift-equipped or ramp-equipped vehicles; these are primarily unaffiliated users.

The SAF special service area corresponds to the 314 square mile city limits of Kansas City, Missouri. In contrast, the regional fixed-route bus system operates over a 150 square mile service area within portions of five counties, including Kansas City, Missouri and Kansas City, Kansas. The SAF service operates seven

days a week from 6 a.m. to 10 p.m., while fixed-route bus service operates 4:07 a.m. to 12:46 a.m. SAF patrons must book their trips one day in advance up to 4 p.m., and trips can be pre-scheduled up to seven days in advance. Most trips are shared rides, and SAF serves all trip purposes and destinations within the city limits of Kansas City, Missouri. SAF also provides medical and work trips throughout the seven-county urbanized region. All demand is served, i.e., there is no wait list, and there is a quick two or three day turnaround to certify and enroll participants. However, tripmaking is limited to 25 one-way trips per month. Patrons justifying the need for additional medical, work, or nutrition trips are granted an additional 25 trips per month.

SAF users are charged a fare of 50 cents for the first three miles, $1.00 for 3-6 miles, and $1.50 for 6-9 miles. The average user cost or fare for taxi service is $1.00 per one-way trip, with an average trip length of 3.6 miles. In comparison, the Kansas City Area Transit Authority (KCATA) charged a basic adult transit fare of 60 cents and an express fare of 70 cents in 1983. The average subsidy cost per trip on the Share A Fare system is $2.50 ($6.40 for wheelchair trips).

Unaffiliated users have greatly enhanced their mobility by participating in SAF. The cost per trip of taxi service is considerably less expensive than the typical fares charged by taxi companies prior to SAF. Wheelchair users who formerly paid a $12.50 minimum fare for door-through-door trips provided by a private carrier now typically pay $1.00 per trip for SAF service. For the agency affiliated users, all agency trips are partially subsidized by SAF, even though some agency clients could possibly be subsidized under a variety of social service entitlement programs.

In FY 1981, SAF served 152,545 total trips of which approximately 40 percent, or 61,000 trips were made by handicapped persons.[1] In FY 1983, the program served 280,739 total trips, an 84 percent increase over FY 1981. Approximately 42 percent of FY 1983 trips, or 116,619 trips were made by handicapped users. The ridership increase is attributed by the Kansas City DOT to increased user

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[1] The SAF fiscal year runs from July to June. The breakdown of both FY 1981 and 1983 trips is based on SAF's estimate of 10% of total trips by wheelchair and semi-ambulatory patrons, 8% of trips by blind patrons, and 8% percent by retarded patrons. It also assumes that 16% of total trips are made by 21 percent of elderly patrons who are "transportation handicapped," (use transit with varying degrees of difficulty). The latter estimate is derived from DOT's 1978 national survey which identified that 21 percent of the nation's total elderly population was "transportation handicapped".

participation, and program abuse involving a substantial number of no-shows and social service agencies shifting their trips to the user-side subsidy program.

The Share A Fare program's low cost of service is attributable to (1) the use of low-cost carriers which provide their own insurance, (2) the use of non-union drivers, and (3) the legalization of shared ride taxis. By minimizing its operating function and utilizing existing carriers' vehicles, SAF has avoided the additional costs associated with the purchase and maintenance of equipment.[2]

The SAF user-side subsidy program satisfies most of the service criteria which a special service would be required to meet under the new 504 final rule.

- The SAF eligibility policy includes elderly (over age 65) and low-income residents of Kansas City, Missouri, plus physically handicapped residents who require some form of assistance to be mobile, and those who are legally blind or mentally retarded. Program eligibility includes persons who reside in some areas of the city which are not served by the fixed-route bus system. These policies exceed the final rule's eligibility requirement, which would limit special service provision to residents of the fixed-route service area who are physically incapable of using the regular bus system.

- However, the SAF program does not fully satisfy the eligibility requirement which requires special service for all eligible handicapped residents of the fixed-route service area. The fixed-route service area extends beyond Kansas City, Missouri, and includes Kansas City, Kansas; Independence, Missouri; Gladstone, Missouri; Johnson County, Kansas; and suburban Jackson County, Missouri. Handicapped residents of these areas are not currently eligible for the SAF user-side subsidy service, but some of these persons are physically incapable of using regular bus service and would be entitled to receive accessible service under the rule.

- The special service operates over a 314 square mile area corresponding to the city limits of K.C., Missouri. This area is more than double the size of the KCATA fixed-route service area which covers portions of five counties including Kansas City, Missouri and Kansas City, Kansas. The special service also provides medical and work trips throughout the

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[2] Share A Fare: A User-Side Subsidy Transportation Program for Elderly and Handicapped Persons in Kansas City, Missouri, UMTA/TSC Project Evaluation Series, U.S. Department of Transportation, Final Report, July 1979.

seven-county urbanized region. This coverage far exceeds the service criterion of the rule, which requires the special service to serve the same area as the fixed-route bus system.

- SAF service is operated seven days per week, but for shorter service hours (6 a.m.-10 p.m.) compared to fixed-route service hours (4 a.m.-12:46 a.m.). Under the rule, the special service would have to be available during the same days and hours of fixed-route bus service.

- There are no limitations or prioritizations on trip purposes within the Kansas City, Missouri service area. The SAF region-wide service limits trip purposes to medical and work, which means that SAF patrons are not afforded fully accessible service to Kansas City, Kansas; Independence, Missouri; Gladstone, Missouri; and Johnson County, Kansas, and suburban Jackson County, where limited fixed-route service is available. However, SAF's regional service provides trip destinations to two additional counties which are not part of the fixed-route service area, and regional service is provided throughout Johnson County, where the KCATA operates only one bus trip per day. The benefit to user-side subsidy patrons of more comprehensive area coverage both on the regional service and within Kansas City, Missouri is assumed to fully offset the trip purpose limitation on the regional service.

- The special service limits tripmaking to 25 one-way trips per month, although an additional 25 trips per month can be granted for medical, work, and nutrition trips. This represents a maximum of 600 trips per year per patron, which appears to be more than adequate compared to the following utilization rates. In FY 1983, the program served 280,739 total trips, of which 20,000 registrants averaged 7.6 trips per year. In terms of actual usage, 6,500 registrants made one or more monthly trips on the service and averaged 23.5 trips per actual user per year. Nationally, special service programs are estimated to serve an average of 60 trips per year per registrant, and up to 190 trips per year per actual user.[3] Significantly, the final rule does not specifically prohibit restrictions on the number of allowable trips per user.

- SAF service must be reserved by 4:00 p.m. on the day before travel. This advance notice requirement would be acceptable under the rule, which limits the waiting period to a reasonable time up to 24 hours.

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[3] Cost-Effectiveness of Transportation Services for Handicapped Persons, National Cooperative Highway Research Program Report, Transportation Research Board, National Research Council, Washington, D.C., September 1983.

- The average user cost for the taxi service is $1.00, compared to the 1983 express bus fare of 70 cents.

These fares might be assumed to be comparable, since the quality of a door-to-door taxi trip could be considered superior to the average transit trip, and the special service provides trips over a larger service area than the fixed-route system. The regulation requires the cost of a special service trip to be comparable, although not equal, to the transit fare for trips of similar length or times of day. Decisions on appropriate fare levels must be determined locally through the public participation process.

The Share A Fare program is providing more service in two areas than is necessary to satisfy the final rule's service criteria requirements. First, the program serves a larger eligible user population within Kansas City, Missouri than is required by the rule. Current patronage includes non-disabled elderly and low-income persons, plus physically and mentally handicapped persons, including those who reside outside the fixed-route service area. In comparison, the fixed-route system serves only about 60 percent of the general public in Kansas City, Missouri within a service area which is one-half the size of the SAF service area. Program eligibility could be reduced by (1) eliminating able-bodied elderly and low-income persons, and (2) limiting the eligible handicapped population to residents of the fixed-route service area who are physically incapable of using the regular bus system. Second, the special service area far exceeds that of the fixed-route system. If the SAF program chose to provide geographic coverage comparable to the fixed-route system, it could probably reduce its service area within Kansas City, Missouri by approximately one-half. (This assumes that handicapped residents are uniformly distributed throughout the city.)

The SAF program is providing less service in two areas than is necessary to meet the servic criteria. First, the special service does not provide service hours comparable to the fixed route system. In order to comply with the regulations, the special service hours would have to be increased by five hours per day from 4 a.m. to 6 a.m. and 10 p.m. to 1 a.m.

Second, The SAF program does not provide special service to physically handicapped residents of the fixed-route service area outside Kansas City, Missouri, who would be eligible for accessible service under the rule if unable to use the regular bus system. In order to comply with the eligibility requirement, the Kansas City Area Transit Authority, which is the recipient of Federal financial assistance for the urban mass transportation system, would have to provide special service or accessible bus service to serve these people. (Note: The KCATA estimates that it is currently providing aproximately 2 percent of UMTA Section 5 operating assistance, or $200.00 to some local municipal programs to improve wheelchair accessible service. Details on these programs were not sufficient to compare to the service criteria.)

Market Penetration: No data on the region's handicapped population were available. The total elderly and handicapped population of Kansas City, Missouri was estimated at 11 percent of the total city population in 1979, or 58,397 persons.[4] The target population for the special service was estimated at approximately 10 percent of the total population of Kansas City, Missouri, or about 54,000 persons. (This includes 50,946 non-disabled elderly and 3,357 handicapped persons unable to use the fixed-route transit.) In terms of market penetration, the program has 20,000 elderly and handicapped registrants, which represents 37 percent of the target population. In terms of actual users, about 6,500 registrants use the service once or more per month. This represents roughly 12 percent of the target population in Kansas City, Missouri.

Program Cost: The total operating cost for the Share A Fare user-side subsidy program was $1,078,828 in FY 1983, or about a $3.85 average cost per trip. Of this amount, the Share A Fare staff estimated that approximately 42.5 percent, or roughly $459,000, was spent for the transportation of handicapped patrons.[5]

In order to determine the cost of the SAF program in providing user-side subsidized service to those individuals who meet the eligibility requirement of the rule, several cost adjustments have been made. First, the costs of providing service to elderly and low-income patrons assumed capable of using existing bus service have been removed. Second, the costs have been adjusted to eliminate trips by mentally retarded patrons who would not be eligible under the rule, unless they also have physical disabilities which would independently qualify them for service based on inability to use the bus system. Ideally, the costs also would have been adjusted to eliminate trips by physically disabled persons who reside in areas of Kansas City, Missouri, which are not served by the fixed-route bus system. This was not done because there is no reliable information on the number of riders in this group. However, based on the Department's adjustments, total trips on the user-side subsidy service would decline from 152,545 to 94,160 eligible handicapped trips, and the total program cost would be reduced from $1,078,828 to $379,394. (See Appendix for detailed cost estimates.)

In order for the Share A Fare program to fully meet all service criteria requirements, several additional adjustments were made. First, the hours of special service were increased to match those of fixed-route bus service. This adjustment resulted in 1638

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[4] Kansas City Fact Book, City Development Department, 1979. Target population defined as those who cannot use transit, or use transit with difficulty.

[5] This estimate is based on 4 percent of total trips by wheelchair patrons, or 11,230 trips at a total cost of $6.84 per trip, and 105,957 trips by other handicapped patrons at $3.62 total cost per trip.

additional service hours which would have to be provided at an estimated cost of $10,310 (see Appendix). This would increase the annual program cost supporting handicapped travel from $379,394 to approximately $390,000.

In order to fully meet the eligibility requirement requiring accessible transportation service for all eligible handicapped residents of the fixed-route service area, the KCATA might work with the K.C. Missouri DOT to provide a mix of fixed-route bus accessibility and special service. A few hypothetical examples may explain how the KCATA could satisfy the requirement. First, the KCATA might supplement the Kansas City DOT's user-side service with lift-equipped buses to serve handicapped residents of the fixed-route service area in Kansas City, Kansas; Independence, Missouri; Gladstone, Missouri; and Jackson County, Missouri. Bus routes serving these areas represent only about 8.5 to 9 percent of the total fixed-route service; service levels on most routes are quite limited, and many of these routes extend into Kansas City, Missouri proper. A lift-bus operation probably represents the most cost-efficient means of servicing these routes. The KCATA estimates that it could serve these areas by making 18 percent of its buses accessible.[6]

If the KCATA chose to replace 18 percent of its fleet of 302 buses or 55 standard size buses with lifts, it is estimated that it would cost $9,500 to add a lift to each bus.[7] The total capital cost for the lifts would come to $522,500. The annualized capital cost would be $43,542.[8] In addition, the annual cost of

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[6] This estimate includes a spare ratio of 100 percent which is very high, compared to the spare ratios maintained by many authorities operating lift-buses. However, the KCATA considers it necessary to guard against unforeseen problems during program start-up, and to provide 100 percent accessible service on some routes with sparse service.

[7] This estimate is based on a comparison an of 1983 bus bids submitted by three lift manufactures to transit authorities for both lift and non-lift standard size buses. The bid price differential for lift-equipped buses ranged from $8,000 to $9,500. Source: Casey, Robert F., Research Memorandum on Accessible Service Cost Data, U.S. Department of Transportation, Transportation Systems Center, Cambridge, MA., January 1984.

[8] The annual capital cost is based on a 12 year depreciation rate.

maintaining a lift-bus, plus program administration and start-up costs are estimated at $975.00 per bus per year, or $53,625 for 55 lift-buses.[9]

Therefore, the total annual cost to the KCATA to purchase and maintain 55 lift buses would include the annual capital expense of $43,542 and the annual maintenance expense of $53,625 or approximately $97,167 per year. This is the estimated annual cost which the KCATA would claim in support of accessible fixed-route bus service.

However, in order to fully satisfy the final rule's service area criterion, the KCATA would have to coordinate the lift-bus service with some form of accessible service within the Kansas City, Missouri service area. This would be necessary to insure that handicapped persons traveling to Kansas City, Missouri on lift-bus routes could transfer to accessible service to reach points throughout the fixed-route service area. To serve these transfer trips, the KCATA would have the options of equipping additional routes operating within Kansas City, Missouri with lift-equipped buses, or negotiating with the Kansas City, Missouri DOT to accommodate lift-bus patrons on the Share A Fare user-side subsidy service. Negotiations with the K.C. DOT would be critical to the success of the latter option, since the DOT would incur additional administrative burdens to arrange appropriate transfer points for lift-bus patrons, devise appropriate procedures to limit trips to eligible points in the service area, and keep track of their costs. Providing these problems could be resolved, the user-side subsidy option would probably be the most cost-effective way of servicing these trips, with the KCATA reimbursing the Kansas City DOT for the additional cost of the transfer trips on the Share A Fare service.

