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of Transportation

Consumer-Based Transit Pricing at the Chicago Transit Authority

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A second volume of this study, entitled Market Analysis of Choice of Method of Payment for CTA Riders, is available at cost through the National Technical Information Service, Springfield, Virginia 22161.

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Final Report
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CONSUMER-BASED TRANSIT PRICING AT THE CHICAGO TRANSIT AUTHORITY

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CHAPTER 1: INTRODUCTION

1.0 INTRODUCTION

In examining potential fare structure revisions, the Chicago Transit Authority (CTA) sought to achieve the generally elusive goal of increasing both revenue and ridership -- or at least meeting revenue goals without suffering any additional ridership loss. Typically, any fare restructuring that produces additional revenue also results in a loss of ridership. However, recent research suggests that the introduction of a "market-oriented" pricing structure that emphasizes "deep discounting" of fares, perhaps in combination with differential pricing (based on service quality or time of day), can achieve the desired goal. Deep discounting involves the use of prepayment mechanisms -- typically tokens or tickets -- priced substantially lower than the cash fare. This approach has been implemented -- generally with success -- in several cities (e.g., Denver, Milwaukee and Allentown, PA), and other cities (e.g., Oakland, Miami, and Madison, WI) are considering implementing such structures.

It was felt that the CTA could benefit from a market-oriented fare structure. Accordingly, UMTA issued a grant to the CTA (through its Planning and Research Department) to help cover the cost of developing, implementing, and evaluating such an approach. The resulting fare study thus had two major objectives: 1) to produce an effective market-oriented fare restructuring for the CTA, and 2) to document the process and results of the effort for use by the rest of the transit industry. In order to carry out the project, CTA hired a team of consultants headed by Multisystems, Inc. (and including COMSIS Corp., Richard Oram, Midwest System Sciences, and Martinez Associates as subcontractors) to perform the necessary analyses, develop alternative fare structures, and evaluate the results of a new fare structure.

1.1 PROJECT ELEMENTS

The major elements of this study were as follows:

- research on "innovative" (deep discounting, peak/off-peak, etc.) fare structures elsewhere -- Information was compiled and presented on the experiences of other transit systems that have implemented innovative fare structures.

- market analysis of choice of payment methods -- A questionnaire was developed, and approximately 800 current CTA riders were interviewed regarding their current usage patterns and fare payment methods; respondents were also asked to indicate whether they would use various types of

prepayment instruments (i.e., passes and tokens at different price levels). The results of this survey served as the basis for the development of a payment method market share model (part of the overall revenue/ridership model, discussed below).

- revenue and ridership model -- A model was developed to predict the impact of different fare structures on revenue and ridership. The model consists of three major submodels: 1) ridership impact evaluation model (based on elasticities for different market segments applied to different fare structures), 2) payment method market share model (based on stated preference findings from the above survey), and 3) passenger revenue model (based on the results of the first two submodels).

- evaluation of alternatives and recommendation of a revised fare structure -- The study team identified six alternative pricing strategies, and then developed a range of specific fare structures within each strategy. The Task Force, in conjunction with the study team, then evaluated the different strategies and selected one based on a peak/off-peak differential (on bus only). Once the basic structure was selected, the study team developed six specific pricing options that all met the specified revenue and ridership targets. These options were subsequently presented to the Board, and then to the public via a series of public hearings. Following these hearings, the preferred option was recommended to -- and adopted by -- the CTA Board.

- implementation and marketing -- Following adoption of the recommended fare structure, the implementation and marketing effort began. All of the implementation responsibilities had been clearly identified prior to the Board's adoption of a specific structure. Hence, while the implementation schedule was extremely tight, the individual activities were able to be carried out quite efficiently. The new fare structure was implemented on April 29, 1990. The transition to the new structure went very smoothly.

- evaluation of the fare structure impacts -- After the new fare structure had been in place for eight months (i.e., the end of 1990), the study team assessed the impacts of the new structure on ridership and revenue. This assessment was based on actual ridership/revenue totals and on the results of "before" and "after" surveys of CTA riders.

In carrying out these tasks, the consultants worked closely with CTA staff, through meetings and discussions with Planning and Research staff, the Fares Policy Task Force, and other representatives of those departments directly concerned with fare implementation and operational issues. The efforts of the Task Force members and the departments they represent were crucial to the successful development and implementation of a workable fare structure. The Task Force meetings were tremendously useful in raising and addressing the key issues involved in deep discounting and introducing any kind of peak/off-peak fare structure. While the consultants made recommendations based on prior experience and research, as well as ongoing analysis, the resolution of most issues was ultimately accomplished through the cooperative efforts of the affected CTA departments.

1.2 FINAL REPORT

This report summarizes 1) the development and evaluation of alternative fare structures and the implementation of the recommended structure, and 2) the impacts of the new fare structure on ridership and revenue. Other elements of the project are described in Volume II, Market Analysis of Choice of Method of Payment for CTA Riders (CTA Report PR91-08), and in Transit Pricing Evaluation Model (CTA Report PR91-05). The period covered by this report is July 1989 - December 1990.

CHAPTER 2: IDENTIFICATION AND EVALUATION OF ALTERNATIVE FARE STRUCTURES

2.0 INTRODUCTION

This chapter discusses the identification and evaluation of alternative fare strategies and specific pricing structures. Included are discussions of the following issues: 1) the goals related to the fare structure revision, 2) definition of the alternative fare strategies considered, 3) the evaluation criteria to be used in selecting a strategy, 4) implementation issues associated with different strategies, and 5) a preliminary evaluation of the alternative strategies.

2.1 GOALS OF THE FARE STRUCTURE REVISION

The initial step in developing potential fare options was to identify a set of goals for the new fare structure. These goals reflect 1) those CTA Fare Policies (adopted by the Board in September 1988) that apply to a "consumer-based" or "deep discount" fare structure and 2) additional issues raised by such a structure. The goals were as follows:

- develop and implement a fare level and structure that is designed to simultaneously meet CTA's revenue goals and increase ridership -- or short of that, to minimize any associated loss in ridership

- develop and implement a fare structure that is publicly acceptable and insures an equitable distribution of financial impacts on existing and future riders

- develop and implement a fare structure that minimizes opportunities for fare abuse by both riders and revenue collection personnel

- increase the availability and diversity of prepaid fare instruments by targeting mechanisms to specific ridership market segments

- maximize use of prepayment mechanisms -- for both regular and occasional riders -- so as to 1) simplify fare payment and collection and 2) minimize the amount of cash-handling and change-making required of operating personnel

- develop a fare implementation and marketing program that provides for orderly, timely, and cost-effective implementation

- implement procedures and equipment that simplify and speed up the revenue accounting and reporting processes

- develop a framework and analytical model to provide for ongoing monitoring and evaluation of financial, ridership, and other impacts of the fare structure

- where cost/benefit ratios and improvements in passenger convenience are favorable, increase the use of automated fare collection equipment and ticket/token-vending and coin-changing equipment

- over the long term, eliminate the use of cash fares altogether.

These goals were intended to represent general guidelines to be followed in developing a new fare structure. The next section reviews the basic fare strategies investigated.

2.2 IDENTIFICATION OF ALTERNATIVE FARE STRATEGIES

Based on the results of the previous CTA Fare Study -- performed by LTI -- coupled with additional subsequent research and discussion, the following fare/pricing strategies were identified as key elements of a revised fare structure for the CTA:

- peak/off-peak fare differential

- bus/rail fare differential

- premium for paying cash -- and/or for using the rail ticket agent window

- deep discounting of fare prepayment mechanisms

- market-segmented passes

It was understood that the new fare structure would likely incorporate two or more -- perhaps all -- of these elements. Some form of deep discounting (i.e., for purchase of 10 or more tokens at a time) was considered likely to be included, and the possibility of offering more than one kind of monthly pass (e.g., a weekday only pass, as well as an everyday pass) was being discussed. At this time, the major decision points regarding the basic pricing structure (i.e., prior to setting actual fare levels) concerned 1) whether to pursue a peak/off-peak differential at all -- or perhaps on bus only, 2) whether to reinstate a bus/rail differential, and 3) whether to charge a premium for the payment of cash (as opposed to tokens or other forms of prepayment). Of course, in essence, a decision to go with peak/off-peak on bus only would create a bus/rail differential, at least during part of the day.

Table 2-1 shows several alternative fare structures that were presented for initial consideration. A number of other specific structures would subsequently be tested in the revenue/ridership model; the examples in Table 2-1 were used to illustrate the types of structures that would result from different combinations of strategies. In most of the alternatives shown here, the increment between peak and off-peak -- or, in some cases, between cash and prepayment (in the form of a single token) -- was $.25 ($1.25 vs. $1.00).

TABLE 2-1: FARE STRUCTURE OPTIONS

Fares	Current	Bus/ Rail Diff.	Bus/ Rail Diff. (with stile disc.)	Peak/ Off-Peak (Both)	Peak/ Off-Peak (Bus only)	Peak/ Off-Peak (Bus, with stile disc.)	Deep Disc. only (A)	Deep Disc. only (B)
Bus								
Peak (cash)	$1.00 ($.50)	1.00	$1.00	$1.25	$1.25	$1.25	$1.25	$1.25
Off-Peak (cash)	1.00 (.50)	1.00	1.00	1.00	1.00	1.00	1.25	1.25
Token (10-pack)	.95 (.50)	.90	.90	.90	.90	.90	1.00	1.00
Token (single)	1.00 (.50)	1.00	1.00	1.00	1.00	1.00	1.25	1.10
Rail								
Peak (cash-agent)	1.00 (.50)	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Peak (cash-stile)	1.00 (.50)	1.25	1.00	1.25	1.25	1.00	1.25	1.25
Off-Peak (cash-agent)	1.00 (.50)	1.25	1.25	1.00	1.25	1.25	1.25	1.25
Off-Peak (cash-stile)	1.00 (.50)	1.25	1.00	1.00	1.25	1.00	1.25	1.25
Token (10-pack)	.95 (.50)	.90	.90	.90	.90	.90	1.00	1.00
Token (single)	1.00 (.50)	1.00	1.00	1.00	1.00	1.00	1.25	1.10
Transfer	.25 (.15)	.25	.25	.25	.25	.25	.25	.25

The bulk token price was either $.90 or $1.00. The key characteristics of these alternatives were as follows (all included some type of deep discount):

1) bus/rail differential -- In this option, there is a premium for rail service over bus at all times, but only where fares are paid in cash. Tokens would be the same for rail and bus. The average price of a token if purchased in a pack of ten would be lower than the cash bus fare, while the single token price would probably be equivalent to the bus cash fare. Because of the relative attractiveness of tokens over cash, this option should greatly reduce the amount of cash in the system.

2) bus/rail differential with discount for using coinstiles -- This option differs from the previous one in that there would be a premium for paying cash to the ticket agent relative to using a coinstile (with cash or token). In other words, the coinstiles would be set at the bus fare level. This option would reduce the extent of cash-handling by agents, although it would not produce as great a reduction in the amount of cash as would the above option.

3) peak/off-peak differential (rail and bus) -- In this option, the fare would change four times a day (at around 9AM, 3PM, 7PM, and 6AM) on both rail and bus. This would entail a number of operational changes, including modifying Visifare and GFI keys and providing signs that indicate which fare is in effect. Peak/off-peak on rail poses its own set of operational problems and issues, including additional opportunities for fare skimming and how to treat coinstiles (i.e., keep coinstiles set at off-peak at all times?). There would presumably not be separate peak and off-peak tokens; the single token price might be set equivalent to the off-peak cash fare.

4) peak/off-peak differential (bus only) -- This option would eliminate the most serious problems related to peak/off-peak by instituting the differential on bus only. On the other hand, it was felt that it could present some marketing problems -- i.e., it would raise questions as to why is there a differential on bus but not on rail. It was argued that the availability of discounted tokens would effectively provide the option to all rail riders to pay significantly less than the full rail fare, thereby offsetting the absence of an off-peak fare. Nevertheless, it was felt that the existence of two separate fare structures would, at least to some extent, complicate marketing, administration, revenue accounting, and data reporting for the overall system.

5) peak/off-peak differential (bus only), with coinstile discount -- This option combined the previous one with Option 2 above. Like Option 2, this would significantly reduce the extent of cash handling by rail ticket agents. On the other hand, it would be even more complex than the bus only peak/off-peak structure.

6) deep discount only -- In this option, there would be no differential in cash fares between rail and bus or between peak and off-peak. There would be a single cash fare, presumably priced higher than the current fare. Tokens

purchased in groups of ten would be priced substantially lower than the cash fare; this savings would be significantly greater than the current $.05 savings. With regard to single tokens, the basic options would be to 1) price them equivalent to the cash fare or 2) price them lower than the cash fare, but higher than the bulk unit price. It was felt that this general strategy would clearly be the simplest to implement and administer, since it is essentially the same as the current structure.

The next section summarizes the key implementation/operational issues associated with these structures.

2.3 SUMMARY OF KEY IMPLEMENTATION/OPERATIONAL CONCERNS

Prior to the development of revenue and ridership projections, discussions about the different structures focused primarily on implementation and operational issues. The level of complexity associated with the different alternatives varied considerably. For instance, implementation issues related to those options involving a bus/rail differential were not considered to be significant; furthermore, such a structure had been in place in the recent past. The structure based only on a deep discount was felt to differ little from the existing flat fare structure. Peak/off-peak, on the other hand, presented a number of significant implementation and operational concerns. The key issues, as identified by CTA staff, can be summarized as follows:

- need to insure that rail ticket agents are properly recording the fares they receive; the major concern was over the potential for theft -- e.g., collecting peak fares but recording them as off-peak and pocketing the difference; another concern was simply over accurate reporting of peak vs off-peak revenues

- need to inform riders which fare is in effect at a particular time; the major concern was over potential confrontations between riders and agents (on rail) or drivers (on bus)

These concerns are discussed below.

Proper Recording of Fares by Ticket Agents/Fare Skimming

Perhaps the major operational concern related to a peak/off-peak fare structure was the potential for theft by rail ticket agents during the daily changeover from off-peak to the afternoon peak. (Because CTA bus operators do not handle fares, this problem would not apply to buses.) It was felt that there would be a need to minimize the extent of this theft as much as possible if the CTA were to avoid losing significant revenues.

CTA staff and the consultants identified a number of alternative approaches to solving or at least minimizing this problem. Some of these actions were noted to be mutually exclusive (e.g., manual vs. automatic switching of keys on Visifare), while some could be used in combination. Unfortunately, none of these actions appeared to offer a fool-proof short-term

solution. The most effective measures -- those in which the agent no longer handles cash fares -- would require significant policy changes and/or hardware improvements, and would likely need fairly long phase-in periods. The various approaches, along with their drawbacks, are summarized below.

Eliminate Cash Fares

There would be definite advantages to eliminating the use of cash fares throughout the system. It would eliminate the opportunity for fare skimming, and would also significantly reduce the costs associated with handling and reporting fare receipts. On the other hand, it was felt that the Board is apparently firmly committed to the policy of allowing cash payment -- and moreover, giving change when fares are paid on-board rail cars. Thus, eliminating cash would represent a major policy change. Furthermore, moving toward prepayment only would entail major changes in pass and token administration, as well as a massive marketing/rider education effort. It was recommended that eliminating cash fares be strongly considered as a long term goal, but it clearly could not be implemented soon enough to coincide with the proposed fare restructuring schedule.

On the other hand, an interim strategy designed to greatly reduce the amount of cash in the system -- as well as the opportunities for skimming -- was proposed: a premium for using the ticket agent's window; in other word, it would be cheaper to use a coinstile. As evidenced by its inclusion among the alternative fare structures introduced earlier, this proposal was considered to have considerable merit.

Eliminate Need for Agents to Collect Fares

Another strategy that would eliminate the peak/off-peak skimming problem would be to fully "automate" the fare collection process, eliminating the need for rail ticket agents to collect fares. Clearly, full automation could not be accomplished within the time frame of the 1990 fare restructuring. On the other hand, it was pointed out that moves could certainly be made in this direction with a fare structure that greatly discouraged the use of the agent's window to pay fares -- i.e., by placing a substantial premium on the use of cash; tokens, which would be deposited directly in the coin turnstiles, would be priced significantly lower than the cash fare.

Besides its effect on the fare skimming problem, other suggested reasons for moving toward automatic fare collection included 1) it would reduce operating costs due to the resulting reduction in the number of ticket agents needed, and 2) it would open up opportunities for new fare structures (including multiple pass arrangements).

Implement Automatic Switching of Visifare Keypad

Probably the most effective short-term strategy for eliminating the opportunity for skimming would be automatic switching from off-peak to peak Visifare keys in all stations. In other words, at the changeover time between the morning peak and off-peak periods, a central controller would lock out the peak period keys in all stations; the off-peak keys would then be locked out in the changeover to the afternoon peak. The major impediment to instituting this strategy was thought to be the high cost it would entail.

An operational problem with this approach was also noted: the potential for confrontations with riders who had been waiting in line before 3 PM but do not reach the agent window until after 3 -- and object to paying the peak fare. The alternative -- a manual switch -- would give the agent some discretion in changing over, and thus could minimize such confrontations. Another option would be to have an automatic lockout, but give the agent the capability to override for a short period (e.g., 5 minutes). Because of the concern over fare skimming, it was recommended that automatic changeover be given strong consideration -- perhaps after a transition period in which manual switching was used.

Install Sign/light Linked to Switch

Regardless of how the time changeover would be done, it was pointed out that it would be important to provide some visible indication of the current period -- i.e., either a sign or a light indicating peak or off-peak. This would clearly be necessary for informing riders, and, if linked to the time change switch, it would also allow supervisors and personnel control specialists to make sure that agents were recording the correct fares. Of course, the efficacy of this in terms of monitoring agents would depend on the number of PCS or supervisory personnel available. Thus, it would minimize the amount of theft only if accompanied by a substantial increase in the level of station monitoring.

Use Separate Lanes for Peak and Off-peak

In stations in which there are two positions in a ticket booth, it would be possible to use one lane during the peak periods and the other during the off-peak. If the Visifare in each booth were permanently set to record only the appropriate fares (peak or off-peak), this would permit a supervisor to readily insure that an agent was recording the correct fare. Of course, this would not work in all stations, and would be only as effective as the level of monitoring allowed.

Institute Tighter Audit Procedures

It was noted that one way to reduce the amount of theft would be to tighten the agent audit procedures -- e.g., automate the comparison of trends (for individual agents and for stations at particular time periods) and expedite the reporting of patterns of possible theft to supervisors. The current data entry and reporting process was noted to be extremely time-consuming; the added complexity of peak/off-peak fares would only add to this time. Thus, speeding up the audit process under the new fare structure would require additional data entry personnel and/or automation of the data entry process; the latter was felt to be clearly a longer-term option. In any event, while this action would have some impact on the extent of theft, it would certainly not eliminate the problem.

In a related issue, the introduction of a peak/off-peak differential on rail would also result in the need to modify the revenue accounting software. These changes would be needed to provide accurate reports on peak and off-peak revenues. It was made clear that the development of new software probably could not be completed before the implementation of the new fare structure; thus, it was seen as a longer term activity.

Install Video Cameras in Stations

Another strategy that was considered potentially useful was the use of video cameras in stations, in conjunction with the audit procedures. It was pointed out that it would be infeasible to review all of the tapes, but tapes could be reviewed to check on cases of suspected skimming. A major drawback of this approach was the significant expense -- in equipment purchase, installation, and maintenance; furthermore, tape filing and storage requirements would be extensive.

Institute Employee Incentive Program

Finally, an indirect approach to minimizing theft that was suggested was to institute a systemwide employee incentive program that would essentially encourage agents to monitor their colleagues. For instance, employees might be granted a share of any system revenue that exceeds an annual target amount (i.e., "profit sharing"). It was felt that this arrangement, which is used in various forms in several transit systems in the U.S., would, at least in theory, encourage agents to report on other agents they believed to be skimming fares -- and therefore essentially stealing from them. Of course, it was noted that instituting such a program would represent a major administrative change at the CTA, and would have major labor negotiation implications; furthermore, the concern was raised that the net revenue gain from this reduction could turn out to be less than the amount of revenue that would be paid out in profit sharing.

It was concluded that, unless the fare skimming problem could be prevented outright (i.e., by removing all cash fare transactions from agents or by physically preventing the misrecording of fares), the best that could be achieved would be to minimize the incidence of skimming through increased controls over agents' actions (i.e., more comprehensive monitoring, coupled with tighter auditing procedures). Over the longer term, it was felt that eliminating cash fares and/or fully automating fare collection would do away with this problem. Until that time, automatic (centrally controlled) switching/lockout of Visifare keys was felt to be the most effective strategy, despite the fact that it could create confrontations between riders and agents. As suggested above, a transition period of manual switching would help to ease this problem; in any event, substantial rider education (i.e., marketing) would be necessary to get riders used to the new structure.

Informing Riders of Fare in Effect

The second implementation/operational issue mentioned above was the need to make riders aware of the fare in effect at any given time -- for information purposes, as well as to minimize the potential for confrontations between riders and agents or operators (i.e., if a rider was already in line before the period change, and insisted on paying off-peak fare). The following possible means of addressing this concern were suggested. Of course, in addition to any of these options, the need for clear signs in stations and on buses describing the fare structure was considered a given.

Install Manual Visifare Lockout Switch

As suggested in the previous section, one possible way to minimize the potential for confrontations would be to install a manual -- rather than automatic -- switch to lock out keys

(i.e., so that an agent would have some discretion if there were a line). It was pointed out that, while this would help to a certain extent, the agent would have to make the changeover at some point.

Make Announcement in Stations

Another suggested possible strategy for addressing this issue was to make announcements in all stations of the impending period change (e.g., "...the peak fare period begins in 5 minutes") and then of the actual change. This would serve to inform all passengers in the station at that moment, but would clearly not address the problem of confrontations following the announcements.

Change Bus Fare Between Stops

It was noted that the situation on buses is obviously different from that in rail stations. The key issue for bus would be when to switch from peak to off-peak (and vice versa). The suggested options included: 1) change at the correct time, even if in the middle of a stop; 2) change between stops, i.e., the operator would allow everyone boarding at a particular stop to pay the off-peak fare, even if the period changed while people were boarding; 3) change between trips, i.e., every bus would be designated either peak or off-peak for its entire trip; or 4) change between runs, i.e., every bus would be designated either peak or off-peak when it left the garage to begin a run. It was recommended -- and agreed to -- that fares should be changed between stops. It was felt that this would be the simplest approach, and would avoid confrontations better than any of the others. It was also recommended that there be some sort of "flip sign" that could be changed by the operator to indicate the fare in effect at any particular time.

Of course, beyond addressing the above concerns, instituting a new fare structure would obviously entail a number of specific implementation activities. These were clearly identified by CTA staff early in the project, and costs were estimated (by the responsible CTA manager) for each activity. The major implementation activities, subsequently assigned to the responsible CTA departments, included marketing, training, reporting/accounting software modifications, farebox and Visifare reprogramming, pass design, and token distribution planning. These activities are described in Chapter 4 of this report.

2.4 IDENTIFICATION OF EVALUATION CRITERIA

Each of the fare options under consideration presented certain advantages and disadvantages over the others. In selecting a specific option, it was therefore necessary to evaluate all of the options based on a range of criteria. The LTI fare study conducted an evaluation of a different set of fare strategies than was considered here; however, that set included the two basic alternative concepts (other than deep discounting) being examined in this study: peak/off-peak and bus/rail differential. These strategies were ranked high in the LTI evaluation, and thus were recommended for further consideration. Because these concepts had already "passed" that initial evaluation, it was not considered necessary to reapply all of the criteria that LTI had employed. Some of these criteria -- "reversibility", "equity", "simplicity", and "management information" -- were not reexamined in this study. Both

peak/off-peak and bus/rail ranked high on each of the first three criteria. In terms of improved management information control, the two strategies received identical rankings, although they were ranked lower than the distance-based approaches.

On the other hand, other criteria used in the LTI evaluation were re-evaluated for the current set of fare options; these were as follows:

- ability to maximize revenue while minimizing loss of ridership
- ability to maximize ridership while maintaining existing net revenue
- ease of implementation (i.e., reflecting extent and complexity of operational and administrative actions or changes necessary)
- reasonableness (i.e., concerning public acceptability)
- revenue protection (including reduction of opportunities for fare skimming and reduction in cash handling in general)
- consistency with long-term fare collection goals (e.g., full automation and/or elimination of use of cash).

The last criterion listed above was not included in the LTI study. It was decided that any fare restructuring within the coming year should represent a positive move toward achieving longer-term goals such as the elimination of all cash in the CTA's fare collection system. It was felt that some fare options may not necessarily work towards such goals.

It was not possible to address the first two criteria until the fare model was completed. Moreover, it was noted that the actual fare levels selected would have the greatest impact on the revenue and ridership projections -- and on the balance between the two. However, it was felt that it would be useful, at this point in the study, to conduct a preliminary evaluation of the basic options based on the remaining criteria.

2.5 EVALUATION APPROACH AND PRELIMINARY EVALUATION

As suggested above, prior to the testing of the revenue and ridership impacts of different pricing options, a preliminary evaluation -- i.e., primarily of implementation and operational issues -- was undertaken. The study team took a first pass at ranking the alternatives based on specific criteria, and this ranking was then revised following discussions with CTA staff. A summary of the results of this revised evaluation is shown in Table 2-2. (It should be noted that this table does not include the last criterion listed above -- consistency with long-term goals; that criterion was actually added after this preliminary evaluation had been completed.) The relative rankings for each criterion reflect an assessment of how each option would rate; this assessment was based on discussions of the advantages and disadvantages of each option and the key implementation/operation issues facing each. Where applicable, the evaluation also incorporated the rankings from the LTI evaluation. The total scores shown on the table

TABLE 2-2: EVALUATION OF FARE OPTIONS (IMPLEMENTATION/OPERATION ISSUES)

	Fare Option*				
Criterion	**1**	**2**	**3**	**4**	**5**
ease of implementation	5	4	1	3	2
reasonableness	4	5	3	1	2
revenue protection	2	5	1	3	4
total	11	14	5	7	8

* Fare Options:
1 - bus/rail differential
2 - bus/rail differential w/ coinstile discount
3 - peak/off-peak diff. (rail & bus)
4 - peak/off-peak diff. (bus only)
5 - peak/off-peak diff. (bus only) w/ coinstile discount

were not weighted based on relative importance; at this point, it seemed that the criteria shown were of roughly equivalent importance.

One of the six basic fare strategies described earlier -- deep discount only -- was not included in the evaluation process, since it was felt to be fundamentally the same as the current CTA fare structure. As indicated, Option 2 (Bus/Rail Differential with Coinstile Discount) received the highest total score for the criteria shown. Option 1 (Bus/Rail Differential) ranked just behind Option 2. The fact that the CTA previously had such a structure in place suggests that it would not be difficult -- or extremely costly -- to implement it again. The three peak/off-peak options (3, 4, and 5) were ranked considerably lower than the others. Among these three, the bus-only option had the highest score; the last place score of Option 3 reflected the various problems that had been identified regarding implementing peak/off-peak on rail.

Clearly, it was impossible to select a "best" option at this point due to the absence of projections of revenue and ridership. However, on implementation issues at least, it was felt that peak/off-peak options would present greater difficulties than would a structure that entailed only minor conceptual changes to the current structure.

2.6 SUMMARY

This chapter has discussed the identification and subsequent preliminary evaluation of a set of alternative fare structures. Each structure was viewed as carrying certain relative advantages and disadvantages. Using a subset of the full list of evaluation criteria developed (revenue and ridership impacts had not yet been identified), these alternatives were evaluated, based primarily on implementation and operational issues. The fare structures based on a bus/rail differential ranked highest according to these criteria, while the structure that included a peak/off-peak differential on both rail and bus ranked last. The low ranking of that structure was due primarily to the concerns over proper recording and reporting of fares by ticket agents -- and the concomitant problem of increased opportunities for fare skimming. The final evaluation of alternatives, following the identification of revenue and ridership impacts, is discussed in the next chapter.

CHAPTER 3: DEVELOPMENT OF RECOMMENDED PRICING OPTIONS

3.0 INTRODUCTION

This chapter discusses 1) the comparison of predicted ridership and revenue impacts of specific pricing options, 2) the selection of a general type of fare structure, and 3) the development of a recommended set of options.

3.1 PREDICTED RIDERSHIP AND REVENUE IMPACTS

Concomitant with the identification and preliminary evaluation of alternative fare structures, the consultants developed a model designed to predict the ridership and revenue impacts of different fare options. The Transit Pricing Evaluation Model (TPEM) was developed based on 1) future method of payment choice models, and 2) a set of elasticities produced in the LTI fare study, as well as other elasticities calculated by the CTA and the study team. The details of the TPEM are presented in a separate report (**Transit Pricing Evaluation Model**, prepared by COMSIS Corporation; August 1990); the model is briefly described below. The method of payment models are also discussed in detail in a separate report (**Market Analysis of Choice of Method of Payment for CTA Riders**, prepared by Midwest System Sciences, Inc.; March 1990), but are described briefly in the following section.

Future Method of Payment Choice Models

The future method of payment choice models were developed from the results of a survey of 800 CTA riders conducted as part of this study in July 1989. The first stage estimation of the models were based on the stated intentions of respondents to use certain fare methods at various price levels. The second stage estimation adjusted the initial estimates to take account of the reported current method of payment shares.

