

# EFFECT OF FARE REDUCTION ON TRANSIT RIDERSHIP IN THE ATLANTA REGION: SUMMARY OF TRANSIT PASSENGER DATA

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This paper presents in summary form the findings from an intensive on-board survey conducted by the Metropolitan Atlanta Rapid Transit Authority during November 1972. On March 1, 1972, transit fares in Atlanta were reduced from 40 cents to 15 cents, with free transfers. Patronage immediately increased significantly and continued to increase as the Authority initiated implementation of service improvements as part of its short-range transit improvements program. The research was designed to answer specific questions generated after the ridership increase was observed, including the magnitude of the increase and the distribution of increase between new transit riders and additional tripmaking by previous riders, the magnitude of diversion from automobile users, and characteristics of new and old riders. This is one of a series of reports from the overall research effort, which includes the on-board study to determine rider characteristics as well as an in-home study to determine attitudes of nonriders and the reasons they do not use transit.

•ON February 17, 1972, the Metropolitan Atlanta Rapid Transit Authority took the first step in implementation of its short-range transit improvement program, which had been approved by referendum in Fulton and DeKalb Counties, Georgia. This first step was the acquisition of the privately owned Atlanta Transit System, Inc., which had been for many years the only significant supplier of public transportation services in the Atlanta Metropolitan Area. On March 1, 1972, the Authority took the second step in the short-range transit improvement program by lowering the fares on its recently acquired operating division from the previous 40-cent base fare with 5-cent transfer charge to a 15-cent flat fare with free transfers.

The reduction in fare was a part of the development of the Authority's overall financial planning. The primary income source for implementation of the \$1.8 billion transit development program is a 1 percent sales and use tax levied in the two-county implementation district. To overcome the inequity of a sales tax, which is highly regressive, a policy of maintaining low fare levels was established, with both sales tax and fare revenues applied to meet development and operating costs.

Implementation of reduced fares had immediate and unanticipated effects. During the first week of reduced fare operation, ridership increased approximately 18.5 percent (based on fares and transfers received), compared to previous estimates for continued Atlanta Transit System operation at the prevailing fare. Ridership continued at an increased rate, and as a result the Authority was forced on an emergency basis to acquire used vehicles from other transit operations to be reconditioned and put into service to relieve overloads.

In subsequent weeks the Authority made other service changes with additional vehicles acquired on an emergency basis. Over the ensuing months ridership continued to grow,

and changes in service were provided within the limits of vehicle availability. Through November 1972, 117 separate changes were made that increased the annualized vehicle-miles of operation from approximately 19 million at the date of acquisition to approximately 22 million annual vehicle-miles of service. The service changes made were primarily in the area of improved headways and expanded service periods. There were 85 such changes; in addition, 13 lines were extended, 14 lines were revised, and 5 new lines were installed.

Some increase in transit patronage had been forecast to result from the fare reduction. This forecast was based on the traditional and time-proved marginal elasticity of fares in Atlanta, which indicated that, for increases or small decreases in fare, total volume would decline or rise approximately 0.25 percent for every 1.0 percent change in fare. Original estimates for ridership increase were on the order of 12 percent; this was significantly exceeded during the first week of reduced fare experience.

As the results of the Authority's experience with increasing ridership became known, many questions were asked by persons outside the Authority, as well as within the organization, as to the reason for this dramatic and unexpected growth in transit ridership. These can be reduced to five basic types of inquiry:

1. What is the increase in ridership? How much of the increase is due to reduced fare and how much is due to service changes?
2. How much automobile traffic has been diverted to transit? What mode of travel did new riders use before they changed to transit?
3. What are the characteristics of transit ridership now as compared to before MARTA? What are the differences between the old and the new riders?
4. How does the quality of service compare now with the quality before MARTA? What do transit riders think of the quality of service? What types of improvements do the riders want? Is there a difference between the types of service improvement that are desirable to new riders and those desired by old riders?
5. Did the fare need to be reduced as much as it was in order to achieve significant increases in transit ridership?

To answer these questions both for its own information and because of the strong national interest in the results of its program, the Authority, in cooperation with the Urban Mass Transportation Administration and as part of the Atlanta Regional Transportation Planning Program, undertook this research effort.