Trips that would be generated by a transfer requirement are assumed to be equivalent to the number of daily lift-bus boardings. Based on a national estimate of the utilization rates of 48 lift-equipped bus systems, lift boardings averaged one or less per day per lift-equipped bus.[10] If this rate holds for the KCATA

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[9] This estimate is drawn from the National Highway Cooperative Research Program Report, Planning Transportation Services for Handicapped Persons- Users Guide, September 1983, pg. 17. The estimate is based on $650.00 per lift for maintenance and $325.00 per lift for driver training, annual insurance, promotion and marketing costs.

[10] Cost-effectiveness of Transportation Services for Handicapped Persons Research Report, National Cooperative Highway Research Program, Transportation Research Board, National Research Council, Washington, D.C., September 1983, pg. 47.

lift-bus operation, this would result in a maximum of 28 lift-boardings per day and 28 transfer trips.[11] The fixed-route service operates seven days per week in Kansas City, Kansas routes, and five to six days per week on the remaining routes.

Assuming an average fixed-route operation of six days per week, or 313 days per year, the maximum number of transfer trips by lift-bus patrons would be 28 per day times 313 days per year, or 8,764 additional trips on the Share A Fare service. It is assumed that the majority of these trips would be made by wheelchair users, who would realize the primary benefit from the introduction of accessible bus service. The average subsidy cost per trip for SAF wheelchair patrons is $6.40. If the KCATA reimbursed the Kansas City DOT for 8,764 additional SAF trips per year at $6.40 per trip, the total annual cost to the KCATA would be approximately $56,000 to provide the maximum level of transfer service for lift-bus patrons. In addition, it is assumed that the KCATA would pay an administrative fee estimated at 15 percent of the total annual cost of the additional trips, or $8400, to the DOT to coordinate the transfer trips. The total annual cost to the KCATA would then be roughly $64,000.

If the KCATA and the Kansas City DOT provided a combined system of accessible bus and user-side subsidy service, the annual lift-bus capital and maintenance cost of $97,167; the DOT's user-side subsidy adjusted program cost of $394,000 supporting eligible handicapped residents of Kansas City, Missouri; plus $64,000 to provide new user-side subsidy trips for lift-bus patrons would amount to a total estimated program expense of $555,167. However, under the final rule, the KCATA would be entitled to claim only it's actual program expense of approximately $161,000 in support of accessible handicapped transportation, since the $394,000 supporting user-side subsidy patrons of the Share A Fare program is provided by the Kansas City DOT rather than the KCATA. If the KCATA chose to provide service at this level, it could fully meet the final rule's service criteria, providing that the cost of these services fall within the proposed cost limits of 7.1 percent of Federal transit aid, or 3.0 percent of total operating expenses. If not, then decisions on service criteria trade-offs to reduce the program cost would have to be negotiated with the local handicapped community through the public participation process.

If the KCATA is unable to negotiate an acceptable level of combined service with the Kansas City DOT and the handicapped community, then the KCATA would probably have to consider the option of fixed-route accessible bus service. Lift-equippage of 50 percent of buses and routes throughout the entire fixed-route service

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[11] This assumes that the KCATA operates 28 lift-buses on the street at all times, and maintains a reserve fleet of 27 lift-buses.

area would duplicate much of the coverage provided by the DOT's user-side subsidy service, since a majority of the KCATA bus routes serve Kansas City, Missouri where Share A Fare operates. However, duplication of service might be the only way to insure that eligible handicapped persons residing outside of Kansas City, Missouri would receive fully accessible service throughout the KCATA fixed-route service area.

The final rule does not specify a percentage of buses which recipients must make accessible in order to comply with the service criteria. However, if the KCATA decided to implement the accessible bus option, it is estimated that 50 percent of its fleet of 302 buses, or 151 buses, would have to be equipped with lifts, plus an assumed spare ratio of 50 percent, or 75 additional buses.[12] If the KCATA ordered lifts for 226 buses, at an estimated cost of $9,500 per lift, the total capital cost would come to approximately $2.1 million. The annual capital cost would be about $175,000.[13] The annual maintenance and operating expense estimated at $975.00 per bus per year would total $220,350 for 226 lift-buses.

Therefore, the total annual cost to the KCATA to purchase, maintain and operate 226 lift-buses would come to $395,350. This is the annual cost which the KCATA would claim in support of 504 accessible handicapped transportation for the Kansas City, Missouri/Kansas City, Kansas urbanized region.

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[12] The assumed spare ratio of 50 percent represents a compromise estimate. The KCATA estimated that it would require a spare ratio of 100 percent at least during the intial phase-in period of lift-bus service. The Department of Transportation estimated that at spare ratio of 20 percent would probably be adequate to keep 50 percent of lift-buses operating on the streets at all times.

[13] The annual capital cost is based on a 12-year depreciation rate.

The total amount of Federal transit assistance to the Kansas City region is presented below:

KANSAS CITY AREA TRANSIT AUTHORITY
UMTA-APPROVED GRANTS[14]
(in Millions of Dollars)

	FY 1981	FY 1982	FY 1983
Section 5	10.0	8.7	10.3
Section 9A	.0	.0	2.1
Section 3	.0	.0	.0
Total	10.0	8.7	10.4

The average total annual Federal transit assistance provided to the Kansas City Area Transit Authority for the three years was $10.4 million.

If the Kansas City transit authority and the Kansas City, Missouri DOT provided a combined system of accessible bus and user-side subsidy services in full conformance with the service criteria, the estimated total program expense would be $555,167. This would represent 5.3 percent of average annual Federal transit aid received by the KCATA in FY 1981-83. However, under the rule, a recipient is permitted to claim only it's actual program expenditures in support of handicapped travel. Accessible transportation service expenditures by parties other than the recipient would not count towards the cost limit, although the recipient could count the service provided by other parties to satisfy the service criteria. Under these guidelines, the KCATA would not be entitled to claim the cost of the user-side subsidy service provided by the Kansas City, Missouri DOT as part of its eligible cost supporting section 504 accessible transportation services. The program expenses which the KCATA could claim for the combined service would include the annual lift-bus cost of approximately $97,000, plus the $64,000 reimbursement and administrative costs to the Kansas City DOT to provide user-side subsidy trips to lift-bus patrons, or an estimated total program expense of $161,000. At this level, the KCATA would spend 1.5 percent of it's $10.4 million average annual Federal transit aid in FY 1981-83 to provide service in full compliance with the service criteria.

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[14] Source: Resource Management Division, Office of Grants Management, Urban Mass Transportation Administration, U.S. Department of Transportation. NOTE: Includes Section 5 apportionments in each fiscal year. (The Federal fiscal year runs from October to September.) Grant amounts are those certified by KCATA to the UMTA Region 5 Office.

The total operating expenses of the KCATA are shown below:

KANSAS CITY AREA TRANSIT AUTHORITY
TOTAL OPERATING EXPENSES[15]

FY 1981	FY 1982	FY 1983
27.9	27.6	26.1

The average total annual operating expense of the KCATA for FY 1983 and the preceding two years was $27.2 million. If the KCATA and the Kansas City DOT provided a combined system of accessible bus and user-side subsidy services in full conformance with the service criteria, the total estimated cost would come to $555,167, or about 2.0 percent of the $27.2 million average total operating expense. The estimated actual cost to the KCATA to provide the combined service would be $161,000. This represents 0.6 percent of the KCATA's $27.2 million average total operating expense, which is far below the 3.0 percent cost limit on total operating costs proposed in the regulation.

Alternatively, if the KCATA chose to provide 50 percent lift-bus service throughout the fixed-route service area, it would have to equip an estimated 75 percent of it's fleet with lifts, or 226 buses, at an annual cost of $395,350. At this level, the KCATA would spend 3.8 percent of it's $10.4 million average annual Federal transit aid in FY 1981-83, or 1.5 percent of it's $27.2 million average annual total operating expense to provide fixed-route accessible bus service in full compliance with the regulations. It should be noted, however, that the 50 percent spare ratio assumed for the lift-bus operation is substantially higher than actual spare ratios experienced in various UMTA lift-bus demonstrations. Therefore, it is expected that the KCATA might reduce its spare ratio after an initial shakedown period to say 20 percent. This would represent an annual cost savings of approximately $79,000, based on 45 fewer lift-buses. At this level, the annual program cost of accessible bus service would be about $316,000, which is 3.0 of average annual Federal assistance and 1.3 percent of average total operating expenses in FY 1981-83.

In summary, it appears that the KCATA could provide either a combined system of accessible bus and user-side services or fixed-route accessible bus service fully meeting the final rule's service criteria, and at costs which are substantially below the proposed cost limits of 7.1 percent of Federal transit assistance or 3.0 percent of total operating costs.

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[15] Source: National Urban Mass Transportation Statistics, Sec. 15 Reporting System, U.S. Department of Transportation, FY 1981-83.

Appendix

1. Total population Kansas City/Missouri/Kansas region (1980) 1.3 million.
   Total population Kansas City, Missouri (1980) 448,000

2. Elderly and handicapped population of Kansas City, MO (1979) 58,397

3. SAF elderly and handicapped registrants (1983) 20,000
   SAF elderly and handicapped actual users (1983) 6500

4. Percent elderly/handicapped population registered for special service: 34%

5. Elderly/handicapped actual users as percent of eligible population: 12%

6. Total Share A Fare User-Side Subsidy Program Cost

   $ 446,161 -- FY 1981 (Administrative cost 15-20%)
   816,340 -- FY 1982
   1,078,828 -- FY 1983 (Administrative cost 17.3%)
   (Computer cost 10%)

7. Share A Fare Program Ridership

   152,545 total trips in FY 1981
   192,776 total trips in FY 1982
   280,739 total trips in FY 1983

8. Ridership Adjustments to Eliminate Able-Bodied Elderly

280,739	Total FY 1983 trips
-28,074	10% trips by users requiring wheelchairs (4%) and apparatus (6%) to be mobile
252,665	
-22,459	8% of total trips by blind patrons
230,206	
-22,459	8% of total trips by mentally retarded patrons
207,747	Total trips by elderly patrons
x .21	Assume 21% elderly trips recertified as handicapped*
43,627	Elderly handicapped represent 16% of total trips
164,120	Ineligible elderly trips (207,747 - 43,627) (assumed capable of using regular bus service and ineligible to receive user-side subsidies under the rule).

* This estimate is based on a DOT survey which identified that 21% of the nation's elderly population was handicapped to some degree in their use of transit, and assumes that such persons would potentially be eligible for special service under the rule. Source: National Survey of Transportation Handicapped Persons, U.S. Department of Transportation, Washington, D. C., June 1978.

9. 1983 Handicapped Trips

28,074	wheelchair/apparatus assisted trips
22,459	blind trips
22,459	mentally retarded trips
43,627	elderly trips recertified eligible handicapped
116,619	Total handicapped trips in FY 1983 = 42% of 280,739 total trips

10. Subsidy Cost per Trip (cost reimbursement to taxi companies)

$6.40	wheelchair users
$2.50	all other users

11. Subsidy Cost Supporting Handicapped Patrons

		Cost
11,230	Assumes 9.6% of total handicapped (H) trips by wheelchair patrons	
x 6.40	Subsidy cost per wheelchair trip	
$71,872	Total wheelchair subsidy cost	$71,872
16,844	Assumes 14% of total H trips by semi-ambulatory patrons	
x 2.50	Subsidy cost per trip non-wheelchair users	
$ 42,110	Total semi-ambulatory subsidy cost	42,110
22,459	19% of total H trips by blind patrons	
x 2.50	Subsidy cost per trip non-wheelchair users	
$56,148	Total subsidy cost blind trips	56,148
22,459	19% of total H trips by mentally retarded patrons	
x 2.50	Subsidy cost per trip non-wheelchair users	
$56,148	Total subsidy cost mentally retarded trips	56,148
43,627	37% of total H trips by elderly handicapped patrons recertified by SAF as eligible	
x 2.50	Subsidy cost per trip non-wheelchair users	
$109,068	Total subsidy cost recertified elderly	109,068
	Total Subsidy Cost Supporting Handicapped Patrons in FY 1983	$335,346

12. Total Program Cost Supporting Handicapped Patrons

42% of $186,637 Administrative Cost (based on 42% handicapped trips)	78,388
42% of $107,883 computer cost	45,311
Total Cost Supporting Handicapped Patrons	$459,045

13. Ridership Adjustment to Eliminate Handicapped Trips Ineligible for Special Service

a. Assume that if the Share A Fare program limited eligibility in accordance with the final rule to handicapped patrons who are physically incapable of using existing bus service, it could potentially eliminate 22,459 trips, or 19 percent of current total handicapped trips, by mentally retarded patrons.

b. 116,619 total SAF H trips - (minus) 22,459 trips by mentally retarded patrons = 94,160 adjusted H trips assumed eligible for SAF service.

c. $335,346 Total subsidy cost of H trips - (minus)
$56,148 Subsidy cost of mentally retarded patrons =
$279,198 Adjusted subsidy cost supporting eligible H patrons

d. $123,699 Administrative and computer costs assumed in support of total H trips X .19 (% trips by mentally retarded patrons) = $23,503 cost reduction.

e. $123,699 - $23,503 = $100,196 adjusted administrative and computer costs supporting eligible H trips.

f. $279,198 adjusted subsidy cost of eligible H trips + $100,196 adjusted administrative/computer cost = $379,394 adjusted total program cost if SAF restricts eligibility for user-side subsidy service to existing handicapped patrons who are physically incapable of using regular bus service .

14. Service Hour Adjustment

a. 143.5 fixed-route weekly service hours - (minus) 112 SAF weekly special service hours = 31.5 more fixed-route service hours in early morning and late evening

b. 94,160 annual H trips - 52 weeks = 1811 trips/week - 7 days = 259 daily trips - 16 service hours = 16 trips per hour

c. Assume 1.6 additional handicapped trip per additional SAF service hour because 4:00 - 6:00 a.m. morning and 10 p.m. - 12:30 a.m. late evening transit ridership is typically one-tenth of the daytime hourly rate

d. 1.6 trip/hour X 31.5 additional hours X 52 weeks = 2,620 additional SAF trips per year

e. Assume the present wheelchair rate of 9.6% of total existing H trips. 9.6% of 2,620 new trips = 252 trips by wheelchair users X $6.40 subsidy cost/trip = $1,613

f. Assume remaining 2,368 new trips @ $2.50 subsidy cost/trip for non-w/c users = $5,920

g. 2,620 new trips X $1.06 administrative cost/trip = $2,777

h. $1,613 new w/c trips + $5,920 for new non-w/c trips + $2,777 administrative cost/trip = $10,310 additional SAF program cost to increase special service hours to match those of fixed-route bus service

15. Final Adjusted Total Cost of SAF User-Side Subsidy Program

$379,394 adjusted cost supporting eligible H trips + $10,310 cost of additional service hours = = $389,704 total adjusted FY 83 user-side subsidy program cost

16. KCATA Total Operating Expense and Federal Transit Assistance

	Operating Expense	Federal Assistance
FY 1979	$21.4	$ 9.4
FY 1980	25.2	9.6
FY 1981	27.9	10.0
FY 1982	27.6	8.7
FY 1983	26.1	10.4

AKRON METRO'S TRANSPORTATION PROGRAM FOR ELDERLY AND HANDICAPPED PERSONS

The Akron METRO Regional Transit Authority provides a mix of special paratransit service and fixed-route accessible bus service benefiting the elderly and disabled residents of Akron, Ohio, a 95.1 square mile area with a population of approximately 660,000 persons.