In developing these models, the survey respondents were assigned to market groups, based on type of pass selected, if any, and whether they were full or reduced fare riders. The survey results were then used to estimate 1) multinomial logit models of token, pass, and cash share for each of the market groups indicating a pass selection; and 2) binomial logit models of token and cash share for the full and reduced fare rider groups not selecting any type of pass. Four sets of variables were considered for inclusion in each model: 1) cost, 2) demographic characteristics, 3) usage pattern, and 4) ratings of payment method. Monthly cost was found to be the most important factor. Demographic characteristics were not determined to be significant, and were thus included in the final models. Ratings of payment method could not be determined for future conditions, and also were not included. Thus, the final models included only cost and trip frequency variables.

The predictive models were used to estimate future share of method of payment for selected fare structure scenarios. The models showed potential for substantial increases in pass and token usage as a result of modest increases in cash fare: increased pass use through adoption of a wider range of passes, and expanded use of passes and tokens through increases in the price differential between cash and alternative methods of payment. As suggested above, the predicted method of payment shares formed the basis for a key component of the TPEM.

Transit Pricing Evaluation Model

The TPEM is an interactive microcomputer-based model designed to evaluate the impact of different pricing scenarios on future ridership and revenue. TPEM predicts ridership and revenue within each of 52 different submarkets; these submarkets include, for full and reduced fare status: peak vs off-peak, bus vs. rail, token use, and use of three different types of passes (everyday, weekday only, and peak only).

The TPEM used the payment method choice input, along with a set of elasticities for each market segment, to estimate the net change in annual ridership for each submarket caused by a new fare for that submarket. The elasticities were based on the experience from past CTA fare changes, the results of surveys, and experience from the transit industry in general. In running the model, the elasticities can be adjusted for individual submarkets. The model produces several output reports, showing fare, ridership, and revenue for each market under base fare and new fare scenarios. Appendix A includes the input elasticities and a sample report from the model.

Testing Fare Options

Because the TPEM allows the user to set a distinct fare level (or pass price, where appropriate) for every fare market segment (e.g., reduced fare peak bus, cash vs. reduced fare peak bus, token), there is an essentially infinite number of combinations possible. In an effort to come up with as many options as possible that would meet the criterion of maximizing revenue while minimizing the loss of ridership, the consultants and CTA staff tested nearly 100 fare combinations. The options tested represented variations within the five basic fare structures identified in the previous chapter:

- rail surcharge
- rail surcharge, with coinstile discount
- peak/off-peak (bus and rail)
- peak/off-peak (bus only)
- peak/off-peak (bus only), with coinstile discount

Within each of these structures, variations were made in actual fare levels (full and reduced), token prices, pass prices, and types of passes. Regarding passes, three types were incorporated into the model (based on the survey results): everyday (i.e., like the existing

monthly pass), weekday only (i.e., not useable for weekend trips), and peak only (i.e., for AM and PM peak hours only).

In accordance with the revenue/ridership criterion, the "best" fare options out of those tested were presented to the Fare Policy Task Force. These options are summarized in Table 3-1. Since all options tested were estimated to produce at least some revenue gain, those shown in the table represent options that resulted in either ridership gain or relatively minimal ridership loss. As indicated, most of the options in the table were actually predicted to result in a gain in ridership.

It was noteworthy that a variety of fare options were predicted to generate significant revenue increases. The cut-off point for further consideration was a gain of at least 4.1 percent. This represented an annual dollar increase of at least $13 million. This was considered the minimum additional revenue needed by the CTA to meet its projected operating deficit for the coming fiscal year; actually, this figure was based on the estimated need for $6.5 million for the second half of FY 1990 (i.e., assuming that the fare restructuring would be implemented roughly halfway through the fiscal year). Thirteen of the 23 options shown in Table 3-1 were predicted to produce annual revenue gains of 4.1 percent or higher. (It should be noted that, at the point that this table was produced, the model's base 1988 revenue figure of roughly $313 million was slightly below the actual 1988 figure of about $316 million; the model was subsequently adjusted to match the actual figure, and the promising options were rerun). Furthermore, 7 of those were expected to result in ridership increases, and only one showed a ridership loss greater than 2 percent (from the 1988 base linked trip total of approximately 332 million; the model's figure equalled the actual in this case).

It was noteworthy that the best of these options all had relatively low reduced fare levels; in these cases, the reduced fares were lower than the existing level ($.50). In several options, the reduced fare token was priced as low as $.30. Reduced fare riders have been shown to be especially sensitive to changes in fare; thus the overall ridership varied considerably with changes in the reduced fare levels. Because of the low level of reduced fares relative to full fares, the revenue impact of lowering reduced fares was less than the ridership impact. With reduced fare levels set at "normal" levels (i.e., half peak full fare), the revenue gains were greater, but the ridership losses were also greater.

As indicated above, the results of different basic options could also be varied significantly by changing individual fare elements. Besides the fare levels themselves, variations in the pricing and types of passes had a significant effect on the ridership and revenue. Introducing different types of passes typically expanded ridership, but also reduced revenues. Thus, in maximizing revenues, a single type of pass was found to be preferable. (Table 3-2 shows an example of the relative impacts of three different pass pricing structures.) On the other hand, it was noted that offering one or more lower-priced passes would increase the market share for prepayment mechanisms, thereby reducing the use of cash in the system. Since that was an important fare policy goal, it entered into consideration in evaluating pass options.

TABLE 3-1: SUMMARY OF PREDICTED RIDERSHIP/REVENUE IMPACTS OF FARE OPTIONS

Fare option	Linked Ridership	Percent Change	Revenue	Percent Change	Avg. Fare
Current Fare Structure					
full:$1, $.95 token, $50 pass red: $.50, $.50 token, $25 pass	332,293,745	0.0%	$312,909,079	0.0%	$0.94
Rail Premium					
full:1.10(r)/1(b),.90 tok, $55 red:.50(r)/.40(b),.40 tok, $20	335,997,281	1.1%	$320,672,909	2.5%	$0.95
full:1.15/1, .90 tok, $55 red:.50/.40, .40 tok, $20	335,527,703	1.0%	$322,262,896	3.0%	$0.96
full:1.20/1, .90 tok, $55 red:.50/.40, .40 tok, $20	335,079,503	0.8%	$323,803,384	3.5%	$0.97
full:1.25/.90, .90 tok, $55 red:.50/.40, .40 tok, $20	338,288,999	1.8%	$320,123,613	2.3%	$0.95
full:1.25/1, .90 tok, $55 red:.50/.40, .40 tok, $20	334,651,741	0.7%	$325,295,940	4.0%	$0.97
full:1.25/1, .90 tok, $55 red:.60/.50, .45 tok, $25	327,816,679	-1.3%	$327,502,549	4.7%	$1.00
full:1.30/1.00, .90 tok, $55 red:.50/.40, .40 tok, $20	330,845,943	-0.4%	$334,059,713	6.8%	$1.01
Rail Premium with stile discount					
full:1.20(r)/1(b),.90 tok, $55 red:.50(r)/.40(b),.40 tok, $20	337,508,064	1.6%	$320,559,844	2.4%	$0.95
Peak/Off-peak (bus, rail)					
full:1.10(p)/1(o),.90 tok, $55 red:.50(p)/.40(o),.40 tok, $20	336,677,449	1.3%	$321,967,197	2.9%	$0.96
full:1.15/1, .90 tok, $55 red:.50/.40, .40 tok, $20	336,144,773	1.2%	$324,048,032	3.6%	$0.96
full:1.20/1, .90 tok, $55 red:.50/.40, .40 tok, $20	335,666,075	1.0%	$325,990,384	4.2%	$0.97 *

TABLE 3-1 (CONT.)

full:1.25/.90, .90 tok, $60 red:.50/.40, .40 tok, $20	337,823,708	1.7%	$330,405,263	5.6%	$0.98 *
full:1.25/1, .90 tok, $60 red:.50/.40, .40 tok, $20	333,896,335	0.5%	$334,734,245	7.0%	$1.00 *
full:1.25/1, .90 tok, $60 red:.60/.50, .45 tok, $25	326,949,409	-1.6%	$336,859,827	7.7%	$1.03
full:1.30/1.00, .90 tok, $60 red:.50/.40, .40 tok, $20	333,480,176	0.4%	$336,575,578	7.6%	$1.01 *
Peak/Off-peak (bus only)					
full:1.10(p)/1(o),.90 tok, $55 red:.50(p)/.30(o),.40 tok, $20	334,170,729	0.6%	$323,361,945	3.3%	$0.97
full:1.15/1, .90 tok, $55 red:.50/.40, .40 tok, $20	333,316,724	0.3%	$325,810,801	4.1%	$0.98 *
full:1.20/1, .90 tok, $55 red:.50/.40, .40 tok, $20	332,539,910	0.1%	$328,087,088	4.9%	$0.99 *
full:1.25/.90, .90 tok, $60 red:.50/.40, .40 tok, $20	332,852,399	0.2%	$334,416,127	6.9%	$1.00 *
full:1.25/1, .90 tok, $60 red:.50/.40, .40 tok, $20	330,433,649	-0.6%	$337,251,147	7.8%	$1.02
full:1.25/1, .90 tok, $60 red:.60/.50, .45 tok, $25	324,034,337	-2.5%	$339,333,353	8.4%	$1.05
full:1.30/1.00, .90 tok, $60 red:.50/.40, .40 tok, $20	327,803,579	-1.4%	$339,933,222	8.6%	$1.04
Peak/Off-peak (bus only) with stile discount					
full:1.20(p)/1(o),.90 tok,$55 red:.50(p)/.40(o),.40 tok, $20	334,303,868	0.6%	$325,123,161	3.9%	$0.97

* option projected to meet minimum 1990 budget requirement and shows ridership gain

TABLE 3-2: COMPARISON OF PASS OPTIONS

basic fare structure: full: $1.25 (pk), $.90 (off-pk)
reduced: $.60 (pk), $.40 (off-pk)
token: $.90 (full) $.40 (reduced)

Pass Structure type of pass Fare	Price full	 reduced	Change from Base ridership	 revenue	System Avg.
everyday weekday peak only	$60 -- --	$25 -- --	+1%	+6%	$.99
everyday weekday peak only	60 45 --	25 20 --	+1%	+5%	$.97
everyday weekday peak only	60 60 40	25 20 --	+2%	+4%	$.96
everyday weekday peak only	60 45 40	25 20 --	+2%	+2%	$.95
everyday weekday peak only	60 45 40	25 -- --	+2%	+2%	$.95
everyday weekday peak only	50 -- --	25 -- --	+2%	+2%	$.94

3.2 SELECTION OF A GENERAL FARE STRUCTURE

The Selection Process

Once the revenue and ridership impacts had been developed and examined, the next step was to select a single general fare structure; a range of specific options within that structure could then be examined further. This selection took place at a consensus-building meeting of the Task Force. At this meeting, which was led by the consultants and Planning and Research personnel, the pros and cons of the different structures were debated. Implementation and operational issues were revisited, and the revenue and ridership impacts were discussed.

Because of the overriding importance of meeting the revenue target, the structures were first narrowed down to those having at least one specific pricing option that was predicted to meet that target with minimal accompanying loss of ridership. As can be seen in Table 3-1, all but two of the options predicted to meet the revenue target fell into the peak/off-peak categories; the two exceptions, both in the rail premium category, were predicted to result in some ridership loss. Because the peak/off-peak structures apparently offered a much broader range of "acceptable" options, consensus was quickly reached among the Task Force members that the new fare structure should be based on a peak/off-peak differential.

The next decision was thus over the nature of the peak/off-peak structure: bus and rail or bus only. Despite some strong support for the concept of a coinstile discount (or agent booth premium), it was more strongly felt that the implementation/operational problems associated such an arrangement outweighed the potential benefits. Thus, that structure was dropped from further consideration.

In choosing between bus/rail and bus only, the Task Force discussed their relative advantages and disadvantages. It was generally agreed that the bus/rail alternative would be more readily accepted by the riding public -- and probably easier to market. However, the consensus opinion of the Task Force was that alternative also presented far greater implementation and operational problems than did the bus only alternative. As explained in the previous chapter, the most serious problems included 1) the inadequacy of current fare collection hardware and revenue accounting procedures (and computer software) to accommodate differential (by time of day) fares and 2) operational issues associated with ticket agents having to switch between off-peak and peak fares. The Task Force felt that, while a peak/off-peak differential on rail as well as bus would be desirable over the long term, it would be impossible to adequately address these issues in time for a fare restructuring in March or April 1990, and probably impossible even by July 1990.

The Task Force therefore recommended that the peak/off-peak element of the coming fare restructuring be limited to bus, but that the CTA should begin to address the rail-related issues now, with an eye toward implementation of that element at a later date (perhaps as part of the planned 1992 fare change).

The Recommended Structure

The fare structure (the specific fare levels are discussed below) selected by the Task Force can be summarized as follows:

- bus (full fare) -- the cash fare would be higher during weekday AM and PM peak hours than during the off-peak and on weekends; this would mean an increase over the existing $1 base fare in the peak, with the off-peak set at a lower level (perhaps held at the existing $1 level or even reduced to $.95 or $.90); the token (when purchased in a 10-pack) would be priced at a substantial discount from the peak fare, and would either equal the off-peak fare or be slightly lower than the off-peak; however, the token could be used at any time -- peak or off-peak -- thus offering an alternative to paying a fare that would be any higher than the existing fare

- rail (full fare) -- the cash fare on rail at all times would be equal to the peak bus fare; in other words, there would be a rail premium (relative to bus) during the off-peak; however, the token could be used at all times; thus, all riders would have the opportunity to avoid paying the higher fare

- bus (reduced fare) -- the reduced cash fare would be higher during the peak than in the off-peak; however, because of the state's reduced fare subsidy program, it seemed possible to institute a reduced fare that would be lower -- or at least no higher -- than the existing level; for instance, the peak fare could be held at the existing $.50, with the off-peak fare lowered to $.40; the reduced token would be lower than the peak fare, and possibly slightly lower than the off-peak fare as well

- rail (reduced fare) -- the off-peak cash fare would be equal to the peak fare; however, the token could be used at any time

- transfers -- the transfer price would not change (i.e., they would remain at $.25 and $.15, respectively); an issue concerning transferring was raised: riders transferring from rail to bus in the off-peak would be paying more than riders transferring from bus to rail -- due to the bus-rail off-peak differential; nevertheless, it was recommended that there not be a surcharge on rail -- transferring riders making round-trips would effectively break even

- passes (full fare) -- it was recommended that the CTA continue to offer two types of passes to full fare riders; however, it was felt that the 14-day pass should be replaced with a monthly weekday pass; the everyday pass would be priced higher than the existing monthly pass, and thus targeted to people who regularly use CTA on the weekend as well as during the week; the weekday pass would be priced at a lower rate, targeted to people who ride only during the week

- passes (reduced fare) -- it was recommended that a single monthly everyday pass be offered to reduced fare riders

Specific pricing options were subsequently developed for the above structure; these are discussed below.

3.3 RECOMMENDED PRICING OPTIONS

Based on further analysis of the different pricing options under consideration and Task Force policy recommendations on issues such as reduced fare levels and pass pricing, the consultants developed the following specific pricing options for consideration by the Board. The first two options, along with Option 6, just meet the revenue target, while Options 3,4, and 5 produce revenue totals that exceed the target. The options are summarized in Table 3-3.

Option 1

- $0.90 token (10-pack average price)
- $1.20 rail and peak bus full cash fare, $1.00 off-peak bus fare
- $0.45 rail and peak bus reduced cash fare; $0.40 off-peak bus and token fare
- $60 everyday full fare pass, $45 weekday full fare pass, $25 everyday reduced fare pass
- overall average fare = $0.98

This option was estimated to produce about a 0.2 percent annual increase in linked trips, and roughly a 4.1 percent annual increase in fare revenue. This estimate assumed a substantial (over 60 percent) increase in the use of tokens. However, if the switch from cash to tokens were to turn out to be significantly higher, the revenue gain would be smaller. For instance, if the use of tokens were to increase by 250 percent (i.e., to about 25 percent of the total linked trips), it was estimated that the revenue gain associated with this option would be on the order of 3.7 percent, rather than 4.1 percent; on the other hand, such a change would also result in greater ridership growth (roughly 0.5 percent, rather than 0.2 percent). Even if the share of tokens increased to nearly 40 percent, there would still be an estimated 3.6 percent revenue increase (and a 0.6 percent ridership increase). Thus, even if there were a massive shift to token use, it was predicted that a substantial revenue gain would still be possible.

Option 2

- $0.95 token (10-pack average price)
- $1.20 rail and peak bus full cash fare, $0.95 off-peak bus fare
- $0.50 rail and peak bus reduced cash fare; $0.40 off-peak bus and token fare

TABLE 3-3

Proposed CTA Fare Options

To go into effect Spring / Summer, 1990

		Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Current Fare
TOKENS	Full fare, each Sold in packs of 10	90¢	95¢	90¢	95¢	95¢	90¢	95¢
	Reduced fare, each Sold in packs of 20	40¢	40¢	40¢	40¢	40¢	40¢	50¢
	NOTE:	A token will save you money. It can be used for one fare at any time on bus or rail.						
PASSES	Everyday full fare monthly pass	$60.00	$60.00	$60.00	$60.00	$60.00	$55.00	$50.00
	Weekday full fare monthly pass	$45.00	$45.00	$45.00	$45.00	$45.00	None	None
	Everyday reduced fare monthly pass	$25.00	$25.00	$25.00	$25.00	$25.00	$20.00	$25.00
CASH FARES	NOTE:	"Peak" hours are on weekdays, from 6 AM to 9 AM and from 3 PM to 6 PM. "Off peak" hours are at all other times.						
	Full fare, cash Rail and peak bus	$1.20	$1.20	$1.25	$1.25	$1.30	$1.15	$1.00
	Full fare, cash Off-peak bus	$1.00	$.95	$1.00	$.95	$.95	$1.00	$1.00
	Reduced fare, cash Rail and peak bus	45¢	50¢	45¢	45¢	40¢	50¢	50¢
	Reduced fare, cash Off-peak bus	40¢	40¢	40¢	40¢	40¢	40¢	50¢
ANALYSIS	Annual revenue increase Percent $ Million	 4.1% $12.9	 4.1% $12.8	 4.7% $14.8	 4.8% $14.9	 5.3% $16.4	 4.1% $12.8	 -- --
	Annual ridership increase (percent)	0.2%	0.1%	0.1%	0.1%	0.3%	0.3%	--
	Average fare*	$.98	$.98	$.99	$.99	$.99	$.98	$.94
	Cash portion of revenue (percent)	61%	62%	60%	61%	60%	63%	66%

*NOTE: Current average fare on poster was calculated for a different series.

OTHER	Transfers	No changes
	Express Surcharges	Either remain at current 20¢ or increase to 25¢
	Supertransfers	Eliminated
	14-Day Pass	Eliminated

MP-90-006
CTA Marketing

- $60 everyday full fare pass, $45 weekday full fare pass, $25 everyday reduced fare pass
- overall average fare = $0.98

This option was estimated to produce a 0.1 percent increase in annual linked trips, and about a 4.1 percent annual increase in fare revenue. (It should be noted that the peak cash reduced fare in this option was higher than in the others; at $.45, this option did not meet the revenue goal.) At a 40 percent token share, the revenue and ridership increases were estimated to be about 3.3 percent and 0.2 percent, respectively.

Option 3

- $0.90 token (10-pack average price)
- $1.25 rail and peak bus full cash fare, $1.00 off-peak bus fare
- $0.45 rail and peak bus reduced cash fare; $0.40 off-peak bus and token fare
- $60 everyday full fare pass, $45 weekday full fare pass, $25 everyday reduced fare pass
- overall average fare = $0.99

This option was estimated to produce a very small increase in annual linked trips, and about a 4.7 percent annual increase in fare revenue. This estimate assumed a 75 percent increase in the use of tokens. If the use of tokens in this option were to increase to about 25 percent of the total linked trips, it was estimated that the revenue gain associated with this option would be on the order of 4.2 percent -- lower than the 4.7 percent suggested above, but still meeting the revenue goal. Ridership growth in this case would be about 0.3 percent. Under a 40 percent shift scenario, revenue growth would be roughly 4 percent (and ridership growth about 0.4 percent)

Option 4

- $0.95 token (10-pack average price)
- $1.25 rail and peak bus full cash fare, $0.95 off-peak bus fare
- $0.45 rail and peak bus reduced cash fare; $0.40 off-peak bus and token fare
- $60 everyday full fare pass, $45 weekday full fare pass, $25 everyday reduced fare pass
- overall average fare = $0.99

This option was estimated to produce a 0.1 percent increase in annual linked trips, and about a 4.8 percent annual increase in fare revenue. This option predicted a 50 percent increase in token use. If the share of token use were to grow to 25 percent, the estimated

revenue and ridership gains would be 4 percent and 0.4 percent, respectively. At a 40 percent token share, the revenue and ridership increases were estimated to be about 3.8 percent and 0.4 percent, respectively.

Option 5

- $0.95 token (10-pack average price)
- $1.30 rail and peak bus full cash fare, $0.95 off-peak bus fare
- $0.40 rail and peak bus reduced cash fare; $0.40 off-peak bus and token fare
- $60 everyday full fare pass, $45 weekday full fare pass, $25 everyday reduced fare pass
- overall average fare = $0.99

This option was estimated to produce the largest increases in both ridership (primarily due to the low reduced peak fare) and revenue (because of the higher rail/peak bus fare): 0.3 percent and 5.2 percent, respectively. This option assumed a 60 percent increase in token use. At a 25 percent token share, the revenue and ridership increases were estimated to be about 4.4 percent and 0.5 percent, respectively. The 40 percent token share scenario produced estimated ridership gains of 4.1 percent and 0.6 percent, respectively. Thus, even with such a large shift to tokens, this option would still meet the 4.1 percent revenue goal.

Option 6

- $0.90 token (10-pack average price)
- $1.15 rail and peak bus full cash fare, $1.00 off-peak bus fare
- $0.50 rail and peak bus reduced cash fare; $0.40 off-peak bus and token fare
- $55 everyday full fare pass, no weekday full fare pass, $20 everyday reduced fare pass
- overall average fare = $0.98

Only one option that held the rail and peak bus full cash fare increase to $1.15 was able to meet the minimum revenue gain target with no ridership loss. However, this option required dropping the weekday full fare pass (a major loss in potential benefit to commuters) in order to attain the revenue goal. The everyday reduced fare pass would also require pricing at $20 in order to avoid ridership loss. This option was estimated to produce a 0.3 percent increase in annual linked trips, and nearly 4.1 percent in annual fare revenue. This option assumed a 64 percent increase in token use. At a 25 percent token share, the revenue and ridership increases were estimated to be about 3.7 percent and 0.5 percent, respectively. The 40 percent token share scenario produced estimated revenue and ridership gains of 3.6 percent and 0.5 percent, respectively.

3.4. REJECTED OPTIONS

As indicated above, nearly 100 different fare combinations were tested in the fare model. Within the policy framework of the recommended fare structure (e.g., regarding pass types and prices and token prices), less than 10 percent of those combinations were predicted to meet both the ridership and revenue goals. The remaining options typically fell short on either ridership or revenue; few options tested failed on both counts. Among the key findings from testing all of these pricing combinations were the following:

- the type and price levels of monthly passes is a crucial factor in determining ridership and revenue; a single (full fare) pass proved viable only if priced at a very high breakeven level (e.g., a $55 pass has a breakeven level, when compared to a $.90 token + a transfer, of 48 trips per month; a $60 pass has a breakeven level of 52); on the other hand, options involving two passes (e.g., a $60 everyday pass and a $45 weekday pass) were often able to meet the ridership and revenue goals, and would appear to be more reasonable from the rider's point of view

- reduced fare riders have been shown to be extremely sensitive to fare levels; on the other hand, due to the low level of reduced fares relative to full fares, the negative revenue impact of offering low reduced fares is less significant than the positive ridership impact; thus, the recommended options all featured reduced fares that were no higher -- and often lower -- than the existing level

- because of the desire to offer 1) off-peak bus fares significantly lower than peak fares and 2) deeply-discounted tokens, options with peak bus (and all day rail) fares lower than $1.15 did not produce sufficient revenue to warrant inclusion in the set of recommended options

Of course, even in the absence of any of the above factors, the complex interrelationships among all of the fare elements produced many "losing" options. Clearly, achieving simultaneous gains in both revenue and ridership has proved to be extremely difficult in the transit industry. Thus, it is not surprising that only certain combinations of fare and pricing elements can be expected to reach such a goal. Table 3-4 shows examples of the rejected fare options. These options were predicted to either lose ridership or produce less than a 4.1 percent revenue increase.

3.5. SUMMARY

This chapter has summarized the recommended fare structure and specific pricing options that were estimated to be capable of meeting both ridership and revenue goals. The recommended structure featured a peak/off-peak differential on bus only -- rail would remain at the peak level all day; ultimately, however, it was recommended that peak/off-peak be extended to rail as well. Other key elements of the recommended structure included deeply-discounted tokens, two types of full fare monthly passes, and a low reduced fare level.

TABLE 3-4. EXAMPLES OF REJECTED OPTIONS

Fare Categories	Full Fare Level (Reduced Fare Level) 1	2	3	4
Bus				
Peak (cash)	$1.15 ($0.45)	$1.15 ($0.50)	$1.25 ($0.60)	$1.50 ($0.50)
Off-peak (cash)	1.00 (0.40)	1.00 (0.40)	1.00 (0.50)	1.25 (0.40)
Token (10-pack)	0.90 (0.40)	0.90 (0.40)	0.90 (0.45)	0.90 (0.40)
Rail				
Peak (cash)	1.15 (0.45)	1.15 (0.50)	1.25 (0.60)	1.50 (0.50)
Off-peak (cash)	1.15 (0.45)	1.15 (0.50)	1.25 (0.60)	1.50 (0.50)
Token (10-pack)	0.90 (0.40)	0.90 (0.45)	0.90 (0.45)	0.90 (0.40)
Transfer	0.25 (0.15)	0.25 (0.15)	0.25 (0.15)	0.25 (0.15)
Pass				
Everyday	60 (25)	50 (20)	60 (20)	60 (25)
Weekday	45 (--)	-- (--)	-- (--)	45 (--)
Ridership (% Change)	0.5%	0.3%	-2.5%	-2.2%
Revenue (% Change)	3.4%	2.1%	8.4%	8.6%

Regarding actual fare levels, the six options recommended for further consideration had rail/peak bus fares between $1.15 and $1.30, with off-peak bus fares at $1 or $.95 and tokens priced at either $.90 or $.95. Five of the options included a single reduced fare monthly pass remaining at the existing price of $25, and full fare passes priced at $60 and $45. The reduced fare levels varied somewhat, although all were between $.40 and $.50. Three of the options were estimated to produce exactly the target revenue total, while the other three showed revenue increases of between 4.7 and 5.2 percent. All six options were expected to produce small ridership gains.

Finally, because there are clearly uncertainties inherent in any predictive model, the study team conducted sensitivity tests on the fare model's results. These tests revealed that, even with very large shifts from cash fares to tokens (i.e., to a total token share of 40 percent of all rides), all of the recommended options were estimated to produce annual revenue gains of at least 3.3 percent. However, based on experiences in Chicago and elsewhere, coupled with the results of the CTA fare survey (summer, 1989), it was not expected that the shift to tokens would be nearly that great. At a more realistic level -- a 25 percent token share (roughly the level that has been experienced in Toronto) -- three of the options met or came very close to the 4.1 percent revenue goal. Thus, substantial revenue gains were predicted to be possible even with a massive shift to discounted fare mechanisms.

These recommendations represented the result of a process in which the consultant team worked closely with the Task Force in 1) identifying a set of alternative fare structures, 2) studying implementation and operational issues associated with the different structures, 3) developing and running a computer model to predict the revenue and ridership impacts of different fare levels and pricing options, 4) evaluating the different structures and selecting one that best addresses the CTA's needs and goals, and 5) identifying specific pricing options that were expected to meet the CTA's revenue goal for the next year and a half -- without producing a concomitant loss in ridership.

At this point in the project, it was up to the CTA Board of Directors to review the recommended set of options. The hope was that the Board would select one to be presented to the public. The next chapter discusses 1) the process through which a single pricing option was adopted and 2) the process of implementing the new structure.

CHAPTER 4: ADOPTION AND IMPLEMENTATION OF THE NEW FARE STRUCTURE

4.0 INTRODUCTION

This chapter describes 1) the process through which the new fare structure was adopted by the CTA Board, and 2) the effort involved in implementing the adopted structure. The former entailed presenting a range of options to the Board, holding Public Hearings, working out remaining pricing details, and presenting the recommended option to the Board; the Board then voted to adopt the recommended structure. At that point, implementation activities accelerated, so as to meet the April 29 implementation date.

4.1 ADOPTION OF THE NEW FARE STRUCTURE

Presentation of Options to the Board

On January 9, 1990 the Study Team presented the six fare options described in the previous chapter to the CTA Board's Finance, Audit and Budget Committee; these options were all projected to meet the CTA's revenue and ridership goals, but represented a range of "base" fares and different combinations of other pricing elements. The Committee accepted the basic pricing strategies implicit in all of the options (i.e., deep discounting, peak/off-peak differential on bus, bus-rail differential during off-peak hours, and lower fares for reduced fare riders), but declined to select a single preferred option -- or even to eliminate any of the six options prior to public hearings.

This decision significantly complicated the implementation process, in that 1) many procedures could not be initiated until a specific option was adopted, and 2) it meant that the explanation of the fare restructuring proposal to the public would be rather complicated. Nevertheless, the Board felt that all six should be presented for consideration at public hearings.

