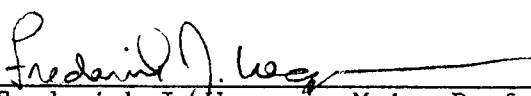


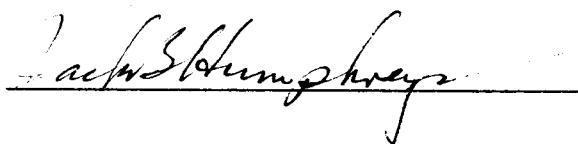
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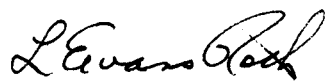

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A CASE STUDY OF A TEMPORARY
INTERRUPTION OF TRANSIT SERVICE

A Thesis
Presented for the
Master of Engineering
Degree
The University of Tennessee, Knoxville

Samuel L. Parnell, Jr.

December 1979

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DEDICATION

Special appreciation is expressed to my wife Sara, whose understanding and cooperation made this thesis possible and to whom this thesis is dedicated.

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ABSTRACT

A very critical question confronting many small and medium-size cities is the role that public transportation plays in meeting the critical mobility needs of individual citizens. The six-week strike of the Knoxville Transit Corporation in 1977 provides an insight as to the community consequences resulting from a temporary interruption of transit service. The strike stranded an estimated 7000 daily fixed-route bus riders and 600 daily express bus riders. The strike study showed that the temporary loss of transit services can have adverse impact on the community and its citizens.

For captive transit riders, this loss of mobility resulted in a reduction in trip making (especially for trips of a discretionary nature) and a forced shift in travel modes and destinations. The group of captives most affected was the elderly living in senior citizen complexes. These individuals had to suppress almost one-third of their normal travel. The captive group as a whole was able to find alternative arrangements for essential travel by relying in most cases on relatives and friends. However, discretionary trips previously made by transit (religious trips, visits to friends and relatives, leisure/recreational trips and personal business trips) were cancelled in many cases.

With a shift in the travel pattern of the transit users due to the strike, downtown merchants, particularly those catering to transit dependents, lost substantial amounts of business. A number of firms reported drops in sales of 50 to 80 percent, forcing reduced operating

hours and layoffs of sales personnel. The downtown business establishments that were affected most seriously were specialty shops, clothing and shoe stores, restaurants and fast food/drug/variety stores. Interviews with store managers, however, revealed that sales returned to normal levels within two months after the strike was settled. Interestingly, many CBD merchants felt only minor repercussions ranging from no loss to 5 or 10 percent declines in sales during the strike. In the cases of many of these merchants, the patrons were automobile-oriented commuters.

Most of the major Knoxville employers reported little difficulty in having their employees get to work during the strike. The strike forced less adjustment than the severe winter and the natural gas curtailment. Some special accommodations were required but, in most cases, these were worked out with little difficulty. No evidence was encountered to suggest excessive traffic congestion. Only in the CBD area was parking mentioned as a problem.

The transit system itself felt the most adverse impact from the strike with system-wide ridership declines of 9 to 12 percent continuing even five months after the strike was settled. This loss in ridership represents about 6,400 to 8,500 transit trips per week. System-wide fare increases, which were anticipated to increase revenue by a minimum of 20 percent, have resulted in a gain of only 10 percent over 1976 revenues. Although some operating costs were deferred during the strike, the loss of revenue during the strike and the loss of ridership due to the strike offset any savings. All parties involved with the Knoxville Transit Corporation strike (city officials, the operating

company, the labor union and the riders) would have benefited by averting the strike or at least by attempting to limit its duration. The loss in ridership almost nullified the gain from the fare increase that had been scheduled prior to the strike. Prevention of the work stoppage could have kept many choice regular and express route transit users from switching to another mode.

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CHAPTER 1

INTRODUCTION

A critical question confronting many small and medium sized cities is the role that public transportation plays in meeting crucial mobility needs of individual citizens. With transit operating costs continuing to rise and fare box revenues usually covering less than 50 percent of total costs, public decision makers are raising questions concerning the nature and extent of community benefits derived from subsidizing public transit operations. A direct measurement of public transit service benefits is difficult to derive but an indirect method might be to examine the consequences of a temporary interruption in existing service. Several hypothetical questions can be raised: How would the citizens respond if the transit service was no longer available? What impact would this have on individual mobility? What alternative supplies of transportation could be made available? What would be the impact on the total transportation system?