The Special Citizens Area Transit (SCAT) provides door-to-door dial-a-ride and subscription service for elderly and handicapped residents of Akron, and the adjoining communities of Barberton, Cuyahoga Falls and Stow. SCAT is operated as a separate program by METRO. The SCAT paratransit operation utilizes vehicles, equipment, and other facilities of the transit authority, and reimburses METRO for the majority of the operating expenses.

SCAT serves persons certified by a doctor as having a permanent or temporary disability which makes them unable to use fixed-route transit service. This includes an inability of the individual to board or alight from a bus; wait or stand in a moving vehicle; read or comprehend informational signs, brochures, schedules and maps; or, hear or comprehend verbal information provided by public transportation personnel. Elderly persons 65 years or older, or 62 to 64 years and retired with limited income, are also qualified to use the SCAT service. SCAT operates Monday through Friday between 6 a.m. to 6 p.m. There is no evening or weekend service, however, during these periods, METRO provides accessible lift-bus service on 50 percent of its routes. The fixed-route bus service operates from 5 a.m. to 11:00 p.m. Monday to Friday, and from 5:30 a.m. to 10:30 p.m. on Saturdays. Passengers must contact SCAT by 4 p.m. the day before they want to travel,[1] except for medical emergencies.

SCAT provides unrestricted service to the handicapped, while restricting most service to the elderly to their zone of residence. Akron is divided into seven SCAT service zones. The elderly are transported outside their zone only for medical, grocery, and banking needs, or other justifiable reasons. SCAT serves elderly and handicapped trips in Barberton, Cuyahoga Falls, and Stow, Ohio, but restricts the trips of elderly residents to their neighborhood zones.

Approximately 15,000 residents have registered for SCAT service, or 28% of the eligible elderly and handicapped population. In 1983, the SCAT program served 156,169 total trips, of which

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[1] Requests for Monday service must be made the preceding Friday.

approximately one-third were made by handicapped patrons, including elderly handicapped persons who currently qualify for service on the basis of age rather than physical disability.

SCAT passengers pay 25¢ per one-way trip. In comparison, the fixed-route base transit fare was 50¢ in 1983, and the express transit fare was 80¢. The average subsidy cost to SCAT was $3.46 per van trip and $3.77 per cab trip in 1983. The average total cost per trip (including administrative expenses) was $4.10.

SCAT operates 15 vans: 10 in Akron, 2 in Barberton, 2 in Cuyahoga Falls, and 1 in Stow. SCAT contracts with a local cab company to provide approximately one-half of Akron's service. The taxi service covers 3 of the 7 Akron zones, although anyone requiring a lift uses one of SCAT's vans. Approximately one-half of SCAT service is dial-a-ride and one-half subscription. In addition to the SCAT paratransit service, the Akron METRO Regional Transit Authority operates 16 lift-equipped GMC buses (15%) out of a total fleet of 107 buses, although the lifts are rarely used. The lifts, manufactured by the Environmental Equipment Corporation (EEC), cost $16,000 per vehicle and were purchased around 1979 or 1980. The total capital cost of the lifts was $256,000, with an estimated annual capital cost of $21,333.[2] The annual maintenance/training cost for the lifts is estimated at $669.00 per bus, or $10,704 total. The total annual cost to support the lift-operation is then approximately $32,000.[3] METRO provides lift service on 50 percent of its coaches and 51.6 percent of its routes on Saturdays and in the evenings when SCAT service is not available. During the day, the 16-lift buses are operated on 16 high demand routes. METRO has experienced few maintenance problems with its lifts. However, there have been problems resulting from the weight of the lifts pulling the front end of the buses out of alignment. METRO is in the process of returning the buses to GMC for body repairs estimated at $500 per coach. METRO has ordered an additional 18 lift-buses, which should be in service by the summer of 1985.

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[2] NOTE: Capital cost estimate assumes that the final rule would permit recipients to claim all capital purchases dating back to the Department's 1979 Accessibility Rule. The annual capital cost of lifts is based on a 12 year depreciation rate and assumes that lifts should last as long as the bus (the standard useful life of a bus for life cycle costing purposes is 12 years).

[3] This estimate does not include the cost of marketing and schedule information on the lift-bus operation.

Akron satisfies all of the service criteria stated in the Department's new regulations for the provision of specialized transportation service for handicapped persons:

- SCAT serves the same service area as the fixed-route bus system.
- The combined SCAT/lift-bus service operates on the same days and hours as regular fixed-route transit.
- There is no constraint on demand.
- There are no restrictions or prioritizations based on trip purpose.
- SCAT fares are 50 percent less than the base transit fare, and 64 percent below the express transit fare. The regulation would allow the SCAT fare to be set at a level comparable to transit fares.
- Service is to be requested 10-24 hours in advance, except Monday service, which must be reserved the preceding Friday.
- SCAT serves handicapped individuals certified by a doctor or authorized agencies as unable to use regular transit and all elderly over 65 years, plus those 62-64 years, if retired. SCAT also serves handicapped persons from out of town, who hold an identification card demonstrating that they are eligible for their home town service. The regulations would limit eligibility for special services to persons who are physically unable to use the existing bus service.

In some areas, Akron provides more service than is required to satisfy the final rule's service criteria:

- SCAT could charge passengers a higher fare comparable to the fixed-route transit fare. SCAT riders might be expected to pay a higher fare for the higher quality door-to-door service they receive. For analytical purposes, it was assumed that SCAT's subscription service fare would be set at 75¢ comparable to the base fare for bus service of 50¢. The fare for dial-a-ride service was assumed to be $1.20 comparable to the transit express fare of 80¢.
- SCAT provides special service to a broad range of handicapped subgroups and non-disabled elderly persons. However, according to the regulations, it is only required to serve persons who are physically incapable of using the regular bus service, and not the entire elderly community.

- During weekdays, lift-bus service duplicates SCAT paratransit service in a portion of the service area. Under the rule, SCAT is not required to provide duplicate lift-bus service since its paratransit service fully meets the service criteria requirements on weekdays.

Program Cost: The total annual cost to support the lift-bus operation was estimated at approximately $32,000. The 1983 operating cost of the SCAT program was $1,103,029 with a $10,758 annual capital cost for three paratransit vehicles, purchased in 1980, for a total SCAT program cost of $1,113,787.[4] The total program cost of the combined system was then approximately $1,145,787. However, SCAT's program costs include the cost of providing service to elderly individuals able to use existing fixed-route service, which is beyond the service required by the new regulations. In order to determine the actual program cost supporting special service to those individuals who would qualify as eligible under the final rule, several cost adjustments have been made. First, the costs of providing service to elderly individuals assumed capable of using fixed-route service have been taken out. Second, in addition to eliminating elderly trips, SCAT also could probably reduce the number of existing handicapped trips by limiting program eligibility to only those persons who are physically incapable of using regular bus service. A detailed description of all assumptions and calculations can be found in the Appendix. The 1983 adjusted SCAT operating and capital cost supporting handicapped individuals assumed eligible for special service under the fixed-rule was estimated at $210,337. This amount, combined with the annual lift bus cost of $32,000, represents an adjusted total program expense of approximately $242,337.

The amount of Federal transit assistance received by Akron METRO in FY 1981-83 follows:

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[4] This assumes that the final rule would permit recipients to claim an annual expense for all paratransit vehicles and other equipment purchased after the Department's 1979 accessibility rule.

AKRON METRO REGIONAL TRANSIT AUTHORITY
UMTA-APPROVED GRANTS[5]
(in millions of dollars)

	FY 1981	FY 1982	FY 1983
Section 5	$4.2	$3.6	$4.7
Section 3	-0-	-0-	-0-
Total	$4.2	$3.6	$4.7

The average total annual Federal transit assistance provided to Akron METRO for FY 83 and the preceding two years was $4.2 million. The estimated total cost of the combined lift-bus/ paratransit program was about $1.1 million in 1983, or 26.0 percent of average total annual Federal transit assistance for FY 81-83.

If Akron chose to limit eligibility for its paratransit service to persons who are physically incapable of using the regular bus service, the adjusted total cost of Akron's combined paratransit/ accessible bus services would be approximately $242,000. This amount represents 5.8 percent of the $4.2 million average annual Federal assistance for FY 1981-83.

The Akron METRO Regional Transit Authority's operating expenses for 1981-83 follow:

AKRON METRO REGIONAL TRANSIT AUTHORITY
TOTAL OPERATING COSTS[6]
(in millions of dollars)

CY 1981	CY 1982	CY 1983
$8.2	$8.4	$8.2

Akron METRO's average total annual operating expense for 1983 and the preceding two years was $8.3 million. The 1983 total annual

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[5] Includes Section 5 apportionments for Federal fiscal years October to September 1979-81. NOTE: Akron METRO receives 88 percent of total Federal assistance apportioned to the Akron urbanized area.

[6] NOTE: Akron's fiscal year is January to December, thus Akron's expenditures in calendar years 1981-83 are used in lieu of Section 15 data which are reported for the average transit fiscal year between July and June. Under Section 15, Akron's cost would be reported in the year following actual expenditure.

cost of the combined paratransit/lift-bus program was about $1.1 million, or 13.3 percent of the average total annual operating expenses. If Akron limited eligibility on SCAT in accordance with the final rule, the adjusted total program cost would be $242,000 or 2.9 percent of average total annual operating expenses.

If Akron chose to provide service at this level, the program would comply with all service criteria requirements of the final rule. The estimated cost to provide this level of service is below both the 7.1 percent Federal assistance cost limit amount, and the 3.0 percent operating budget cost limit amount.

If the 504 regulations were changed to allow recipients to claim only the net program cost of accessible services, then Akron METRO would claim a net program expense estimated at $220,000. This amount represents approximately 5.2 percent of the $4.2 million average annual Federal assistance for FY 1981-83, and roughly 2.7 percent of average total annual operating expenses in 1981-83.

Appendix

1. SCAT Vans: twelve 1976 model year vans with lifts bought in 1977 for $35,000 each and three 1974 model year vans without lifts bought in 1980 for $22,000 each. Assume that the final rule would permit SCAT to claim an annual capital expense for accessible vehicles purchased after the Department's 1979 accessibility rule ($22,000 X 3 vehicles X .163[7] = $10,758 annual capital cost).

2. Total Trips (1983) 156,169 Average Total Cost Per Trip (capital costs of 1¢/trip are included):

	Vans	Taxis	Administration	Total
1981	$3.11	$2.97	$0.50	$3.54
1982	3.29	3.26	0.40	3.68
1983	3.46	3.77	0.48	4.10

3. SCAT Drivers: union; paid $9.81/hour

4. Ride Alone vs. Shared Ride Trips:

Vans	Taxis
40% ride alone	75% ride alone
60% shared ride	25% shared ride

5. Dial-A-Ride vs. Subscription Trips:

Dial-A-Ride	Subscription
44% SCAT vans	66% SCAT vans
56% cabs	34% cabs

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[7] Assumes a ten percent discount factor over a ten year life for paratransit vehicles, with a capital cost recovery factor of .163.

6. Elderly vs. Handicapped Passenger Trips:

Elderly	Non-Elderly Handicapped	Handicapped Elderly[9]	Total Eligible Handicapped
67%	15%	18%	33%

7. Total Population of Akron (1980) SMSA: 660,328

8. Elderly and Handicapped Population: 54,000 (1982)

9. Percent Elderly and Handicapped Served: 28%

10. SCAT Registrants: 15,000 (1983)

11. Total Program Cost (excludes capital costs):

	Total Operating Cost	Passenger Fares	Subsidy
1981	$ 930,499	$34,556	$ 895,943
1982	1,011,786	65,038	946,748
1983	1,103,029	79,439	1,023,590

12. Fixed Route Service Hours:

Monday-Friday	5:00 a.m. - 11:15 p.m.
Saturday	5:30 a.m. - 10:30 p.m.
Sunday	No service

13. Bus Fares:

	1981	1983
Base	50¢	50¢ (peak 60¢)
Express	70¢	80¢
Students	35¢	40¢
Elderly & Handicapped	25¢	30¢

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[9] Estimate is derived from 1978 DOT survey that identified approximately 21 percent of the Nation's elderly population as "transportation handicapped" involving various degrees of difficulty in using conventional transit services. Therefore, it is assumed that 21 percent of total elderly trips were made by elderly handicapped patrons which accounts for 18 percent of total SCAT trips.

14. Annual SCAT Ridership:

	Trips	Passengers
1981	190,363	263,653
1982	198,877	275,446
1983	156,169[9]	267,199

15. METRO Vehicles in 1982 (includes SCAT): 107 buses (16 have lifts and 22 vans (12 have lifts)

16. METRO Operating Cost and Federal Assistance (from UMTA Management Office):

	Operating Cost[10]		Federal Assistance[11]
CY 1979	$6,000,000	FY 1979	$4,000,000
CY 1980	7,100,000	FY 1980	4,000,000
CY 1981	8,200,000	FY 1981	4,200,000
CY 1982	8,400,000	FY 1982	3,600,000
CY 1983	8,200,000	FY 1983	4,700,000

17. Adjustments to 1983 SCAT Program Costs:

Eliminate Elderly Trips

1. 156,169 1983 total trips X .15 H trips = 23,425 H trips
2. 156,169 " " " - 23,425 H trips = 132,744 elderly trips
3. 132,744 E trips X .21 trips = 27,876 elderly trips assumed to be recertified by SCAT as eligible handicapped trips.
4. 23,425 H trips + 27,876 E H trips = 51,301 total H trips

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[9] During 1983, there was a 35 day strike.

[10] Metro fiscal year is January to December.

[11] Federal fiscal year is October to September.

Eliminate Handicapped Trips Ineligible Under the Rule

1. Current eligible users on SCAT include persons with mental, visual and hearing impairments. Many of these persons may not be eligible under the new rule unless they are physically incapable of using regular bus service. Ridership data from SCAT are insufficiently detailed to estimate the number of current handicapped users who might not qualify for special service, if SCAT limited its eligible user population in accordance with the requirements of the final rule.