Public Hearings

CTA staff scheduled the public hearings and prepared presentation materials on both the basic concepts and the details of all six options (Exhibit 1 is a copy of the fare options chart that was distributed before and at the Hearings). Eleven public hearings were held around the CTA service area during the week of January 22-26, 1990. Various members of the CTA Strategic Planning staff served as presenters and moderators; each presenter followed a script that had been prepared for the occasion.

Attendance at the hearings was generally modest, ranging from a low of 15 to a high of 100; total attendance at all of the hearings was 521, for an average of 47 per hearing. Oral

testimony was received from 207 people, or an average of 19 per hearing, while 25 people provided written comments. Many of the oral comments did not pertain directly to fare issues, but rather focused on general complaints about CTA service. In fact, there were virtually no comments on any particular fare option, e.g., favoring one over the others. However, some comments -- both positive and negative -- did address relevant issues. Positive statements supported lower fares during the off-peak and the lowering of reduced fares. Negative statements concerned higher fares in general, the prospect of an increase in the everyday monthly fare price, the elimination of the Supertransfer and the 14-day pass, and the inconvenience of buying and using tokens. Letters of support for the fare change were received from four major civic organizations (CACI, MPC, the Civic Federation, and the Greater State Street Council).

The first day's hearings received both TV and newspaper coverage. The importance of an effective marketing/public education campaign was underscored by the fact that both the media coverage (before and after the hearings) and the public comments invariably described the fare restructuring as a fare "increase." On the other hand, editorials in the Chicago Tribune, Chicago Sun-Times, and Crain's Chicago Business were all supportive of the fare restructuring in general.

In summary, while there was obviously opposition to any increase in cash fares, the relatively small attendance at the public hearings (in contrast, the hearings held earlier the same month for proposed service cuts drew overflow crowds) suggested that the proposed restructuring in general was apparently not widely opposed by the public.

Adoption by the Board

Following the hearings, CTA staff and members of the consultant team conducted additional analyses of the revenue and ridership implications of variations to certain elements of "Fare Option #3" (peak and rail cash fare of $1.25), the option recommended by both staff and consultants. Changes to the token and pass prices were considered, but were not found capable of meeting the revenue and ridership targets. Thus, Fare Option 3 was recommended to the Board exactly as it had been presented to the public (see Exhibit 1). The reasons for recommending that particular option were as follows:

- it was predicted (by the fare model) to achieve the largest shift to prepaid fares -- i.e., resulting in the smallest share of cash payments, and therefore the greatest opportunity to reduce operating costs associated with cash-handling
- it offers fare reductions for all current cash-fare riders because of the decreased price of both full- and reduced-fare tokens
- it provides the highest level of discount between peak bus -- and rail -- cash fares and tokens
- it was found to be most likely to be able to meet the 1990 budget goal even if the shift to token usage were much higher than expected
- its predicted 1990 revenue gain is significantly higher than the 1990 revenue target

While several members of the Board reportedly had reservations over certain elements of the recommended option, these concerns were apparently allayed, as, on February 7, 1990 the Board voted unanimously to adopt the recommended option exactly as presented. This Board meeting was attended by a large and vociferous crowd; the Board members voted as they did despite loud protests from certain members of the audience.

Thus, the Board adopted a fare structure that represents a radical departure for the CTA -- and for large transit systems in general. In this new structure, the CTA is taking a market-segmented approach toward the pricing of its services. The new fares reflect differences in the costs of providing peak vs. off-peak service, as well as differences in service quality -- but at the same time offer a substantial discount for paying in advance.

Resolution of Additional Considerations

Beyond the basic fare structure, it was necessary to resolve several pricing-related considerations. The key issues and their resolution were as follows:

- integration with Pace fare structure -- following a couple of meetings with CTA staff, Pace staff recommended to their Board that Pace "match" CTA's new structure, at least in terms of adopting the $45 weekday-only pass (Pace dropped its everyday pass) and matching the CTA peak fare with transfer

- pricing of Culture Bus -- CTA staff examined the implications of different fare levels, and ultimately recommended a flat fare of $2.50

- disposition of the Sunday Supertransfer -- after considering several alternative strategies, the Fares Policy Task Force recommended eliminating the Supertransfer

- pricing of express surcharges -- following consideration of several options, it was decided that express surcharges should remain unchanged

- need to pay surcharges -- it was decided that a rider using a pass would be able to use all CTA services (as long as his or her pass was valid) without having to pay a surcharge (i.e., no express surcharge or Culture Bus fee)

- fare for Special Service -- it was decided, based on the views of the advisory group, that the fare for Special Services (the demand-responsive service for the disabled) would be increased from $1.00 to $1.25 (at all times)

The adoption of the new structure represented the culmination of the first phase of the fare restructuring effort. With the decision to begin the new fare structure on April 29, 1990, the focus immediately shifted to the second phase: implementation.

4.2 IMPLEMENTATION OF THE NEW FARE STRUCTURE

Implementation Requirements and Responsibilities

The fact that a specific fare structure was not selected until February 7 left time for a very short implementation period. Whereas all of the key implementation steps had been identified and assigned prior to the Board's decision, most of these actions could not actually commence until the details of the new structure had been finalized. The major implementation areas and responsibilities, as identified by CTA staff, were as follows:

- public information -- to be led by the Marketing Department, with input from Operations Planning (Graphics section), Operations (Transportation Administrative Services), Media Relations, and others; includes production, distribution, and posting of signs and bulletins on vehicles and in stations

- marketing -- to be led by the Marketing Department, with input from Strategic Planning, Operations Planning, Transportation Administrative Services, Consumer Affairs; includes communication and promotion of new structure

- training -- to be handled by Transportation Administrative Services, with assistance from others as needed; involves training bus operators (use of peak/off-peak features on farebox, transition between peak and off-peak periods) and revenue accounting personnel (accounting for peak and off-peak revenues separately)

- GFI software modification -- to be handled by Operations Planning; involves completing modifications of software to accommodate ridership and revenue data for peak and off-peak periods

- ridership monitoring -- to be led by Strategic Planning, with assistance from Operations Planning (Schedules section); includes pre-implementation surveys (of pass-buyers and riders in general) and selected bus and rail boarding counts

Once the fare structure was adopted, specific steps and responsibilities were identified.

The Implementation Effort

Despite the complexity of the fare structure changes, coupled with the short time frame, the CTA staff was able to successfully implement the new structure on the designated start date. The keys to the successful implementation were 1) an intensive and cooperative effort on the part of all concerned CTA departments, and 2) the leadership of the CTA's top management.

The Acting Executive Director led the staff in the implementation effort, holding weekly meetings to receive status reports on each individual activity. This level of support was crucial to meeting the various interim -- and the ultimate -- deadlines. The Acting Executive Director's efforts were noteworthy, especially considering that a new Executive Director was scheduled to take over the position on May 1 -- two days after the implementation of the new fare structure.

To facilitate the timely completion of all steps, a detailed schedule and procedure for tracking progress were developed; the focus was on the necessary external contracts (e.g., related to marketing) and those activities or items that required coordination among several departments. Marketing was a crucial element, due to the extent of changes to the fare structure. The key activities and products developed during this eleven week period are summarized below.

Marketing and Market Research

The overall marketing strategy was developed by CTA's marketing department, with input from the study team. The study team produced a memorandum on marketing recommendations; this document suggested a series of specific actions and a schedule for implementation, and identified key issues to be resolved.

The CTA marketing department developed materials aimed at introducing the new fare structure and promoting the use of tokens and passes. These materials were tested in March through an on-board survey and several focus groups involving CTA riders. Following revisions based on the feedback from the market research, 1.5 million brochures were printed; brochures were distributed on each seat of buses and trains (i.e., a "seat drop"), as well as in the TV listing magazines of the two major daily newspapers in Chicago (the Tribune and the Sun-Times) on Sunday, April 15. A radio ad campaign also began in April.

A pre-fare change market research effort was also undertaken, via two surveys: a pass-buyer survey was distributed at pass sale locations in March, and a general travel diary survey was administered on-board CTA vehicles in April. These surveys were designed by CTA staff, with input from the study team. The results are compared, in Chapter 6, to the results of the after survey administered in the Fall of 1990.

Token and Pass Sales

Obviously, a crucial aspect of the implementation process was to introduce appropriate distribution and auditing procedures for tokens and passes under the new structure. The token audit system was planned -- and staff assigned -- in March. The sale of the two types of monthly passes began on April 25. Sales of tokens at the new, lower price began on April 27 at all sales locations; this day was marketed as "Token Day." The token distribution process was improved -- both to rail stations and outside sales locations -- so as to quickly replenish stock at sold-out locations.

Unfortunately, these changes did not prevent problems with maintaining sufficient token stock at many locations on the first day of the new structure. However, these problems were addressed by the following day. One source of problems was the fact that new token-wrapping machinery and token vending machines that had been ordered were not in place by the fare implementation date, due to manufacturer delays.

Other Actions

A range of other actions also had to be coordinated and completed before April 29. These included the following:

- training procedures for bus operators and ticket agents regarding the new structure were developed and implemented
- public outreach employees (RTA Travel Center and CTA Consumer Affairs) were trained to answer questions regarding the new structure
- all fare equipment was reset to the new price levels, and informational signs were posted in stations and on buses
- software revisions addressing basic bus fare box data, rail ridership and revenue data, and pass sales information were completed; however, additional revisions to the bus farebox reporting software still had to be completed

The Transition to the New Fare Structure

Through the above efforts, coupled with the cooperation of the riding public, CTA staff was able to effect a smooth transition from the old fare structure to the new one. The aforementioned token distribution problem notwithstanding, the changeover went remarkably well. There was minimal confusion on the part of riders and little confrontation between riders and CTA employees over the new fares. Based on a survey of riders on the first day of the new structure, it was estimated that 85-90 percent of riders were aware of the new structure and had chosen their preferred method of payment. This suggests that the marketing campaign was very successful in disseminating the necessary information. Thus, the CTA, aided by the consulting team, was able to successfully develop and implement a market-oriented fare structure that would offer riders a range of fare options. The remainder of this report discusses the results of this restructuring.

CHAPTER 5: RIDERSHIP AND REVENUE IMPACTS

5.0 INTRODUCTION

This chapter and Chapter 6 present the evaluation of the CTA's consumer-based fare restructuring. The purpose of the evaluation is to assess and document the new fare structure's impacts on ridership, revenue, and travel behavior. The key evaluation issues can be summarized as follows:

- What are the impacts of the fare restructuring on the average fare paid?
- What are the ridership impacts of the fare restructuring (system-wide and by market segment)?
- What are the fare revenue impacts of the restructuring (system-wide and by market segment)?
- What is the nature of changes in individuals' travel behavior -- and fare payment methods -- as a result of the fare restructuring?
- How effective were the marketing procedures for the fare restructuring?

The first three issues are addressed in this chapter; the latter two are discussed in the next chapter.

5.1 IMPACTS OF RESTRUCTURING ON FARE LEVELS

Of perhaps greatest significance in the April 1990 fare restructuring is the fact that riders purchasing a ten-pack of tokens pay a lower fare (per token) than both the previous cash and token prices. Buyers of the new weekday pass also pay less than they did for the old monthly pass. Reduced fare riders experienced fare price decreases for both cash and token usage. The restructuring resulted in a fare increase only for those full fare rail and peak bus riders opting to pay cash, as well as buyers of the everyday pass. Off-peak full fare bus riders paying cash and reduced fare pass buyers experienced no change in fare level. The changes in the fare levels are summarized in Table 5-1.

Table 5-1 also shows the impact of the restructuring on the average fare paid, i.e., based on the actual distribution of fare payments. As indicated on the table, the average fare is up about 7 percent (per unlinked ride) for all full fare riders, while for reduced fare riders the average fare has dropped by about 8 percent. The average pass price is up

TABLE 5-1

CHANGES IN PRICING FROM RESTRUCTURING

FARE CATEGORY	FULL FARE PRICE	REDUCED FARE PRICE
RAIL CASH, ALL DAY	UP 25%	DOWN 10%
BUS CASH, PEAK	UP 25%	DOWN 10%
BUS CASH, OFF-PEAK	NO CHANGE	DOWN 20%
TOKEN	DOWN 5%	DOWN 20%
EVERYDAY PASS	UP 20%	NO CHANGE
WEEKDAY PASS	DOWN 10%	--
AVERAGE CASH FARE*	UP 5%	DOWN 11%
AVERAGE PASS PRICE	UP 16%	NO CHANGE
OVERALL AVERAGE FARE*	UP 7%	DOWN 8%

*AVERAGE FARE PER UNLINKED RIDE

considerably -- 16 percent -- and, as is discussed below, the sale of everyday monthly passes (full fare) has dropped commensurately. The number of riders paying cash has also fallen, in line with the price increase. However, a tremendous increase in token usage, coupled with significant growth in reduced fare demand, produced a modest overall gain in ridership in the eight months following the restructuring.

The remainder of this chapter examines the impact of the fare restructuring on CTA's ridership and revenue; the period covered by this review is calendar year 1990, with the major focus on the eight-month period beginning with the fare change (May 1990) through the end of the year. The patterns during this period are reviewed, and the figures during this period are compared to those for the corresponding months in 1989. The chapter also includes a comparison of the predicted market segment ridership impacts with the actual impacts.

In looking at ridership, both systemwide trends and impacts within the following market segments are examined:

- fare category (full vs. reduced)
- payment method (cash vs. token vs. pass)
- mode (bus vs. rail)
- day of week (weekday vs. weekend) and time of day (peak vs. off-peak)

Revenue impacts are reviewed in terms of source (farebox vs. pass sales). The section on revenue impacts also examines pass sale trends and pass usage.

The major source of the information in this chapter is CTA ridership and revenue data, as reported in the monthly "Ridership Fact Sheets" and summarized in the 1990 Ridership Review (May 1991).

5.2 RIDERSHIP IMPACTS

One of the major goals of the fare restructuring was to avoid the ridership loss typically accompanying a revenue-generating fare change. It is thus necessary to measure the impact of the restructuring on overall system ridership. However, because of the market orientation of this restructuring, it is also useful to consider the impact on individual market segments.

Systemwide Trends

Table 5-2 summarizes the shifts among the different fare categories, in terms of the percent increase (or decrease) for each period in 1990 as compared with the same period in 1989. As indicated, there was a small systemwide ridership increase (0.1 percent) for the whole year. While most of this increase occurred prior to the fare restructuring, a slight

TABLE 5-2

1990 RIDERSHIP SHIFTS

PERCENT CHANGE COMPARED WITH SAME PERIOD IN 1989

	BUS				RAIL				SYSTEM			
1990 PERIOD	FULL FARE	REDUCED FARE	PASSES/ PERMITS	TOTAL	FULL FARE	REDUCED FARE	PASSES/ PERMITS	TOTAL	FULL FARE	REDUCED FARE	PASSES/ PERMITS	TOTAL
1	6.9%	-7.1%	-2.0%	1.0%	1.0%	-8.0%	-2.4%	1.0%	4.9%	-7.2%	-2.1%	1.0%
2	10.6%	-8.7%	-0.2%	3.2%	6.0%	-8.4%	-1.0%	4.1%	9.1%	-8.6%	-0.4%	3.4%
3	10.3%	-2.4%	-1.2%	3.2%	6.2%	-4.3%	-2.1%	3.6%	8.9%	-2.6%	-1.4%	3.3%
4	12.9%	-10.8%	-10.8%	0.2%	5.0%	-9.7%	-11.4%	0.5%	10.0%	-10.7%	-10.9%	0.2%
5	9.8%	-4.3%	-21.0%	-2.3%	2.2%	-6.3%	-13.1%	-3.2%	7.2%	-4.5%	-19.1%	-2.5%
6	12.9%	1.7%	-15.9%	-0.8%	4.3%	-2.1%	-15.0%	-2.2%	9.9%	1.3%	-15.7%	-1.2%
7	13.9%	9.8%	-16.2%	-0.5%	7.1%	5.4%	-15.7%	-0.9%	11.5%	9.2%	-16.1%	-0.6%
8	11.4%	8.3%	-17.0%	-2.1%	4.9%	5.0%	-17.3%	-1.8%	9.1%	7.8%	-17.1%	-2.0%
9	11.0%	12.1%	-14.7%	0.4%	4.2%	3.6%	-17.8%	-2.2%	8.7%	11.1%	-15.5%	-0.3%
10	9.3%	16.1%	-14.9%	0.6%	3.4%	2.8%	-17.6%	-2.7%	7.3%	14.6%	-15.6%	-0.2%
11	9.9%	11.7%	-15.7%	-0.5%	4.0%	4.0%	-19.3%	-3.2%	7.9%	10.9%	-16.6%	-1.2%
12	9.8%	23.7%	-15.1%	1.2%	6.8%	16.1%	-19.4%	-1.3%	8.8%	22.8%	-16.2%	0.6%
ANNUAL TOTAL	10.8%	3.6%	-12.1%	0.4%	4.6%	-0.4%	-12.6%	-0.7%	8.7%	3.2%	-12.2%	0.1%

SOURCE: CTA 1990 RIDERSHIP FACT SHEETS

gain was experienced in December. Ridership (unlinked) for 1990 totaled 568.4 million, as compared to 567.9 million for 1989.

As indicated in the CTA's 1990 Ridership Review, the pre-restructuring ridership gain (particularly in February and March) over the previous year is not readily explainable, other than perhaps by 1) an especially mild winter and spring, and 2) the fact that mandatory Illinois automobile insurance began, with strong enforcement and widespread publicity, at the beginning of the year. However, this increase was apparently temporary, as it had largely disappeared by the time the new structure was implemented: the 1990 ridership figure for April 1990 -- the month before the fare change -- was just barely above the April 1989 figure, and substantially lower than the February and March numbers.

While ridership suffered a relatively significant drop in the first month of the new structure, the magnitude of the loss (compared to the previous year) in the next couple of months was smaller than in May. Then, except for more substantial drops in August and November, the percent decrease for the remaining months was progressively smaller; this trend culminated in the gain in December. For Periods 5 - 12 (May - December) alone, there was a 0.9 percent loss in system ridership.

The overall loss is primarily attributable to a major drop in Sunday ridership; weekday ridership actually experienced a small gain. Thus, while there was a small overall ridership loss following the fare restructuring, it must be viewed within the context of the focus of the new structure, which was targeted toward increasing weekday demand. Given the typical impact of fare changes -- significant ridership losses -- these results are quite positive.

Ridership Trends by Day of Week

The impact of the restructuring has been quite different on weekends than on weekdays. The impact on weekdays vs Sundays is summarized in Table 5-3 (The impact on Saturdays has been similar to that for weekdays, and is not examined here). As shown, there was an average increase per period of 1.5 percent in weekday ridership in the eight months following the fare restructuring.

In contrast, Sundays experienced a very large ridership loss following the fare change -- an average decrease of nearly 17 percent per month. This loss is attributable to two major factors: 1) the elimination of the Supertransfer, which had allowed unlimited riding with a single $1.75 ticket all day on Sundays; and 2) lower weekend pass usage (due in part to the introduction of the weekday-only pass). Thus, as indicated in the table, these changes resulted in a major shift on Sundays from pass and transfer to cash and token. There has also been a shift to cash and token on weekdays, but not nearly as great as on Sundays. On the other hand, Sunday revenue was considerably higher after the change. The CTA had decided to eliminate the Supertransfer as part of the overall fare restructuring, chiefly as a means of controlling abuse (i.e., passing the transfer on to others); the accompanying ridership loss was expected. Thus, the impact on Sunday ridership must be kept in mind in considering the fact that there was an overall systemwide loss.

Ridership Trends by Fare Category

The breakdown of ridership patterns by fare category -- full fare cash/token vs. reduced fare cash/token -- is summarized in Table 5-2 and shown graphically in Figure 5-1. As indicated, both full and reduced fare ridership experienced an increase following the fare restructuring. As shown in Table 5-3, reduced fare cash and token ridership was, on average, more than 9 percent higher per month after the fare change than before. In the full fare cash and token category, the average monthly increase over the pre-restructuring period was nearly 9 percent.

It is noteworthy that the reduced fare difference (1990 vs. 1989) generally increased during the eight months following the restructuring; this can be clearly seen in the graph. The impact on the reduced fare market is especially positive, in light of the steady loss of riders in this group over the past three years. Reversing this trend was one of the major goals of the restructuring.

In contrast to the escalating reduced fare market, the full fare difference remained fairly steady over the eight months, and, in fact, stayed at the same general level after the restructuring as it had in the three months leading up to the change. However. the composition of this category changed dramatically as a result of the restructuring, as is discussed in the next section.

Ridership Trends by Payment Method

Beyond the overriding goal of increasing revenue without losing ridership, the CTA sought to reduce the use of cash -- particularly dollar bills -- in the payment of fares. By shifting riders from cash to tokens or passes, the Authority would reduce 1) the substantial cost of handling cash; and 2) the possibilities for theft on the part of agents and other personnel. Regarding the former point, for instance, the CTA has determined that it costs more than 11 times as much to process dollar bills as it does to process the same dollar amount of coins.

If all prepayment methods (passes and tokens) are taken together, the CTA has clearly achieved its goal of reducing the amount of cash in the system (i.e., other than paying for the passes and tokens). This is shown by the fact that cash fare ridership is down by nearly 30 percent; since overall ridership is down less than 1%, most of these riders have clearly switched to tokens or passes. The switch to prepayment has resulted in a monthly decrease in dollar bills of over 10 percent.

Thus, the fare restructuring has resulted in a significant shift among fare payment methods at the CTA. However, while one prepayment method, token, experienced much greater usage, usage of the other, the monthly pass, dropped significantly. There has been a major shift of both cash and pass users to token. As shown in Table 5-4, the use of tokens increased by 273 percent (average per period for the 5th-12th period) in the post-restructuring period, and represented an average of over 17 percent per month of all trips. For full fare riders only, the increase in token usage was over 360 percent, as compared to under 65 percent for reduced

TABLE 5-3

WEEKDAY VS. SUNDAY RIDERSHIP IMPACTS (5TH-12TH PERIODS)

	% CHANGE FROM SAME PERIOD, 1989		
CATEGORY	AVERAGE WEEKDAY *	AVERAGE SUNDAY	PERIOD AVERAGE
FULL FARE CASH/TOKEN	5.9%	41.0%	8.8%
REDUCED FARE CASH/TOKEN	8.1%	23.9%	8.9%
PASS/PERMIT	-13.4%	-32.2%	-16.4%
TRANSFERS RECEIVED	8.1%	-39.7%	2.3%
SYSTEM RIDERSHIP	0.7%	-17.5%	-0.9%

* THE SYSTEM RIDERSHIP CHANGE WAS INITIALLY REPORTED IN 1990 AS +1.5%, BUT WAS REVISED UPON REVIEW AND FINAL VALIDATION OF OFFICIAL RIDERSHIP FIGURES. THE SLIGHT DECREASE IS DUE TO THE PRELIMINARY NATURE OF THE INITIAL WEEKDAY/WEEKEND RIDERSHIP SPLIT.

FIGURE 5-1

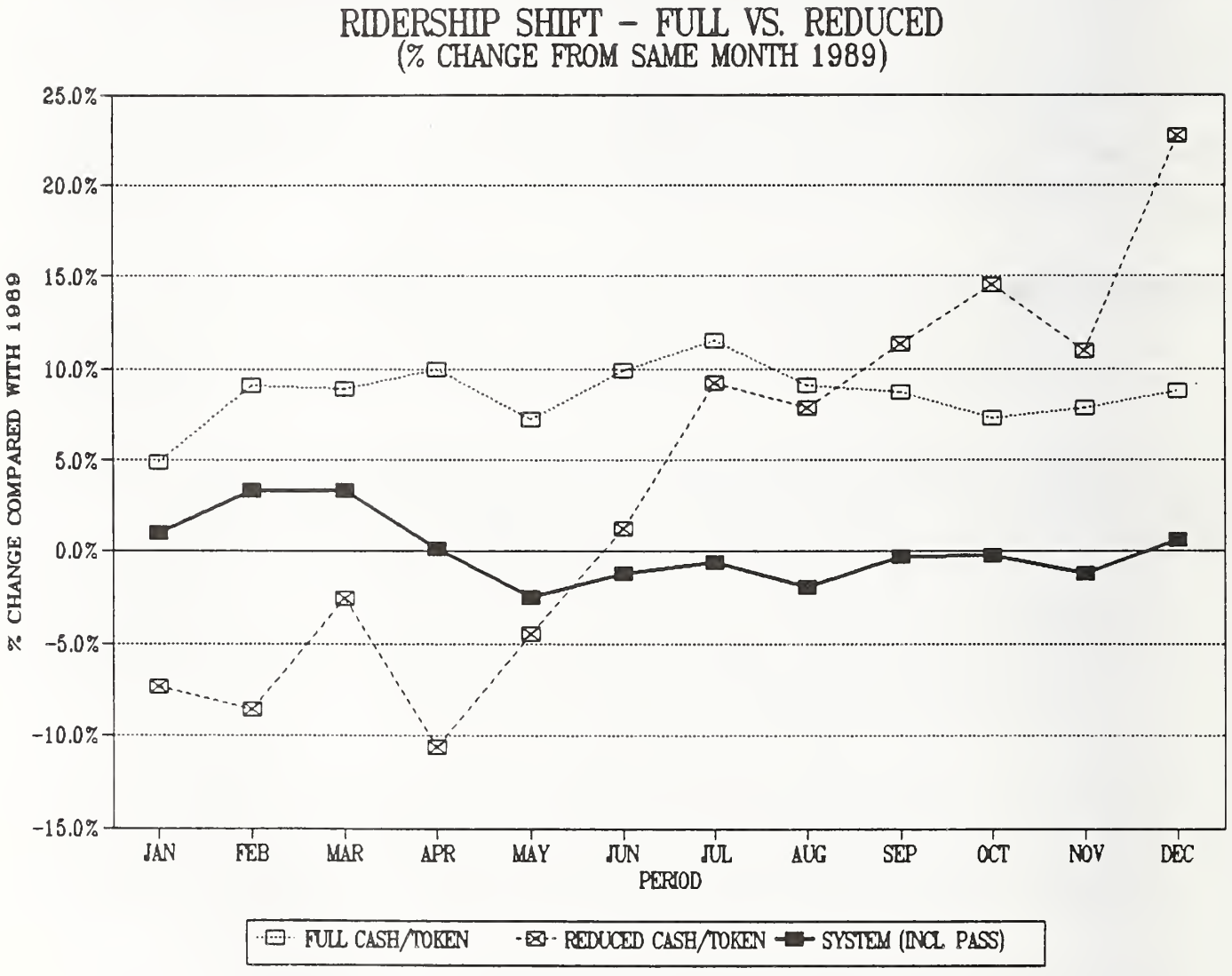

RIDERSHIP SHIFT - FULL VS. REDUCED
(% CHANGE FROM SAME MONTH 1989)
% CHANGE COMPARED WITH 1989
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
-5.0%
-10.0%
-15.0%
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
PERIOD
FULL CASH/TOKEN
REDUCED CASH/TOKEN
SYSTEM (INCL. PASS)

TABLE 5-4

SUMMARY OF WEEKDAY RIDERSHIP IMPACTS BY PAYMENT METHOD (5TH-12TH PER.)

	% CHANGE COMPARED WITH SAME PERIOD IN 1989		
PAYMENT METHOD	FULL FARE	REDUCED FARE	TOTAL
TOKEN	367%	65%	273%
CASH	-31%	-7%	-27%
PASS	NA	NA	-13%
TRANSFERS RECEIVED	NA	NA	8%
OVERALL CASH & TOKEN	6%	8%	6%

fare riders. On the other hand, the loss of cash riders was much greater for the full fare market: more than 30 percent per month as compared to 7 percent for the reduced fare market.

As indicated in the table, both cash and pass usage dropped significantly following the change (an average of 27 and 13 percent, respectively, per month when compared to 1989). The drop in cash usage is not at all surprising, given the fact that the cash fare for rail riders and peak bus users increased by 25 percent. The pass impact is more complicated, given the availability of two types of monthly passes -- one priced higher than the previous monthly pass, one lower -- coupled with the discontinuance of the 14-day pass available prior to the restructuring; pass usage is discussed further in Section 5.4. The shift among payment methods in general is addressed further in Chapter 6, based on the survey results.

Ridership Trends by Mode

The impact of the restructuring on ridership by mode is shown in Table 5-2 and Figure 5-2. As indicated, bus ridership experienced an increase during 1990 (0.4 percent per period for the whole year) as compared to 1989, while rail ridership suffered a loss (0.7 percent). As shown, rail experienced losses relative to 1989 in all eight post-restructuring months, while bus showed increases in three of the last four months of the year.

Assessing the impact on bus ridership is complicated by the fact that a peak/off-peak differential on bus cash fares was introduced as part of the restructuring; rail cash fares were set at a single level throughout the day. Table 5-5 summarizes the peak vs. off-peak breakdown of bus ridership for the eight post-restructuring periods. As indicated in the table, off-peak usage accounted for more than half of CTA's bus ridership following the restructuring. However, ridership experienced a general shift toward the peak over the course of the eight months.

Thus, the CTA was largely successful in meeting its goal of avoiding a loss of ridership following the fare restructuring. The relatively large drop in Sunday ridership created a slight overall system decline in usage, and the use of monthly passes dropped significantly. By contrast, weekday ridership was up over the comparable period in 1989. Travel behavior impacts, as gleaned from the surveys of CTA riders, are discussed in the next chapter.