## STUDY DESIGN

Beginning in April 1972 the Authority, with assistance from professional consultants, designed a two-part research effort to seek answers to these questions. The study consists of a survey of transit riders to determine their actual characteristics and patterns and an in-home interview survey to determine transit attitudes of those who did not ride. This report deals with the survey of transit riders.

Traditionally, surveys of transit riders are made through a "hand-out, mail-back" technique where interview cards are distributed to transit riders on a given day or series of days. The riders are asked to complete the cards and return them to a collection point on the vehicle or to mail them to a central collection point. This type of survey was conducted by the Authority in October 1970 as a part of its planning program to develop the short-range transit improvements program. However, for the purposes of this current research effort, it was felt that detailed and in-depth interviews would be necessary to determine characteristics of the riders and the reasons for their change to transit, if indeed they had changed their mode of travel. In-depth information is difficult to obtain through the hand-out, mail-back survey because the respondent must complete the information on a voluntary basis with little explanation and assistance. It was therefore determined that the research effort would best be accomplished through intensive interviews conducted in person with a small number of transit riders. With the assistance of consultants Alan M. Voorhees and Associates and Behavior Science Corporation, it was determined that a sample of approximately 3,500 transit riders would provide sufficient statistical reliability and that such a sampling process could be accomplished with reasonable expenditures of effort and funds.

It was decided that, to achieve a representative sample, it should be stratified into six time periods. Four of these time periods are within the normal weekday: the morning peak between 6 and 9 a.m., the midday or base period between 9 a.m. and 3 p.m., the afternoon peak period between 3 and 6 p.m., and the evening or balance of day from 6 p.m. until the termination of service and its resumption in the early morning hours prior to 6 a.m. Since transit ridership is small on the weekend in relation to the weekday, Saturday and Sunday in their entirety were each selected as a sampling period.

The survey was further stratified into market segments. All transit routes were classified into four major categories: those serving predominantly low- and middle-income residential areas, those serving predominantly middle- and high-income residential areas, those that could not be placed in either of those two groups, and those providing special types of services. Because several changes in service had been made during the preparation of the study, it was decided to further stratify each of these four classifications into two subclasses: those routes on which service had been changed and those on which it had not. After consideration of the estimated ridership volumes within each of the eight classifications, it was determined that the volumes in several were not sufficient for statistical reliability and the classifications were then recombined into four final classified groups:

1. Route type one—routes serving primarily low- to middle-income residential areas on which no service improvements had been made; domestic routes are also included;
2. Route type two—routes serving primarily low- to middle-income residential areas on which service improvements had been made, or the routes initiated;
3. Route type three—routes serving middle- to high-income residential areas; and
4. Route type four—all routes that had received the fare reduction not included in any category above; also includes mixed-income areas and/or business area service.

The number of special service routes (Shoppers Special, Town Flyer, Stadium Shuttle, school bus, and other similar services), their volumes, and the specific characteristics of these routes were such that they were excluded from the survey. Based on the percentage of total ridership estimated within each of these route classifications and time periods, the total number of interviews required (3,500) was divided proportionally into "survey cells".

Since a primary concern was determination of the number of new riders (i.e., those who did not ride transit regularly prior to March 1, 1972, the date of the reduced fare) and old riders (i.e., those who did utilize transit regularly prior to March 1, 1972) and, since the characteristics of the old and new riders were a basis of comparison, a separate questionnaire was developed for each of these "transit markets". Many identical questions were asked both new and old riders, but in some cases separate or specific questions relating to that market were asked.

In structuring the interview procedure it was decided that, if a respondent had changed his place of residence between the time of the fare reduction and the interview, then his or her response would be biased by the change in location and would not be in response to either the fare change or service changes that had taken place. Therefore, no interviews were conducted with persons whose residence had changed after March 1, 1972. The assumption was implicitly made that, had these persons been able to respond purely to changes in the transit system, then they would have responded in the same proportions as those who had not made a change in residence location.