2. Estimates obtained from the Kansas City case study, various UMTA special service demonstrations, and other studies indicate that the average use rates for mentally retarded patrons alone range from 10-33 percent of total handicapped ridership on existing special services (see detailed discussion in Chapter II, pg. II-41). For purposes of this analysis, it is assumed that 20 percent of current handicapped users of SCAT's special service would not qualify for service under the eligibility requirement of the new rule.

3. 51,301 total H trips X .20 trip reduction = 10,260 trips ineligible for SCAT service.

4. 51,301 total H trips - 10,260 trips = 41,041 eligible H trips

5. Assume .50 of total trips are dial-a-ride and .50 are subscription

6. 20,520 DAR H trips X $6.15 DAR average cost/trip[12] = $126,201 adjusted cost supporting H DAR trips

7. 20,521 subscription H trips X $4.10 subscription cost/trip[13] = $84,136 adjusted cost supporting H subscription trips

8. $126,201 DAR H trips + $84,136 H subscription trips = $210,337 adjusted SCAT program cost supporting eligible H trips in 1983.

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[12] Assumes 1.5 times the average SCAT cost/trip to support longer trip lengths of H patrons.

[13] Assumes 1.5 times the average SCAT cost/trip to support longer trip lengths of H patrons.

Adjusted Total Cost of H Service in 1983

$210,337 adjusted SCAT cost supporting H travel in 1983 + $32,000 annual lift-bus program cost = $242,337 total adjusted cost to comply with all service criteria requirements of the final rule.

Net Cost

1. Assume 267,199 passengers on SCAT in 1983. Assume 15% H passengers or 40,080 and 21% of total elderly passengers, or 47,695 elderly H passengers = 87,775 total H passengers.

2. 87,775 total H passengers X $0.25 SCAT fare = $21,943 current estimated revenue of H passengers.

3. $242,337 adjusted cost - $21,943 fare revenue = $220,394 net cost of SCAT service supporting existing H passengers.

Fare Adjustment

1. Assume SCAT dial-a-ride fare at $1.20 "comparable" to the express transit fare of $0.80.

2. Assume SCAT subscription fare of $0.75 "comparable" to the base transit fare of $0.50.

3. $1.20 - $0.25 current SCAT fare = $0.95 more per trip for dial-a-ride service.

4. $0.75 - $0.25 SCAT fare = $0.50 more per trip for subscription service.

5. Assume 50% of 87,775 H passengers use dial-a-ride, and 50% use subscription service.

6. 43,888 H DAR passengers X $0.95 = $41,694 additional revenue.

7. 43,888 H sub. passengers X $0.50 = $21,944 additional revenue.

8. $41,694 + $21,944 = $63,638 reduced program cost if fares are raised to levels comparable with transit fares.

9. $220,394 estimated current net cost of SCAT service - (minus) $63,638 additional revenue if fares are made comparable = $156,756 potential net cost of SCAT service supporting handicapped patrons.

NEWPORT NEWS/HAMPTON: HANDI-RIDE

Special services transportation in Newport News and Hampton, Virginia is provided by Handi-Ride, an operating division of the Peninsula Transportation (Pentran) District Commission's Easyride transportation brokerage program. The Newport News/Hampton, Virginia area includes a population of approximately 270,000 persons within a 121.5 square mile area. Handi-Ride is a demand-responsive paratransit service provided for the handicapped, which currently operates two mini-buses, three cars, and four lift-equipped vans. Three additional lift-equipped vans will be added in FY 1984. Handi-Ride provides door-to-door transportation for eligible persons and contracts with a taxi company (which operates 20 vehicles) to supplement its services.

The Handi-Ride program is offered for the physically and mentally handicapped who are certified by a physician as unable to use the Pentran bus system. However, even though service is provided only for the handicapped, over half of its users are elderly persons who qualify because of their physical disabilities. Acceptance to the program is decided by the Handi-Ride Director on the basis of a questionnaire which is completed by the applicant and the applicant's physician.

The application requests the applicant to detail his/her disabilities, present means of transportation, and the nature of his/her trips. The applicant is also asked whether he/she is confined to a wheelchair, uses a cane or crutches, is able to board cars unassisted, or must be accompanied by an attendant. Applicants are required to sign a release form that discharges Pentran and its employees from any liability for any bodily injury or property damage sustained during participation in the program.

The applicant's physician is asked to verify the nature of the patient's disability and whether the applicant is physically or mentally able to use the bus system. The physician is also required to answer a list of questions, such as whether the applicant can walk a quarter of a mile, stand for a period of ten miles, or negotiate steps.

One-way fares for Handi-Ride are $1.50 for an exclusive ride and 75¢ for a shared ride. Payment is made to the driver with tickets which are sold in 75¢ increments. These can be purchased at several area hospitals, social service agencies, and the Pentran office. If a user requires assistance to use the service, an "escort" is also eligible for the reduced fare.

If the taxi company provides the trip, the passenger pays the taxi driver $1.50 in Handi-Ride tickets (75¢ for shared rides) and Handi-Ride pays the balance of the regular taxi fare up to a

maximum of $12.00, or 12 miles. Once any trip surpasses 12 miles, the passenger must pay an additional fare (75¢) or, if the metered fare is greater than $12.00, the remainder of the fare. The taxi operator imposes a service charge to Handi-Ride for trips which are canceled without advance notice. The service charge is two dollars for trips in Hampton and four dollars for trips to Newport News.

Eligible users schedule rides a day ahead by calling Handi-Ride between 8 a.m. and 2 p.m. Handi-Ride employs a scheduler and a dispatcher to receive the calls; record the time, origin, and destination of the initial and return trips; and schedule the trips. Handi-Ride also operates on a subscription basis for regularly scheduled service such as routine work, education, or medical trips. Handi-Ride places no restrictions on trip purposes or destinations and currently has no waiting list. If demand is greater than available service, Handi-Ride may prioritize trips (e.g., a person making a trip to the hairdresser would be asked to postpone his/her trip so that a person making a trip to the doctor could make his/her trip).

The Handi-Ride program satisfies most of the service criteria designated for special services for handicapped persons in the new final rule. The correspondence between Handi-Ride service and the service criteria are discussed below.

The final rule requires that "the special service shall be available throughout the same service area as the recipient's bus service for the general public." The Handi-Ride service area includes Newport News and Hampton which encompasses 121.5 square miles. This is the same area served by the Pentran bus system; thus, Handi-Ride meets this criterion.

The final rule requires that "the service shall be available on the same days during the same hours as the recipient's bus service for the general public." Handi-Ride operates from 6 a.m. to 6 p.m., Monday through Saturday, or 3.5 hours less than the fixed-route bus service which operates from 5:00 a.m. to 8:30 p.m. No service is offered on Sundays by either Handi-Ride or Pentran. Although the absence of Sunday service can be limiting, the same limitations are placed on the general public.

The regulations also require that "the cost of a trip on the service to each user shall be comparable to the cost of a trip of similar length, at a similar time of day, to a user of the recipients' service for the general public." The fare for Handi-Ride service is higher than the regular base fare for the fixed-route system. However, the fare differential depends upon the types of services compared. Handi-Ride has two fares: 75¢ for shared-ride and $1.50 for exclusive ride. Base fares for the fixed-route system are 50¢ for regular fixed-route service and $1.00 for express service. Thus, the fare for a Handi-Ride trip

is either 25¢ or $1.00 more than the base-fare for the fixed-route system, depending upon whether or not the trip is shared. However, the differential depends upon the types of services compared. For example, one could compare the fixed-route express fare of $1.00 to the $1.50 exclusive-ride of Handi-Ride. Although Handi-Ride is 50¢ more, the trip is exclusive ride and door-to-door transportation whereas the express bus trip is not. A shared-ride Handi-Ride trip may cost as little as 75¢, which may result in the same level of service as the $1.00 express bus ride.

The final rule states that "use of the service shall not be restricted by priorities or conditions related to trip purposes." While Handi-Ride does not restrict trip purpose, if demand is greater than supply, Handi-Ride reserves the right to prioritize trips by requesting that someone postpone a non-essential trip to allow for someone needing the service for an essential trip. Although Handi-Ride reserves this right, it very seldom occurs that trips must be prioritized.

The regulations also require that users of the service shall not be required to wait for the service more than 24 hours. Handi-Ride requires all trips to be scheduled on the day prior to the trip. Therefore, Handi-Ride meets this criterion.

The eligibility requirement of the rule states that special service is to be provided for persons who are physically incapable of using the existing bus service. Handi-Ride's eligibility policy, includes not only physically handicapped persons who are unable to use existing bus service, but mentally retarded persons who would not be eligible for service under the rule. However, current ridership on the Handi-Ride system is quite low compared to that in other case study systems. Therefore, no adjustment will be made in Hampton's cost to reflect the potential removal of trips by retarded patrons.

The Handi-Ride program has three potential deficiencies with regard to the service criteria:

1. Handi-Ride operates three hours less daily than the fixed-route system.

2. Handi-Ride fares are higher than those for the Pentran systems.

3. Sometimes trips are prioritized by purpose.

Whether or not the Handi-Ride program is deficient in these areas depends upon interpretation of the regulations through the local participation process, and subsequent determinations of what constitutes "comparable" fares.

The operating cost of the Handi-Ride program for fiscal years 1981, 1982, and 1983 are shown in Table 1.

Table 1
COST OF HANDI-RIDE

	Total Cost	Operating Cost	Administrative Cost	Revenue	Subsidy Cost
1981	$70,988	$66,215	$ 4,773	$12,086	$58,902
1982	78,469	65,826	12,643	17,485	60,984
1983	84,533	75,133	9,400	21,007	63,526

In FY 1983, the total operating cost of Handi-Ride was $84,533. The total program cost including an annual capital cost for paratransit vehicles of $8,699,[1] was then $93,232. Handi-Ride provided 15,778 handicapped trips in FY 1983; therefore, the average total cost per trip was $5.90, and the average subsidy cost per trip was $4.03.

The total amount of Federal transit assistance to Pentran is presented below:

PENINSULA TRANSPORTATION TRANSIT COMMISSION
UMTA APPROVED GRANTS[2]
(In thousands of dollars)

	FY 1981	FY 1982	FY 1983
Section 5 or 9	2.067	2.024	1.841
Section 9A			.885
Section 3	.839		
TOTAL	2.907	2.024	2.726

[1] The total capital cost of $53,369 for paratransit vehicles is amortized at 10 percent interest, over a 10 year life, with a capital cost recovery factor of .163.

[2] Source: Resource Management Division, Office of Grants Management, Urban Mass Transportation Administration, U.S. Department of Transportation. NOTE: Includes Section 5 or 9 apportionments in each fiscal year.

The average annual Federal assistance provided Pentran for the three years was approximately $2.6 million. The total operating and capital cost of Pentran's Handi-Ride program was estimated at approximately $93,000 in FY 1983, which is about 3.6 percent of average annual assistance in FY 1981-83.

The total operating expenses of Pentran are presented below:

PENINSULA TRANSPORTATION DISTRICT COMMISSION
TOTAL OPERATING EXPENSES[3]
(In thousands of dollars)

FY 1981	FY 1982	FY 1983
5.397	5.508	5.396

The average total annual operating expense of Pentran for FY 81-83 was approximately $5.4 million. The total operating and capital cost of the Handi-Ride program was about $93,000 in FY 1983, or about 1.7 percent of the average total operating expense.

At this level, the Handi-Ride program potentially satisfies five of the six service criteria at a cost which is well below both of the proposed cost ceilings. This assumes that Handi-Ride fares are "comparable" to transit fares.

In terms of fare comparability, Handi-Ride patrons received door-to-door taxi or van trips, most of which were exclusive rides. All other things being equal, the quality of an exclusive taxi ride could be considered superior to an express bus trip, and a shared van or taxi ride could be judged superior to the average transit trip. Therefore, the exclusive and shared ride fares which are 50 percent higher than the express and base transit fares are assumed comparable for analytical purposes. However, comparability is to be determined through the local participation process.

If Pentran extended the Handi-Ride service hours to those of the fixed-route service, this would amount to three additional hours of service daily, or about 936 hours annually. Pentran has estimated the additional cost to provide these service hours at approximately $10,000. This cost, together with the $93,000

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[3] National Urban Mass Transportation Statistics, Section 15 Reporting System, FY 81-83. Fiscal year begins July and ends in June.

annual capital and operating expense estimated for Handi-Ride in 1983, amounts to a total adjusted program cost of $103,000. At this level, Pentran would spend 4.0 percent of the $2.6 million average annual Federal assistance, or 1.9 percent of its $5.4 million average annual operating budget to provide a level of service assumed to be in full compliance with the eligibility and service criteria requirements of the final rule.

Appendix

HAMPTON/NEWPORT NEWS HANDI-RIDE

PROVIDER: Peninsula Transit District Commission and Langley Cab Company

FUNDING SOURCES:

	1981	1982	1983
State Capital	52,369	--	--
UMTA Sec. 5	29,562	31,786	35,186
State Admin.	5,220	9,082	27,446
Hampton	15,650	16,866	1,407
Newport News	7,534	7,135	6,334
	110,335	64,869	70,373

SUBSIDY: For Taxi: fare up to maximum of $12 minus $1.50 exclusive ride or $0.75 shared-ride.

SERVICE AREA: Newport News and Hampton (121.5 mi)

FIXED ROUTE: Newport News and Hampton (121.5 mi)

TYPE OF SERVICE: Door-to-door, 24-hour advance notice (may be as little as 17 hours)/subscription service for regularly scheduled trips/both exclusive-ride and shared-ride.

OPERATOR: PTDC-Easyride-Handi-Ride

FLEET	CARS	LIFT VANS
1981	3	1
1982	3	2
1983	3	6

Langley Cab -- 20 vehicles (1983)

SERVICE HOURS: 6 a.m. - 6 p.m. Mon-Sat/No Sunday service

ELIGIBILITY: Physically and mentally handicapped who are unable to use the PENTRAN bus system doctor certification required based on inability to walk 1/4 mi to nearest bus stop; stand for 10 minutes negotiate steps; comprehend bus schedules or money exchange; or use the system without an attendant.
Application with doctor certification -- detail disabilities, present means of transportation, nature of trips, wheelchair, cane or crutches, ability to board cars unassisted.

REGISTRANTS:	1981		787 (includes escorts)
	1981	1,000	70 escorts
	1983	2,500	125 escorts

E&H POP.: 30,354 Elderly (60+) and 6,125 transit disabled. NOTE: Service is only for handicapped.