The six-week strike of the Knoxville Transit Corporation (KTC) stranded 7,000 to 8,000 daily fixed-route bus riders and 600 daily express bus riders.¹ It provides an interesting and realistic opportunity for assessing the impact resulting from temporarily interrupting transit service in a medium size city and thus obtaining a perspective of the role of the transit service in the community. Although transit service in Knoxville carries less than 3 percent of

the total daily trips made in the city, a recent transit planning study--the Transit Development Study--concluded that 84 percent of the riders on the fixed-route system could be classified as transit dependent. These individuals either possessed no driver's license (60 percent of riders), owned no automobile in the household (47 percent of riders) or had no automobile available at the time of a transit trip (61 percent of riders). Among other significant characteristics, it is noteworthy that 22 percent of the riders were elderly and 31 percent of riders had household incomes of less than \$3,000 per year. Considering all these factors, it was feared that the loss of transit service would cause severe hardships on individuals least able to make adjustments.¹

Impacts of a transit strike could spread out also to the business community as employers would lack the services of workers not able to commute, merchants would lose customers, and other institutions would have their operations hampered due to clients not being able to gain access to their services. Activities in the Central Business District (CBD) would be most adversely affected as over 20 percent of the daily transit trips were identified as having a trip end in the CBD area.

Express bus users, most of whom are choice riders, might pose a different type of issue as a result of the transit strike. Since all express buses converge on the CBD at 7:45 a.m. and 4:45 p.m. each day, any shift of the riders of 13 KTC express buses to automobile usage could cause an influx of 300 to 500 additional automobiles into

the already congested downtown area. The all-day storage of these additional commuter vehicles in the central area would further aggravate the parking situation.

The Knoxville transit strike thus provided an opportunity to trace the impact of temporarily interrupting a transit service on a variety of groups within the community and identify how the residents actually coped with the situation.

Objectives

The objective of this study is to identify the impact of the six-week bus strike on:

1. Travel behavior and modal choice decisions of individuals representing major transit markets. The alternative modes utilized during the strike, as well as after the strike was settled will be identified.
2. The impact of the strike on vehicle occupancy, traffic volumes and the use of downtown parking.
3. The impact of interrupting transit service on selected businesses, institutions and employers.
4. The impact of the strike on the ridership and revenue of Knoxville Transit Corporation. The short-range and long-range implications of the strike from the standpoint of transit operation will be identified.
5. The effect of the strike on other suppliers of transportation services. This analysis will examine actions taken by the community to ease adverse affects from the loss of

public transit service by providing alternative supplies of transportation services or coordinating carpooling and vanpooling efforts.

Limitations

Because the impact study was initiated concurrently with the beginning of the transit strike, opportunities were not available to collect data immediately before the strike. Therefore, the descriptions of conditions existing prior to the strike were based on secondary data sources. Secondly, some of the impact data could not be obtained in precise and quantifiable form. For instance, effects on the business community were described in terms of general estimates as specific records were either not available or were proprietary in nature.

With the need to collect as much information as possible from former transit users during the unknown duration of the strike period, reliance was placed on telephone surveys. Many transit dependents do not have access to a telephone and thus had to be excluded from the survey. Thus, scientific sampling procedures could not be utilized. The major emphasis was placed on interviewing individuals residing in housing clusters (elderly housing units, public housing units, etc.) where large numbers of transit riders were known to reside.

CHAPTER 2

BACKGROUND

For the purpose of study design and assessment of the impact of the transit strike, an understanding of the existing physical and socioeconomic characteristics of Knoxville is essential along with a thorough knowledge of its transit system and the users of the service. The Transit Development Study, which was completed just prior to the strike, had compiled substantial information on these aspects and thus was very useful for this study. A brief review of characteristics of the City and the transit service is presented in this chapter.

Characteristics of Knoxville

Knoxville, Tennessee, is the third largest city in the state of Tennessee with a 1976 population of approximately 181,500. The current population of the urbanized area is approximately 198,500. The physical development of the city originally occurred along the radial corridors that generally followed the old street car lines. However, as the use of private automobiles increased, the land between the street car corridors was developed and the development density began to decrease. Natural land features such as mountain ridges and the Tennessee River have also influenced the physical growth of the city in an east-west direction. The construction of Interstate 40 during the 1960s also has had influence on the sprawling development that has occurred in the western sector of the city.²

The economic base of Knoxville is diversified with several medium size industries. The two largest employers, however, are nonindustrial. These are The University of Tennessee (UT), which employs approximately 8,000 persons, and Tennessee Valley Authority (TVA) with approximately 3,400 employees. The Central Business District (CBD) of Knoxville, like many other cities of its size, has lost its predominance in retail activities. Public agencies and service institutions are the primary establishments in downtown Knoxville, TVA being the largest employer in the area. In recent years a few new developments have been initiated in the central core and these include the city/county building and a new bank/office complex. The University campus is located on the western fringe of the CBD.