5.3 REVENUE IMPACTS

Systemwide Trends

While avoiding a loss of ridership was a major goal of the restructuring, the most important goal was to meet the revenue target established by the CTA. As explained earlier, the CTA's revenue target for the fare restructuring was 4.1 percent additional fare revenue -- over the previous year's total -- for the twelve months following the change. The revenue shifts (as compared to the same period in 1989) for 1990 are summarized in Table 5-6. As shown, the revenue from the farebox (cash and tokens) and pass sales for the whole year were up by 5.4 percent (or approximately $17 million) over 1989; the total fare revenues for 1990 were $335.7 million. The average increase over 1989 for Periods 5 - 12

FIGURE 5-2

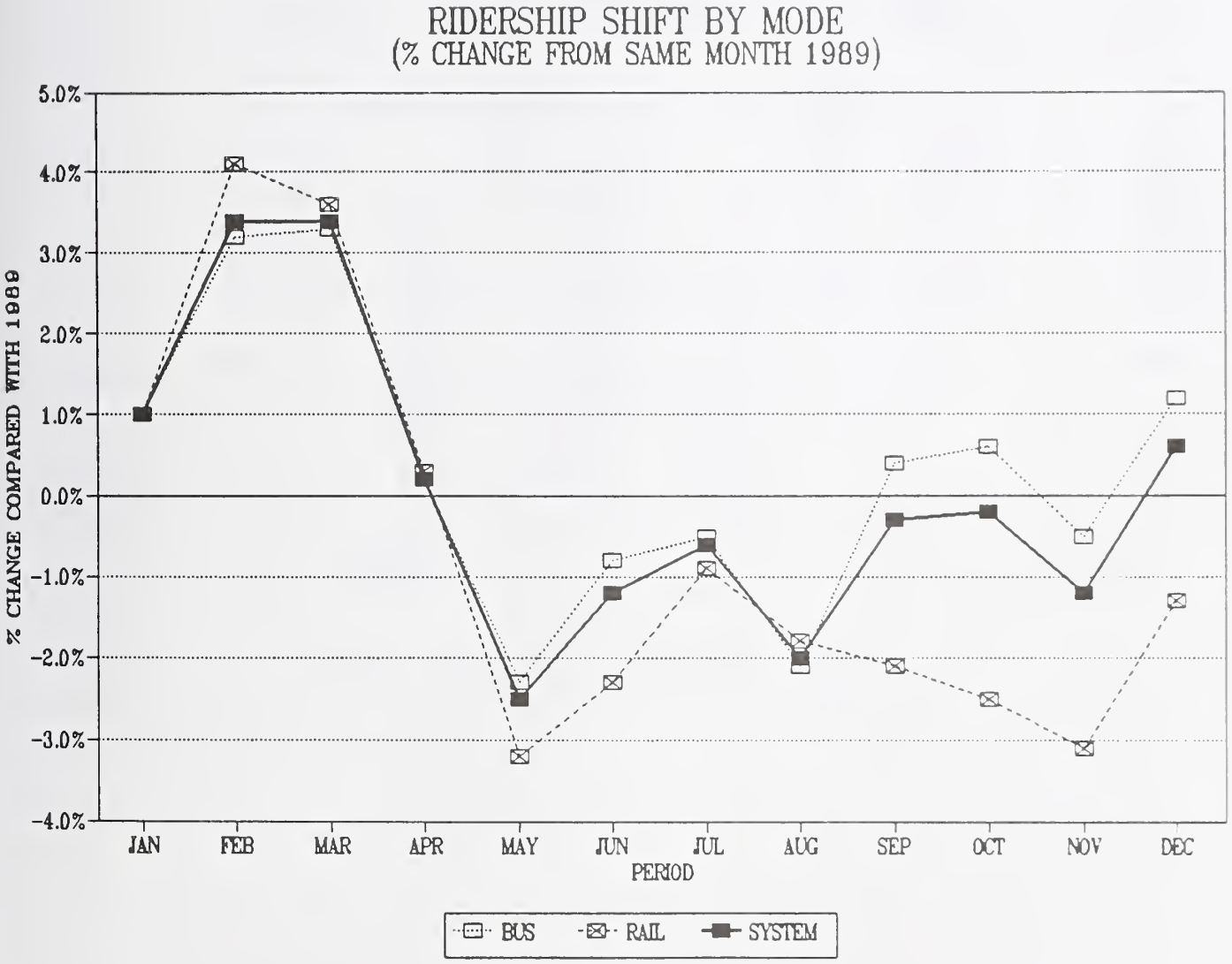

RIDERSHIP SHIFT BY MODE
(% CHANGE FROM SAME MONTH 1989)
% CHANGE COMPARED WITH 1988
5.0%
4.0%
3.0%
2.0%
1.0%
0.0%
-1.0%
-2.0%
-3.0%
-4.0%
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
PERIOD
BUS
RAIL
SYSTEM

TABLE 5-5

BUS SYSTEM RIDERSHIP - PEAK VS. OFF PEAK (5TH-12TH PERIODS)

RIDERSHIP (000)

PERIOD	PEAK RIDERSHIP	(%)	OFF PEAK RIDERSHIP	(%)	TOTAL RIDERSHIP
MAY	14,285	42%	19,656	58%	33,941
JUN	15,639	48%	17,070	52%	32,709
JUL	11,249	46%	13,188	54%	24,437
AUG	11,583	46%	13,489	54%	25,072
SEPT	16,276	49%	16,626	51%	32,902
OCT	14,129	51%	13,730	49%	27,859
NOV	12,923	50%	12,867	50%	25,790
DEC	15,345	49%	16,252	51%	31,597
AVG	13,929	48%	15,360	52%	29,288

TABLE 5-6

1990 PASSENGER REVENUE SHIFTS

1990 PERIOD	PERCENT CHANGE COMPARED WITH SAME PERIOD IN 1989 FAREBOX	PASSES	TOTAL REVENUE
JAN	3.6%	1.2%	3.0%
FEB	7.4%	3.3%	6.3%
MAR	6.5%	1.4%	5.3%
APR	5.3%	-10.5%	1.5%
MAY	11.5%	-7.6%	7.0%
JUN	12.1%	-7.1%	7.6%
JUL	14.3%	-8.7%	9.2%
AUG	12.0%	-20.6%	4.3%
SEP	12.2%	-12.9%	6.6%
OCT	10.3%	-16.0%	4.2%
NOV	10.1%	-13.0%	4.6%
DEC	11.9%	-16.3%	5.2%
ANNUAL TOTAL	9.8%	-8.8%	5.4%

SOURCE: CTA "1990 RIDERSHIP REVIEW"

was a 6.1 percent gain; thus, the target was exceeded by nearly 50 percent during the first eight months of the new structure. As indicated on the table, farebox revenue growth (fueled by the massive increase in token sales) accounts for the increase, since pass revenue was considerably lower than in the previous year.

It should be noted, of course, that the revenue totals for January - April 1990 were already running somewhat higher than in the same months in 1989. However, the average increase for Periods 1 - 4 was 4 percent, or 50 percent less than the post-restructuring average. Furthermore, as can be seen in Figure 5-3, the percentage increases had been declining between February and April. This trend reversed following the fare restructuring, as the percentage increases were higher in each of the next three periods. The percentage increases were no lower than 4.2 percent during any of the eight post-restructuring periods. Thus, the restructuring enabled the CTA to meet -- and exceed -- its revenue target for the year: the budgeted passenger revenue total for 1990 was exceeded by 3.2 percent ($10.4 million).

Perhaps the most significant revenue-related impact, however, was in the distribution of revenue sources. As shown in Table 5-6 and Figure 5-3, pass revenue experienced a fairly steady decline during the eight months, while cash and token revenues were considerably higher than before the restructuring. As is discussed further in the following section, pass sales had been declining before the restructuring, but the new fare structure apparently accelerated the decline. Regarding the relative percentages of individual revenue sources, by the end of 1990, tokens represented nearly 25 percent of total revenue -- up from 7 percent at the beginning of the year. Passes, on the other hand dropped from approximately 25 percent of the total to less than 17 percent at the end of the year. Cash fell from 69 to 58 percent of all revenues. Thus, the overall percentage of revenue from prepayment was significantly affected by the restructuring, and the split between token and pass changed substantially; as indicated earlier, the percentage of ridership using prepayment did increase, however.

Thus, the effective mix of available fare payment methods has allowed the CTA to exceed its revenue goal, without suffering the significant loss of ridership that would normally accompany such a fare change. On the other hand, there was substantial ridership loss in one major market segment that was expected to show a gain: pass users. The next section explores the impact of the restructuring on this market.

Pass Sale Trends

Number of Passes Sold

The trends in the sale of the different types of CTA passes for 1989 and 1990 -- for January through December -- are presented in Table 5-7. However, it must be kept in mind in examining these figures that those for the periods before the restructuring include the absolute numbers of 14-day passes sold. Table 5-8 and Figure 5-4 show the "monthly equivalent" total sales for the two years; in this table, 14-day passes were converted to monthly equivalents, i.e., representing the average of the number sold in each two-week period of the month.

FIGURE 5-3

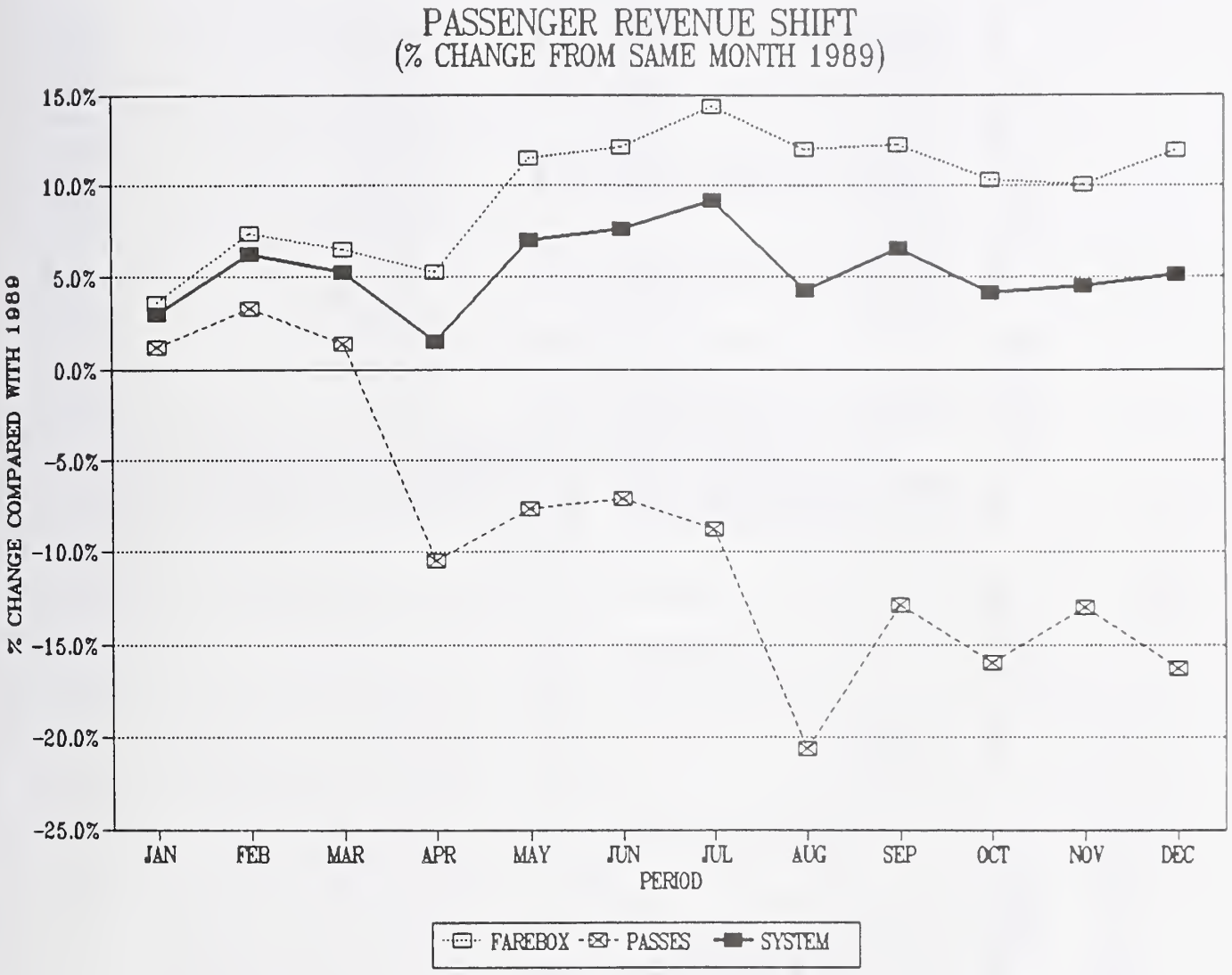

PASSENGER REVENUE SHIFT
(% CHANGE FROM SAME MONTH 1989)
% CHANGE COMPARED WITH 1989
15.0%
10.0%
5.0%
0.0%
-5.0%
-10.0%
-15.0%
-20.0%
-25.0%
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
PERIOD
FAREBOX
PASSES
SYSTEM

TABLE 5-7

PASS SALES: NUMBERS OF PASSES SOLD (1990 VS. 1989)

	EVERYDAY			WEEKDAY			14-DAY			TOTAL FULL FARE			REDUCED			OVERALL TOTAL		
MONTH	1990	1989	CHANGE	1990	1989	CHANGE	1990	1989	CHANGE	1990	1989	CHANGE	1990	1989	CHANGE	1990	1989	CHANGE
JAN	76616	78832	-2.8%	0	0	NA	60374	56796	6.3%	136990	135628	1.0%	22549	22271	1.2%	159539	157899	1.0%
FEB	81585	83107	-1.8%	0	0	NA	60491	59341	1.9%	142076	142448	-0.3%	22946	22445	2.2%	165022	164893	0.1%
MAR	84260	87025	-3.2%	0	0	NA	59367	59323	0.1%	143627	146348	-1.9%	23284	22923	1.6%	166911	169271	-1.4%
APRIL	82663	87219	-5.2%	0	0	NA	56011	82917	-32.4%	138674	170136	-18.5%	23385	23412	-0.1%	162059	193548	-16.3%
MAY	59520	85985	-30.8%	42966	0	NA	0	57817	NA	102486	143802	-28.7%	24321	23799	2.2%	126807	167601	-24.3%
JUNE	55610	82175	-32.3%	38087	0	NA	0	58926	NA	93697	141101	-33.6%	24275	23771	2.1%	117972	164872	-28.4%
JULY	50271	73808	-31.9%	33154	0	NA	0	59569	NA	83425	133377	-37.5%	23595	23032	2.4%	107020	156409	-31.6%
AUG	48600	75781	-35.9%	34139	0	NA	0	60471	NA	82739	136252	-39.3%	23748	23265	2.1%	106487	159517	-33.2%
SEPT	49275	79874	-38.3%	34150	0	NA	0	54299	NA	83425	134173	-37.8%	23909	23503	1.7%	107334	157676	-31.9%
OCT	50705	84217	-39.8%	39086	0	NA	0	88589	NA	89791	172806	-48.0%	24417	23684	3.1%	114208	196490	-41.9%
NOV	50705	85194	-40.5%	38980	0	NA	0	62165	NA	89685	147359	-39.1%	24442	23885	2.3%	114127	171244	-33.4%
DEC	47500	77296	-38.5%	32202	0	NA	0	60983	NA	79702	138279	-42.4%	23903	23616	1.2%	103605	161895	-36.0%
TOTAL	737310	980513	-24.8%	292764	0	NA	236243	761196	NA	1266317	1741709	-27.3%	284774	279606	1.8%	1551091	2021315	-23.3%
AVG.	61443	81709	-24.8%	36596	0	NA	59061	63433	NA	105526	145142	-27.3%	23731	23301	1.8%	129258	168443	-23.3%

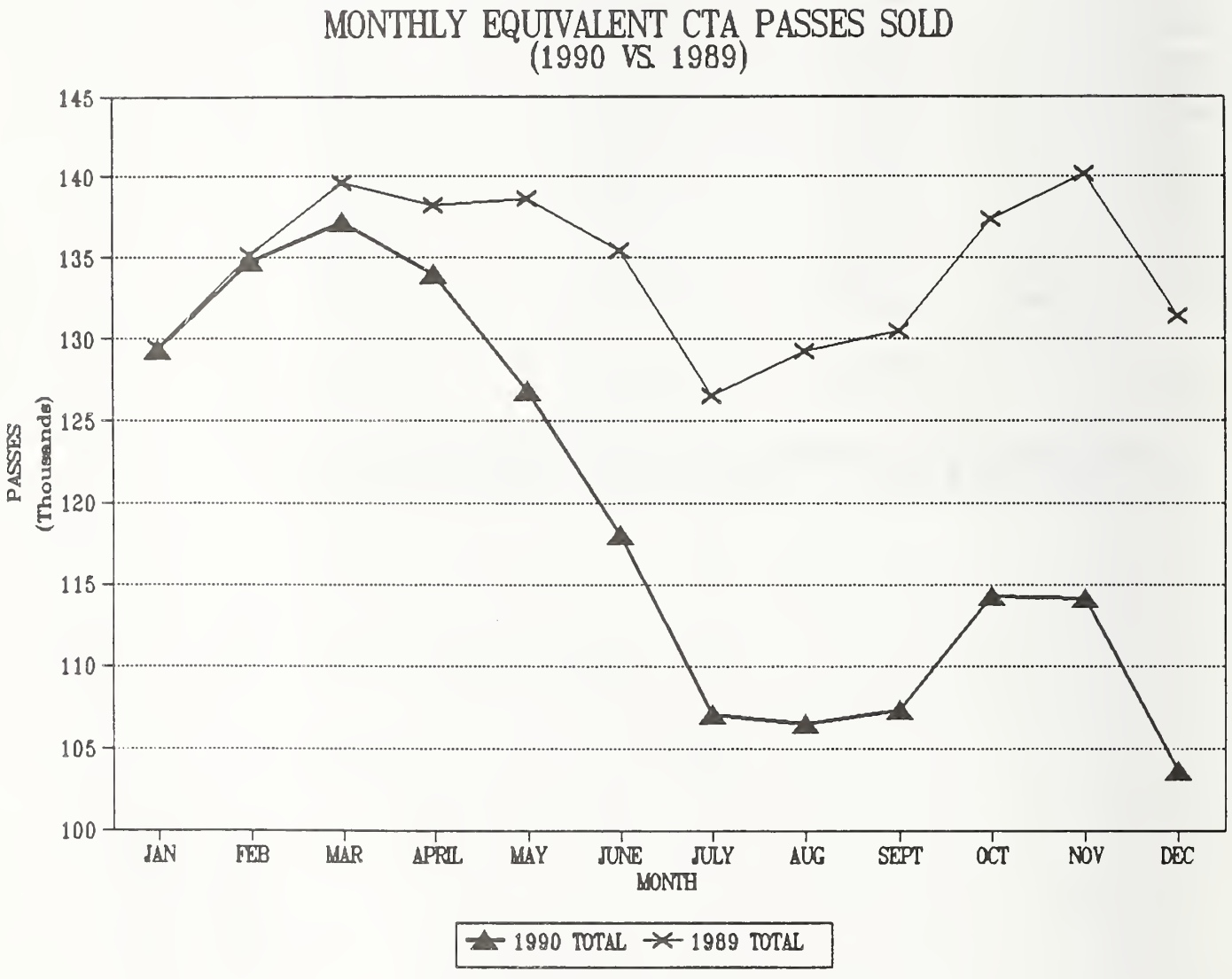
TABLE 5-8

MONTHLY EQUIVALENT PASS SALES*

MONTH	1990	1989	CHANGE
JAN	129352	129501	-0.1%
FEB	134777	135223	-0.3%
MAR	137228	139610	-1.7%
APRIL	134054	138270	-3.0%
MAY	126807	138693	-8.6%
JUNE	117972	135409	-12.9%
JULY	107020	126625	-15.5%
AUG	106502	129282	-17.6%
SEPT	107334	130527	-17.8%
OCT	114208	137431	-16.9%
NOV	114128	140162	-18.6%
DEC	103605	131404	-21.2%
TOTAL	1432987	1612137	-11.1%
AVG.	119416	134345	-11.1%

*14-DAY PASS SALES CONVERTED TO MONTHLY EQUIVALENT:
AVG. OF PASSES SOLD IN EACH TWO-WEEK PERIOD OF MONTH

FIGURE 5-4


MONTHLY EQUIVALENT CTA PASSES SOLD
(1990 VS. 1989)
PASSES
(Thousands)
145
140
135
130
125
120
115
110
105
100
JAN
FEB
MAR
APRIL
MAY
JUNE
JULY
AUG
SEPT
OCT
NOV
DEC
MONTH
1990 TOTAL
1989 TOTAL

As shown in both tables, the 1990 pass sales had been dropping prior to the fare restructuring. However, as suggested above, it would appear that the restructuring accelerated the decline, at least at first. While the 1989 trend between May and December displays a very similar pattern to that in 1990, the rate of decline in the first two periods after the restructuring was greater than during the same two periods in the previous year. Between August and November, on the other hand, the patterns for the two years are quite similar; this is shown in Table 5-8, as the percentage difference between the 1990 and 1989 monthly totals remained fairly steady (roughly 17-18% lower in 1990 for each month). The difference increased, however, in December, which was marked by the smallest pass sale total of the two years in question. Thus, the rate of decline after the restructuring had stabilized -- at least until December -- although the number of passes sold was considerably lower than in the corresponding months before the fare restructuring.

As indicated in Table 5-7, the reduced fare pass sales were actually slightly higher in 1990 than in 1989. This difference increased slightly since the fare restructuring. The source of the drop in overall sales is thus full fare passes, and these are the focus of the remainder of the review of pass sales trends.

The change in the pass structure beginning in May 1990 was as follows:

- elimination of the 14-day pass
- creation of the Weekday-only monthly pass, priced at $45
- increase in the price of the Everyday monthly pass from $50 to $60

As suggested in Table 5-7, there has been a substantial amount of shifting among the pass categories. As discussed earlier, there has also been substantial shifting between fare payment methods (e.g., from pass to token). In looking at Table 5-7, it is apparent that the weekday-only pass has attracted some buyers from both the everyday and 14-day pass markets. However, the weekday pass has undoubtedly also attracted new pass buyers, i.e., riders who formerly paid cash. They seldom use the CTA on weekends, but take sufficient trips during the week to warrant purchasing a weekday-only pass. These shifts are discussed further in Chapter 6, based on the survey results.

Pass Revenues

The trends in pass sale revenues were summarized in Table 5-6. While the overall revenue patterns generally mirror those of the numbers of passes sold, it should be noted that the percentage revenue differences for individual periods in 1990 vs. 1989 are generally smaller than the percentage pass sale differences. This is due to the fact that the average price per pass unit sold was higher after the fare restructuring than before. The average price for all passes in 1989 was $37.13, while the average price in 1990 was $43.32; the 1990 figure breaks out to $37.43 for the four months prior to the change and $47.60 for the eight months following the restructuring.

Pass Usage Rates

Pass usage rates were developed by CTA staff, based on fare registrations and actual pass sales. The average weekday rides (unlinked) per pass for all of 1990 was 3.85; the average for the first eight months of the new fare structure was 3.73. The corresponding total for 1989 (the entire year) was 3.82 trips per weekday. Thus, the average weekday use per pass has decreased slightly following the fare restructuring.

With regard to total monthly usage, the overall 1990 average monthly figure, as reported by CTA, was 103.9; the average for Periods 5-12 was 102.9. This compares to 1989 figures of 107.6 for the whole year and 111.2 for Periods 5-12. The drop in 1990 reflects the fact that weekend pass use experienced a major decline as a result of the fare restructuring. This drop-off was caused primarily by the shift away from purchase of everyday passes, in favor of weekday passes. However, the decrease in 1990 is also consistent with a steady decline in pass usage over the past four years; the CTA reports that average monthly uses per pass totalled 111.3 in 1987 and 110.3 in 1988.

The travel behavior of pass users -- and former pass users -- is examined in the next chapter. The information presented there is based on the results of the surveys of pass users and other riders.

5.4 COMPARISON OF MODEL PREDICTIONS WITH ACTUAL RESULTS

In addition to examining the impacts of the restructuring, it is useful at this time to revisit the ridership forecasts for the different market segments, and compare them to the actual results. This exercise is important in determining the likely effectiveness of the forecasting model (i.e., the TPEM) in developing future fare adjustments. As explained in Chapter 3, the market shares for individual segments were predicted using the fare revenue and ridership model; in addition, a separate sensitivity analysis was performed to estimate the impact of higher than predicted (by the TPEM) shifts to token use.

A comparison of the predicted to actual impacts is shown in Table 5-9. As indicated, the predictions for the major market segments (system total, reduced fare, full fare) were reasonably accurate: the percent error in the system total was only -0.6 percent, 10.4 percent for the reduced category, and -3.2 percent for the full category. However, the forecasts for the individual submarkets were quite far off in a number of cases. The most serious errors were for tokens and passes, as full fare pass usage was overpredicted by as much as 29 percent and full fare tokens were underpredicted by 170 percent. The actual increase in token use was within the range of the sensitivity analysis, however; as explained in Chapter token shifts as high as 250 percent were considered.

Regarding the revenue forecast, the model predicted an increase (over 1989) of 4.7 percent, somewhat less than the actual post-restructuring total of 6.1 percent. Of course, the model was intended to be somewhat conservative in its forecast, so as to avoid overpredicting the actual revenue.

TABLE 5-9

COMPARISON OF PREDICTED AND ACTUAL RIDERSHIP BY MARKET SEGMENT

MARKET SEGMENT	PREDICTED 1990 RIDERSHIP (000)*	ACTUAL 1990 RIDERSHIP (000)	PERCENT ERROR IN MODEL
SYSTEM TOTAL	332234	334091	-0.6%
REDUCED FARE	65095	58333	10.4%
EVERYDAY PASS	13577	14714	-8.4%
WKDAY PASS	3480	3876	-11.4%
CASH	42771	27673	35.3%
TOKEN	5268	12069	-129.1%
FULL FARE	267138	275758	-3.2%
EVERYDAY PASS	54564	39708	27.2%
WKDAY PASS	19046	13474	29.3%
CASH	141861	128678	9.3%
TOKEN	29313	79204	-170.2%

* SOURCE OF PREDICTED RIDERSHIP: TRANSIT PRICING EVALUATION MODEL

Thus, the TPEM was reasonably accurate in forecasting aggregate figures: the projected system ridership total was less than 1 percent off, and the overall full fare category forecast was only 3 percent off. While the individual submarket predictions were much farther off, the model has proved its basic usefulness in assisting in the development of market-oriented fare structures. (Indeed, now that actual results are available, the CTA has recalibrated the model based on the results in order to improve its predictive capabilities for the different submarkets for use in future fare changes.)

5.5 SUMMARY

This chapter has examined the impacts of the April 1990 fare restructuring on CTA's ridership and revenue patterns. The specific results of the restructuring can be summarized as follows; these figure represent the average for the months May-December 1990, as compared to the average for the same months in 1989:

- system passenger revenue was up 6%
- average weekday ridership was up 0.7%
- system ridership (including weekends) was down 0.9%, although ridership for the full year (1990) was up 0.1%
- average Sunday ridership was down 17%, although Sunday revenue was up 19%
- reduced fare (elderly, disabled, students) ridership was up 8%
- full fare cash and token ridership was up 6%, while overall pass usage was down 13%; pass buying had been decreasing in the months prior to the restructuring, but the restructuring apparently accelerated this decline
- the fare model proved quite accurate in its forecast of overall ridership, as well as the split between full and reduced fare ridership; however, there were significant errors in predicting certain individual submarkets, particularly regarding pass and token usage

Thus, based on the results through the end of 1990 (i.e., eight months after the implementation of the new structure), the restructuring has proven quite successful. In particular, it has been found that 1) the budgeted revenue goals were met and, in fact, exceeded; 2) weekday ridership experienced a gain as compared to the same period the year before the change; and 3) reduced fare ridership increased for the first time in three years. Thus, this consumer-based approach has succeeded in reversing the CTA's -- and indeed the entire industry's -- past experience of significant ridership loss with any fare increase.

CHAPTER 6: TRAVEL BEHAVIOR AND MARKETING IMPACTS

6.0 INTRODUCTION

In evaluating the impacts of the fare restructuring, it is important to examine the effect on the travel behavior of CTA riders. In other words, how has the new structure influenced riders' usage patterns and their choice of methods of fare payment? These issues are important to understand because they represent the underlying factors affecting the ridership and fare revenue impacts discussed in the previous chapter. This chapter reviews the travel behavior impacts and attitudes toward different payment methods, as well as the impact of the CTA's marketing program in implementing the new fare structure.

The major sources of data for this analysis were the "before" surveys undertaken by CTA in April 1990 (prior to the implementation of the new fare structure) and the "after" surveys carried out by the study team in November 1990. The data collection activities are summarized below.

6.1 DATA COLLECTION ACTIVITIES

"Before" Surveys

The pre-restructuring (i.e., "before") surveys were carried out and analyzed by CTA staff, with assistance from field workers recruited for the effort. Two surveys were undertaken: 1) a survey of cash and token users, distributed on-board buses and in rail stations on a random basis; and 2) a pass buyer survey, distributed at point of purchase (i.e., randomly selected currency exchanges, Jewel and Dominick's grocery stores, and various employers) to everyone buying a pass at the selected locations. Both survey instruments included a trip diary.