REGISTRANTS AS % OF ELIGIBLE HANDICAPPED POPULATION: 41% of transit disabled in service area

% H SERVED: 100% of target population in service area

FARE:

	EXCLUSIVE RIDE	SHARED RIDE	ESCORTS
1981	$1.00	$0.50	$0.50
1982	1.50	0.75	0.75
1983	1.50	0.75	0.75

BUS FARE: $1.00 express

$0.25 off-peak senior citizen and E&H + $0.05 transfer

$0.50 regular service, peak + $0.10 transfer

SERVICE RESTRICTIONS: May prioritize trips if full capacity reached

USER RESTRICTIONS: Doctor certification/approved application

QUALITY OF SERVICE: No complaints/very few trip requests refused

ANNUAL TRIPS:

	# TRIPS	# PASS	# POOLED TRIPS	% TAXI TRIPS
1981	13,043	14,416	11	40
1982	11,230	14,880	33	36
1983	15,778	17,424	11	28

PROGRAM COSTS:

	TOTAL COST	OP COST	ADMIN COST	REVENUE
1981*	$70,988	$66,215	$ 4,773	$12,086
1982	78,469	65,8826	12,643	17,485
1983	84,533	75,133	9,400	21,007

* TOTAL CAPITAL EXPENSE: $53,369 in 1981

AVERAGE OPERATING COST PER TRIP:

1981	$5.44
1982	6.98
1983	5.35

FEDERAL ASSISTANCE:

FY 1981	$2,907,000
FY 1982	2,024,000
FY 1983	2,726,000

TOTAL OPERATING COSTS:

FY 1981	$5,397,588
FY 1982	5,508,416
FY 1983	5,396,138

BROCKTON, MASSACHUSETTS DIAL-A-BAT PROGRAM FOR ELDERLY AND HANDICAPPED TRANSPORTATION

The Brockton Area Transit Authority (BAT) provides innovative paratransit service that both complements regular BAT fixed-route transit service, and consolidates and coordinates transportation for most area human service agencies. The paratransit service, known as DIAL-A-BAT, provides transportation to elderly and handicapped residents of Brockton, Massachusetts, pre-school children, and social service agency clients in the adjacent towns of Avon and Stoughton, Massachusetts (estimated area population 130,000). BAT is responsible for setting policies, rates, and fares, and establishing agreements with participating agencies. BAT contracts out the special service to Self-Help, Inc., a non-profit organization, overseeing a number of social service agencies in the Brockton area. To the extent needed to meet the demand for service, DIAL-A-BAT service is supplemented by private taxicab service. Both door-to-door, dial-a-ride and subscription (6 or more traveling together) services are offered.

DAB currently serves all elderly persons over age 60, low-income pre-school children, and individuals certified as handicapped. Handicapped individuals include those who have physical disabilities or mental retardation or psychological problems which affect their ability to use regular bus service, as well as some who have been certified as handicapped, but are capable of using existing bus service. Any resident who holds a valid BAT Handicapped I.D. card is eligible to use the service. Such cards are issued to anyone who is:

1. A disabled veteran certified by the Brockton Veterans Administration Hospital.

2. A person with an employment disability certified by the Massachusetts Rehabilitation Commission.

3. A person with an emotional, mental, or psychological handicap certified by the Brockton Multi-Service Center.

4. A person with a significant temporary or permanent physical disability that limits his/her ability to:

   a. use stairs, escalators, ramps; or

   b. ride a regular BAT bus; or

   c. stand in a moving vehicle; or

d. read informational signs, i.e., is legally blind; or

e. hear announcements, i.e., at least 50% deaf; or

f. walk unassisted more than 200 feet, i.e., without crutches, walker, wheelchair, prosthetic devices, or other aids.

In addition to providing service for eligible E&H residents of Brockton, DIAL-A-BAT serves handicapped social service agency clients in the neighboring towns of Avon and Stoughton who want to travel to Brockton. The fixed-route service area covers Brockton (25 square miles), Avon and Stoughton (an additional 25 square miles), and one commuter route to the Boston-area rail system (about 20 miles). DIAL-A-BAT will carry passengers to all areas served by the fixed-route system plus some additional out-of-town areas, particularly hospitals in neighboring towns. DIAL-A-BAT owns 27 vans (approximately one-half are lift-equipped), and contracts out the service delivery to a non-profit provider, Self Help, which employs van drivers, management and office staff. Bay State Corporation, operator of BAT's fixed-route bus service, maintains all DAB equipment and provides drivers for two vehicles. Private taxis provide back-up service as needed, and serve approximately 0.4% of dial-a-ride trips.

The DIAL-A-BAT service hours are much shorter than regular fixed-route service hours. In FY 1983, service was available from Monday through Friday between 7 a.m. and 6 p.m., Saturday service was provided until FY 1982 from 9 a.m. to 5 p.m. However, DIAL-A-BAT no longer offers regular Saturday service, since approximately 75 percent of Saturday trips were made by patrons capable of using fixed-route bus service. Currently, Saturday and Sunday dial-a-ride service is by appointment only, and evening service is provided twice a week up until 11:30 p.m. for agency clients. In comparison, regular transit service operates Monday through Saturday from 5:15 a.m. to 1:45 a.m.; however, service between 5:15 a.m. and 6:00 a.m. and 8:40 p.m. to 1:45 a.m. is limited to one commuter route serving a rail terminal to Boston.

Most DIAL-A-BAT trips are by subscription and do not require advance reservations. Dial-a-ride passengers must reserve trips 24 hours in advance; however, reservations are taken up to 5:00 p.m. on the day before service. Also, some trips are provided on an immediate response basis, although this policy is not advertised. DIAL-A-BAT provides unrestricted service to eligible elderly and handicapped residents, and trips are not prioritized by trip purpose. Most dial-a-ride trips are taken by non-agency users (79%), while essentially all subscription trips are agency affiliated. In addition, most dial-a-ride trips (approximately 90%) and all subscription trips are shared ride, two or more passengers riding together in the vehicle, although

their origins and destinations may differ. Approximately 3,000 E&H residents have registered for DIAL-A-BAT service, or 17% of the targeted eligible elderly and handicapped population in the Brockton/Stoughton/Avon area.

A significant amount of all DIAL-A-BAT trips (74%) are made by clients of Brockton's human service agencies. The human service agencies, rather than the passengers, contact DIAL-A-BAT to make trip arrangements, and are regularly billed for their clients' fares. Approximately one-half of the agencies' clients are elderly and handicapped individuals who would qualify on their own for DIAL-A-BAT service. The other one-half are pre-schoolers. The agencies reimburse the DIAL-A-BAT program at a higher rate than unaffiliated riders, and cover the total variable cost of their clients' in-town trips. Agencies pay $3.75 for each non-wheelchair and $7.00 for each wheelchair dial-a-ride trip (approximately 22% of all trips) made by their clients. Subscription trips cost $11.50 per in-town vehicle hour of use and $16.00 for each out-of-town vehicle hour of use. The DIAL-A-BAT program subsidizes $3.40 per agency affiliated dial-a-ride passenger trip, and approximately 24¢ per agency affiliated in-town subscription passenger trip. The agencies pay the full cost for their clients' out-of-town trips.

Dial-a-ride passengers unaffiliated with a Brockton human service agency pay $1.00 per one-way trip, or twice as much as the 50¢ base fare on fixed-route transit. Non-agency patrons who use subscription service, 6 or more passengers traveling together, pay 50¢, the same as the base fixed-route fare. However, only a negligible number of non-agency users take advantage of this service. Local and Federal funds subsidize the remaining cost--$3.87 per dial-a-ride trip and $1.32 per subscription trip. DIAL-A-BAT trips to out-of-town destinations, primarily medical trips to Boston, cost patrons unaffiliated with a human service agency approximately $2.50 per one-way trip. The full cost of out-of-town trips is $16.00 per vehicle hour, with the program subsidy dependent on the number of riders. As required by State law, blind individuals ride free of charge.

Brockton's DIAL-A-BAT service appears to satisfy all but two of the final rule's service criteria requirements for provision of special transportation service to handicapped persons:

- DIAL-A-BAT provides service to all areas served by the fixed-system plus some trips to points outside the fixed-route area, primarily medical trips to Boston. This coverage exceeds the service criterion of the rule, which requires special service throughout the same area served by the fixed-route system.

- Twenty-four hour advance reservations are required for dial-a-ride service. However, calls are taken up to 5:00 p.m. on the day before the trip, and immediate response trips are

served if capacity permits. Few immediate response trips are refused. The final rule permits response times up to a maximum of 24 hours.

- o There is no constraint on demand and all eligible trips are served.
- o There are no restrictions or prioritizations based on trip purpose.

- o The final rule requires special service fares to be comparable to regular bus fares. DIAL-A-BAT fares for non-agency patrons are $1.00 per dial-a-ride trip, and 50 cents per subscription trip. The subscription fare is equivalent to the FY 1983 base transit fare of 50 cents. The dial-a-ride fare is two times the 50¢ base transit fare. For analytical purposes, the dial-a-ride fare of $1.00 is assumed to be comparable to the current base fare, since dial-a-ride is providing door-to-door exclusive or shared rides, which could be considered superior in quality to regular bus trips. However, decisions on fare comparability are to be determined through the local participation process.

- o DIAL-A-BAT's eligibility policy includes all Brockton residents over age 60, and persons with a broad range of physical disabilities or mental or emotional problems which affect their ability to use regular bus service. Eligible users also include low-income pre-school children (none of whom are assumed handicapped by DIAL-A-BAT), and social service agency clients in the towns of Avon and Stoughton, which are part of the fixed-route service area. However, handicapped residents of these towns unaffiliated with a social service agency are currently ineligible for special service.

In two areas, DIAL-A-BAT appears to provide more service than is required to satisfy the service criteria:

- DIAL-A-BAT serves a significantly larger area than the fixed-route service, such as trips to hospitals in some surrounding towns, and medical trips to Boston.

- Current patronage on DIAL-A-BAT includes non-disabled elderly, low-income pre-schoolers, retarded persons and and some patrons who have been certified as handicapped but are capable of using existing bus service. The final rule only requires special service for persons who are physically incapable of using regular bus service.

In two areas, DIAL-A-BAT provides less service than is required to satisfy the service criteria requirements of the rule. First, DIAL-A-BAT has shorter service hours than regular transit service (55 DIAL-A-BAT hours weekly vs. 87 fixed-route service hours), and provides evening and weekend service primarily to agency clients for special group events. In order to satisfy the regulations,

DIAL-A-BAT would have to increase it's service hours in the evenings and on Saturday to match the fixed-route service hours. Alternatively, DIAL-A-BAT might contract out the weekend and evening service to taxicab companies on a reservation basis, or the transit authority might choose to provide accessible bus service on evenings and weekends.

Second, DIAL-A-BAT does not fully meet the eligibility requirement which requires special service for all physically handicapped residents of the fixed-route service area who are incapable of using regular bus service. To meet this requirement, service would have to be extended to all eligible handicapped residents in Stoughton and Avon, since these towns are part of the fixed-route service area.

Demand: In FY 1983, DIAL-A-BAT provided a total of 196,754 program trips--50,910 Dial-a-Ride elderly and handicapped trips; 67,844 subscription elderly and handicapped trips; and approximately 78,000 pre-schooler trips. It is estimated that approximately 59,000 trips were made by patrons certified as handicapped, including those with physical or psychological problems which affect their ability to use existing bus service, as well as some who could use the existing bus service. In addition, it is assumed that 21 percent of total elderly trips, or about 12,000 trips, were made by elderly handicapped patrons whom Brockton might recertify as eligible for special service if they meet the requirement of the rule.[1] Therefore, a total of approximately 72,000 handicapped trips, or roughly 37 percent of total trips, are estimated to have been made on DIAL-A-BAT in FY 1983.

Program Cost: The FY 1983 operating cost of the DIAL-A-BAT program was $513,292, which together with an estimated annual capital cost of $71,634, yields a total program cost of $584,661 in FY 1983.[2] This program cost includes the cost of providing

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[1] Source: Summary Report of Data from National Survey of Transportation Handicapped People, U.S. Department of Transportation, Washington, D.C., June 1978, p. 17.
NOTE: Approximately 21 percent of the Nation's total elderly population was identified as "transportation handicapped" involving various degrees of difficulty in using conventional transit services.

[2] Capital cost estimate assumes that the final rule would permit recipients to claim all capital purchases dating back to DOT's 1979 Accessibility Rule. Administrative costs are not included since the Brockton Area Transit Authority (BAT) would have the same administrative costs with or without the DIAL-A-BAT program. Brockton's fiscal year runs from July 1, 1982-June 30, 1983.

service to elderly, handicapped, and pre-school individuals, which is beyond the service required by the new regulations.

In order to determine the cost of the program in providing service to only those who would be eligible under the final rule, several cost adjustments have been made. First, the costs of providing service to low-income pre-school children and non-disabled elderly patrons assumed capable of using existing fixed-route bus service have been removed. Second, in addition to eliminating elderly and school trips, DIAL-A-BAT also could probably reduce the number of existing handicapped trips by limiting program to only persons who are physically incapable of using regular bus service. Currently, DIAL-A-BAT provides service for persons with emotional, mental or psychological problems, persons with employment disabilities certified by the State, disabled veterans certified by the V.A. hospital, and persons who are at least 50 percent deaf. No data are available to estimate how many of these current users might qualify as eligible for special service under the final rule based on physical inability to use regular bus service.

Estimates from the Kansas City case study, various UMTA special service demonstrations, and other studies indicate that the average use rates of mentally retarded patrons alone range from 10 percent to 33 percent of total handicapped ridership on existing special services (see full discussion of ridership data and assumptions in Chapter II, pg. II-41). For purposes of this case study analysis, it is assumed that DIAL-A-BAT could potentially eliminate 25 percent of current handicapped trips, if it limited program eligibility in accordance with the requirements of the final rule.

Third, in order to fully meet the Fderal eligibility requirement, the costs have been adjusted to extend special service to physically handicapped persons in Avon and Stoughton, Massachusetts, who would qualify as eligible under the rule. Then, to determine the cost of providing a paratransit service which meets all service requirements of the rule, additional adjustments were made. These included the impact of increased days and hours of service to match those of the fixed-route system, and the elimination of out-of-town trips to points beyond the fixed-route service area. A detailed description of all assumptions and calculations can be found in the Appendix. The adjusted total DIAL-A-BAT compliance cost for FY 1983 assumed to support 51,345 potentially eligible handicapped trips is $244,955.

The amount of Federal transit assistance to Brockton Area Transit for FY 1981-83 follows:

Brockton Area Transit Authority
UMTA-Approved Grants and
Section 5 Apportionments
(in millions of dollars)

	FY 1981	FY 1982	FY 1983
Section 5	$1.7	$1.7	$1.7
Section 3	.4	.0	.0
Section 9A	.0	.0	.6
Total	$2.1	$1.7	$2.2

Source: Resource Management Division, Office of Grants Management, Urban Mass Transportation Administration, U.S. Department of Transportation.