The first question asked of a respondent was the locational question, "Did you live at the same address you are living now before March 1 of this year?" If the respondent replied negatively, the interview was terminated and the interviewer moved to the next respondent. The second question was, "Did you ride the bus regularly before March 1 when the fare was 40 cents?" Based on this response the interviewer then proceeded with one or two sets of questions.

Questions asked or observations made of both old and new respondents included the race and sex of respondent; the means by which they reached the vehicle; the number of transfers required if transfers were required; the means by which they would leave the vehicle to complete the trip and the number of transfers which would be required, if any; the origin and destination of the trip; determination if either origin or destination were

at home; the purpose of trip; the number of automobiles owned by the family; whether the respondent was an automobile driver; if an automobile was available for the trip; the number of weekly transit trips made; the reasons for these trips; the perceived quality of service; the types of improvements desired; the age of the respondent; and the respondent's household income.

Questions asked only of "old" riders included whether the respondent made more trips now than previously, and the perceived change in service quality since the initiation of MARTA operation.

Questions asked only of new riders included the mode previously used for making the same trip or if the trip were not made previously; if the respondent would continue to use transit at a 25-cent fare, and if continuing to use at 25 cents would respondent still continue at a 40-cent fare.

An interview required 5 to 7 minutes to complete.

Before initiating the survey, which was conducted November 11 to 21, 1972, notice was given to transit riders through the newsletter "Two Bells", distributed on the buses, and through news releases to the media. On the first day of operation news media publicized the survey and in some cases television film interviews were made and telecast.

Approximately a 1 percent sample was taken, or one interview for every 100 riders. Interviews were clustered on selected routes throughout the specified time periods. The number of surveys required in each time period on each route type was compared with volumes on the higher volume routes within a classification or route type. Samples required within each route type and time period stratification were compared, along with the time required to conduct an interview and the run time of each route, and for each route and time period a sampling factor was determined. Sufficient routes were scheduled for interviews to result in a sufficient number of interviews to meet the original study design. A safety factor of additional interviews was also included to compensate for expected "bad" or incomplete interviews or interviews unusable for some other reason. The sample factor for each route varied within the area from one to ten. For example, with a sampling factor of seven, the interviewer interviewed each seventh person on the vehicle during his assignment period. After completing the survey the data were coded for machine processing. After editing the data some interviews were rejected, resulting in a total of 3,738 usable interviews. An expansion factor was then determined for each route and time period so that the interview data could be expanded to represent the entire transit ridership.

From the sampling techniques used, it is felt that the information derived from the survey is reliable and that the percentage distributions found are within 2 to 4 percent of true values, with confidence levels of at least 90 to 95 percent. These indications of statistical reliability are based on a standard assumption that the sample itself is a random sample. There is naturally no assurance that randomness is present. However, the purpose of stratification in the sampling procedure and computation of expansion factors by survey route and time periods, rather than using average or overall expansion factors, was to provide reasonable assurance that survey results were achieved within the designed reliability and confidence.

## SUMMARY FINDINGS

As a result of analysis of the survey, those questions relating to transit ridership characteristics can now be answered.

### Characteristics of Ridership Increase

The first questions needing answers were What is the increase in ridership? How much of the increase is due to reduced fare and how much is due to service changes? How much of the increase is due to new riders, and how much is due to more trips made by old riders?

Overall transit ridership increased 30.2 percent, with 91 percent of the increase due to new rider trips. On weekdays, the increase was 28.0 percent, due entirely to new rider trips. On Saturday transit ridership increased 41.0 percent, with over half of the increase (52.2 percent) due to new rider trips. The largest increase in ridership oc-

curred on Sunday, where it is indicated to be 78.8 percent, with almost two-thirds (63.5 percent) of the increase due to increased tripmaking by old riders. The volumes of ridership developed from the survey within each of these classifications are given in Table 1.

When asked if the reason for their change to transit was fare, service, or other, half or more of all new riders responded fare (56.2 percent of weekday new riders, 49.3 percent of Saturday new riders, and 53.1 percent of Sunday new riders). A negligible number of new riders stated that service changes were the primary reason for their change to transit, with the percentage so responding on weekdays, Saturday, and Sunday below the indicated reliability of the survey. Remaining new riders selected "other" as the reason for their change to transit. Volumes obtained for each response for weekday new riders are given in Table 2. Volumes for all riders on weekend days are given in Table 3.