The growth in the western portions of Knoxville and Knox County includes medium to high income housing. Many retail and service establishments also have been attracted to this area. The city has several public housing projects for elderly and low income families, and these are scattered throughout the city primarily in the northeast, northwest and south Knoxville area.

Transit System in Knoxville

Regular route service. The Knoxville Transit Corporation (KTC) is the principal transit carrier in the Knoxville area. KTC provides daily bus service on eight routes that radiate from the CBD. Most of these routes are through routes, and the system can be viewed as having 17 legs terminating at the CBD. The service on six routes is combined with others during the night hours. The regular transit routes cover 59

percent of the land area of the city, which includes 76 percent of the population.¹

Two private carriers, B&C Lines and Autrey Bus Lines, provide limited fixed-route, fixed-schedule bus service within the metropolitan area. The routes of these companies connect Knoxville with communities lying outside the city limits. Although these private bus companies are small, they have experienced moderate growth through participation in the express bus program.¹

Express route service. Besides providing service on regular routes, KTC provides express bus service of one round trip to the downtown area on 13 routes. Most of this service is provided for the major downtown employer--TVA. Express bus service is also provided by KTC to The University of Tennessee campus from the married student housing units under contract with the University.¹ In addition to the KTC service there were 10 express routes served by the B&C and Autrey Bus Lines prior to the transit strike (and currently these companies are providing service on 11 express routes).

Other transit suppliers. In addition to the traditional bus system, there are paratransit and charter bus services in Knoxville. For example, taxis are an important component of Knoxville's overall public transportation system. It has been estimated that Knoxville's taxi service handles over 5,000 passenger trips daily. This is approximately one-third of the Transit Corporation's regular fixed-route ridership. In addition, private charter bus service is provided by the Loy Bus Company and Seymour Bus Lines.¹

Ridesharing is a major form of transportation used by Knoxville's commuters. Recent studies indicate that approximately 46 percent of Knoxville's commuters use a rideshare mode. The most frequently used rideshare mode is carpooling. Vanpooling also has been introduced in the community through the efforts of TVA, the University and the city. TVA's credit union operates 18 commuter vans as part of TVA's commuter transportation program. In 1975, the Knoxville Commuter Pool (KCP) was initiated and the program provides 50 commuter vans in a 12 county area in and around Knoxville. Finally, there are 25 to 30 vans operated by social service agencies in the Knoxville area. Some of these vans carry both handicapped and nonhandicapped clients.¹

Management of Knoxville Transit Corporation

The largest share of public transportation service in the Knoxville urban area at present is provided by the Knoxville Transit Corporation. The City of Knoxville owns the transit vehicles and associated capital equipment of KTC, and the American Transit Corporation (ATC) of St. Louis, a subsidiary of the Chromalloy Corporation, operates the system under a contract with the city. The KTC system is managed by a General Manager, who is an employee of the management company. Major policy directives for KTC are provided by the Knoxville Transit Authority (KTA), the members of which are appointed by the Mayor of Knoxville. The city's Director of Public Transportation Services serves as the liaison between the KTA, the Mayor and the City Council. The operation of the KTC system is subject to budget approval by the Mayor and City Council.¹

Transit User Characteristics on KTC Regular Routes

The analysis of an on-board bus survey conducted in 1975 as part of the short-range transit planning study revealed the main user market segments served by the regular routes of KTC (excluding the express routes) are the elderly, the economically disadvantaged, and the commuter. Eighty-five percent of the trips made on these regular routes are home-based (trips beginning or ending at home). The most common trip purpose for all users is work, comprising 41 percent of all trips. School and shopping trips are the next most common trip purposes. Low income transit users were found to be dependent on transit for all types of trips and the main purposes of trips made by persons of 65 years of age or older were work and shopping. Approximately 20 percent of all trips were made to and from the CBD on which all of the 17 legs of eight regular routes converge.¹