The average annual Federal transit assistance provided under sections 5, 9A and 3 to Brockton for FY 1983 and the preceding two years was $2.0 million. The FY 1983 total operating and capital cost of the DIAL-A-BAT program was $584,661, or 29.2 percent of average annual Federal transit assistance.

The Brockton Area Transit operating expenses for FY 1981-83 follows:

Brockton Area Transit Authority
Total Operating Expenses
(in millions of dollars)

FY 1981	FY 1982	FY 1983
$5.0	$4.7	$5.0

Source: National Urban Mass Transportation Statistics, Section 15 Reporting System, U.S. Department of Transportation. Data for 1979-81 is based on a fiscal year beginning in July and ending in June.

The average annual total operating expense for FY 1983 and the preceding two years was $4.9 million. The FY 1983 total cost of the DIAL-A-BAT program was $584,661, or 11.9 percent of the average total operating expense.

If Brockton chose to (1) limit eligibility on DIAL-A-BAT to only those persons who meet the final rule's requirement, (i.e., physically incapable of using the existing bus service; (2) extended service to all eligible handicapped persons in Avon and Stoughton;

(3) increased days and hours of service; and (4) eliminated out-of-town handicapped travel; the adjusted FY 1983 total program cost would come to approximately $245,000. This represents 12.2 percent of Brockton's $2.0 million average annual Federal transit aid in FY 1981-83, and 5.0 percent of it's $4.9 million average total operating expense for FY 1981-83. If Brockton chose to provide service at this level, it would potentially satisfy all service criteria requirements of the final rule. However, the estimated program cost to provide this level of service would exceed the cost limits of 3.0 percent of average total operating expenses and 7.1 percent of average Federal transit assistance.

If the 504 regulations were changed to allow recipients to claim only the net program cost of providing handicapped service, then Brockton would claim an estimated FY 1983 net program cost of $152,713 in support of eligible handicapped travel. This is 7.6 percent of Brockton's $2.0 million average annual Federal transit aid, and 3.1 percent of its $4.9 million average total annual operating expense in FY 1981-83. At this level, Brockton's estimated net cost would only slightly exceed the 7.1 and 3.0 percent cost limit amounts.

The DIAL-A-BAT paratransit cost and handicapped ridership are substantially above those estimated for the other small case system of Hampton/Newport News, Virginia. Factors appearing to influence the high handicapped ridership and cost in Brockton include: (1) a more liberal eligibility policy including an undeterminable number of persons who may be capable of using existing bus service, (2) concentrated social service programs and special education facilities for persons who cannot attend regular schools financed by the State of Massachusetts, (3) Brockton has the highest number of social workers per capita in the State, (4) the V.A. Hospital in Brockton is one of the largest in the nation, and there are four other large hospital facilities in the area.

Appendix

1. DIAL-A-BAT Program Registrants: 3,000

2. Area Population: Brockton (95,172), Stoughton/Avon (35,000); Elderly and Handicapped Population: 18,000

3. Estimated Transportation Handicapped Population: 4,740; Percent Elderly and Handicapped Served By DIAL-A-BAT: 17%

4. Bus Fare:

	1981	1983
Base	35¢	50¢
Elderly & Handicapped	15¢	25¢

5. Annual DIAL-A-BAT Trips (includes pre-school trips):

1981	182,251
1982	176,897
1983	196,754

6. Total Program Cost (includes $71,639 annual capital cost of 27 van purchases 1979-83):

1981	$503,466
1982	$556,801
1983	$584,661

7. Average Total Cost Per Trip (includes $0.36 per trip for annual capital cost):

	Dial-A-Ride	Subscription	Average (includes pre-school trips)
1981	$5.44	$1.98	$2.73
1982	6.02	2.12	3.10
1983	5.23	2.18	2.97

8. 1983 Operating Statistics

	Dial-A Ride	Subscrip-tion	Grand Total
Total Ridership	50,910	145,844	196,754
Total Operating Cost	$248,139	$265,153	$513,292
Total Revenue	75,140	230,324	305,464
Total Net Deficit	172,999	34,824	207,828
Operating Cost/Passenger	$4.87	$1.82	$2.61
Revenue/Passenger	1.48	1.58	1.55
Deficit/Passenger	3.40	0.24	1.06

9. Unaffiliated vs. Agency Trips (excludes pre-school trips):

	Unaffiliated	Agency
Total Trips	38%	62%
Dial-A-Ride Trips	79%	21%
Subscription	0.1%	99.9%

10. Ride Alone Trips vs. Shared Ride Trips:

Dial-A-Ride	Subscription
10% ride alone 90% shared ride	100% shared ride

11. Agencies pay the variable cost of in-town trips and the total cost of out-of-town trips. Thirty percent of agency trips travel out-of-town.

12. Subsidy Per Cab Trip: averages $4-$7 per trip

13. Percent Cab Trips of Total Trips: 0.4% of dial-a-ride trips

14. Bus Driver Hourly Wages:

	DIAL-A-BAT	Fixed Route
Union	$10.56 (2 drivers)	$10.31
Non-Union	6.50 (35 drivers)	-----

15. DIAL-A-BAT Fares (FY 1983):

GENERAL PUBLIC (ELDERLY AND HANDICAPPED), COMPANIONS, AND NON-PROFIT AGENCIES

Dial-a-Ride	$1.00/one-way trip
Subscription (6 or more traveling together)	.50/one way trip
Boston Medical Trips	$5.00/round trip $15.00/week

PUBLICLY FUNDED AGENCIES

Dial-a-Ride Fare	
Regular	$3.75/one-way trip
Wheelchair	$7.00/one-way trip
Subscription Fare	$11.50/vehicle hour
Out-of-Town Service (covers full operating cost)	$16.00/vehicle hour
Boston Medical Trips	$32.00/round trip

16. Brockton Area Transit Operating Cost and Federal Assistance:

	Operating Cost	Federal Assistance
1981	$4,977,600	$2,100,000
1982	4,655,400	1,700,000
1983	5,001,700	1,500,000

17. DIAL-A-BAT operates 27 vans:

9 with lifts bought in 1979 for $19,900 each
12 without lifts bought in 1980 for $17,700 each
6 used vans bought in 1982-83 for $39,000 and rehabilitated for $9,000

Total cost of 27 vans equals $439,500, or an annual capital cost of $71,639.[3] Based on 196,754 DIAL-A-BAT trips in 1983, the capital cost per trip equals 36¢ per trip.

18. Adjustments to 1983 DIAL-A-BAT Program Costs

Assumptions:

1. In FY 1983, DIAL-A-BAT provided 196,754 total trips.

2. Agency pre-school trips equal 50% of total trips while school is in session (39 weeks/year).

3. Program trips average 4000/week (39 weeks) when school is in session and 2000/week (13 weeks) when school is not in session.

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[3] Annualization is based on a 10% interest rate, a 10 year life, with a capital cost recovery factor of .163.

4. Elderly individuals comprise 25% of all trips while school is in session and 50% of all trips when school is not in session.

5. Handicapped individuals including those who could use fixed-route service comprise 25% of all trips while school is in session and 50% of all trips when school is not in session.

6. One-half of the elderly trips are agency subscription trips and one-half of the elderly trips are non-agency Dial-A-Ride trips.

7. One-half of the handicapped trips are agency subscription trips and one-half of the handicapped trips are non-agency Dial-A-Ride trips.

Calculations:

1. 2,000 pre-school trips/week X 39 weeks = 78,000 pre-school trips (none of the pre-school children are assumed handicapped by DIAL-A-BAT).

2. 196,754 total FY 1983 trips - 78,000 pre-school trips = 118,754 E&H total trips.

3. 118,754 E&H trips - 50,910 E&H DAR trips = 67,844 E&H subscription trips in FY 1983

Adjustment to Eliminate Elderly Trips for Individuals Assumed Capable of Using Fixed-Route Service

1. 67,844 E&H subscription trips X .50 = 33,922 H subscription trips.

2. 33,922 total elderly subscription trips X .21 = 7,124 elderly handicapped (E H) subscription trips.[4]

3. 33,922 H trips + 7,124 E H trips = 41,046 total H subscription trips.

4. 50,910 E&H DAR trips X .50 = 25,455 H DAR trips.

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[4] Assumes 21 percent of elderly patrons are "transportation handicapped" and would potentially qualify under the final regulations as eligible for special service.
Source: Summary Report of Data from National Survey of Handicapped People, U.S. Department of Transportation, June 1978, p. 17.

5. 25,455 total E DAR trips X .21 = 5,346 E H DAR trips.

6. 25,455 H trips + 5,346 E H trips = 30,801 total H DAR trips.

7. 41,046 H Subscription trips + 30,801 H DAR trips = 71,847 total H trips.

Adjustment to Eliminate Current Handicapped Trips Assumed Ineligible Under the Final Rule for Special Service

1. Current eligible users of DIAL-A-BAT include persons with mental, emotional and psychological problems; those with hearing impairments; disabled veterans certified by the V.A. hospital; and persons with employment handicaps certified by the State. Many of these persons would not be eligible for service under the final rule, which limits eligibility to persons who are physically incapable of using existing bus service.

2. Assume that if DIAL-A-BAT limited program eligibility in accordance with the final rule's requirement, it could potentially eliminate 25 percent of current handicapped trips (see discussion of assumptions on page 6).

3. 41,046 H subscription trips X .25 = 10,262 ineligible trips.

4. 41,046 H subscription trips - (minus) 10,262 trips = 30,784 eligible H subscription trips.

5. 30,801 H DAR trips X .25 = 7,700 ineligible H DAR trips.

6. 30,801 H DAR trips - (minus) 7,700 trips = 23,101 eligible DAR trips.

7. 30,784 eligible H subscription trips + 23,101 eligible H DAR trips = 53,885 total eligible H trips.

8. 30,784 eligible H subscription trips ÷ 67,844 total E&H subscription trips = 45% eligible H subscription trips.

9. 23,101 eligible H DAR trips ÷ 50,910 total E&H DAR trips = 45% eligible H DAR trips.

Adjustments to Make DIAL-A-BAT Service Hours Comparable to Fixed-Route Service Hours

1. 87 fixed-route weekly service hours minus 55 DAB weekly service hours = 32 more special service hours needed.

2. Assume new Saturday service at one-half the weekday dial-a-ride service rate, and evening service at one-tenth the DAR rate because:

   a. Evening and weekend ridership rates are typically lower than weekday ridership. Weekday DAR service for handicapped patrons who would qualify for service under the rule averages 8 trips per hour. Therefore, assume 4 additional trips per hour would be needed on Saturday and 0.8 trips per additional evening hour.

   b. Currently, weekend dial-a-ride service is provided by appointment, and evening service is provided twice a week until 11:30 p.m. for social service agency clients. During the new weekend and evening hours, assume that only dial-a-ride service would be increased, since the agencies would probably not be open Saturdays and most evenings.

   c. Regular transit operates very late at night (from 8:40 p.m. until 1:45 a.m.); however, service is provided on only one commuter route to a rail terminal serving Boston. Assume this route could be made accessible, or DAB could provide Saturday and evening trips on this route on a reservation basis.

   d. Some existing riders will shift their trips to the new service hours, so not all trips during the new hours will be additional trips.

3. Four trips/hour X 14.5 Saturday service hours X 52 weeks = 3,016 new Saturday DAR trips per year.

4. 0.8 trip/hour X 17.5 additional weekly evening hours X 52 weeks = 728 additional DAR evening trips/year.

5. 3,016 new Saturday trips + 728 additional evening trips = 3,744 new DAR H trips. 3,744 new DAR H trips X $5.23 total average DAR cost/trip = $19,581 additional program cost to make days and hours comparable to those of the fixed-route system.

<u>Adjustment to Extend Eligibility for Dial-A-Ride Service to Eligible Handicapped Persons Residing in Fixed-Route Service Area in Stoughton and Avon, Massachusetts</u>

1. Stoughton: Add 9400 wheelchair trips for Stoughton residents X $7.00 cost/trip = $65,800 additional program cost.

2. Avon: Add 30 H trips/week X 52 weeks = 1,560 new H trips X $4.87 DAR average operating cost/trip = $7,925

3. $65,800 Stoughton cost + $7,925 Avon cost = $73,725 total additional cost to meet eligibility requirement.

Service Area Adjustment to Eliminate Out-of-Town Subscription Trips

1. Assume 30,000 total out-of-town subscription trips on DAB in FY 1983 based on DIAL-A-BAT agency estimate.

2. Assume .45 of 30,000 out-of-town trips were made by eligible handicapped persons = 13,500 H out-of-town trips.

3. Assume average cost per trip @ $2.50 based on agency estimate.

4. 13,500 eligible H out-of-town trips X $2.50 cost/trip = $33,750 operating cost supporting H out-of-town trips.

5. 13,500 eligible H out-of-town trips X $0.36 capital cost/trip = $4,860 capital cost of H out-of-town trips.

6. $33,750 + $4,860 = $38,610 program cost reduction if H out-of-town subscription trips eliminated.

Final Program Cost Adjustments

DAR Cost:

1. $248,139 total FY 1983 DAR operating cost X .45 eligible H DAR trips = $111,663 operating cost assumed to support 23,101 existing H DAR trips.

2. $111,663 operating cost of 23,101 eligible DAR H trips + $8,316 capital cost (23,101 X $0.36 cost per trip) + $19,581 total cost of new DAR H trips due to increased service hours = $139,560.

3. $139,560 + $73,725 increased cost of eligibility adjustment to include Stoughton/Avon H trips = $213,285 total cost for eligible H DAR trips.

Subscription Cost:

1. $265,153 total subscription operating cost X .50 = $132,576 operating cost assumed in support of total E and H agency subscription trips (excludes cost of .50 pre-school trips).

2. $132,576 X .45 eligible H subscription trips = $59,659 operating cost assumed in support of 30,784 eligible H subscription trips.

3. 30,784 H subscription trips X $0.36 capital cost/trip = $11,082 capital cost of eligible H agency subscription trips.

4. $59,659 adjusted H subscription operating cost + $11,082 adjusted capital cost = $70,741 adjusted program cost for eligible H subscription agency trips.

5. 30,784 H subscription trips - 13,500 out-of-town H subscription trips = 17,284 total eligible H subscription trips.

6. $70,741 adjusted H subscription program cost - $38,610 cost reduction for elimination of out-of-town H subscription trips = $32,131 adjusted total cost supporting eligible H subscription trips in FY 1983.

Adjusted Total Program Cost:

1. $213,285 DAR cost of eligible H trips + $32,131 subscription cost of eligible H agency trips = $245,416 adjusted total 1983 program cost in support of 55,271 total handicapped trips.

Adjusted Net Program Cost:

1. $172,999 total DAR net deficit X .45 eligible H DAR trips = $77,850 net deficit of existing DAR eligible H trips.