In structuring the survey questionnaire, it was implicitly assumed that either fare or service would be the reason for change of mode. The large proportion of responses selecting neither of these two reasons strongly indicates that there is not a simple dichotomy but that there is severe overlapping of fare and service considerations in the decision to change one's mode to transit. The relative weights of these two factors in the complex mode choice decision, however, are not available from this research.

Although there is no basic reason for rejecting the results of this survey regarding reason for change to transit, the initial inference that might be drawn is contrary to previous research and in part also to intuitive reasoning. The magnitude of the response in the "other" category clearly indicates that no definitive conclusion can be drawn from this study. There is clear indication of the importance of fare, but the importance of service improvements cannot be minimized strictly from the apparently low proportion shown in the survey. It is probable that service considerations are present in the decision categorized as "other" in the responses, and it is also likely that the proportion attributed to fare may be somewhat overstated due to publicity factors. However, even with these constraints, it is clear that reduction in fare is one method by which transit ridership may be increased. Service changes are individually of small impact, whereas fare reduction is newsworthy and has a large impact on public awareness of transit.

It cannot be concluded that service improvements are of small significance in increasing transit ridership. It can be concluded, however, that in Atlanta, as a result of increased public awareness of reduced fares, and only limited implementation of major service improvements at the time of the survey, fare was the primary single reason for increased ridership.

### Diversion

The second question was How much automobile traffic has been diverted to transit?

On the weekday 41.8 percent of new riders, some 21,642, previously made the trip now made on transit by driving an automobile. An additional 21.9 percent of weekday new riders, some 11,324, previously made the trip now made on transit by riding in an automobile driven by someone else. In total, almost two-thirds (63.7 percent or 32,966) of the new riders each weekday made the trip now made by transit in an automobile either as a driver or as a passenger. A total of 21,642 automobiles have been removed from the streets, either entirely or at least for the primary portion of the trip during the weekday. The breakdown by time period within the day is given in Table 4.

From Table 4 it can be seen that the largest volume of automobiles diverted occurs during the afternoon peak period from 3 to 6 p.m. If it is assumed that 50 percent of this volume, or 3,753, occurs during the highest volume 1-hour period, then to achieve stable flow conditions for this number of vehicles on a single highway facility would require a 4- to 6-lane freeway, according to the requirements published in the Highway Capacity Manual.

An additional point of interest is that 21.5 percent of the weekday new rider (11,151) trips were not made before the rider made the trip on transit.

On the weekend almost one-third of the new riders previously made the trip by driving an automobile, with a total of half of the new riders previously making the trip either

**Table 1. Composition of increase in ridership.**

Time	Category	Number	Percent	Percent Added
Weekday	Continuing old riders	185,091	100	
	Induced old riders	—	—	
	New riders	<u>51,788</u>	<u>28.0</u>	
	Total	236,879	128.0	
Saturday	Continuing old riders	81,440	100	
	Induced old riders	15,954	19.6	( 47.8)
	New riders	<u>17,452</u>	<u>21.4</u>	( 52.2)
	Total	114,846	141.0	(100.0)
Sunday	Continuing old riders	24,062	100	
	Induced old riders	12,032	50.0	( 63.5)
	New riders	<u>6,923</u>	<u>28.8</u>	( 36.5)
	Total	43,017	178.8	(100.0)
Seven-day week	Continuing old riders	1,030,957	100	
	Induced old riders	27,986	2.7	( 9.0)
	New riders	<u>283,315</u>	<u>27.5</u>	( 91.0)
	Total	1,342,258	130.2	(100.0)

**Table 2. Stated reason for change to transit: New riders, weekday.**

Reason	Number	Percent
Fare only	29,145	56.2
Service only	1,487	2.9
Other	<u>21,156</u>	<u>40.9</u>
Total	51,788	100.0