The importance of transit to a family or individual is directly related to the income of the household. If income limits an individual from purchasing a car or using modes such as taxis, he/she is forced to rely on the bus service for his/her basic mobility. In Knoxville 40 percent of the transit users are below the poverty level (with annual income less than \$5,000 for a family of four) and another 30 percent can be considered marginally poor. Auto ownership and auto availability are also good indicators of an individual's dependence on transit. Forty-seven percent of the riders indicated that they did not own an automobile and 61 percent of those who owned a car did not have a car available for the trip. In addition, 60 percent of those interviewed during

the on board survey did not have a driver's license. When auto ownership, auto availability, and possession of a driver's license are used as a composite indicator of transit dependency, 84 percent of Knoxville's transit riders are transit dependent or captive riders.¹

In addition to income, the age of a transit rider is a noteworthy characteristic since it has significant implications for physical mobility. Approximately 22 percent of all riders on KTC regular routes are elderly being 65 years or older.¹

User Characteristics on KTC Express Routes

There are striking differences in the characteristics of the users of regular bus routes and the express service. Whereas only about 5 percent of the regular KTC transit users are professionals, 53 percent of public express bus passengers are professionals. Another significant difference is income. While more than 60 percent of the regular transit users earn less than \$6,000 a year, only 6 percent of the public express bus passengers had family incomes of less than \$10,000 a year.¹

A large percentage of the KTC express bus riders are employees of the Tennessee Valley Authority. These individuals clearly are choice riders. Less than 1 percent of those surveyed did not own a car, 33.6 percent owned one car and the remaining 65.5 percent owned two or more cars. The two most frequently mentioned reasons for using the express transit were the cost of travel and conservation of gasoline. The characteristics of the users of the privately operated express buses also were similar to those of the KTC express routes.¹

Issues Leading to the Strike

The primary causes of the strike were related to the desires of the members of the Amalgamated Transit Union Local 1164 (ATU) for greater wages, more liberal fringe benefits, and a cost of living escalator clause in the contract. When the ATU members (drivers and maintenance personnel) went on strike on Monday, February 14, 1977, they had already been working without a contract for two weeks, since January 31, 1977, when the old three-year contract had expired. More specifically, ATU was requesting the following:

1. A 10 percent wage increase from the existing \$5.74 per hour level.
2. Improvements in group life, accident, and medical/hospitalization insurance program (including a doubling of life insurance coverage from \$5,000 to \$10,000, a slight hike in health insurance payments to \$15 of which ATU members would pay \$10.70, and an increase in medical insurance benefits to cover the daily cost of a semi-private room in a hospital).
3. An increase of KTC's share of pension fund payments by 25 percent coupled with ATU members increasing their individual shares by 75 percent.
4. A cost of living provision giving one cent in wages for each 0.4 point rise in the consumer price index.

KTC was authorized by the City Administration to offer ATU no more than the following:

1. A 5 1/2 percent wage increase over a 17 month period with no cost of living clause.
2. Retention of the existing insurance program with KTC paying 100 percent of the costs (KTC maintained it was already contributing annually in excess of \$1,000 for each employee's pension and life, hospital, and medical insurance).

At the time of the labor negotiations, the City of Knoxville was developing an 18 month fiscal year budget in contrast to a calendar fiscal year budget. The new 18 month period would end on June 30, 1978. Because of a tight financial situation, Mayor Randy Tyree instructed all departments, including the Knoxville Transit Authority which oversees KTC operations, to operate on a budget which was 150 percent of the City's 1976 calendar fiscal year budget. Obviously, this situation did not take into account the inflation and did not permit any expansion of programs or wage increases. However, city officials indicated that the City would be compelled to impose service cuts for all city departments in order to end this new 18 month fiscal year within budget, to maintain its current rating on the municipal bond market and to avoid other tax increases. In addition, the City was recently denied enforcing its city sticker vehicle law which had been a \$2,000,000 annual revenue source.

After the preliminary meetings of KTC management and union representatives did not prove productive and 14 days since the end of the old contract expired, a strike was initiated on Monday, February 14, 1977.

At the time of the strike the city budget was not finalized. Ultimately, the budget was approved on March 29, 1977, with no additional funding for transit over the 1976 base. An increase in property taxes, however, made it possible to increase the budget for several other services.