Approximately 10,000 cash/token questionnaires were handed out on a random stratified basis on thirty bus routes and thirty rail stations. The entire distribution effort took place over three weeks. The questionnaires could either be completed and returned on the vehicle or in the station, or could be mailed back to CTA. A total of 1623 useable responses were obtained (16 percent response rate); the responses were weighted to insure a representative survey population.

Approximately 12,000 pass questionnaires were delivered to designated sales outlets; a questionnaire was to be handed to everyone purchasing a pass at that outlet. A total of 1462 useable questionnaires were returned to CTA (12 percent response rate); the responses were weighted by zone to insure a representative survey population.

"After" Surveys

The post-restructuring surveys were administered and analyzed by the study team. Like the before effort, two surveys were undertaken: cash/token users and pass buyers. The questionnaires were very similar to the before questionnaires, except that the after questionnaires did not include a trip diary; trip-making information was elicited instead through a series of specific questions. The questionnaires are included in Appendix B.

The distribution methods for the after surveys were nearly identical to those for the before surveys. However, since fewer after questionnaires were distributed, the exact distribution plan/schedule (i.e., in terms of 1) the hours to be covered on each route/station, and 2) the number of pass outlets) was revised slightly. As was the case for the before pass effort, letters were sent to each pass vendor in advance, explaining the survey distribution procedure. For the cash/token survey, a staff of field workers was recruited and trained; the study team supervised the distribution effort, which was completed during one week (November 12 - 16, 1990). A pretest of the on-board survey had been carried out by the study team on October 22 - 23, 1990.

Approximately 7,000 cash/token questionnaires were distributed; 1447 useable responses were received (21 percent response rate). These were weighted so as to correct for a sampling bias (related to respondent trip frequencies) inherent in on-board surveys (see Appendix C). Approximately 11,000 pass buyer questionnaires were printed and sent out with passes to sales outlets. However, apparently most of these either did not reach individual sales outlets or were not handed out to pass buyers at the outlets, as only 390 useable responses were received (4 percent response rate). No specific reasons for this low response could be determined. Only one explanatory letter was received: one of the grocery chains explained that a total of 183 questionnaires were never handed out (pass sales were low at some stores, one store misplaced its surveys).

The breakdown of socioeconomic characteristics for the pass survey respondents, as well as for other surveys (before cash/token, before pass, after cash/token, the telephone survey of CTA riders carried out as part of this study in August 1989, and the rider households in the 1988 Travel Behavior and Attitude Survey) is summarized in Table 6-1. As shown, the characteristics for the after pass survey are reasonably consistent with those of the other surveys, particularly the before pass survey. Therefore, while the low response rate should be kept firmly in mind, the after pass survey results do provide some useful input to this evaluation, and are presented and discussed in this chapter.

The after survey results were processed using SPSS. Frequencies and crosstabulations were produced for both the cash/token and pass surveys. These formed the basis for the evaluation of travel behavior and marketing impacts of the fare restructuring.

6.2 SHIFTS IN FARE PAYMENT METHODS

Shift Between Cash and Token

The shift between cash and token is reflected in the survey responses; Table 6-2 (and the accompanying graph) shows the change in cash and token usage between the before

TABLE 6-1

SOCIOECONOMIC CHARACTERISTICS FROM CTA RIDER SURVEYS

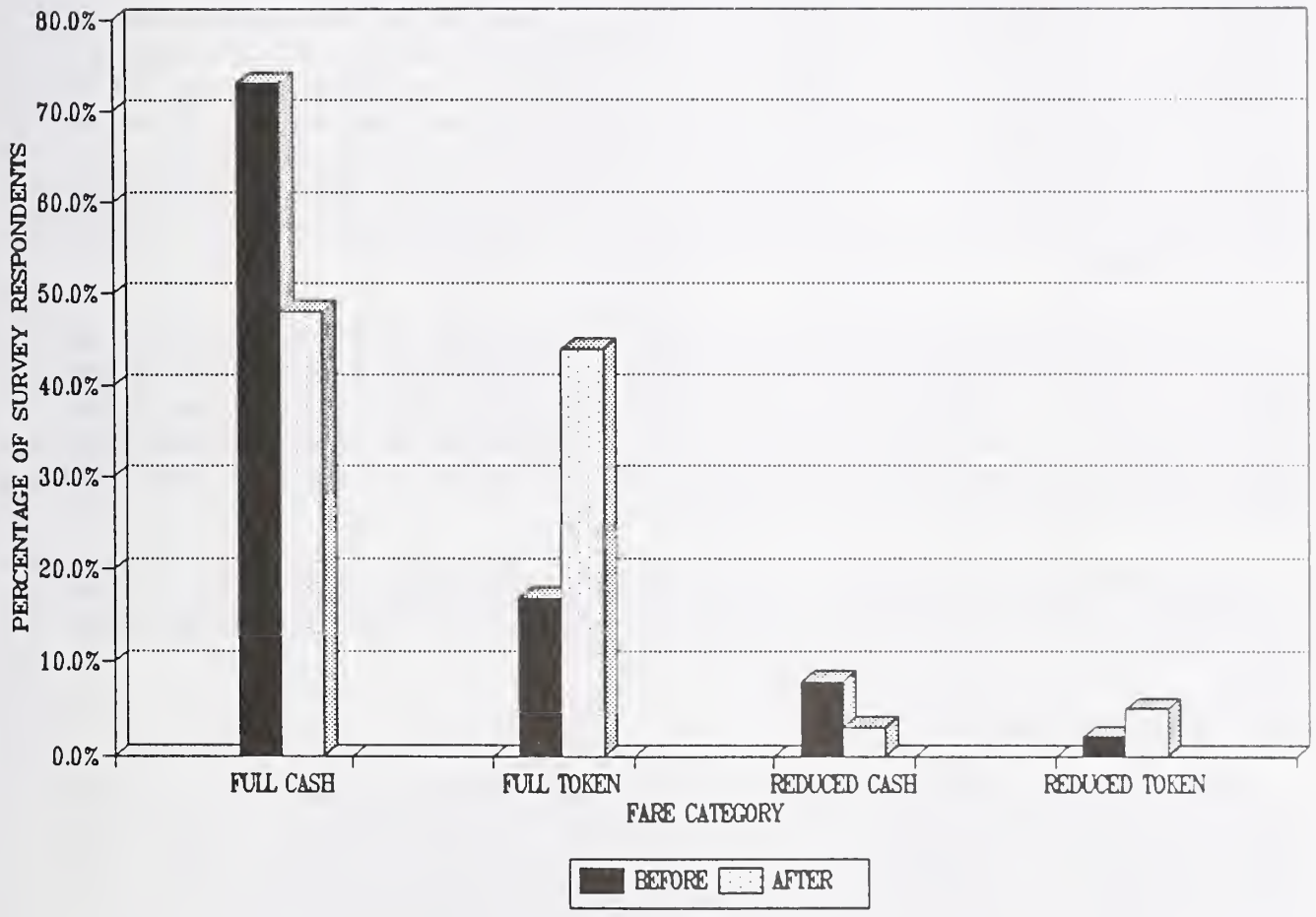
CHARACTERISTIC	CASH/TOKEN BEFORE	CASH/TOKEN AFTER	PASS BUYER BEFORE	PASS BUYER AFTER	RIDER 1989	RIDER 1988
MALE	40%	38%	37%	37%	33%	37%
FEMALE	60%	62%	63%	63%	67%	63%
AFRICAN-AMERICAN	37%	34%	48%	45%	45%	38%
WHITE	50%	55%	40%	45%	42%	48%
OTHER	13%	11%	12%	10%	13%	14%
0 VEH IN HH	34%	22%	54%	46%	25%	27%
1 VEH IN HH	39%	38%	32%	32%	42%	36%
2 VEH IN HH	19%	27%	11%	18%	23%	21%
3 OR MORE VEH	8%	12%	3%	4%	10%	11%
<$20,000 HH INC	41%	36%	57%	49%	39%	39%
$20-40,000	30%	34%	30%	34%	40%	40%
>$40,000	29%	30%	13%	17%	21%	22%

TABLE 6-2

CHANGE IN CASH AND TOKEN USAGE: BEFORE VS. AFTER (SURVEYS)

FARE	% OF SURVEY RESPONDENTS BEFORE	AFTER	CHANGE
FULL CASH	73%	48%	-34%
FULL TOKEN	17%	44%	159%
REDUCED CASH	8%	3%	-63%
REDUCED TOKEN	2%	5%	150%

CHANGE IN CASH AND TOKEN USAGE
(BEFORE VS. AFTER SURVEYS)



and after surveys.[1] As shown, the distribution of cash and token use among survey respondents changed substantially for both full and reduced fare riders. In particular, the percentage of token users is much higher in the after survey, in line with the great increase in token use reported in the previous chapter.

Trip Rate by Fare Payment Method

Table 6-3 (and the accompanying graph) shows the post-fare change distribution of fare methods (cash and token only) based on weekly trip rate. As indicated, approximately 70 percent of the most infrequent full fare riders -- those reporting 3 or fewer trips per week -- paid cash (at least for the trip on which they were surveyed). Above that level of usage, tokens show a marked increase in popularity; in fact, for those full fare respondents reporting 4-9 trips per week, the use of tokens nearly equalled the use of cash. At the 10-12 trip per week level, token use becomes the dominant fare medium. The pattern does not follow through at higher usage levels, however, as those respondents reporting between 13 and 18 (and over 21) trips per week display a preference for cash. This group would clearly save money by purchasing tokens -- or a monthly pass. It is unclear why the use of cash is so high for this group. However, it is the 10-12 group that is the single largest group shown, and this group has behaved as would be expected in this regard.

Table 6-4 summarizes the trip rates for cash/token vs pass users, based on the after survey results. As would be expected, the average rates are significantly higher for pass than for the other two methods. (The trip rates for the different types of passes are discussed in the following section.) While the pass figures are considerably lower than those calculated from CTA boarding data (see Chapter 5), the survey figures do indicate that pass users take significantly greater numbers of trips than non-pass users.

Regarding the impact of the fare restructuring on trip rates, the average number of trips per week for the after on-board survey respondents is virtually identical to that for the before on-board survey: 9.4, or just under 41 trips per month.

Fare Method by Length of Use of CTA

Table 6-5 (and graph) shows the breakdown of after survey respondents, for full fare token vs. cash, based on length of time using the CTA. As indicated, those respondents who have used the CTA for the shortest time are more apt to pay in cash; two-thirds of those who have been riding for six months or less reported using cash, as did 60 percent of those in the 7-12 month group. Those who have been using CTA for more than two years (by far the largest segment of respondents) favored tokens by a slight margin. Among reduced fare riders, tokens were preferred in each grouping, with the greatest difference occurring in the 12-24 month group.

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1 It should be noted that both the before and after surveys include a higher percentage of token users than in the actual ridership totals. Because of the importance of finding out about token user characteristics, this difference is considered advantageous to the evaluation effort. The actual percentages of token use for unlinked trips (i.e., among non-pass users) during 1989 and 1990 were 9 and 41 percent, respectively.

TABLE 6-3

FARE METHOD (CASH & TOKEN) BY TRIPS PER WEEK (AFTER SURVEY)

NO. TRIPS (ONE-WAY)	% OF TOTAL RESPONSES	METHOD OF PAYMENT (% OF RESPONDENTS) % OF FULL FARE FULL CASH	% OF FULL FARE FULL TOKEN	% OF REDUCED FARE REDUCED CASH	% OF REDUCED FARE REDUCED TOKEN
1-3	23%	71%	29%	50%	50%
4-6	18%	51%	49%	38%	63%
7-9	7%	51%	49%	50%	50%
10-12	30%	33%	67%	14%	86%
13-15	6%	57%	43%	50%	50%
16-18	4%	56%	44%	45%	55%
19-21	3%	44%	56%	65%	35%
>21	8%	64%	36%	44%	56%
% OF TOTAL RESPONSES		52%	48%	38%	63%

FARE METHOD BY TRIPS PER WEEK
(FULL FARE, AFTER SURVEY)

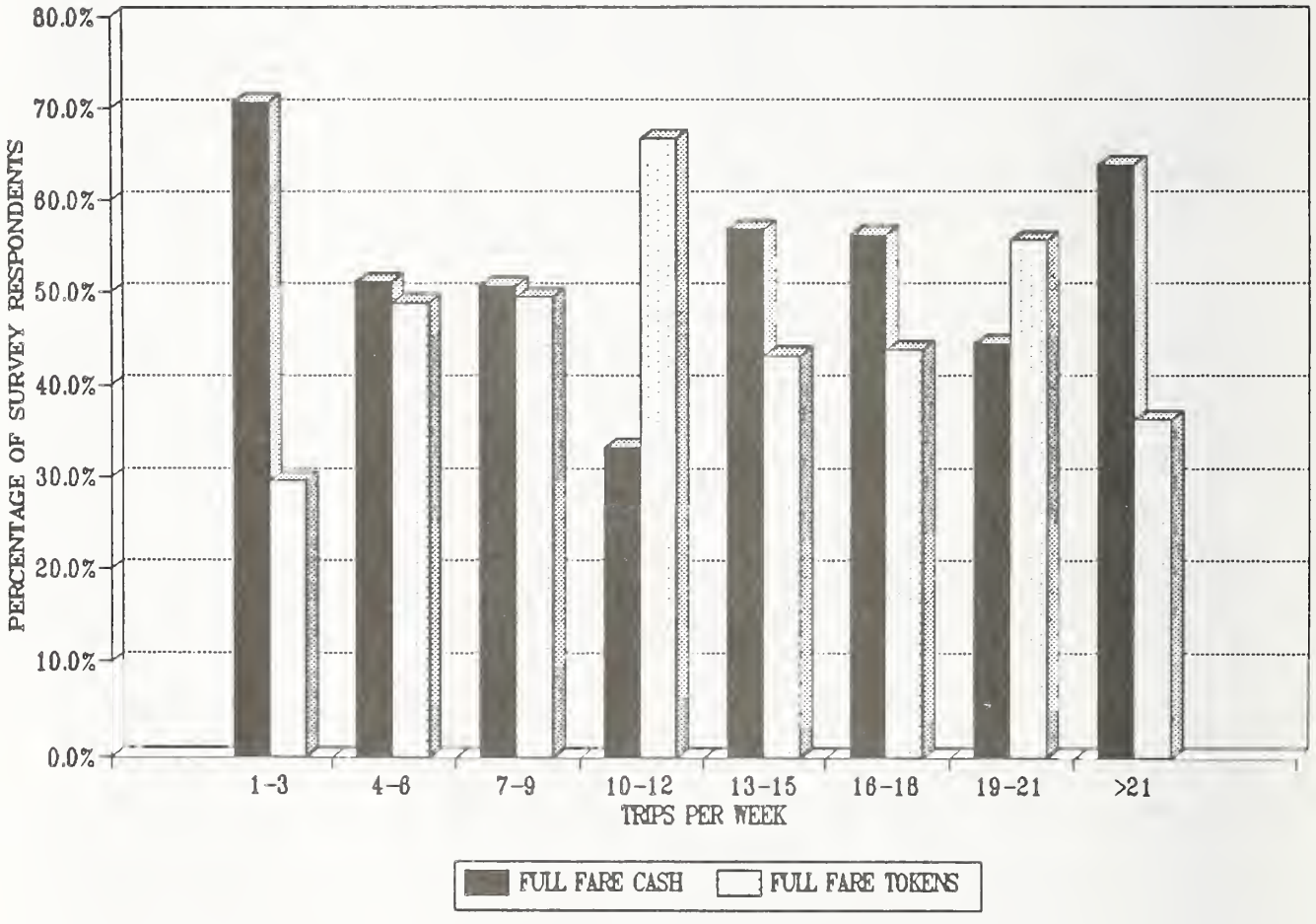


TABLE 6-4

TRIP RATES (AFTER SURVEY)

	ONE-WAY TRIPS	
	ON-BOARD	PASS
TRIPS/WKDAY	2.33	2.73
TRIPS/WKEND	1.27	2.85
TRIPS/WK (INC. WKENDS)	9.4	15.96
WKDAYS/WK	3.4	4.78
TRIPS/MO.*	40.83	69.32

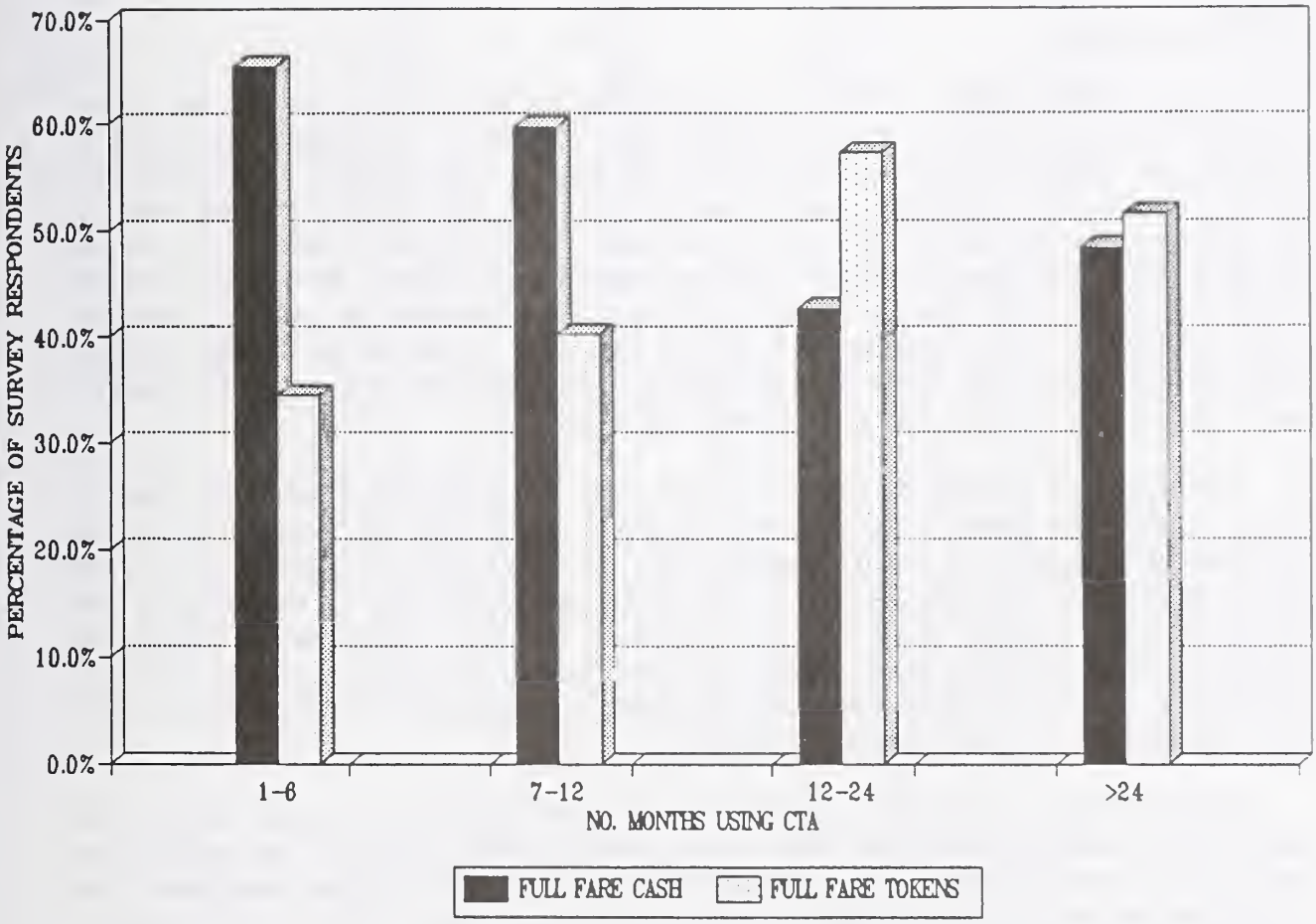
* TRIPS/MO.=TRIPS/WK*4.34

TABLE 6-5

FARE METHOD (CASH & TOKEN) BY LENGTH OF USE OF CTA (AFTER SURVEY)

		METHOD OF PAYMENT (% OF RESPONDENTS)			
		% OF FULL FARE		% OF REDUCED FARE	
NO. MOS. USING CTA	% OF TOTAL RESPONSES	FULL CASH	FULL TOKEN	RED. CASH	RED. TOKEN
1-6	17%	66%	34%	40%	60%
7-12	7%	60%	40%	38%	62%
12-24	7%	43%	57%	20%	80%
>24	70%	48%	52%	43%	57%

FARE METHOD BY LENGTH OF USE OF CTA
(FULL FARE, AFTER SURVEY)



6.3 PASS-RELATED TRAVEL BEHAVIOR

Information on pass users comes from the after survey of pass purchasers distributed at sales outlets. As indicated above, the response rate on this survey was very low; nevertheless, the distribution of responses, based on the socioeconomic characteristics of the respondents, is reasonably consistent with the distribution from other recent surveys of CTA riders; the socioeconomic characteristics, broken out by fare payment, are discussed further in Section 6.6, below. Thus, while the low response rate should be kept in mind, the results do provide some useful information on pass users' travel characteristics. This section also presents findings on former pass users, as identified in the on-board survey. Pass users' and non-pass users' attitudes toward passes, as well as the latter's reasons for not buying a pass, are discussed in the next section.

Current Pass Users

Table 6-6 (and graph) shows the type of pass purchased -- as well as the overall breakdown of pass buying -- based on weekly trip frequency. The overall breakdown of everyday vs. weekday pass from the survey is 58 percent to 36 percent. As indicated, 6 percent of the survey respondents reported making fewer than 10 trips per week, and over half (52 percent) reported between 10 and 15 per week. The trip rate figures under 10 are probably either inaccurately reported or not representative of a typical week, since they fall well below the breakeven rate for a pass; in any event, these responses are generally consistent with past surveys.. The breakeven trip rates for each pass, as well as the average trip rates from the after survey, are summarized in Table 6-7; the breakeven rates shown are based on using tokens, as well as a combination of token and transfer.

The breakdown between the two pass types by trip rate is roughly as would be expected, with a couple of exceptions. In other words, those pass buyers at the lower end of the trip rate scale would be expected to buy the weekday rather than everyday pass. This is true for the survey respondents reporting 10-12 trips per week. At rates above 12, the everyday pass begins to make economic sense (i.e., the breakeven rate for a person whose typical trip requires a transfer is 52 trips per month, or approximately 12 trips per week). Indeed, a significantly greater number of respondents reporting trip rates above 12 bought the everyday pass; the exception is those in the 19-21 category.

Table 6-7 clearly shows the difference in usage patterns between everyday and weekday pass buyers: everyday pass buyers take a much greater number of trips on the weekend (an average of 16 per month) than do weekday pass buyers. Indeed, weekday pass buyers take fewer than the everyday pass breakeven number of trips per week. Thus, there is clearly a market that has been accurately targeted by the weekday pass.

Former Pass Users

The after on-board survey included questions about former pass use. Among the different pass types, 30.3 percent of the survey respondents had bought an everyday pass at one time, 10.1 percent had bought a weekday pass, and 9.4 percent reported having purchased a 14-day pass. A total of 44.2 percent of the respondents reported having purchased some type of pass;

TABLE 6-6

TYPE OF PASS BY TRIPS PER WEEK (AFTER SURVEY)

NO. TRIPS (ONE-WAY)	% OF TOTAL RESPONSES	TYPE OF PASS (% OF RESPONDENTS) % OF FULL FARE EVERYDAY	% OF FULL FARE WEEKDAY	TOTAL FULL FARE	REDUCED FARE
1-3	0%	0%	0%	0%	0%
4-6	3%	20%	80%	83%	17%
7-9	3%	70%	30%	54%	46%
10-12	36%	42%	58%	86%	14%
13-15	16%	76%	24%	92%	8%
16-18	10%	63%	37%	92%	8%
19-21	7%	42%	58%	97%	3%
22-24	12%	76%	24%	87%	13%
>24	12%	80%	20%	80%	20%
% OF TOTAL RESPONSES		58%	36%	86%	14%

TYPE OF PASS BY TRIPS PER WEEK
(FULL FARE, AFTER SURVEY)

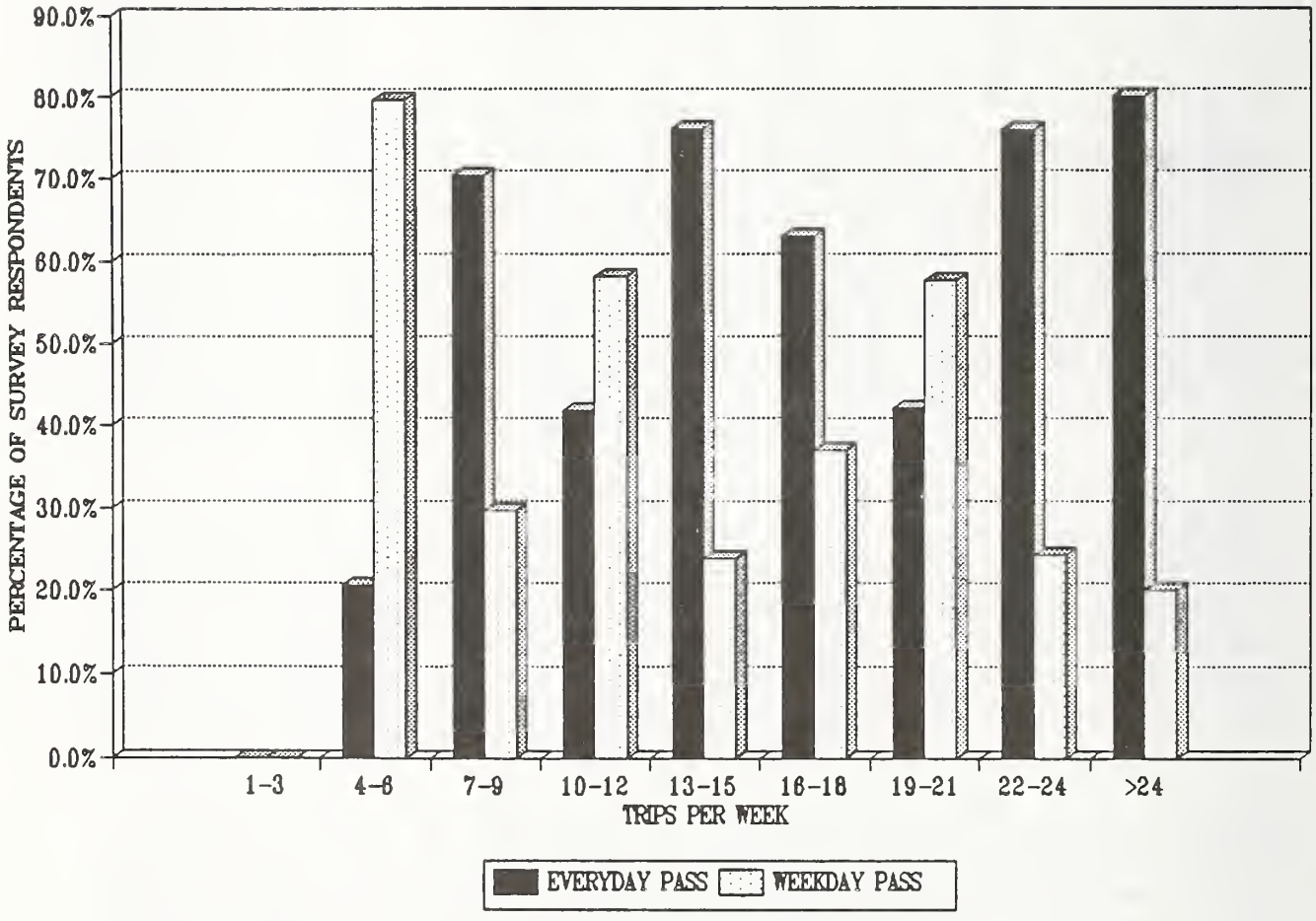


TABLE 6-7

MONTHLY TRIP RATES BY TYPE OF PASS (AFTER SURVEY)

TYPE OF PASS	AVG. TRIP RATE WEEKDAYS & WEEKENDS	AVG. TRIP RATE WEEKDAYS ONLY	BREAKEVEN TRIP RATE TOKEN	BREAKEVEN TRIP RATE TOKEN & TRANSFER
EVERYDAY (FULL)	75	59	67	52
WEEKDAY	61	54	50	39
REDUCED	69	57	63	45
OVERALL AVERAGE	69	57	--	--

clearly, some people had bought more than one type of pass. Table 6-8 shows the breakdown of pass retention rate by type of pass, i.e., the number of times during the previous twelve months survey respondents bought the different types of passes. It should be kept in mind in examining this table that 1) the price of the everyday pass changed from $50 to $60 in May 1990, 2) the weekday pass had only been offered for eight months at the time of the survey, and 3) the 14-day pass was discontinued in May 1990, although the survey requested information on the six months prior to May 1990.

The table shows that 46 percent of the former everyday pass users bought a pass for more than four months -- i.e., continued buying after the pass price was raised. The average number of months of everyday pass purchase was 5.2. The average for the weekday pass was 3.2 months. For the 14-day pass buyers, the average was 5.3 passes (i.e., two-week periods).

Table 6-9 (and accompanying graph) summarizes the breakdown of type of pass formerly purchased by type of fare paid now (full fare riders only). Of those who stopped using a pass since the fare restructuring, most (by a small margin) shifted from pass to token; in fact, 47 percent of token users are former pass users.. However, a large share shifted from pass to cash; 42 percent of cash users are former pass users. Presumably, those shifting to token made few enough trips, without transfers, to earn a cost advantage with the discounted token. Those who shifted to cash appeared to have set a budget limit on travel costs, and have taken fewer trips per month than in the past.