**Table 3. Stated reason for change to or increased use of transit: New riders and all riders, weekend.**

Reason	New Riders		All Riders	
	Number	Percent	Number	Percent
Saturday				
Fare only	8,607	49.3	40,069	34.9
Service only	503	2.9	2,842	2.5
Other	<u>8,342</u>	<u>47.8</u>	<u>71,935</u>	<u>62.6</u>
Total	17,452	100.0	114,846	100.0
Sunday				
Fare only	3,675	53.1	15,083	35.1
Service only	209	3.0	589	1.4
Other	<u>3,039</u>	<u>43.9</u>	<u>27,340</u>	<u>63.5</u>
Total	6,923	100.0	43,012	100.0

**Table 4. Weekday distribution of previous automobile drivers.**

Time Period	Number	Percent
6-9 a.m.	4,990	23.0
9 a.m.-3 p.m.	5,582	25.8
3-6 p.m.	7,506	34.7
Remainder of day	<u>3,564</u>	<u>16.5</u>
Total	21,642	100.0

**Table 5. Previous travel mode for new riders.**

Mode	Weekday		Saturday		Sunday	
	Number	Percent	Number	Percent	Number	Percent
Auto driver	21,642	41.8	5,800	33.2	2,057	29.7
Auto passenger	11,324	21.9	3,274	18.8	1,477	21.3
Walk	2,328	4.5	1,348	7.7	1,076	15.5
Other vehicle	5,343	10.3	1,938	11.1	440	6.4
No trip	<u>11,151</u>	<u>21.5</u>	<u>5,092</u>	<u>29.2</u>	<u>1,873</u>	<u>27.1</u>
Total	51,788	100.0	17,452	100.0	6,923	100.0

as driver or as passenger. Also, approximately one-fourth of weekend new riders are making trips that they did not make before the MARTA program was initiated. The actual volumes and percentages for weekday and weekend previous travel mode are given in Table 5.

### Rider Characteristics

The third type of questions concerned What are the characteristics of transit ridership now as compared to before MARTA? What are the differences between the old and new riders?

If the November 1972 survey is compared with the October 1970 survey, it may be seen that total weekday ridership is up 17 percent, from 201,734 passengers per day to 236,879. It should be noted that between October 1970 and the initiation of the MARTA program the historically observed decline of approximately 5 percent per year in ridership had been continuing in Atlanta. Therefore the increase between October 1970 and November 1972 of 17 percent is consistent with the overall increase determined in this study of 30.2 percent. Within the total weekday ridership, weekday revenue passengers are up 25 percent, from 151,767 to 189,969.

Between October 1970 and November 1972 the percentage of non-home-based trips, those trips with neither end at home, increased from 5.9 percent to 14.0 percent, showing greater mobility during midday and evening. The percentage of non-work trips, coincident with the previous observation, increased from 29.9 percent to 39.9 percent. The percentage of park-and-ride, where a patron drives to a transit stop and leaves the car all day, increased from 2.8 percent to 4.8 percent. This is a small number, but it should be remembered that at the time of this survey no formal park-and-ride facilities had been established by the Authority. The percentage of kiss-and-ride trips, where the transit rider is driven to the stop and picked up at the end of the day, increased from 4.2 percent to 14.4 percent, also small in number but indicative of a significant change in ridership patterns.

Data from the November 1972 survey show that on the weekday nearly two-thirds (64.3 percent) of new riders are between 18 and 35, compared to only half (48.2 percent) of old riders. With increasing age, the proportion of new riders as a part of the total transit rider population decreases, emphasizing the conclusion that transit has been made attractive to a different segment of the population. In comparison, 1970 population figures for Fulton and DeKalb Counties combined show 25.7 percent of the total population to be between the ages of 18 and 34 and 38.3 percent to be 35 and older. Where old riders generally follow the area-wide population age distribution, new riders show a larger attraction to a smaller percentage of the total population.

New riders are almost equally divided between male and female (51.1 percent female, 48.9 percent male). This is very close to the 1970 population figures for Fulton and DeKalb Counties, which show males to constitute 47.7 percent of the total population and females 52.3 percent. In contrast, for old riders the proportional part of female riders is twice that of males (64.9 percent female, 35.1 percent male). The distribution of new riders is nearly that of the total population, also indicating a stronger attraction to a different segment of the total population.