Settlement of the Strike

Within the first two weeks of the transit strike, it became apparent that a settlement would not be reached quickly. Officials with the Amalgamated Transit Union were not willing to change their demand while KTC and Knoxville City officials maintained that all funds available for transit were exhausted.

In March 1977, two events served to focus the community's concern for the delay of a settlement. On Thursday, March 3, a demonstration was held in Market Square Mall by the merchants who wanted to call attention to the adverse effect of the strike upon the retail business in the Knoxville CBD. The demonstrators later marched to City Hall Park calling upon Mayor Tyree to use his influence to get the strike settled. In the following week, the Mayor held a meeting with the Market Square Mall Merchants, KTC officials, and the union leaders. The meeting, however, did not produce any immediate results. All parties involved with the strike merely answered the merchants' questions and defended their positions. The Mayor's position was that the City was a "third party" to the strike as the ATU members were employees of KTC and not the City of Knoxville, even though the City owns the buses. ATU officials insisted that the settlement of the strike was in the hands of the

City and that the City was not a "third party," as the mayor had claimed, since the funds for KTC to pay its drivers and other employees came from the budget authorized by the Mayor and City Council. This meeting did result in the Mayor's assurance to review the possibility of allowing free usage of on-street parking spaces in downtown Knoxville on Saturdays. This policy was adopted soon thereafter.

On March 19, 1977, Mayor Tyree issued a public ultimatum announcing that KTC and ATU had one week to reach an agreement or the City would seek other ways with other firms to operate a local transit system. He said that the City could no longer wait while the strike continued to create problems for the elderly, the downtown retail merchants, and the handicapped. On March 23, 1977, the members of the local union approved by a 102-12 vote a new contract to be effective through June 30, 1978, which included several improvements toward employee benefits amounting to approximately \$200,000. The hourly wage was increased immediately by \$0.18 and was to be followed by a \$0.10 increase in February 1978. A cost of living clause permitted up to an eight cent per hour raise every three months. In addition, the individual life insurance coverage was increased from \$5,000 to \$7,500 and the pension program was changed from a trust to an insured program with both KTC and employees adding \$10 per month to the plan for each ATU member. The final rate for the pension plan was to have been determined by an actuarial study.

On Monday, March 28, 1977, KTC resumed its regular fixed-route and express operations. The level of service provided by KTC, however, was reduced based on a decision taken by KTA. The evening service, which

had run until midnight, was cancelled after 9:00 p.m. for all days. In addition, the Sunday service was to begin at 9:00 a.m. instead of 7:00 a.m. and the holiday service was curtailed from 7:00 a.m. through midnight to 11:00 a.m. through 7:00 p.m.

An increase in fare also was instituted two weeks after the service was resumed. The fare increase called for the regular fare to change from 30 cents to 40 cents, the fare for senior citizens changed from 15 cents to 20 cents, the express bus fare increased from 50 cents to 60 cents, and the student fare increased from 20 cents to 25 cents. The fare increase had been announced publicly before the strike had been settled. It should be pointed out that the reduction in service hours as well as the fare increase were being contemplated prior to the strike as they were recommended in the Transit Development Study. In the case of certain other transit properties, post-strike modifications in service and fare were made in response to the increased cost that resulted from the new labor contracts. In the case of Knoxville, however, these decisions were not based on changes in the labor contract.

CHAPTER 3

LITERATURE REVIEW

It is only in recent years that detailed documents related to impacts of transit strikes have been developed. A number of case studies of strike-induced transit shut-downs have been completed in the last 10 to 12 years. These studies considered many factors related to transit strike impact and utilized many different data gathering techniques. A publication written by three Purdue University researchers, Brachman, Sinha, and Pustay, released in December 1976, summarized several of these studies and also reported the results of their comprehensive analysis of service interruptions that have occurred across the United States.³ A brief overview of these different cases is presented in this section.

Simpson and Curtin Study in 1960³

The consulting firm of Simpson and Curtin, Philadelphia, Pennsylvania, completed a study entitled "Impact of Strikes on Transit Riding" in 1960. The report, developed from an analysis of 18 different transit strikes, concluded that a direct relationship existed between the loss in post-strike system ridership and the duration of strike. A brief summary of the study findings is presented below:

1. Strikes lasting less than one week usually result in no discernable permanent loss in ridership.
2. For a strike lasting longer than one week, there would be a 2 percent loss of the projected ridership for each week of

the strike's duration, and the loss will continue at this rate for the first two months after the strike is over. For the following three months, the loss is estimated to be 1.5 percent per week of strike. Finally, for the balance of the first post-strike year, the loss of ridership is estimated to be 1 percent per week of strike.