2. 3,926 new DAR H trips due to increased service hours + 10,960 Avon/Stoughton trips = 14,886 new trips X $3.40 DAR deficit/passenger = $50,612 additional deficit.

3. $77,850 net deficit of existing DAR H trips + $8,316 capital cost supporting existing DAR H trips + $50,612 net deficit of new DAR H trips + $5,359 capital cost of new DAR H trips = $142,137 adjusted DAR program net deficit of eligible H trips.

4. $34,829 total subscription net deficit X .50 = $17,415 net deficit for total E and H subscription trips (excludes 50 percent pre-school trips).

5. $17,415 total E and H subscription deficit X .25 eligible H subscription trips = $4,354 net deficit for eligible H subscription trips.

6. $4,354 net deficit for H subscription trips + $6,222 capital cost (17,284 H subscription trips x $0.36 cost/ trip) = $10,576 adjusted subscription service deficit for eligible H subscription trips.

7. $142,137 DAR program net deficit + $10,576 subscription program net deficit = $152,713 adjusted net deficit of total eligible H trips in FY 1983.

APPENDIX C

A COMPARISON OF NATIONAL AGGREGATE COST ESTIMATES FROM PRELIMINARY AND FINAL REGULATORY IMPACT ANALYSES

I. Background and Purpose

In conjunction with its deliberations on the implementation of Section 504 of the Rehabilitation Act of 1973, the Department of Transportation (DOT) has conducted two independent analyses to examine the potential costs of implementing various handicapped transportation services permitted under the proposed regulations. The first of these analyses was completed in May 1983 as the Preliminary Regulatory Impact Analysis (PRIA) accompanying the Notice of Proposed Rulemaking issued by DOT in September 1983. A second, more detailed study was initiated shortly thereafter to address the comments raised by transit agencies and advocates for the transportation handicapped, and to provide more disaggregate information on the incidence of the cost burden among various sized transit systems. Many of the findings of this second study are based on a mathematical model developed by a consultant to the Department, Mr. David Lewis, which estimates the demand for specialized paratransit services by handicapped individuals under various levels of service scenarios and in different sized urban areas.

The purpose of this document is to compare the national aggregate cost estimates derived under each of the two aforementioned impact analyses and to explain any observed differences in light of differences in the assumptions used. Moreover, where such differences do occur, this document will discuss the reasonableness of the assumptions in light of existing empirical evidence and our current state of knowledge concerning the travel behavior of transportation handicapped individuals.

II. A Comparison of the Cost Cap Estimates

As part of their impact analyses, both the Lewis and the PRIA studies computed the total costs, nationwide, to meet proposed transit service criteria. Costs were computed for both an accessible bus option and an alternative paratransit option. In addition, estimates were made for the maximum cost burden required under two alternative proposed cost caps. These costs are summarized in Table C-1.

Both analyses computed the present value of total costs over a 30-year period, using a 10 percent discount rate as recommended by OMB. Both analyses also used 1983 as the starting date for their present value computations. However, in computing its cost cap estimates, the PRIA study consistently converted all costs to constant 1981 dollars and then discounted them two years to 1983. The Lewis study was somewhat less rigorous in converting all costs to a common base year, but implicitly assumed that all costs were expressed in terms of 1983 dollars.

TABLE C-1

TOTAL NATIONWIDE COSTS TO PROVIDE ACCESSIBLE PUBLIC TRANSPORTATION
(Present Value of Costs Discounted at 10% over 30 Years)

	Costs in Millions of $	
	PRIA (1981)	LEWIS (1983)
OPTION 1: Lift-equipped Buses without fleet expansion	586.8	750
OPTION 2: Paratransit	715.6-16,600	1660
MAXIMUM BURDEN UNDER ALTERATIVE COST CAPS		
1. 7.1% of UMTA Assistance	2,082.5	2,724
2. 3.0% of Transit Operating Expenses	2,104.8	2,210

1. Differences Attributable to Changes in Base Years

The use of different base years in the cost cap calculations caused a systematic difference in the estimates which is equal to the relative decline in the value of the dollar from 1981 to 1983. This decline can be measured by any of several price or purchasing power indices, with each one producing slightly different results. For the purposes of this comparison, we have used the change in the purchasing power of the dollar for producers, as reported in the Summary of Current Business. Over the period 1981 to 1983, this index decreased from .367 to .335. Thus, the cost to produce one dollar's worth of goods and services in 1981 would cost $1.096 in 1983. Using this index to inflate the 1981 costs used in the PRIA study to constant 1983 dollars results in an overall increase in the PRIA base year costs of 9.6%.

The effect of this difference in base years can be seen most clearly in a comparison of the estimated Federal funding cost caps. In computing the Federal funding cost cap, Lewis used UMTA's total FY 1983 outlay for transit assistance -- $3,700 million. The PRIA used UMTA's FY 1981 outlay for transit assistance -- $3,416 million. Using the 9.6% inflation index described above, the value of UMTA's FY 1981 funding in 1983 dollars is $3,742 million, or approximately the same as that used in Lewis' analysis.

2. Data Sources Used for Cost Cap Computations

A comparison of the cost cap based on transit operating expenditures is somewhat more complicated because the two studies also used different data sources. The costs in Lewis' analysis are

based on transit operating expenses taken from UMTA's Section 15 Report for FY 1981-82; this value, which is used directly without correcting for inflation, is $7,122 million. The PRIA used transit operating costs for calendar year 1980 as reported in APTA'S Transit Fact Book, and inflated that to 1981 dollars for a value of $8,176.7 million. If both of the above values were inflated to 1983 constant dollars, Lewis' study would be using a base of $7,356 million while the PRIA would be using a base of $8,958 million. The corrected base costs, expressed in constant 1983 dollars, and the resulting present values derived from these bases are presented in Table C-2.

TABLE C-2

PROJECTED COSTS OF PROPOSED COST LIMITS
FOR A COMMON BASE YEAR (1983)

	Costs in Millions of $	
	PRIA	LEWIS
I. UMTA TRANSIT ASSISTANCE CAP		
1. UMTA FY 81 funding	3,416	
inflated to 1983 (9.6%)	3,742	
2. UMTA FY 83 funding (actual)		3,700
3. 7.1% if FY 83 funding	265.7	262.7
PRESENT VALUE OF COST CAP	2,755.2	2,724.1
II. TRANSIT OPERATING COST CAP		
1. APTA 1980 operating costs	7,487	
inflated to 1981 (9.2%)	8,176.7	
inflated to 1983 (9.6%)	8,956.8	
2. UMTA 1981/82 Section 15 operating costs		7,122
inflated to 1983 (3.3%)		7,355.9
3. 3.0% of FY 83 transit operating costs	268.7	220.7
PRESENT VALUE OF COST CAP	2,786.4	2,288.6

After correcting for the differences in base years used by the two studies, there appears to be little difference in the computed present value of the cost cap based on Federal transit assistance. What differences do exist can be attributed to rounding errors and to the difference in the actual growth of Federal transit expenditures in 1983 relative to inflation as reflected in the inflation index. Of the two values presented above, it appears that Lewis' value more accurately reflects 1983 Federal transit expenditures.

The relatively large difference in the estimated present values of the cost cap based on transit operating expenditures can be attributed principally to the different sources used by the two studies to obtain their operating cost data. The PRIA used data that was developed by APTA and which is currently about 5 years old. The Lewis study, on the other hand, used data from the latest available Section 15 Report published in November 1983. In the event that DOT adopts cost caps in their 504 regulations, it is very likely that Section 15 data will be used by UMTA to determine a transit agency's operating expenditures. Therefore, in terms of overall reasonableness, it appears that the Lewis study again more accurately reflects the cost impacts of a cost limit based on transit operating expenditures.

III. Cost Estimates for Accessible Bus Option

Both the Lewis and the PRIA studies used a similar approach to estimate the total nationwide costs of equipping transit buses with wheelchair lifts and other accessibility features. The resulting cost differences shown in Table C-1 must therefore be attributed to differences in the assumptions used by the studies. These assumptions are discussed below.

1. Capital Cost Assumptions

In order to calculate the total capital costs for an accessible bus option, the following data are needed:

- incremental unit costs for accessibility features
- number of buses in nationwide transit fleet
- percent of nationwide transit fleet to be made accessible
- number of years over which new accessible buses would be introduced
- expected useful life of accessible buses

Each study computed the costs to make 100 percent of the U.S. transit bus fleet accessible by assuming that all new buses purchased after 1983 would be required to have wheelchair lifts and related accessibility features. Both studies used UMTA and transit industry standards of a 12-year life span for a transit bus, and assumed that 1/12th of the current nationwide fleet would be retired and replaced with accessible buses every year. Under this scenario, full nationwide bus accessibility would be achieved in 12 years.

Both studies assumed the incremental cost for accessibility features on a new bus purchase to be $10,000. Neither study assumed that retrofitting of non-accessible buses would be required under the final regulations.

TABLE C-3

ACCESSIBLE BUS COST ESTIMATES
(Present Value of Costs Discounted at 10% over 30 Years)

	PRIA	LEWIS
INPUT ASSUMPTIONS		
1. Unit Cost of Accessibility Features	$10,000	$10,000
2. # Buses in Nationwide Fleet	52,000	56,000
3. Expected Life Span of Accessible Bus	12 years	12 years
4. # New Buses Purchased Per Year	4,333	4,667
5. # Years to Achieve Full Accessibility	12	12
6. Incremental Unit O&M Costs	$1000/$380	800
COST CALCULATIONS (in millions of dollars)		
1. Capital Costs (over 30 years)	449.3	483.9
2. Operating and Maintenance Costs:		
a. years 1 - 3	23.0	19.8
b. years 4 - 12	57.8	131.0
c. years 13 - 30	56.8	128.8
Total O&M Costs (over 30 years)	137.6	279.6
TOTAL 30-YEAR COSTS FOR 100% BUS ACCESSIBILITY	586.9	763.5

The PRIA study used a nationwide transit fleet estimate of 52,000 buses. The fleet estimate used in the Lewis study was never explicitly stated; however, since this study used other data from UMTA's FY 1981-82 Section 15 Report, it is likely that it also used that report's nationwide fleet estimate of 56,000 buses. Thus, the only apparent difference between the capital cost estimates is attributable to the different transit fleet size estimates used by the two studies, with the Lewis study using a more recent (and higher) estimate than the PRIA study.

2. Operating and Maintenance Cost Assumptions

To compute the incremental operating and maintenance (O&M) costs associated with making the U.S. bus fleet accessible, the following additional data are required:

- o incremental unit O&M costs for an accessible bus
- o the number of new accessible buses added to the nationwide fleet in each year

The Lewis study estimated incremental O&M costs to be $800 per bus per year -- $650 for additional maintenance and $150 for marketing, promotion, and insurance. These estimates were taken from an NCHRP Report, entitled Planning Transportation Services for Handicapped Persons -- User's Guide, September 1983. The PRIA study apparently based its O&M cost estimates on those presented by DOT in its 1979 Notice of Proposed Rulemaking (NPRM). The NPRM estimated that O&M costs for accessibility features would average $1000 per bus for the first three years after implementation of 504 regulations, and $380 per bus thereafter -- the decrease in costs reflecting increased maintenance experience and parts availability as transit fleets become more accessible.

The O&M unit costs were apparently multiplied by a nationwide accessible bus fleet that increased by 4,333 buses per year up to a maximum of 52,000 buses in the PRIA study and by 4,667 buses up to a maximum of 56,000 buses in the Lewis study. Both studies assumed that full nationwide accessibility would be achieved in 12 years.

Table C-3 summarizes the capital and O&M cost assumptions and calculations used in the two studies. The capital cost presented in Appendix C of the PRIA study is $23.8 million higher than the calculations presented in the Table, while the O&M cost is $23.9 million lower. The reason for these differences in the subtotals is unknown. The total costs presented in the Lewis study are $13.5 million lower than those presented in the table. This difference may be due to Lewis' use of a slightly lower nationwide fleet estimate.

3. Cost Estimates for 50% Fleet Accessibility

Aside from the different fleet size estimates, the other major difference between the two studies concerns how accessible bus O&M costs were assumed to change over time. While it does seem likely that unit maintenance costs should decline as a greater proportion of the bus fleet becomes accessible, it is not obvious that overall O&M costs will drop by 62 percent in only 3 years. A more conservative estimate of a 50 percent decrease in costs (from $1000 to $500) after full systemwide accessibility is achieved in 12 years would yield a total O&M cost estimate of $269 million, and result in a total nationwide cost of $752.9 million -- only $2.9 million higher than that obtained in the Lewis study. On the basis of these reasonableness checks, it appears that the accessible bus cost estimates presented in the Lewis study are more representative of the minimum costs likely to be incurred nationwide if 100 percent bus accessibility were mandated under Section 504.

Under the current version of proposed Section 504 regulations, a transit agency would be required to make only 50 percent of its bus fleet accessible to the transportation handicapped in order to be in compliance. If the final regulations do, in fact, require only 50 percent of the transit bus fleet to be made accessible, then the preceding calculations clearly overestimate the total nationwide costs of this mandate.

Only the Lewis study calculated alternative cost estimates under the assumption of a 50 percent accessible transit fleet. Moreover, Lewis computed these costs for two separate implementation scenarios -- one in which accessibility is phased in over 6 years, and one in which it is phased in over 12 years. The input assumptions and cost calculations for these two scenarios are summarized in Table 4.

Under the 12-year phase-in scenario, computations are identical to those summarized in Table C-3 except that the number of new accessible buses purchased and put into revenue service each year is 2,333 instead of 4,667. Under a 6-year phase-in scenario, it is assumed that all new buses purchased by a transit agency would have to be equipped with accessibility features until 50 percent of the transit system became accessible. This is roughly equivalent to loading all capital costs into the first 6 years with no additional capital costs for accessibility in years 6 through 12. Operations and maintenance costs would build up to a peak in year 6 and remain constant thereafter.

The cost estimates presented in Table C-4 do not readily agree with the estimates in Lewis' study. Lewis estimates range from 33 to 45 percent higher, with the largest differences appearing in comparisons of the costs under a 12-year phase-in scenario. The major reason for these differences appears to be due to the fact that Lewis' estimates assume that transit authorities would have to purchase 20 percent spares for their lift-bus fleet in order to maintain 50 percent on-street accessible service. Taking the

spare ratio into account, it does not appear that Lewis costs are unrealistically high.

The cost estimates clearly show that the proposed relaxation of bus fleet accessibility requirements will clearly reduce the overall costs for the accessible bus alternative by 38 to 51 percent, depending upon how the buses are phased in. However, even under the requirement of 100 percent bus accessibility, the total nationwide costs for the accessible bus alternative still fall below both proposed cost caps.