Of new riders, 60.8 percent are black and 39.2 percent are white, compared with old riders who are 72.1 percent black and 27.9 percent white. Of all riders, 70.4 percent are black and 29.6 are white. This is the reverse of the racial distribution for Fulton and DeKalb Counties as indicated in 1970, where 71 percent are shown as Caucasian and 29 percent are shown as Negro and other. Although new riders do show a larger proportion of white riders in comparison to old riders, the total is still not representative of the entire service area population.

Of those who reported their family income level (84.8 percent of new riders and 82.8 percent of old riders), 30.4 percent of new riders have family incomes over \$10,000 compared to only 21.2 percent of old riders. The 1970 census figures show 53.6 percent of families within the two counties having incomes over \$10,000. While transit has been made more attractive to higher income riders, the income distribution of old and new riders is still far from representative of the income distribution of the entire service area.

More than half (55.7 percent) of new riders reported that no automobile was available for their trip either as driver or passenger, compared to nearly three-fourths (72.3 percent) of old riders. Only one-fourth (27.7 percent) of new riders have no family automobile, compared to nearly half (45.5 percent) of old riders. It is interesting to note that the 55.7 percent of new riders who indicate they are "captives" corresponds closely to the 58.2 percent of new riders that were previously auto passengers (21.9 percent), utilized some other vehicle type (10.3 percent), walked (4.5 percent), and did not previously make the trip (21.5 percent). A much larger percentage of new riders than of old riders have automobiles in their families and have automobiles available to them for their trip but have selected transit on a basis of choice.

Nearly half (48.1 percent) of new rider trips are for reasons other than to and from work, while slightly more than one-third (37.7 percent) of old rider trips are for purposes other than work. This indicates a higher mobility and freedom to make non-work trips among new riders.

Nearly three-fourths of both new (73.8 percent) and old (70.9 percent) riders walk to the bus they ride. Only 16.1 percent of new riders reached the bus they may be riding at any point in time by transferring from another bus, compared to 20.8 percent for old riders. Only 3.2 percent of new rider trips are preceded by a drive-and-park activity, compared to only 1.6 percent for old riders. Almost equal proportions of new (5.0 percent) and old (6.0 percent) riders reached their bus by riding with someone driving an automobile. While the number of drive-and-park riders is a small percentage of the total ridership, it should be noted that 4,560 vehicles are parked per day while their drivers take transit for a portion of their trip. All of this parking is done on an informal basis, with no provision of lots by the Authority.

When a transfer is required by new riders, only 5 percent of those transferring make more than one transfer, while 16 percent of old riders who transfer make more than one transfer. It is indicated that new riders do not make trips requiring transfers as often as old riders, and when transfers are required a much smaller proportion of new riders make more than one. New riders are more likely to use park-and-ride for access to transit, but new riders and old riders show almost equal propensity to ride to transit as an auto passenger. There may well be a correlation between the higher usage of park-and-ride and kiss-and-ride activity with the lower transfer rate for new riders. Obviously, with higher automobile ownership ratios the new rider has more flexibility to drive to a transit line that provides more direct service, thereby reducing the need for transfers, whereas old riders, who do not have as high a ratio of automobile availability, are forced to use the closest transit line regardless of the transfer requirements.

### Service Quality

The fourth question group was How does the quality of service compare now with the quality before MARTA? What do transit riders think of the quality of service? What types of improvements do the riders want? Is there a difference in the types of service improvements that are desirable to new riders and those desired by old riders?

In the opinion of the old rider, transit service has improved or remained unchanged, as evidenced by 38.3 percent of weekday old riders who think service is improved and 54.6 percent who believe service is unchanged. Only 6.9 percent of weekday old riders believe service has deteriorated. Comparable figures were reported on Saturday and Sunday (Table 6). Both new riders and old riders perceive service quality as good on weekdays, Saturdays, and Sundays, with over half of both new and old riders selecting "good" when offered a choice of "good", "fair", or "poor". On weekdays and Saturdays approximately 40 percent of new riders and old riders thought service should be classified as fair. On Sundays a smaller percentage, approximately one-third, believe service to be fair, but a larger percentage on Sunday select good than for weekdays and Saturdays. Overall, in excess of 90 percent of new riders and old riders believe service to be good or fair, with the exception of old riders on Sunday, when 5.0 percent had no opinion. The actual responses are given in Table 7.