With regard to type of pass, the largest difference between cash and token is among the former 14-day pass buyers, as 58 percent now use tokens. The breakdown for former weekday pass users is nearly even. Among former everyday pass users, 53 percent now use tokens.

6.4 ATTITUDES TOWARD PREPAYMENT METHODS

In attempting to understand transit riders' motivation for choosing specific fare methods, it is useful to review their attitudes toward the different options. In other words, what do they feel are the major advantages and disadvantages of one method over another, and what are their reasons for not using a certain method? Furthermore, it is of particular interest in examining these attitudes to compare the feelings of current users of each fare method to those of non-users -- or former users, if applicable. This section discusses the attitudes toward passes and tokens, in terms of ratings of different attributes, as well as stated reasons for not buying passes.

Attitudes Toward Passes and Tokens

Riders' attitudes toward passes and tokens are summarized in Tables 6-10 through 6-13. Table 6-10 presents pass buyers' and cash or token users' ratings of different attributes of passes. The surveys requested that respondents indicate the degree of importance they attached to each of the following "reasons people buy passes" (these questions were identical for the two surveys):

TABLE 6-8

PASS RETENTION RATE
(FULL FARE ONLY, ON-BOARD "AFTER" SURVEY)

NO. MONTHS BOUGHT PASS	% OF BUYERS OF EACH TYPE OF PASS EVERYDAY	WEEKDAY	14-DAY*
1	13%	30%	13%
2	16%	17%	14%
3	13%	18%	8%
4	11%	16%	18%
5	9%	8%	6%
6	10%	6%	14%
7	4%	6%	4%
8	4%	0%	7%
9	7%	0%	2%
10	4%	0%	3%
11	1%	0%	0%
12	10%	0%	5%
13	0%	0%	6%
AVG. NO. MOS.	5.2	3.2	5.3 *
% OF RESPONDENT WHO BOUGHT PASS	30%	10%	9%

* FOR 14-DAY PASS, THIS REPRESENTS TWO-WEEK PERIODS, NOT MONTHS

TABLE 6-9

NEW FARE MEDIUM FOR FORMER PASS USERS

FORMER TYPE OF PASS	NEW FARE MEDIUM (% OF RESPONDENTS) CASH	TOKEN
EVERYDAY	47%	53%
WEEKDAY	49%	50%
14-DAY	43%	58%

NEW FARE MEDIUM FOR FORMER PASS USERS
(FULL FARE RIDERS)

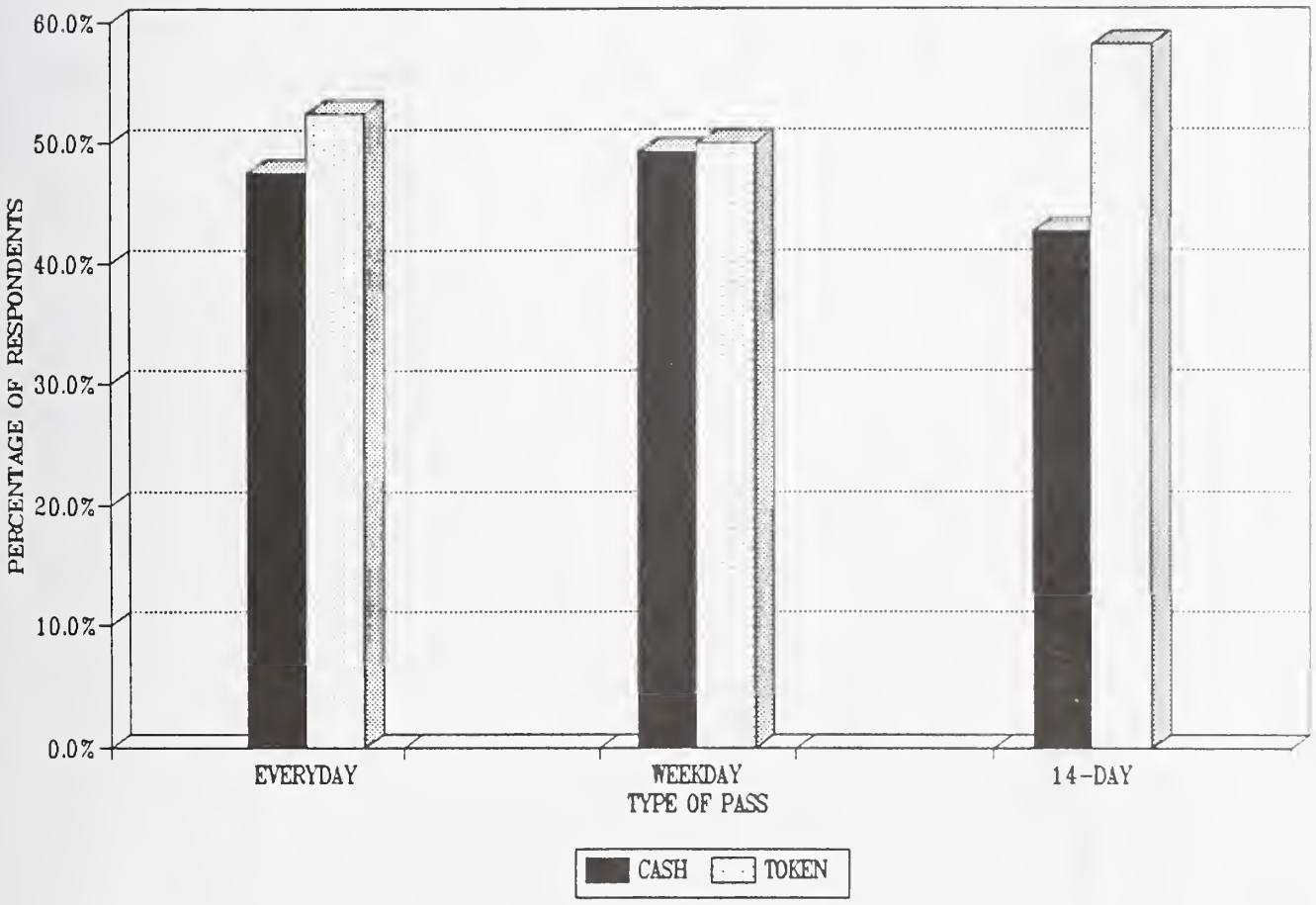


TABLE 6-10

ATTITUDES TOWARD PASSES

ATTRIBUTE	NOT IMPORTANT		SOMEWHAT IMPORTANT		VERY IMPORTANT	
	PASS BUYERS	CASH/TOKEN USERS	PASS BUYERS	CASH/TOKEN USERS	PASS BUYERS	CASH/TOKEN USERS
SAVE MONEY	2%	6%	9%	12%	89%	82%
TAKE EXTRA RIDES	17%	28%	26%	38%	57%	33%
NO EXACT CHANGE	13%	19%	20%	32%	68%	49%

TABLE 6-11

ANY EXTRA TRIPS TAKEN WITH PASSES/TOKENS (NOT MADE BEFORE)

	PASSES		TOKENS	
	PASS BUYERS	EX-PASS BUYERS	PASS BUYERS	CASH/TOKEN USERS
YES	53%	39%	10%	11%
NO	47%	61%	90%	89%

TABLE 6-12

ATTITUDES TOWARD TOKENS

ATTRIBUTE	AGREE		NEUTRAL		DISAGREE	
	PASS BUYERS	CASH/TOKEN USERS	PASS BUYERS	CASH/TOKEN USERS	PASS BUYERS	CASH/TOKEN USERS
SAVE TIME OVER CASH	72%	76%	19%	18%	8%	7%
CHEAPER THAN CASH	76%	80%	17%	17%	7%	4%
DIFFICULT TO BUY	11%	13%	20%	25%	70%	62%
TOO EXPENSIVE	15%	14%	25%	31%	60%	55%
MORE CONVENIENT THAN CASH	85%	83%	9%	13%	6%	4%

TABLE 6-13

ATTITUDES TOWARD TOKENS: TOKEN VS. CASH USERS (FULL FARE)

	AGREE		NEUTRAL		DISAGREE	
ATTRIBUTE	CASH USERS	TOKEN USERS	CASH USERS	TOKEN USERS	CASH USERS	TOKEN USERS
SAVE TIME OVER CASH	66%	87%	27%	9%	7%	4%
CHEAPER THAN CASH	68%	91%	26%	7%	6%	2%
DIFFICULT TO BUY	17%	7%	34%	17%	49%	76%
TOO EXPENSIVE	20%	6%	41%	23%	39%	71%
MORE CONVENIENT THAN CASH	72%	93%	21%	5%	7%	2%

- To save money
- To take extra rides I would not otherwise make
- No need for exact change

As can be seen in Table 6-10, both pass buyers and non-pass buyers place by far the greatest degree of importance on the fact that passes save money over cash; even among non-pass buyers, more than 80 percent felt this to be "very important." The second most important attribute among the three suggested is passes' ability to avoid the payment of exact change; in this case, however, pass buyers felt that this was considerably more important than did cash/token users, as nearly 70 percent of the former labelled it very important, in contrast to about half of the latter group. Finally, only a third of the cash/token users felt that it was very important to "take extra rides," as opposed to more than half of the pass buyers.

With regard to taking extra rides, Table 6-11 shows 1) the responses from pass buyers and former pass buyers to the question "When you first bought a pass, did you change your travel habits by taking extra rides on CTA which you previously did not take before you bought a pass?" and 2) the responses from pass buyers and cash/token users to the same question regarding tokens. Slightly over half of the current pass buyers reported making extra trips, as compared to under 40 percent of the former pass buyers. This is in sharp contrast to the responses regarding tokens: in both surveys, roughly 90 percent of the respondents did not take extra rides after buying tokens. Thus, while many pass users take trips they would not take if they were paying for each trip, tokens are clearly not perceived in the same way; even though the per trip cost of tokens is significantly lower than the cash cost, offering discounted tokens apparently generates little additional ridership.

Tables 6-12 and 6-13 summarize attitudes toward tokens. The surveys requested that respondents indicate whether they "agree", "feel neutral about" or "disagree" with the following statements:

- Tokens save time paying the fare
- Tokens are much cheaper than paying cash
- It is difficult to find a place to buy tokens
- Buying packs of tokens requires too much cash in advance
- Tokens are more convenient to use than cash

As indicated in Table 6-12, the strongest agreement was with the last of the statements, as over 80 percent of both groups agreed that "tokens are more convenient than cash." The level of agreement was nearly as high with two other attributes: "save time" and "cheaper than cash." At the other end of the spectrum, relatively few respondents felt that tokens are "difficult to buy" or "too expensive." All in all, these responses suggest that CTA riders by and large accept what are typically thought to be the most positive attributes of tokens, but, at the same

time, do not perceive the potential disadvantages (difficult to buy and too expensive) as serious problems.

Table 6-13 breaks out the attitudes toward tokens of cash users vs. those of token users. The results are very much along the lines of what would be expected from the respective groups. For each statement, token users more strongly agree with the positive attributes than do cash users, and, similarly, disagree more strongly with the potentially negative aspects.

Reasons for Not Buying a Pass

The reasons for not buying a pass are summarized in Tables 6-14 through 6-16 (and accompanying graphs). As shown in Table 6-14, nearly two-thirds of the after on-board survey respondents reported that they "will not take enough rides this month" to make a pass worthwhile. One-quarter reported price as the reason, while only 2 percent said that they "did not know where to buy one" as the reason they did not buy a pass. In contrast, the difference between "not enough rides" and "could not afford it" was not as great in the before survey.

The reasons for not buying a pass are broken out by weekly trip rate in Table 6-15. As would be expected, the frequency of responses indicating "will not take enough rides" decreases as the trip rate increases. However, even at trip frequencies over 15 trips per week (which translates into a total of approximately 63 per month), a surprisingly high percentage of respondents indicated insufficient tripmaking as the reason. This suggests that either 1) these people are not correctly calculating their monthly trip rates (or the breakeven rate), 2) they are not correctly reporting their trip rates, or 3) their tripmaking for the week covered in the survey was not typical of their normal monthly tripmaking. The major reason at the higher rates is, more understandably, "could not afford it." The initial purchase price is clearly the issue here, since, on a trip by trip basis, it is cheaper to buy a pass than to pay cash or buy tokens at these trip rates. This is discussed further below.

Table 6-16 shows the reasons for not buying a pass broken out by type of former pass. For both 14-day and everyday pass buyers, "could not afford it" was cited most frequently, while that reason and "will not take enough rides" were cited approximately equally by former weekday pass buyers. This suggests that 14-day pass buyers were more likely to switch to cash or token because of the upfront payment required for a monthly pass -- as opposed to feeling that they would not make sufficient trips -- than were users of monthly passes. Finally, Table 6-16 shows the breakdown of reasons among riders who had never bought any kind of pass;. taking insufficient rides was by far the most common reason (70 percent). These findings underscore the above observation that initial purchase price is an important consideration in the pass buying decision.

Preference for Other Types of Passes

Both pass buyers and non-pass buyers were asked if they would prefer any of several types of passes as an alternative to the existing monthly passes. Table 6-17 summarizes the results of these questions. As can be seen, the pass preferred by the highest percentage of

TABLE 6-14

REASONS FOR NOT BUYING A PASS

REASON	% OF RESPONSES AFTER SURVEY	BEFORE SURVEY
NOT ENOUGH RIDES	62%	45%
COULDN'T AFFORD	25%	35%
DIDN'T KNOW WHERE	2%	-
OTHER	11%	20%

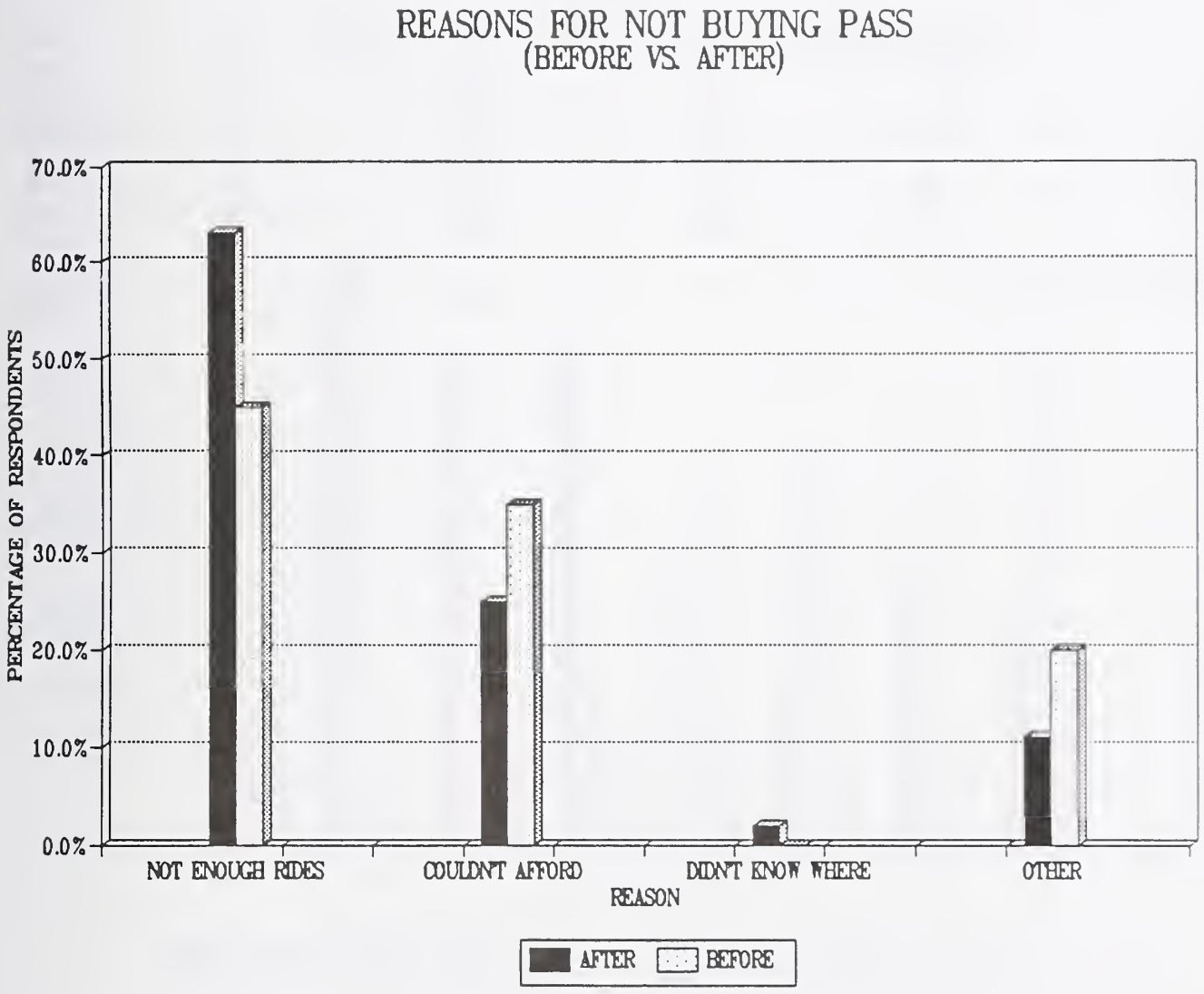

REASONS FOR NOT BUYING PASS
(BEFORE VS. AFTER)
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
PERCENTAGE OF RESPONDENTS
NOT ENOUGH RIDES
COULDN'T AFFORD
DIDN'T KNOW WHERE
OTHER
REASON
AFTER
BEFORE

TABLE 6-15

REASONS FOR NOT BUYING A PASS, BY TRIPS PER WEEK

		REASON (% OF RESPONDENTS)			
NO. TRIPS PER WEEK	% OF TOTAL RESPONSES	WON'T TAKE ENOUGH RIDES	COULDN'T AFFORD IT	DIDN'T KNOW WHERE TO BUY	OTHER
1-3	24%	82%	9%	1%	9%
4-6	18%	72%	18%	2%	9%
7-9	7%	63%	26%	2%	11%
10-12	30%	63%	20%	3%	14%
13-15	5%	38%	46%	3%	13%
16-18	5%	38%	48%	5%	9%
19-21	3%	34%	53%	0%	15%
>21	8%	29%	59%	3%	13%
% OF TOTAL RESPONSES		62%	25%	2%	11%

REASONS FOR NOT BUYING PASS (TRIPS/WK)

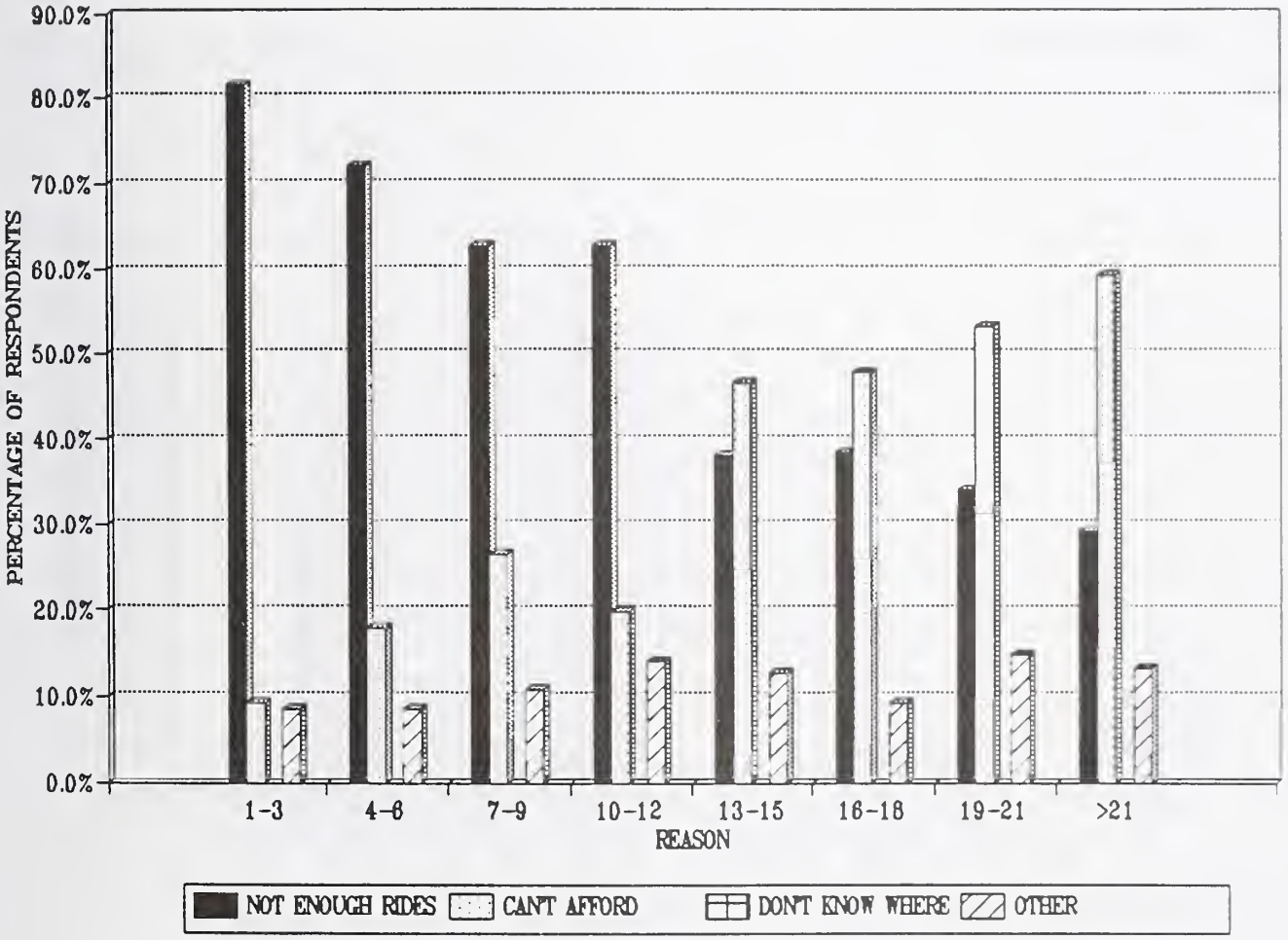


TABLE 6-16

REASONS FOR NOT BUYING A PASS
BY TYPE OF FORMER PASS

REASON	% OF RESPONDENTS USED TO BUY 14-DAY PASS	USED TO BUY WEEKDAY PASS	USED TO BUY EVERYDAY PASS	HAS NEVER BOUGHT PASS
NOT ENOUGH RIDES	28%	43%	33%	71%
COULDN'T AFFORD IT	57%	41%	44%	16%
DIDN'T KNOW WHERE	4%	1%	9%	3%
OTHER	10%	14%	13%	10%

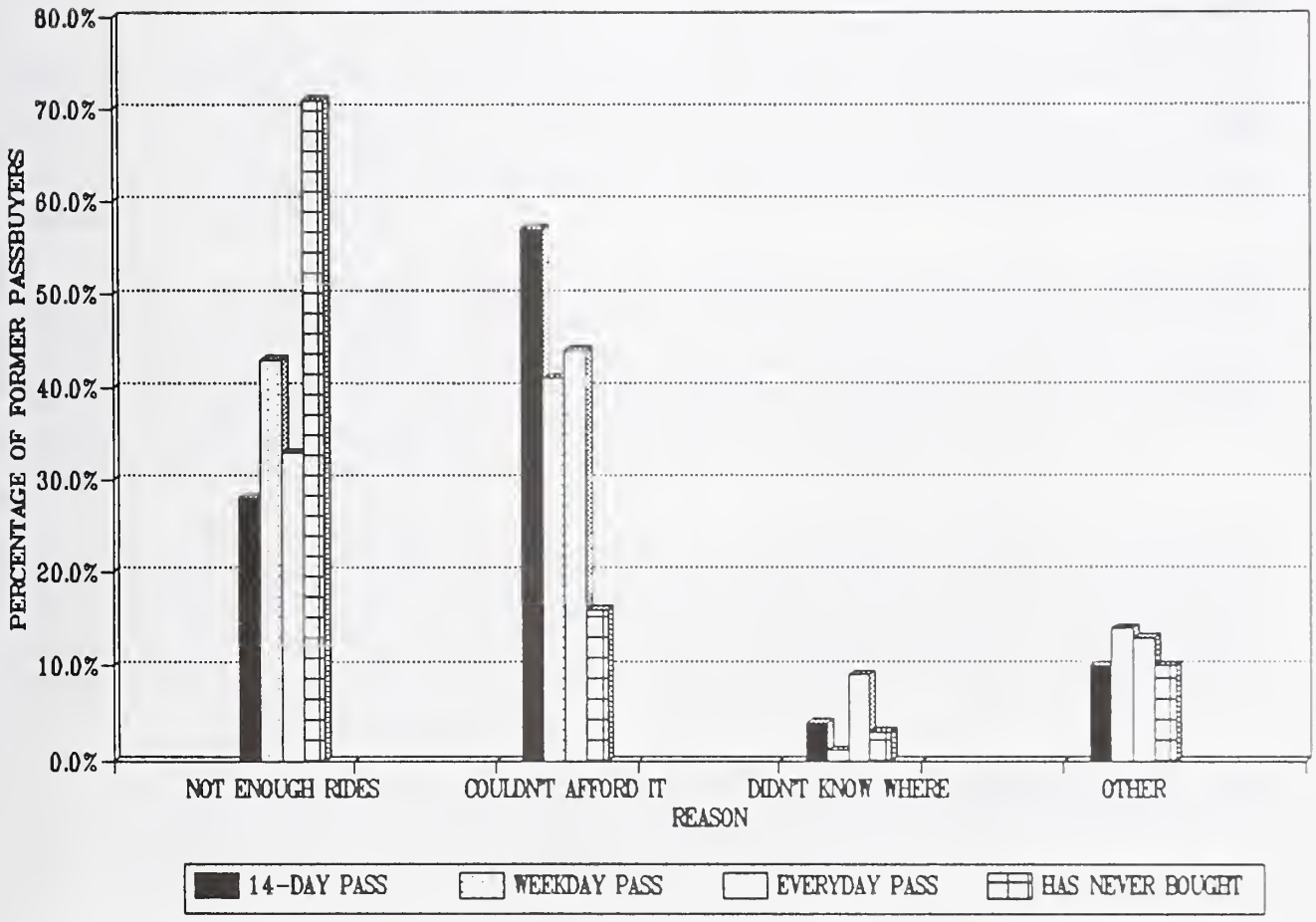

REASON FOR NOT BUYING PASS
(BY FORMER PASS TYPE)
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
PERCENTAGE OF FORMER PASSBUYERS
NOT ENOUGH RIDES
COULDN'T AFFORD IT
DIDN'T KNOW WHERE
OTHER
REASON
14-DAY PASS
WEEKDAY PASS
EVERYDAY PASS
HAS NEVER BOUGHT

TABLE 6-17

PREFERENCE FOR OTHER TYPES OF PASSES

	YES		NO	
TYPE OF PASS	PASS BUYERS	CASH/TOKEN USERS	PASS BUYERS	CASH/TOKEN USERS
PEAK ONLY	30%	67%	70%	33%
OFF-PEAK ONLY	29%	39%	71%	61%
BUS ONLY	24%	33%	76%	67%
QUIKPASS	71%	66%	30%	34%
14-DAY	56%	67%	44%	33%

pass buyers is the Quikpass (71 percent), which is available, but can be used at only some stations. More than half of the pass buyers would like a 14-day pass (discontinued when the new fare structure was implemented), while the other three passes were favored by relatively few pass buyers. Two-thirds of the cash/token respondents, on the other hand, would apparently like to see a peak only pass, as well as the 14-day pass and the Quikpass.

Thus, there is apparently widespread support for expanding the Quikpass, some sentiment -- more among non-pass buyers -- for reintroducing the 14-day pass, and little interest in either an off-peak or bus-only pass; there is considerable interest in a peak only pass, but only among current cash and token users.

6.5 MARKETING IMPACTS

In successfully implementing a new fare structure, especially one as complicated as this, effective marketing is clearly crucial. As explained in Chapter 4, CTA riders displayed a very high level of knowledge about the fare changes, even on the first day. Thus, the preimplementation marketing was apparently extremely effective in informing people about the new structure. The on-board and pass buyer surveys provide some useful information about the impact of the marketing.

Table 6-18 (and the accompanying graph) summarizes the sources of information about the new pass structure for the two surveys. The results are quite similar for pass buyers and cash/token users. In each group, the most frequently cited sources of information are "from a friend" and "ads on the bus or train" (27-30 percent of the respondents to each survey for each source). Newspaper ads were next, at about 17 percent for each group, while "on the radio" received the smallest response (just over 2 percent on each survey).

The sources of information about tokens are summarized in Table 6-19 (and the accompanying graph). These figures are reasonably close to each other and quite similar to the distribution of responses regarding passes (Table 6-18). The results to both questions suggest that print advertisements (i.e, on the bus and in the newspaper) are a more effective means of transmitting information about transit fares to present riders than are either marketing brochures or use of the broadcast media.

With regard to the place of purchase of tokens and passes, Tables 6-20 and 21 (and graphs) show that currency exchanges are by far the most common responses (49-63 percent). CTA rail stations are the next most common places to buy tokens.

6.6 SOCIOECONOMIC CHARACTERISTICS

Table 6-22 presents the socioeconomic characteristics of the survey respondents, broken out by fare payment method; for comparison purposes, the characteristics of CTA riders from the 1989 "Household Survey of the CTA Service Area" are also included.