TABLE C-4

ACCESSIBLE BUS COST ESTIMATES - 50% ACCESSIBLE FLEET
(Present Value of Costs Discounted at 10% over 30 Years)

	12-Year Phase-in	6-Year Phase-in
INPUT ASSUMPTIONS		
1. Unit Cost of Accessibility Features	$10,000	$10,000
2. # Accessible Buses Needed	28,000	28,000
3. Expected Life Span of Accessible Bus	12 years	12 years
4. # Accessible Buses Purchased:		
Yr. 1 - 6	2,333	4,667
Yr. 7 - 12	2,333	0
Yr. 13 - 30	2,333	2,333
COST CALCULATIONS (in millions of dollars)		
1. Capital Costs for Accessible Buses:		
Yr. 1 - 6	111.8	223.6
Yr. 7 - 12	63.1	0.0
Yr. 13 - 30	67.1	67.1
Total Capital Costs for Accessible Buses	242.0	290.7
2. O&M Costs for Accessible Buses:		
Yr. 1 - 6	28.8	57.7
Yr. 7 - 12	46.6	60.6
Yr. 13 - 30	64.4	64.4
Total O&M Costs for Accessible Buses	139.8	473.4
TOTAL 30-YEAR COSTS FOR ACCESSIBLE BUSES (without fleet expansion)	381.8	473.4

IV. Cost Estimates for Paratransit Alternatives

The PRIA and Lewis studies used very different approaches to estimate the total nationwide costs of providing paratransit services in lieu of accessible buses to satisfy Section 504 requirements. Consequently, a detailed comparison of the two cost estimates, as was done in the previous section for accessible bus costs, is not feasible. Instead, this section examines the basic input assumptions regarding paratransit service costs and demand, and discusses their reasonableness in light of current knowledge and available empirical evidence.

1. Paratransit Unit Costs

The PRIA study based its unit paratransit costs on data from a selection of cities which had specialized paratransit services operating in 1981. These costs ranged from $3.50 to $17.00 per trip, but no details were provided in the report about the nature of the services (e.g., type of service, clients served, etc.) or their likely impacts on cost. It appears that for the purpose of total cost computations, the PRIA simply used an average cost of $10.90 per trip.

Lewis also used an average unit cost for paratransit services. His cost ($23.00 per vehicle-hour) was derived from a dataset of 53 specialized paratransit systems which he had used to calibrate his models of paratransit demand and productivity. At typical paratransit productivity levels of 2 or 3 passengers per vehicle-hour, Lewis' unit costs fall into the range of $7.67 to $11.50 per passenger trip, only slightly lower than that used in the PRIA study.

On the basis of unit costs for paratransit services, there appears to be little difference between the two studies. Moreover, since both studies based their estimates on the reported costs of operational paratransit services, there is little basis for disputing the reasonableness of these unit costs. A somewhat more recent investigation of paratransit service costs based on the UMTA Section 15 Report for FY 1981-82 (memorandum from Bruce Spear to Nancy Ebersole, June 6, 1984) suggests that average paratransit operating costs nationwide are approximately $21.50 per vehicle-hour. This cost is only slightly lower than the $23.00 estimate used by Lewis.

2. Paratransit Demand

Unlike accessible bus, the cost of providing demand-responsive paratransit service is extremely sensitive to demand. It is in the estimation of this demand where the PRIA and the Lewis studies differ radically.

Although not explicitly discussed in his report, it seems likely that Lewis computed an estimate of total nationwide demand for specialized paratransit services by aggregating the demand estimates derived from his model across all U.S. cities. The

nationwide paratransit demand, as projected by Lewis, was 10.1 million trips per year.

The PRIA study based its estimate on the potential demand reported by respondents to DOT's "National Survey of Transportation Handicapped People." Three different demand levels were estimated based on different assumptions about who among the transportation handicapped population would be eligible for and would use paratransit service. The lowest demand estimate, 7.66 million trips per year, was computed by assuming that service would be limited only to those "severely disabled" individuals who could not physically board a non-accessible bus. An intermediate demand estimate, 56.6 million trips per year, was computed by including the travel of those who said that they would make additional trips if buses were made accessible. The highest demand estimate, 177.6 million trips per year, was computed by including the travel of individuals who said that they would make additional trips if accessible door-to-door paratransit service were provided. Although not explicitly stated in the PRIA report, it is likely that these last two demand estimates are based on the barrier-sensitive trip rates for additional trips reported by all transportation handicapped people.

It can be argued that the demand estimates in the PRIA study are unrealistically high because they are based on responses to a hypothetical and somewhat ambiguous question. Past research on the accuracy of this type of question has consistently shown it to overestimate actual demand behavior by 100 percent or more. Furthermore, the question was posed to a group of individuals who would be the principal beneficiaries of such a service. Therefore, it is very likely that many of the respondents may have consciously exaggerated their potential ridership in order to influence policy decisions based on the survey findings.

It is also unrealistic to expect that a transit agency would implement a paratransit system that has higher levels of service than the existing fixed-route bus system without somehow limiting demand to those unable to use the bus. Most likely, paratransit services implemented under the rule would restrict eligibility to the subgroup identified in the National Survey as "severely handicapped." It is estimated that this group includes about 1.4 million individuals nationwide, in contrast to the 7.4 million individuals identified as "transportation handicapped."

Using this smaller population estimate in the demand projections of the PRIA study yields annual nationwide paratransit trips of 7.66 million, 10.7 million, and 33.6 million. These demand levels result in total nationwide costs over 30 years in the range of $715.6 million to $3797.8 million. Lewis' estimate of $1660.0 million lies within this range, but is closer to the lower end of the costs. It should also be noted that Lewis' estimate explicitly assumes that paratransit services would be restricted to "severely disabled" persons (i.e., unable to use a conventional bus).

reasonableness an accuracy of the estimates in light of existing empirical evidence and knowledge about the travel behavior of transportation handicapped people.

It is concluded, based on the preceding analysis, that in general, the Lewis study presents a more reasonable and accurate forecast of the likely nationwide cost burden resulting from the implementation of alternative transportation services permitted under the regulation.

Based on the above findings, it may further be concluded that, at least on a nationwide level, adequate levels of transportation service could be provided for transportation handicapped people at costs which do not seem to exceed "reasonable" limits on local cost burden.

EXHIBIT SIX

COSTS AND BENEFITS OF HOUSING NONDISCRIMINATION

FROM

THE APPENDIX OF

TOWARD INDEPENDENCE

NATIONAL COUNCIL ON THE HANDICAPPED

IV. COSTS AND BENEFITS

As the previous sections have indicated, two major efforts of the Federal Government to promote the availability of appropriate housing opportunities for people with disabilities are equal housing opportunity laws and housing construction and rent subsidy programs. Such initiatives may be justified on the basis of purely humanitarian concerns that disabled persons be afforded minimally adequate shelter and an equitable chance to pursue housing opportunities. In addition to such considerations of equity and basic human rights, the Council has also examined the costs and potential benefits of such efforts to secure opportunities for appropriate housing for people with disabilities. Although available data are not precise, current reliable estimates strongly suggest that efforts to promote appropriate housing for individuals with disabilities make economic as well as humanitarian sense.

Equal housing opportunity laws impose a duty upon landlords and developers covered by these laws not to discriminate against persons with disabilities. To the extent that this simply requires the cessation of discriminatory admission standards, rules, practices, or attitudes, it does not cost anyone any money, and would clearly be economically beneficial insofar as it enhances the independence and self-sufficiency of persons with disabilities.

In the Council's view, equal housing opportunity laws should also require the architectural accessibility of all housing constructed in the future that is subject to these laws. This

latter requirement will involve some costs, but, according to studies, relatively small ones. A 1979 report published by the U.S. Department of Housing and Urban Development, The Estimated Cost of Accessible Buildings, provides the most authoritative study of accessibility costs. It contains cost estimates for achieving accessibility in various types of buildings, including high rise towers, garden apartments, and single family dwellings. Figures are provided on the costs of making structures either adaptable or adapted for housing persons with disabilities. Adaptable housing, for purposes of the study, means that it satisfies housing adaptability standards of the American National Standards Institute (ANSI), which require that a dwelling unit be basically accessible and easy to convert to full accessibility through such means as removing two base cabinets under counters in the kitchen and installing grab bars in the bathroom for people who need these features (particularly wheelchair users). Costs of adapted housing includes the additional cost for adapting a residential unit by removing the cabinet fronts, installing grab bars, etc. (HUD, 1979, #2, p.5). The study found the costs of incorporating accessibility in the design and construction of residential structures to be as follows:

Type of Building	Adaptable	Adapted
High Rise Tower	0.98 percent	1.6 percent
Garden Apartments (to make all ground floor units accessible)	0.59 percent	.93 percent
Single Family House	2 percent	3 percent

(HUD, 1979, #2, pp. 34, 57, 66)

The relatively small costs of accessibility in new construction have been confirmed in other studies. In a 1982 publication, the Architectural and Transportation Barriers Compliance discussed several such studies, and quoted findings of one-half of one percent and one-tenth of one percent as the cost of accessibility features in new buildings (About Barriers, p. 5). A 1975 Report to Congress prepared by the General Accounting Office concluded that "the additional cost for accessibility features included in the original construction program may only be one-tenth of 1 percent of total construction cost" (GAO, 1975).

Given the small proportion of these costs compared to overall project costs, it is not an egregious burden to expect that accessibility should be built into all construction funded by HUD or subject to Fair Housing Laws. And from a governmental and societal perspective, such costs are offset by benefits that accrue from reducing dependency costs and increasing opportunities for productivity and independence for individuals with disabilities. Another HUD study published in 1979, A Cost-Benefit Analysis of Accessibility, presented a cost-benefit analysis of the removal of architectural barriers from residential and nonresidential buildings. The study found that "The net benefits attributable to the removal of architectural barriers are, in most cases, very large" (HUD. 1979, #1, p. 67).

Likewise, it appears that Federal programs providing subsidies for the construction (i.e., Section 202) or rental (i.e., Section 8 and the Voucher program) of housing for persons with disabilities are economically beneficial to the nation, when

one considers that the alternative to securing adequate housing options for persons with disabilities is the costly institutionalization of such persons and the continuation of federally underwritten dependency costs. The Digest of Data on Persons with Disabilities, published by the Congressional Research Service in 1984, estimates that 1.3 million Americans reside in nursing homes, 232,340 in inpatient mental health facilities, and 152,000 in public residential facilities for mentally retarded persons (CRS, 1984, pp. 10, 14, 16). The results of a Survey of Institutionalized Persons conducted by the Bureau of the Census in 1976 found that 1,550,120 persons were in long term residential care facilities, including: facilities for mentally retarded persons (189,210); facilities for physically handicapped persons (37,780); children's facilities (43,790); psychiatric institutions (65,400); nursing homes (1,182,670); and other facilities (31,270) (U.S. Bureau of the Census, 1976, p. 108).

There are no precise statistics indicating what proportion of this institutionalized population could reside in the community if appropriate housing were available. Information obtained at consumer forums conducted by the Council suggests that the number of such situations is sizeable. Anecdotal examples include:

o The young man with a spinal cord injury and resulting quadriplegia who continues to reside in a hospital many months after his medical release would have been warranted solely because he cannot find any accessible housing in his local

community.

o The mentally retarded young woman who is kept in a State institution year after year, even though she has been evaluated as capable of living in the community, because no community group home residence is available.

o The former mental patient whose attempts to reestablish an independent life are frustrated by the refusal of landlords in her local community to rent her an apartment.

o The deaf man whose ability to earn a living and live independently depend upon his taking a promising job offer, but who cannot find any affordable housing within a reasonable proximity of the job (and several owners of suitable units have refused to rent to him).

o The low-income couple, each with cerebral palsy, who have been unable to secure housing in public housing projects and are forced to stay in a federally funded State institution.

For those individuals who could live in the community if they are able to obtain appropriate housing, the potential savings of Federal dollars are dramatic. Depending upon geographical location, it costs between $30,000 and $110,000 per year for each individual who is elderly and/or disabled to be housed in federally-funded facilities. This should be compared with the average expenditure of $7,121 per year for a Section 8 certificate in a Section 202 project. And the current $50,000 per unit allocation for Section 202 construction is comparatively quite small considering that it may provide a housing unit suitable for persons with disabilities for thirty or forty years or more. When compared with the alternatives of long-term

institutionalization and Federal dependency entitlements, the expenditures necessary to secure appropriate housing opportunities for persons with disabilities can be seen to be money well spent. And this is without even considering the difficult-to-estimate returns that result whenever an individual with a disability is permitted to live in the community and becomes an economic contributor by earning money, paying taxes, and purchasing goods and services.

EXHIBIT SEVEN

LETTER OF NATIONAL ASSOCIATION OF HOME BUILDERS

REGARDING

ACCESSIBILITY REQUIREMENTS OF

THE FAIR HOUSING AMENDMENTS ACT BILL

National Association of Home Builders

15th and M Streets, N.W., Washington, D.C. 20005
Telex 89-2600 (202) 822-0500 (800) 368-5242

June 22, 1988

Dale Stuard
1988 President

The Honorable Don Edwards, Chairman
Subcommittee on Civil and Constitutional Rights
Committee on the Judiciary
U.S. House of Representatives
Washington, D.C. 20515

Dear Chairman Edwards:

On behalf of the 155,000 member firms of the National Association of Home Builders -- representing builders, owners and managers of multifamily and single family housing -- we offer the following comments with respect to an amendment expected to be offered by Rep. McCollum (R-FL) to delete the Committee language from H.R. 1158 with respect to future multifamily housing construction requirements and establish a set-aside with increased requirements.

The proposed amendment would delete the legislative language agreed upon after several months of negotiation between disability and civil rights organizations, architects, builders, and managers to achieve a reasonable balance between meeting the intent of the bill, to assure equal opportunity in housing for handicapped individuals, while minimizing both construction costs and potential issues of marketability. The bill as reported by the Committee clearly achieves this goal.

Current laws which establish a set aside of adaptable and accessible housing units result in a serious problem from all perspectives. Many handicapped individuals neither want nor need grab bars, adjustable or removable cabinetry nor other adaptive features. The result from a marketing perspective is clear: units with these features sit vacant with neither the handicapped nor the non-handicapped willing to live in them. In California, as well as other parts of the country, we have owners and managers with projects with waiting lists to occupy the non-handicapped units, while the set aside units sit vacant. Set asides are far more costly than the initial additional construction cost when the unit once built, remains vacant and generates no revenue.

The McCollum amendment which establishes a set aside with greater requirements than the Committee reported bill would result in a higher and more costly standard, thereby destroying the delicate balance between cost, accessibility, and aesthetics achieved by H.R. 1158 as reported by the Committee.

For this reason, we must oppose the McCollum amendment which undermines the uniformity that the Fair Housing Amendments Act achieves.

HOUSING
THE AMERICAN PROMISE

Sincerely,

Dale Stuard
President