Both new and old riders agree on five most important service improvements, on weekday and weekend. These five improvements are the first choice of three-fourths of all riders on weekdays, Saturday, and Sunday. These five selections are increased



**Table 6. Change in quality of service: Old riders, weekday and weekend.**

Quality	Weekday		Saturday		Sunday	
	Number	Percent	Number	Percent	Number	Percent
Improved	101,075	54.6	49,653	51.0	16,052	44.4
Unchanged	70,876	38.3	41,271	42.4	15,545	43.1
Deteriorated	12,831	6.9	5,577	5.7	4,109	11.4
No opinion	309	0.2	893	0.9	388	1.1
Total	185,091	100.0	97,394	100.0	36,094	100.0

**Table 7. Perceived quality of service: New and old riders, weekday and weekend.**

Quality	Weekday		Saturday		Sunday	
	Number	Percent	Number	Percent	Number	Percent
<b>New riders</b>						
Good	28,694	55.4	8,870	50.8	4,445	64.2
Fair	20,464	39.5	7,159	41.0	2,035	29.4
Poor	2,630	5.1	1,423	8.2	443	6.4
No opinion	—	—	—	—	—	—
Total	51,788	100.0	17,452	100.0	6,923	100.0
<b>Old riders</b>						
Good	103,887	56.1	53,773	55.3	20,733	57.4
Fair	67,109	36.3	37,241	38.2	11,729	32.5
Poor	13,200	7.1	5,568	5.7	1,835	5.1
No opinion	895	0.5	812	0.8	1,797	5.0
Total	185,091	100.0	97,394	100.0	36,094	100.0

**Table 8. Improvement priorities indicated by all riders on weekday, Saturday, and Sunday.**

Type of Improvement	Weekday (percent)	Saturday (percent)	Sunday (percent)
Increased frequency of service	22.0	19.4	18.7
Improved schedule reliability	17.1	15.2	15.0
Waiting shelter	15.7	17.0	16.7
Increased seat availability	13.2	12.5	9.3
Increased weekend service	7.8	10.8	16.8
Subtotal top five	75.8	74.9	76.5
Improved schedule information	6.8	7.5	6.0
Improved transfer efficiency	4.2	5.5	4.2
Air-conditioned buses	4.4	4.1	3.0
Improved operator attitude	2.6	3.4	3.6
Park-and-ride lots	1.6	0.8	0.9
Subtotal next five	19.6	21.3	17.7
Increased late-in-day service	0.5	0.5	0.3
Other/no opinion	4.1	3.3	5.5

**Table 9. Financial effects of increasing ridership through reducing fares.**

Condition	Revenue Trips	Revenue (\$)	Percent Change in Revenue Trips	Percent Change in Revenue	Average Cost per Revenue Trip Generated <sup>a</sup>
Basic condition at 40-cent fare	825,000	330,000	—	—	—
Fare decreased to 25 cents	1,007,800	251,950	+22.2	-23.7	0.427
Fare decreased to 15 cents	1,051,700	157,750	+27.5	-52.2	0.760
Average marginal cost per revenue passenger gained through additional fare reduction from 25 cents to 15 cents = \$2.146					

<sup>a</sup>Cost in terms of foregone revenue.

frequency, improved schedule reliability, bus shelters, seat availability, and improved weekend service. It should be noted, in line with previous analysis indicating that a negligible percentage of new riders and old riders are riding because of service changes, that four of the five types of service improvements selected by new and old riders as being the most important are the types of improvements that have been made and that people have recognized as resulting in improved or at least maintained service. This indicates the validity of the explanation given previously that the types of service change made are not usually recognizable by the transit user specifically as improvements and that the improvements that were made are not dramatic enough to capture the attention of the rider. The actual volumes of all riders selecting each of the service improvements as their first choice are given in Table 8.