TABLE 6-18

WHERE DID YOU FIND OUT ABOUT THE NEW PASS STRUCTURE?

	ON-BOARD SURVEY(%)	PASSBUYER SURVEY(%)
NEWSPAPER	17%	17%
ADS ON-BOARD	27%	27%
BROCHURES	9%	8%
RADIO	2%	3%
TV NEWS	6%	10%
FRIEND/FAMILY	30%	28%
OTHER	10%	8%

WHERE DID YOU FIND OUT ABOUT PASSES

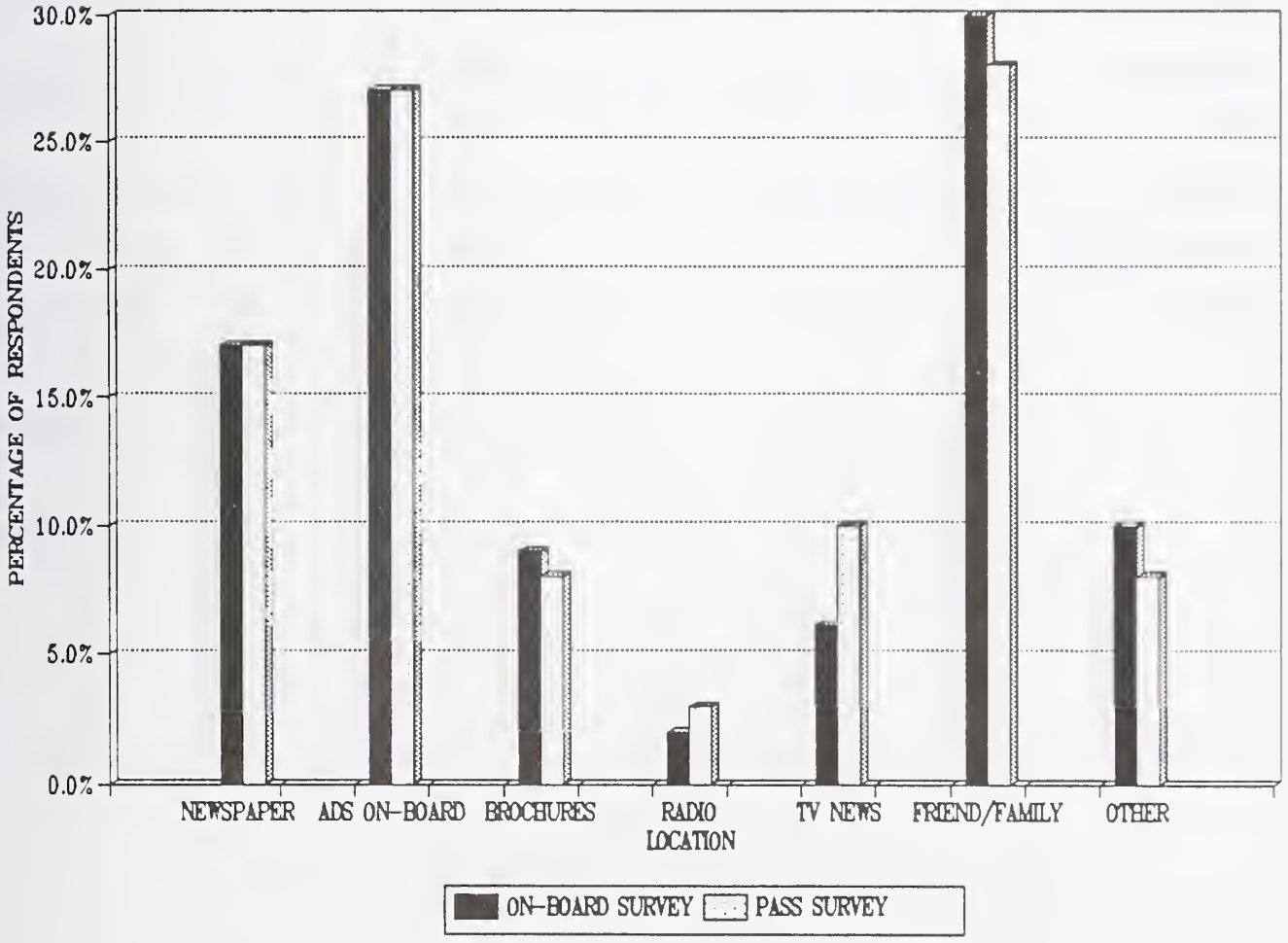


TABLE 6-19

WHERE DID YOU FIND OUT ABOUT TOKENS?

	ON-BOARD SURVEY(%)	PASSBUYER SURVEY(%)
NEWSPAPER	18%	21%
ADS ON-BOARD	24%	34%
BROCHURES	10%	7%
RADIO	2%	2%
TV NEWS	7%	9%
FRIEND/FAMILY	30%	22%
OTHER	8%	5%

WHERE DID YOU FIND OUT ABOUT TOKENS

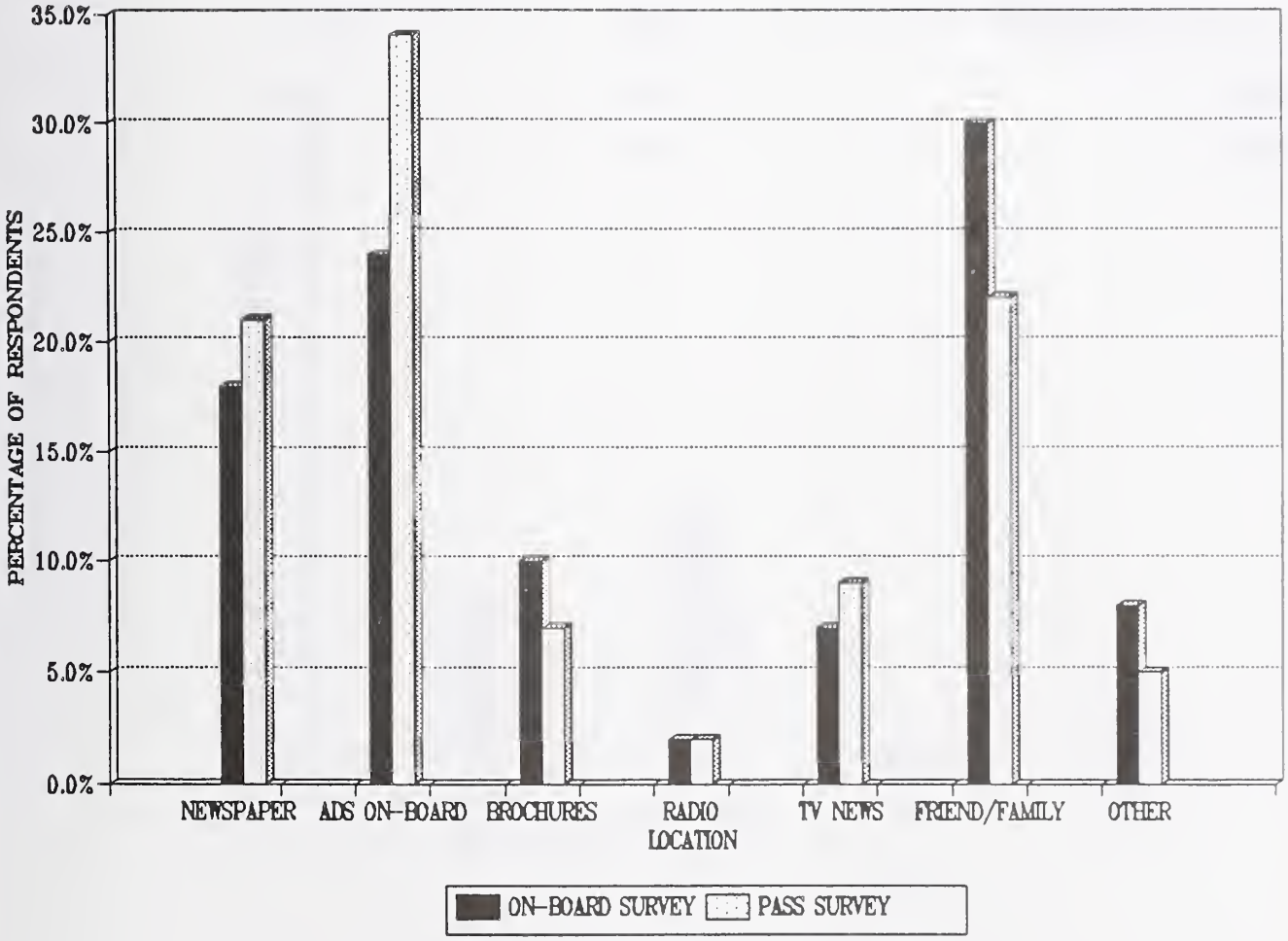


TABLE 6-20

WHERE DID YOU BUY YOUR MOST RECENT TOKENS?

	ON-BOARD SURVEY (%)	PASS SURVEY (%)
CURRENCY EXCHANGE	49%	62%
JEWEL/DOMENICKS	16%	14%
CTA RAIL STATION	25%	16%
WORK	3%	3%
OTHER	7%	5%

WHERE DID YOU BUY MOST RECENT TOKEN

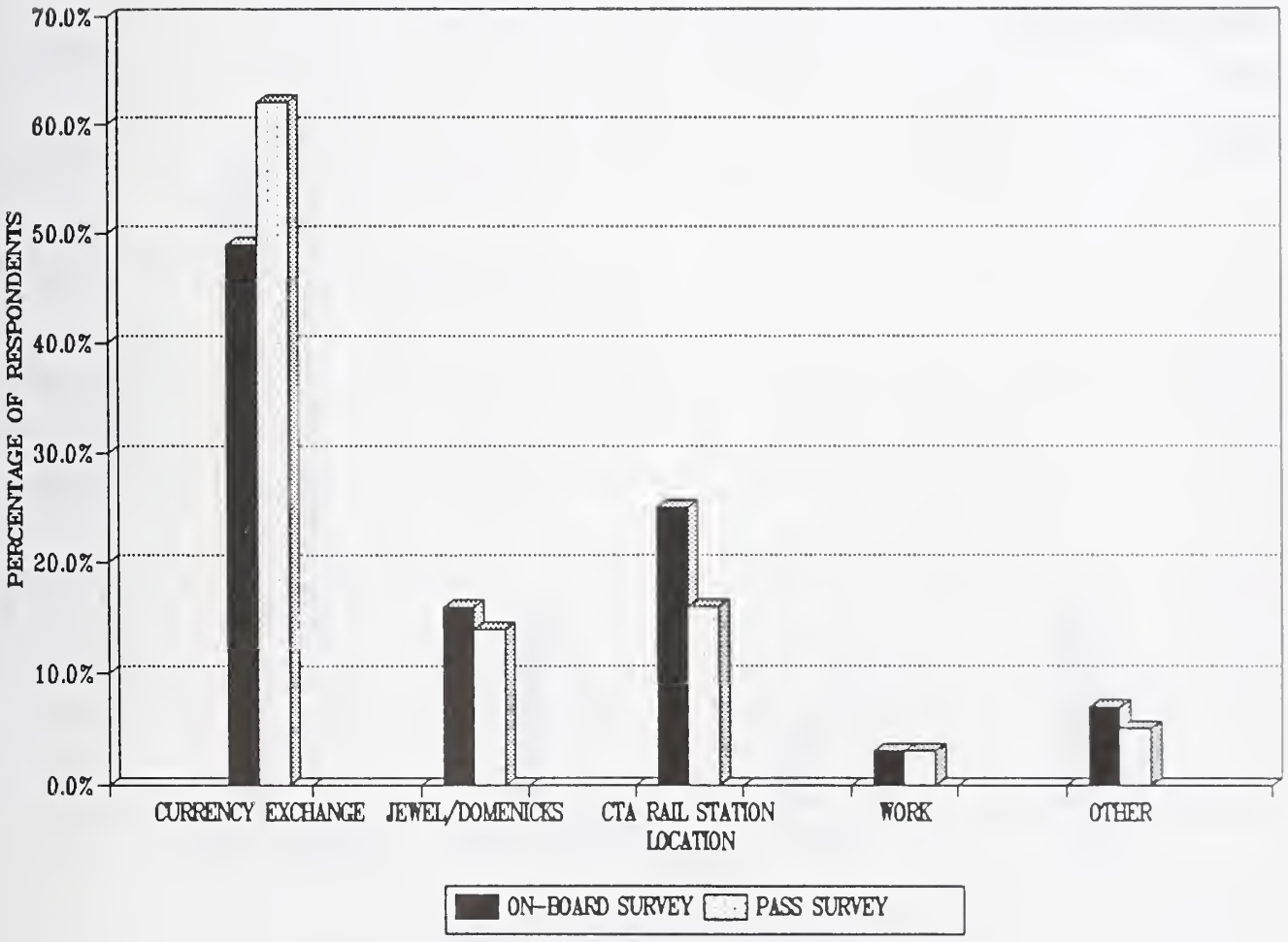


TABLE 6-21

WHERE DID YOU BUY YOUR MOST RECENT PASSES?

	ON-BOARD SURVEY (%)	PASS SURVEY (%)
CURRENCY EXCHANGE	58%	63%
JEWEL/DOMENICKS	17%	13%
WORK	7%	14%
OTHER	18%	11%

WHERE DID YOU BUY YOUR MOST RECENT PASS

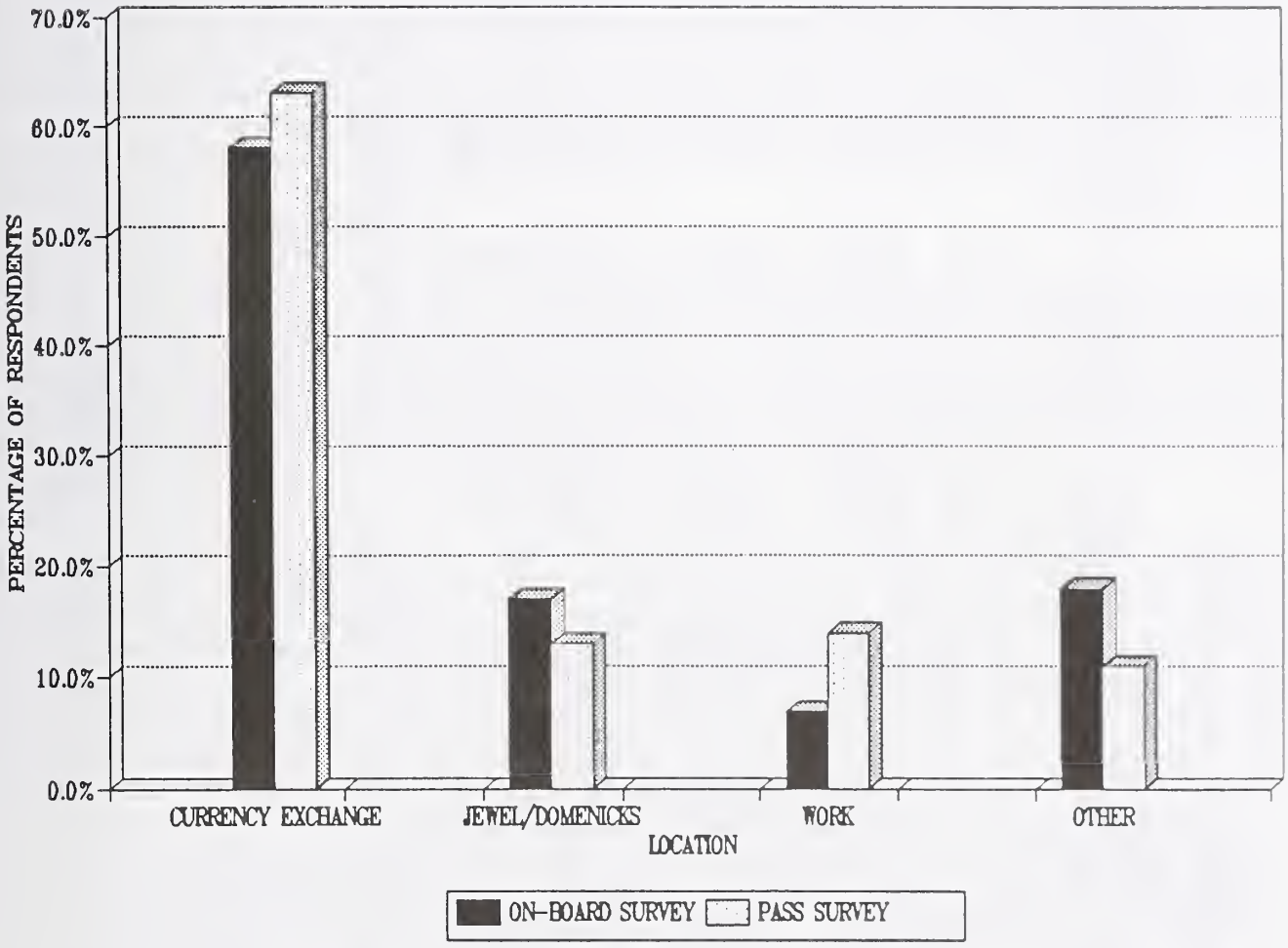


TABLE 6-22

SOCIOECONOMIC CHARACTERISTICS/FARE METHOD

CHARACTERISTIC	ON-BOARD SURVEY FULL CASH	FULL TOKEN	REDUCED CASH/TOK	OVERALL SURVEY	PASS SURVEY EVERYDAY PASS	WEEKDAY PASS	REDUCED PASS	OVERALL SURVEY	OVERALL AREA (RIDERS)*
MALE	46%	37%	35%	41%	37%	35%	46%	37%	37%
FEMALE	54%	63%	65%	59%	63%	65%	54%	63%	63%
AFRICAN-AMER.	43%	24%	33%	34%	61%	29%	31%	45%	38%
WHITE	46%	64%	57%	55%	30%	58%	67%	45%	48%
OTHER	11%	12%	10%	11%	9%	13%	2%	10%	14%
0 VEH. IN HH	22%	21%	33%	22%	56%	24%	67%	46%	27%
1 VEH. IN HH	37%	39%	29%	38%	28%	40%	25%	32%	36%
2 VEH. IN HH	29%	27%	23%	28%	14%	28%	4%	18%	21%
3 OR MORE VEH.	11%	12%	15%	12%	2%	8%	4%	4%	11%
<$10,000 HH INC	18%	13%	30%	17%	24%	13%	29%	21%	16%
$10-20,000	16%	15%	23%	16%	29%	17%	40%	26%	23%
$20-30,000	20%	18%	18%	19%	20%	21%	16%	20%	26%
$30-40,000	14%	15%	7%	14%	14%	20%	2%	15%	14%
$40-50,000	12%	11%	4%	11%	6%	9%	7%	8%	10%
>$50,000	20%	28%	22%	24%	7%	20%	7%	12%	12%

*OVERALL AREA FIGURES FROM "TRAVEL BEHAVIOR AND ATTITUDE SURVEY" (1988)

Overall Comparison

With regard to the overall breakdown for the different surveys, the responses appear to be reasonably representative of the overall area, as indicated by the household survey breakdown. However, there are some significant differences, as described below.

The male-female distribution is very close for the three surveys, and, in fact, the pass survey distribution is identical to that of the household survey. In terms of race, the on-board survey included a slightly lower percentage of African-Americans than did the household survey, while in the pass survey the percentage was somewhat higher. The reported vehicle availability was slightly higher in the on-board survey than in the household survey, while that reported in the pass survey was considerably lower than the other two: nearly half of the pass survey respondents reported no vehicles available to them or their households. Finally, the household income distribution was higher for the on-board survey than the other two: nearly half of the on-board respondents reported incomes greater than $30,000, as compared to just over a third for each of the other two surveys.

Distribution by Fare Method

As indicated in Table 6-22, the characteristics of the riders using cash vs. those using tokens show marked differences in sex, race, and household income. Cash users included higher percentages of males, African-Americans, and those from lower-income households. Vehicle availability was nearly identical for the two groups. Reduced fare riders (cash and token combined) reported significantly lower vehicle availability and income than did either full fare group.

In examining the pass users, the differences between the different types of pass buyers are even more pronounced than the cash vs. token differences. With regard to race, the table indicates that over 60 percent of the everyday pass users were African-American, while nearly 60 percent of the weekday pass users were white; 67 percent of the reduced fare pass users were white. Everyday pass buyers showed a very low level of vehicle availability: 84 percent reported 0 or 1 vehicle. The percentage of weekday pass users reporting 0 or 1 vehicle was also relatively high -- 64 percent -- but much lower than in the everyday pass group. The reduced fare pass users had the lowest vehicle availability rate of the three groups: 92 percent reported 0 or 1 vehicle. Everyday pass users also reported rather low household incomes: 53 percent at $20,000 or less, and only 13 percent over $40,000. In contrast, the weekday pass users reported much higher incomes: 30 percent at $20,000 or less, 29 percent over $40,000. Reduced fare users had the lowest incomes, as 69 percent were below $20,000, and 14 percent above $40,000.

Summary

The breakdown of socioeconomic characteristics among the different categories reveals some significant differences in the various market segments. For instance, in comparing pass users to those using cash or tokens, the pass users were generally less affluent and had fewer vehicles available to them. The racial distribution showed a higher percentage of cash/token

users being white, while the breakdown between whites and African-Americans among pass users was even.

With regard to the individual fare categories, there are also several pronounced socioeconomic differences. Token users were the most affluent of all the groups, followed by cash payers; everyday and reduced pass buyers had by far the lowest incomes. As expected, everyday pass users reported significantly lower vehicle availability than any other full fare segment; the other full fare groups all had similar availability levels.

While these comparisons must be viewed with caution, given the low pass survey response rate and the uncertainties it introduces, the findings do provide a reasonable indication of the general response by the different market segments to the CTA's fare restructuring.

CHAPTER 7: SUMMARY AND CONCLUSIONS

7.0 INTRODUCTION

By offering riders a choice of fare payment methods and prices -- thereby allowing all riders to decide how much they are willing to pay -- the CTA has achieved the elusive goal of increasing revenues without losing ridership. Despite the fact that cash fares (on bus during peak hours and all day on rail) were raised 25%, the use of 1) deeply discounted tokens (good at all times), 2) a discounted off-peak bus cash fare, 3) lower fares for seniors, the disabled, and students and 4) two different types of monthly passes has enabled the CTA to realize both a revenue gain in excess of the target amount and a ridership gain on weekdays. Other key impacts include a significant reduction in the amount of dollar bills in the system and a substantial increase in reduced fare ridership.

This report has discussed the development, implementation, and results of the CTA's new fare structure. The CTA sought a structure that would offer riders a range of fare options -- including the ability to pay less than they did under the previous structure. Through the use of "deep discounting," in combination with differential pricing (based on service quality or time of day), it was felt that the CTA could increase both ridership and revenue. Thus, with that goal -- as well as other fare-related goals -- in mind, the study team worked with the CTA Fares Policy Task Force in developing a new fare structure that would meet CTA's revenue target for the coming year, while also producing a small gain in weekday ridership.

Based on research into innovative pricing at other transit properties, coupled with market research into the prospective travel behavior and fare payment preferences of CTA riders, the study team developed a model to predict the ridership and revenue impacts of different fare structures. At the same time, a range of types of fare structures (bus/rail differential, peak/off-peak, etc.) was assessed in terms of implementation and operational difficulties.

Following the testing of over 100 different fare combinations, as well as the evaluation of six different generic structures, a list of six specific options was developed for consideration by the CTA Board of Directors. Once the Board had approved the basic recommended concept -- peak/off-peak on bus only, with prepaid tokens priced lower than the existing token and two different types of monthly passes -- the six options were presented to the public through a series of Public Hearings. A single option was then recommended and subsequently adopted by the Board. Finally, given a very short implementation lead time, CTA staff completed an extraordinary effort and successfully met the very tight implementation deadline (April 29, 1990).

The results (i.e., after eight months of the new structure) indicate that the CTA has successfully achieved its primary goal of meeting its increased revenue target without suffering significant ridership loss. These findings indicate that this market-segmented deep discount pricing strategy holds substantial promise for the transit industry as a whole.

The elements of the study and the key findings are summarized below.

7.1 ELEMENTS OF THE FARE RESTRUCTURING PROJECT

In July 1989, the CTA contracted with a team of consultants to assist in the development and implementation of a market-oriented fare structure; the project consisted of the following basic elements:

- market analysis of choice of payment method: this involved the prediction of method of payment for CTA riders based on 1) a telephone survey of 800 current riders and 2) the development of disaggregate (logit) models of method of payment choice

- research on innovative fare structures elsewhere: this involved a review of the experiences of other transit systems that have implemented deep discount strategies, peak/off-peak differentials, or other innovative approaches

- development of ridership and revenue model: a model (Transit Pricing Evaluation Model) was developed to predict the impact of different fare structures on revenue and ridership; this model used the above predictions of payment choice and a range of elasticities (for different submarkets) as inputs; it predicted the impacts on 52 submarkets

- assessment of alternative strategies and recommendation of a revised fare structure: this involved 1) the identification and evaluation of alternative pricing strategies (peak/off-peak differential, bus/rail differential, premium for paying cash, deep discounting of prepayment, and market-segmented passes), 2) testing 100 different specific pricing structures, 3) selection of a preferred strategy and six alternative pricing options, and 4) adoption of the selected option

- implementation and marketing: implementation and marketing took place in three months, and required an intensive cooperative effort among many CTA departments; CTA's top management played a key role in insuring proper cooperation/coordination

- evaluation of the impacts of the fare restructuring: this involved the evaluation of the restructuring's impacts on ridership/revenue and travel behavior, based on actual results, as well as surveys (before and after the fare change) of pass buyers and cash/token users

The key findings from the study are presented below.

7.2 DEVELOPMENT AND IMPLEMENTATION OF THE NEW FARE STRUCTURE

In conducting this study, a number of important findings emerged related to the development and implementation of the new structure. These findings may be transferable to other transit agencies considering a new fare structure.

- In assessing alternative fare strategies (peak/off-peak, deep discounting, etc.), it is important to clearly identify the full range of operational and implementation concerns associated with each alternative. It is necessary to consult representatives of the various operational and administrative departments in identifying these concerns.

- Selection of the "best" strategy involves an iterative process that includes consideration of 1) the operational/implementation concerns, 2) predicted revenue and ridership impacts, and 3) short and long-range fare collection goals. The actual selection process requires the development of consensus among representatives of the key departments.

- It is helpful in selecting -- and then implementing -- a new fare structure to establish a task force made up of management-level representatives of the key operational and administrative departments of the transit agency. In Chicago, the Fares Policy Task Force played a vital role throughout the project.

- Implementing a complicated new fare structure (i.e., involving multiple changes from the existing structure) requires the full cooperation -- and careful coordination among -- all of the key departments of the transit agency. Close involvement on the part of the agency's top management can be necessary to facilitate this coordination, especially if there is a short lead time. Despite having less than three months to implement the new structure, the CTA received the necessary leadership (from the Executive Director) and cooperation from all key departments, and was able to effect a very smooth transition to the new structure.

- In implementing an innovative fare structure such as was done by the CTA, it is necessary to effectively sell the concept to the public. A carefully planned and executed marketing program is thus essential. In Chicago, the marketing/public information effort proved extremely effective: despite the complexity of the new fare structure, there was minimal confusion among riders and very little confrontation between riders and CTA operators/ticket agents. A survey of riders on the first day of the new structure indicated that nearly 90 percent of riders were aware of the new structure and had chosen their preferred method of payment.

- In the post-restructuring surveys, the responses suggest that print advertisements (on the bus/train, and, to a lesser extent, in the newspaper) are a more effective means of transmitting information about payment methods (i.e., token and pass) than either marketing brochures or use of radio.

7.3 RIDERSHIP AND REVENUE IMPACTS

The key findings regarding ridership and revenue impacts can be summarized as follows. While these results are specific to the CTA, the general findings should be of interest to any transit agency considering a market-oriented fare structure.

- The average cash price for full fare riders was up 5 percent from before the restructuring, while the average cash price for reduced fare riders was down 11 percent. The average pass price for full fare riders was up 16 percent, while the reduced fare pass price was unchanged.

- Average weekday ridership was up 0.7 percent. System ridership (including weekends) was down 0.9 percent, although ridership for the full year (1990) was up 0.1 percent.

- The decline in system ridership is attributable to the fact that Sunday ridership was down 17 percent. This is predominantly the result of the elimination of the "Supertransfer," which had allowed purchasers to take an unlimited number of rides on Sunday; the price of the Supertransfer was $1.75 ($0.85 for reduced fare riders). The CTA had felt that the Supertransfer was costing too much in "lost" revenue, and thus decided to discontinue it as part of the restructuring; Sunday revenue has indeed shown a significant rise since the fare change.

- Reduced fare (elderly, disabled, students) ridership was up 8 percent. In developing the new fare structure, the CTA had been particularly interested in reversing the three-year decline in reduced fare ridership. Thus, the growth in usage by this market represents an important result. The reduced fare market has clearly responded to the decrease in fares.

- There was a significant shift among fare payment methods: overall cash use was down 27 percent (compared to the same period in the previous year), and pass use was down 13 percent, while token use was up 273 percent. Beyond the overriding goal of increasing revenue without losing ridership, the CTA sought to reduce the use of cash -- particularly dollar bills -- in the payment of fares. The CTA has clearly achieved its goal of reducing the amount of cash in the system (i.e., other than paying for the passes and tokens). This is shown by the fact that cash fare ridership is down by more than 20 percent; since overall ridership is down less than 1 percent, most of these riders have clearly switched to tokens or passes. The switch to prepayment has resulted in a monthly decrease in dollar bills of over 10 percent.