### Fare Elasticity

The fifth question asked was Did the fare need to be reduced as much as it was in order to achieve significant increases in transit ridership?

Included in the questionnaire for new rider interviews was the query, Would you have made this trip by bus today if the fare were 25 cents, or if it were 40 cents? On a 7-day week basis there are 283,315 new transit riders riding at the 15-cent fare, which is an increase of 27.5 percent over the 7-day volume of continuing old rider trips of 1,030,957. In response to the question to determine if they would be riding if the fare were 25 cents, the 7-day week volume of new riders at 25 cents is indicated to be 228,559, which is 80.7 percent of the total new rider trips under the 15-cent fare. Interestingly enough, 131,261 of the weekly new riders indicated they would continue to ride if the fare were raised to the original 40-cent level. This number is 46.3 percent of the total weekly new riders, very close in magnitude to the number of new riders who stated the primary reason for their change to transit was other than fare.

From survey results it is clearly indicated that, had the objective of fare reduction been to increase ridership rather than to achieve equity in the method of funding, then a smaller reduction would have achieved a substantial increase in ridership. However, even with a lesser reduction in fare, the increase in ridership would not have been sufficient to compensate for revenues foregone through the fare reduction. In Table 9 it is indicated that, in terms of estimated weekly revenue trips, a decrease in fare to 25 cents would have resulted in an increase in revenue patronage, but with a decrease in fare revenue of 23.7 percent. However, it is indicated that the decrease in fare to 15 cents resulted in a decrease in fare revenue of 52.2 percent.

In terms of foregone revenue, and therefore under Authority funding a public cost, and discounting transfer trips as well as all benefits accrued such as increased mobility, weekly automobile trips diverted to transit are estimated on the order of 116,000, at a cost of \$172,250. The cost per auto trip diverted is therefore \$1.48, or, assuming an average trip length of 10 miles, 14.8 cents per vehicle-mile of automobile travel diverted to transit.

### GENERAL SUMMARY

1. The indicated increase in ridership for the 12 months ending June 30, 1973, was 30.2 percent, of which 91 percent is due to trips made by new riders and only 9 percent is due to increased tripmaking by old riders. It is also indicated that the fare reduction, taken alone, is more significant in attracting new riders to transit than are service changes taken alone. However, there is a large proportion of new riders who are attracted by other, undetermined factors and/or a combination of fare reduction and service change.

2. Almost two-thirds (63.7 percent or 32,966) of weekday new transit riders previously made the trip now made by transit in an automobile either as the driver or as a passenger. Nearly half (41.8 percent or 21,642) of weekday new riders previously made the trip now made by transit by driving an automobile. Increased mobility is evidenced by the 26.0 percent (13,379) of new riders who previously walked or did not make the trip at all. Over 20,000 automobile trips have been removed from the streets entirely or at least for the major part of the trip, 58 percent of this during the peak-volume periods.

3. New riders are generally younger and wealthier than the old riders, with a higher proportion of males and whites. The new riders tend to ride later during weekdays and not as much on weekends. A larger proportion of new riders have an automobile available but choose to ride transit, primarily because of the low fare. The new riders show a higher propensity to make trips other than home-to-work by transit. The amount of park-and-ride and kiss-and-ride access to transit service has more than doubled, even though MARTA has not as yet implemented specific action encouraging this activity.

4. Old riders believe that transit service has improved or remained unchanged, generally. New and old riders alike on weekdays and weekends believe that increased frequency, improved schedule reliability, bus shelters, improved seat availability, and improved weekend service are the most important types of improvements that can be made. It is also apparent that slight improvements in transit services are not significant enough to be noticed by the transit rider even though accumulated small improvements—in headways, for example—may account for significant increases in total transit operations.

5. A lesser decrease in fare, to 25 cents, would have achieved approximately 80 percent of the increase in ridership that was realized with the decrease in fares to 15 cents. Had the objective of fare reduction been to increase ridership, then the amount of decrease need not have been as large in order to achieve significant increases in ridership. However, even with the smaller reduction, an operating deficit would have resulted.

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