- Pass buying had been decreasing in the months prior to the restructuring, but the restructuring apparently accelerated this decline. The decline in pass purchasing is attributable to two major factors: 1) the elimination of the 14-day Pass ($25); and 2) the increase in the price of the Everyday Pass from $50 to $60. While many of the former Everyday and 14-day Pass users have switched to the Weekday Pass ($45), a considerable number of both groups has switched to tokens.

- System passenger revenue was up 6 percent (over the same period in the previous year). The CTA's revenue goal for restructuring was an average monthly total 4.1 percent higher than the pre-implementation average. Achieving this target required that a sufficient number of riders opt to pay the higher cash fare instead of switching to the discounted tokens or to passes. The results indicate that, indeed, a significant portion of the CTA's ridership is essentially insensitive to price: as shown above, the revenue target has been exceeded. While the number of riders (full fare) paying cash was 31 percent lower than before the restructuring, the tremendous growth in riders using tokens (up about 360 percent) has produced the net gain in revenue -- with virtually no loss in overall ridership. Forty-eight percent of all originating passengers still pay cash.

- The fare model proved quite accurate in its forecast of overall ridership, as well as the split between full and reduced fare ridership; however, there were significant errors in predicting certain individual submarkets, particularly regarding pass (overpredicted) and token usage (underpredicted).

7.4 TRAVEL BEHAVIOR IMPACTS

The major findings related to riders' travel behavior and attitudes toward different fare payment methods are as follows. These findings are based primarily on the results of the rider surveys.

- There was a substantial shift from cash to token use between the before and after surveys: 17 percent token use in the before vs. 44 percent after.

- Approximately 70 percent of the most infrequent full fare riders responding to the after survey -- those making 3 or fewer trips per week -- reporting using cash, rather than tokens. For those survey respondents making 4-9 trips per week, the use of tokens nearly equalled the use of cash. At the 10-12 trip level (representing the single largest group), token use became the dominant payment method.

- Those riders who have used CTA for the shortest length of time are more apt to pay cash than to use tokens. Tokens were preferred only by those (after) survey respondents who had been using CTA for more than one year.

- A total of 44 percent of after cash/token survey respondents had purchased a pass at some time in the past. The majority of all former pass buyers now use tokens. The greatest difference between cash and token is among the former 14-day pass buyers, 58 percent of whom now use tokens; 53 percent of former everyday pass buyers now use tokens, and the split for former weekday pass buyers is even.

- In rating the degree of importance they place on different attributes of passes, both pass buyers and non-pass buyers place by far the highest level of importance on the fact that passes save money over other methods.

- In rating the advantages and disadvantages of tokens, both cash/token users and pass buyers agreed most strongly with the contention that tokens are "more convenient to use than cash." However, the level of agreement was nearly as high concerning 1) tokens' ability to "save time paying the fare" and 2) the fact that tokens are "much cheaper than paying cash." On the other hand, relatively few respondents in either group felt that tokens are "difficult to buy" or "require too much cash in advance."

- Pass users report a much higher propensity to "take extra rides they would not otherwise take" than do token users: roughly half of the pass buyers vs. only 10 percent of token users.

- Regarding reasons for not buying a pass, nearly two-thirds of the after survey respondents reported that they "will not take enough rides this month;" one-quarter reported price as the reason. When broken out by trip frequency, the major reason at the higher frequencies is price; the initial purchase price is clearly the issue here, since, at higher than breakeven trip rates, a pass is cheaper than cash or token on a trip by trip basis.

7.5 CONCLUDING REMARKS

In recent years, transit research has made it increasingly clear that 1) transit demand is composed of a wide variety of market segments, and 2) the different segments react differently to a given fare level. The transit industry has now come to recognize that there are benefits -- to both riders and transit operators -- of offering a range of fares and payment mechanisms, targeted to different markets. For the rider, a market-oriented fare structure offers a choice among a range of options, based on his or her specific travel needs and sensitivity to price. For the operating agency, a market-oriented approach can make it possible to increase revenue without suffering significant ridership loss.

The Chicago Transit Authority pursued such an approach in its 1990 fare change. Based on the results through the end of 1990 (i.e., eight months after the implementation of the new structure), the restructuring has proven quite successful. It has been found that the budgeted revenue goals were met -- and, in fact, exceeded -- and weekday ridership experienced a gain as compared to the same period the year before the change. Thus, this market-oriented approach has succeeded in reversing the CTA's past experience of significant ridership loss with any fare increase. The findings from the CTA's effort indicate that the market-oriented pricing strategy holds substantial promise for the transit industry as a whole.

APPENDIX A: SAMPLE TPEM INPUT AND FARE REPORT

FIGURE A-1: INPUT VALUES FOR TRANSIT PRICING EVALUATION MODEL

RIDERSHIP MARKETS	NEW FARE	ELASTICITY	---- AGGREGATE ----- NEW FARE	ELASTICITY
■			0.95	-0.33
Reduced Fare			0.55	-0.58
Everyday Pass			25.00	-0.50
Peak			25.00	-0.50
Bus	25.00	-0.50		
Bus with Transfer	25.00	-0.50		
Rail	25.00	-0.50		
Rail with Transfer	25.00	-0.50		
Off-Peak/Weekend	25.00	-0.50		
Off-Peak/Wknd w/Transfer	25.00	-0.50		
Weekday Pass			25.00	-0.50
Peak			25.00	-0.50
Bus	25.00	-0.50		
Bus with Transfer	25.00	-0.50		
Rail	25.00	-0.50		
Rail with Transfer	25.00	-0.50		
Off-Peak/Weekend	25.00	-0.50		
Off-Peak/Wknd w/Transfer	25.00	-0.50		
Cash			0.60	-0.61
Peak			0.61	-0.35
Bus	0.50	-0.38		
Bus with Transfer	0.65	-0.38		
Rail	0.50	-0.12		
Rail with Transfer	0.65	-0.12		
Off-Peak/Weekend	0.50	-0.75		
Off-Peak/Wknd w/Transfer	0.65	-0.75		
Token			0.59	-0.62
Peak			0.59	-0.35
Bus	0.50	-0.38		
Bus with Transfer	0.65	-0.38		
Rail	0.50	-0.12		
Rail with Transfer	0.65	-0.12		
Off-Peak/Weekend	0.50	-0.75		
Off-Peak/Wknd w/Transfer	0.65	-0.75		
Full Fare			1.04	-0.28
Everyday Pass			50.00	-0.18
Peak			50.00	-0.18
Bus	50.00	-0.18		
Bus with Transfer	50.00	-0.18		
Rail	50.00	-0.18		
Rail with Transfer	50.00	-0.18		
Off-Peak/Weekend	50.00	-0.18		
Off-Peak/Wknd w/Transfer	50.00	-0.18		
Weekday Pass			50.00	-0.18
Peak			50.00	-0.18
Bus	50.00	-0.18		
Bus with Transfer	50.00	-0.18		
Rail	50.00	-0.18		
Rail with Tranfer	50.00	-0.18		
Off-Peak/Weekend	50.00	-0.18		
Off-Peak/Wknd w/Transfer	50.00	-0.18		
Peak-only Pass			50.00	-0.18
Bus	50.00	-0.18		
Bus with Transfer	50.00	-0.18		
Rail	50.00	-0.18		
Rail with Transfer	50.00	-0.18		
Cash Fare			1.17	-0.33
Peak			1.18	-0.21
Bus	1.00	-0.30		
Bus with Transfer	1.25	-0.30		
Rail	1.00	-0.10		
Rail with Transfer	1.25	-0.10		
Off-Peak/Weekend	1.00	-0.42		
Off-Peak/Wknd w/Transfer	1.25	-0.42		
Token			1.10	-0.30
Peak			1.08	-0.20
Bus	0.95	-0.28		
Bus with Transfer	1.20	-0.28		
Rail	0.95	-0.10		
Rail with Transfer	1.20	-0.10		
Off-Peak/Weekend	0.95	-0.38		
Off-Peak/Wknd w/Transfer	1.20	-0.38		

FIGURE A-2: IPEM NEW FARE REPORT

RIDERSHIP MARKETS	NEW FARE	RIDERSHIP	REVENUE
■	0.95	332293744.00	$ 315,880,466
├─Reduced Fare	0.55	60012242.00	$ 32,850,873
│ ├─Everyday Pass	25.00	13855355.00	$ 5,697,103
│ │ ├─Peak	25.00	6193344.00	$ 2,546,605
│ │ │ ├─Bus	25.00	2881914.00	$ 1,184,998
│ │ │ ├─Bus with Transfer	25.00	2729505.00	$ 1,122,329
│ │ │ ├─Rail	25.00	110843.00	$ 45,577
│ │ │ └─Rail with Transfer	25.00	471082.00	$ 193,702
│ │ ├─Off-Peak/Weekend	25.00	2681704.00	$ 1,102,674
│ │ └─Off-Peak/Wknd w/Transfer	25.00	4980307.00	$ 2,047,824
│ ├─Weekday Pass	25.00	3783872.00	$ 1,668,374
│ │ ├─Peak	25.00	1854097.00	$ 817,503
│ │ │ ├─Bus	25.00	348116.00	$ 153,490
│ │ │ ├─Bus with Transfer	25.00	1214623.00	$ 535,548
│ │ │ ├─Rail	25.00	94597.00	$ 41,710
│ │ │ └─Rail with Transfer	25.00	196761.00	$ 86,755
│ │ ├─Off-Peak/Weekend	25.00	675421.00	$ 297,805
│ │ └─Off-Peak/Wknd w/Transfer	25.00	1254354.00	$ 553,066
│ ├─Cash	0.60	38602880.00	$ 23,246,172
│ │ ├─Peak	0.61	13704023.00	$ 8,369,105
│ │ │ ├─Bus	0.50	3242642.00	$ 1,621,321
│ │ │ ├─Bus with Transfer	0.65	9071677.00	$ 5,896,590
│ │ │ ├─Rail	0.50	347426.00	$ 173,713
│ │ │ └─Rail with Transfer	0.65	1042278.00	$ 677,481
│ │ ├─Off-Peak/Weekend	0.50	8714600.00	$ 4,357,300
│ │ └─Off-Peak/Wknd w/Transfer	0.65	16184257.00	$ 10,519,767
│ └─Token	0.59	3770135.00	$ 2,239,225
│ ├─Peak	0.59	1338398.00	$ 786,262
│ │ ├─Bus	0.50	524049.00	$ 262,025
│ │ ├─Bus with Transfer	0.65	678624.00	$ 441,106
│ │ ├─Rail	0.50	33931.00	$ 16,966
│ │ └─Rail with Transfer	0.65	101794.00	$ 66,166
│ ├─Off-Peak/Weekend	0.50	851108.00	$ 425,554
│ └─Off-Peak/Wknd w/Transfer	0.65	1580629.00	$ 1,027,409
└─Full Fare	1.04	272281502.00	$ 283,029,592
├─Everyday Pass	50.00	57390636.00	$ 41,647,777
│ ├─Peak	50.00	22554520.00	$ 16,367,577
│ │ ├─Bus	50.00	6886876.00	$ 4,997,733
│ │ ├─Bus with Transfer	50.00	9985971.00	$ 7,246,714
│ │ ├─Rail	50.00	975641.00	$ 708,013
│ │ └─Rail with Transfer	50.00	4706032.00	$ 3,415,118
│ ├─Off-Peak/Weekend	50.00	12192641.00	$ 8,848,071
│ └─Off-Peak/Wknd w/Transfer	50.00	22643475.00	$ 16,432,130
├─Weekday Pass	50.00	16055265.00	$ 13,031,870
│ ├─Peak	50.00	7610196.00	$ 6,177,107
│ │ ├─Bus	50.00	1846356.00	$ 1,498,666
│ │ ├─Bus with Transfer	50.00	3066556.00	$ 2,489,088
│ │ ├─Rail	50.00	931205.00	$ 755,848
│ │ └─Rail with Tranfer	50.00	1766079.00	$ 1,433,506
│ ├─Off-Peak/Weekend	50.00	2955774.00	$ 2,399,167
│ └─Off-Peak/Wknd w/Transfer	50.00	5489295.00	$ 4,455,597
├─Peak-only Pass	50.00	16859183.00	$ 17,063,951
│ ├─Bus	50.00	5597249.00	$ 5,665,232
│ ├─Bus with Transfer	50.00	4231655.00	$ 4,283,052
│ ├─Rail	50.00	3051512.00	$ 3,088,575
│ └─Rail with Transfer	50.00	3978767.00	$ 4,027,092
├─Cash Fare	1.17	163006554.00	$ 190,412,031
│ ├─Peak	1.18	70092818.00	$ 82,399,813
│ │ ├─Bus	1.00	11573465.00	$ 11,573,465
│ │ ├─Bus with Transfer	1.25	27711114.00	$ 34,638,893
│ │ ├─Rail	1.00	9291374.00	$ 9,291,374
│ │ └─Rail with Transfer	1.25	21516865.00	$ 26,896,081
│ ├─Off-Peak/Weekend	1.00	32519808.00	$ 32,519,808
│ └─Off-Peak/Wknd w/Transfer	1.25	60393928.00	$ 75,492,410
└─Token	1.10	18969864.00	$ 20,873,964
├─Peak	1.08	8157041.00	$ 8,844,698
│ ├─Bus	0.95	2105655.00	$ 2,000,372
│ ├─Bus with Transfer	1.20	2466082.00	$ 2,959,298
│ ├─Rail	0.95	1669348.00	$ 1,585,881
│ └─Rail with Transfer	1.20	1915956.00	$ 2,299,147
├─Off-Peak/Weekend	0.95	3784488.00	$ 3,595,264
└─Off-Peak/Wknd w/Transfer	1.20	7028335.00	$ 8,434,002

APPENDIX B: SURVEY QUESTIONNAIRES

Thank you for your help. We would like to know a few things about you. This will help us to ensure that our survey represents all groups of riders.

22. **Are you:** 1 ☐ MALE 2 ☐ FEMALE

23. **What is your home postal zip code?**_____

24. **Is your age:** 1 ☐ 12-17 2 ☐ 18-24 3 ☐ 25-34
4 ☐ 35-44 5 ☐ 45-64 6 ☐ 65 or over

25. **Are you:** 1 ☐ Hispanic 2 ☐ Asian 3 ☐ Black/African-American
4 ☐ White 5 ☐ American Indian
6 ☐ Other (Specify _____)

26. **How many people live in your household?** (Circle)

1 2 3 4 5 6 7 8 9 or more

27. **How many vehicles (car, van, or other) are available to you and members of your household?**

0 1 2 3 4 5 or more

29. **What was your combined household income last year? (1989)**

1. ☐ Under $10,000
2. ☐ $10,001-$20,000
3. ☐ $20,001-$30,000
4. ☐ $30,001-$40,000
5. ☐ $40,001-$50,000
6. ☐ over $50,000

Now please fold the card in half and either return it to the person who gave you the survey or tape it closed and mail it to CTA (no stamp required)

NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 11103 CHICAGO, ILLINOIS

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CHICAGO TRANSIT AUTHORITY
Mr. Evan Fowler
Special Project Liaison
Merchandise Mart, Box 3555
Chicago, Illinois 60654

tape here

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CTA RIDER SURVEY

Dear Rider

We are carrying out a survey of CTA riders to study the demand for Tokens and Passes. Please help us by completing this questionnaire and returning it either by mail or to the person who gave you the survey. As part of this survey, CTA will randomly draw five surveys for which the prize will be a FREE Everyday pass ($60 value). If you wish to be eligible to win, complete the entire survey and indicate below where we may contact you.

_____ ( ) _____
Name Phone No

_____
Street City Zip Code

1. **What fare did you just pay for this trip?**

1 ☐ $1.00
2. ☐ $1.25
3 ☐ $1.50
4. ☐ token ($.90)
5 ☐ token + $.25
6 ☐ $.40
7 ☐ $.45
8. ☐ token ($.40)
9 ☐ token + $.15

2. **Why did you not buy a pass this month?**

1 ☐ will not take enough rides to make it worth buying a pass
2 ☐ could not afford it
3 ☐ did not know where to buy one
4 ☐ other; please explain: _____

3. **Have you ever bought a CTA pass (check all that apply)?**

1. ☐ no (Go to 8)
2 ☐ yes, monthly everyday pass
3 ☐ yes, weekday pass
4 ☐ yes, 14-day pass

4. **How often did you buy a pass in the last 12 months (including this month)?** number per year (please circle)

everyday/monthly	0	1	2	3	4	5	6	7	8	9	10	11	12
weekday	0	1	2	3	4	5	6	7					
14-day	0	1	2	3	4	5	6	7	8	9	10	11	12 13

(prior to May 1990)

5. **Here are some reasons people buy passes. How important are these reasons to you?** Check one box for each reason.

	Not important	Somewhat important	Very important
1 To save money	☐	☐	☐
2 To take extra rides I would not otherwise make	☐	☐	☐
3 No need for exact change	☐	☐	☐
4 Other, please explain	☐	☐	☐

6. Where did you buy your most recent pass?

1 ☐ currency exchange
2 ☐ Jewel or Dominick's Grocery Store
3 ☐ at work, place of employment: _____
4 ☐ other, please specify _____

7. When you first bought a pass did you change your traveling habits by taking extra rides on CTA which you previously did not take before you bought a pass? 1 ☐ yes 2 ☐ no

If yes, how many rides per week? _____

8. Where did you find out about CTA's passes (in the new fare structure)?

1. ☐ CTA ads in the newspapers (which one: _____?
2. ☐ ads on the bus or train
3. ☐ brochures on the bus or train
4. ☐ on the radio (station: _____)
5. ☐ on TV news (channel: _____)
6. ☐ from a friend, family member, or co-worker
7. ☐ other; please specify: _____

9. As an alternative to the existing Monthly passes, would you prefer:

		yes	no
1.	A cheaper pass valid only during peak hours (i.e. between 6-9 A.M. and 3-6 P.M. on weekdays)	1 ☐	2 ☐
2.	A cheaper pass valid only during off-peak hours (i.e., between 9 A.M.-3 PM and 6 P.M.-6 A.M. on weekdays and all day Sat. and Sun.)	1. ☐	2. ☐
3	A cheaper pass valid only on buses, not on trains	1. ☐	2. ☐
4	A premium (Quik) pass giving faster station entry via automatic gates and on buses	1 ☐	2. ☐
5	A 14-day pass valid at all times	1 ☐	2 ☐

10. Have you ever bought CTA tokens? 1 ☐ no (Go to 14) 2 ☐ yes

11. When did you begin buying tokens?

1 ☐ before May 1990
2 ☐ May
3 ☐ June
4 ☐ July
5 ☐ August
6 ☐ September
7 ☐ October
8 ☐ November

12. Where did you buy your most recent tokens?

1 ☐ currency exchange
2 ☐ Jewel or Dominick's Grocery Store
3 ☐ at CTA rail station
4 ☐ at work
5 ☐ other, please specify _____

13. When you first bought a 10-pack of tokens did you change your traveling habits by taking extra rides on CTA which you previously did not take before you bought tokens? 1. ☐ yes 2 ☐ no

If yes, how many rides per week? _____

14. Where did you find out about the new low-price CTA tokens?

1. ☐ CTA ads in the newspapers (which one: _____?
2. ☐ ads on the bus or train
3. ☐ brochures on the bus or train
4. ☐ on the radio (station: _____)
5. ☐ on TV news (channel: ____)
6. ☐ from a friend, family member, or co-worker
7. ☐ other; please specify: _____

15. Do you agree or disagree with the following statements about tokens?

		Agree	Neutral	Disagree
1.	Tokens save time paying the fare	☐	☐	☐
2.	Tokens are much cheaper than paying cash	☐	☐	☐
3.	It is difficult to find a place to buy tokens	☐	☐	☐
4.	Buying packs of tokens requires too much cash in advance	☐	☐	☐
5.	Tokens are more convenient to use than cash .	☐	☐	☐

16. How long have you been using CTA?

1. ☐ 6 months or less 2 ☐ 7-12 months 3. ☐ 12-24 months 4 ☐ more than 24 months

17. Please check all of the days you used CTA in the last 7 days?

1 ☐ Mon. 2 ☐ Tues. 3 ☐ Wed. 4 ☐ Thurs. 5 ☐ Fri. 6 ☐ Sat. 7 ☐ Sun

18. How many one-way trips did you make by CTA yesterday or the last weekday you used CTA? (Please count each time you went someplace or returned as one trip. For example, going to work and back is two trips.) (Please circle the number of trips you made on ONE DAY.)

1 2 3 4 5 6 7 or more

19. When you traveled by CTA that day, how many of your CTA trips were taken during the morning and evening peak periods from 6 a.m. to 9 a.m. and from 3 p.m. to 6 p.m.? (Please circle the number of peak trips you made ON THAT DAY.)

0 1 2 3 4 5 or more

20. Now, thinking about last weekend, how many trips did you make by CTA, counting both Saturday and Sunday? (Please circle the number)

0 1 2 3 4 5 6 7 or more

21. Please check the one type of trip you most often take on CTA?

1 ☐ work 2 ☐ school 3 ☐ shopping 4 ☐ social or recreational
5 ☐ medical 6 ☐ other _____

Thank you for your help. We would like to know a few things about you. This will help us to ensure that our survey represents all groups of riders.

22. **Are you:** 1 ☐ MALE 2 ☐ FEMALE

23. **What is your home postal zip code?**_____

24. **Is your age:** 1 ☐ 12-17 2 ☐ 18-24 3 ☐ 25-34
4 ☐ 35-44 5 ☐ 45-64 6 ☐ 65 or over

25. **Are you:** 1 ☐ Hispanic 2 ☐ Asian 3 ☐ Black/African-American
4 ☐ White 5 ☐ American Indian
6 ☐ Other (Specify _____)

26. **How many people live in your household? (Circle)**

1 2 3 4 5 6 7 8 9 or more

27. **How many vehicles (car, van, or other) are available to you and members of your household?**

0 1 2 3 4 5 or more

29. **What was your combined household income last year? (1989)**

1. ☐ Under $10,000
2. ☐ $10,001-$20,000
3. ☐ $20,001-$30,000
4. ☐ $30,001-$40,000
5. ☐ $40,001-$50,000
6. ☐ over $50,000

Now please fold the card in half and either return it to the person who gave you the survey or tape it closed and mail it to CTA (no stamp required).

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Mr. Evan Fowler
Special Project Liaison
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Chicago, Illinois 60654

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CTA PASSBUYER SURVEY

Dear Rider,

We are carrying out a survey of CTA riders to study the demand for Tokens and Passes. Please help us by completing this questionnaire and returning it either by mail or to the person who gave you the survey. As part of this survey, CTA will randomly draw five surveys for which the prize will be a FREE Everyday pass ($60 value). If you wish to be eligible to win, complete the entire survey and indicate below where we may contact you.

_____ ( ) _____
Name Phone No.

_____
Street City Zip Code

1. **What price pass have you just bought?**

1. ☐ $60.00 2. ☐ $45.00 3. ☐ $25.00

2. **CTA first introduced Everyday Monthly passes in 1979, 14-Day passes in March 1988, and Weekday passes in May 1990. Please give the approximate date when you bought your first pass of one of these types.**

Everyday month_____ 19____
14-Day month_____ 19____
Weekday month_____ 1990

3. **Have you ever bought a different type of CTA pass (check all that apply)?**

1. ☐ no
2. ☐ yes, monthly everyday pass
3. ☐ yes, weekday pass
4. ☐ yes, 14-day pass

4. **How often did you buy a pass in the last 12 months (including this month)?** number per year (please circle)

everyday/monthly 0 1 2 3 4 5 6 7 8 9 10 11 12
weekday 0 1 2 3 4 5 6 7
14-day 0 1 2 3 4 5 6 7 8 9 10 11 12 13
(prior to May 1990)

5. **Here are some reasons people buy passes. How important are these reasons to you? Check one box for each reason.**

	Not Important	Somewhat Important	Very Important
1 To save money	☐	☐	☐
2 To take extra rides I would not otherwise make	☐	☐	☐
3 No need for exact change	☐	☐	☐
4 Other, please explain	☐	☐	☐

6. **Where did you buy your most recent pass?**

1. ☐ currency exchange
2. ☐ Jewel or Dominick's Grocery Store
3 ☐ at work, place of employment. _____
4 ☐ other, please specify. _____

7. **When you first bought a pass did you change your traveling habits by taking extra rides on CTA which you previously did not take before you bought a pass?** 1. ☐ yes 2. ☐ no

If yes, how many rides per week? _____

8. **Where did you find out about CTA's passes (in the new fare structure)?**

1 ☐ CTA ads in the newspapers (which one: _____?
2 ☐ ads on the bus or train
3 ☐ brochures on the bus or train
4 ☐ on the radio (station. _____)
5 ☐ on TV news (channel: _____)
6 ☐ from a friend, family member, or co-worker
7 ☐ other, please specify: _____

9. **As an alternative to the existing Monthly passes, would you prefer:**

		yes	no
1	A cheaper pass valid only during peak hours (i.e between 6-9 A.M. and 3-6 P.M. on weekdays)	1 ☐	2 ☐
2	A cheaper pass valid only during off-peak hours (i.e., between 9 A.M.-3 P.M. and 6 P.M.-6 A.M. on weekdays and all day Sat. and Sun.)	1 ☐	2 ☐
3	A cheaper pass valid only on buses, not on trains	1 ☐	2 ☐
4	A premium (Quik) pass giving faster station entry via automatic gates and on buses	1 ☐	2 ☐
5	A 14-day pass valid at all times	1 ☐	2 ☐

10. **Have you ever bought CTA tokens?** 1 ☐ no (Go to 14) 2 ☐ yes

11. **When did you begin buying tokens?**

1 ☐ before May 1990
2 ☐ May
3 ☐ June
4 ☐ July
5 ☐ August
6 ☐ September
7 ☐ October
8 ☐ November

12. **Where did you buy your most recent tokens?**

1 ☐ currency exchange
2 ☐ Jewel or Dominick's Grocery Store
3 ☐ at CTA rail station
4 ☐ at work
5 ☐ other, please specify _____

13. **When you first bought a 10-pack of tokens did you change your traveling habits by taking extra rides on CTA which you previously did not take before you bought tokens?** 1. ☐ yes 2 ☐ no

If yes, how many rides per week? _____

14. **Where did you find out about the new low-price CTA tokens?**

1. ☐ CTA ads in the newspapers (which one: _____ _____?
2. ☐ ads on the bus or train
3 ☐ brochures on the bus or train
4. ☐ on the radio (station: _____)
5. ☐ on TV news (channel: ____)
6 ☐ from a friend, family member, or co-worker
7. ☐ other, please specify: _____

15. **Do you agree or disagree with the following statements about tokens?**

		Agree	Neutral	Disagree
1.	Tokens save time paying the fare	☐	☐	☐
2.	Tokens are much cheaper than paying cash	☐	☐	☐
3.	It is difficult to find a place to buy tokens	☐	☐	☐
4.	Buying packs of tokens requires too much cash in advance	☐	☐	☐
5	Tokens are more convenient to use than cash	☐	☐	☐

16. **How long have you been using CTA?**

1. ☐ 6 months or less
2. ☐ 7-12 months
3. ☐ 12-24 months
4 ☐ more than 24 months

17. **Please check all of the days you used CTA in the last 7 days?**

1 ☐ Mon. 2 ☐ Tues. 3 ☐ Wed. 4 ☐ Thurs. 5 ☐ Fri. 6 ☐ Sat 7 ☐ Sun.

18. **How many one-way trips did you make by CTA yesterday or the last weekday you used CTA? (Please count each time you went someplace or returned as one trip. For example, going to work and back is two trips.) (Please circle the number of trips you made on ONE DAY.)**

1 2 3 4 5 6 7 or more

19. **When you traveled by CTA that day, how many of your CTA trips were taken during the morning and evening peak periods from 6 a.m. to 9 a.m. and from 3 p.m. to 6 p.m.? (Please circle the number of peak trips you made ON THAT DAY.)**

0 1 2 3 4 5 or more

20. **Now, thinking about last weekend, how many trips did you make by CTA, counting both Saturday and Sunday? (Please circle the number)**

0 1 2 3 4 5 6 7 or more

21. **Please check the one type of trip you most often take on CTA?**

1 ☐ work 2 ☐ school 3 ☐ shopping 4 ☐ social or recreational
5 ☐ medical 6 ☐ other _____

APPENDIX C: WEIGHTING PROCEDURE TO CORRECT FOR TRIP FREQUENCY BIAS

In order to correct for a sampling bias (related to respondent trip frequencies) inherent in on-board surveys, a statistical weighting procedure was applied to the results of the on-board "after" survey. The weighting factor (as discussed by Larry Doxsey: "Trip Frequency Bias in On-Board Surveys", TSC, January 1983), has the following form:

$$w_i = \frac{n}{f_i \sum_{i=1}^{n} 1/f_i}$$

This factor was applied as follows. The term $1/f_i$ is called the inverse transit travel frequency, or ITTF. The weight w_i can thus be expressed as the ITTF for individuals i divided by the average ITTF for the sample, or:

$$w_i = \frac{1/f_i}{1/n \sum 1/f_i} = \frac{ITTF_i}{\overline{ITTF}}$$

The variable ITTF was then defined (in an SPSS run), the mean value for the sample was calculated, and then, in a second pass, a weighting variable was computed and applied by dividing the ITTF variable for each respondent by the constant (sample mean).

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