3. The percent change in ridership should be applied on the projected ridership estimates, which should reflect probable changes due to other causes, such as economic trends or changes in fare.

New York City Transit Strike

The consulting firm of Barrington and Company analyzed the impact of the work stoppage by seven New York City transit properties during January 1 to January 13, 1966. The study team conducted approximately 10,400 telephone and home interviews, and the transit users were segmented into several groups--workers, shoppers, other-purpose transit users, and non-regular transit users. The information regarding each user group was analyzed to determine the strike's impact including any post-strike diversion from the transit system to other modes. The major conclusions of the study are as follows:

1. The system lost 2.1 percent of the regular transit-using commuters in the four major boroughs after the strike.
2. More than 50 percent of the shoppers who did not return to using the transit system switched to walking.

3. More than 50 percent of those who stopped using the mass transit system for social and personal activities switched to their own cars and taxis after the strike but one-third had no fixed modal pattern.
4. About 5 percent of the suburban users stopped using the city transit system after the strike.

Madison, Wisconsin, Bus Strike

During the fall of 1967, the employees of the Madison Bus Company (MBC) initiated a strike that lasted for 63 days. A thorough analysis of the effect of the strike on the post-strike ridership was made with the development and use of a time-series stochastic model. The findings of this analysis would be of interest to the Knoxville study due to the similarity in the size of the two urban areas. The study revealed that the loss in ridership attributable to the strike was 17.9 and 13.9 percent during each of the two years respectively following the service interruption.

Southern California Rapid Transit District Strike

An interesting study was conducted by Bigelow-Crain Associates on the impact of the Southern California Rapid Transit District (SCRTD) strike in 1974. The purpose of this study was to analyze the obvious and immediate effects of the SCRTD labor strike on the mobility and commerce of the area. Six significant findings of the study are listed below:

1. Retail sales decreased by 10 to 30 percent in transit-service areas.

2. Except for major congestion on a few radial freeways and arterials, the overall impact on regional traffic flow was small.
3. Automobile occupancy rates in the vicinity of downtown increased from about 1.35 to 1.5 persons per car.
4. Employment was affected.
5. Transit dependents--particularly the poor, elderly and handicapped--were seriously affected by the strike.
6. A gradual recovery of most or all of the pre-strike ridership was expected.

The Alameda-Contra Costa Transit Strike

The Alameda-Contra Costa Transit (AC Transit) Strike began on July 1, 1974, and lasted for 62 days. This strike affected the patrons in the San Francisco Bay area who usually made 200,000 trips per day on the AC Transit system. Of interest was the AC Transit strike's impact on its complementary transit service, the Bay Area Rapid Transit District (BART), which continued its operation during the strike. The major findings of an impact study are summarized below:

1. There was a net increase in the patronage on BART of 7 percent during the strike.
2. About 21 percent of the work trips normally taken on AC Transit were suppressed due to the transit strike, and 46 to 59 percent of the normal nonwork trips were not made due to the lack of a feasible alternative mode.

3. The main groups of users affected were the elderly and the young. Fifty to 60 percent of their normal trips were not made during the strike.
4. Daily traffic counts on key bridges leading to the downtown San Francisco area indicated the following increases in vehicular traffic: (a) an increase of 6 percent on the San Francisco-Oakland Bay Bridge; (b) an increase of 15 percent on the San Mateo-Hayward Bridge; and (c) an increase of 6 percent on the Richmond-San Rafael Bridge.

Transport of New Jersey Bus Strike

Transport of New Jersey (TNJ) is one of the largest commuter bus operators in the Metropolitan New York area. The majority of TNJ's riders are commuters living in one of the New York City's "bedroom" communities in northern New Jersey. During the spring of 1972, employees of TNJ began a work stoppage that interrupted service for 75 days. A study of this strike included only those Trans-Hudson work trips which entered the Manhattan CBD during the morning peak period from 8:00 a.m. to 9:00 a.m. The following are the major findings:

1. There was a 20 percent decline in ridership. Similar losses were also experienced on other TNJ routes. (The decline was large even after it was adjusted for the trend decrease in bus usage.)
2. The competing or alternative modes and services of TNJ experienced significant increases in ridership during the strike. The most significant increase in patronage during

the strike was among competing bus modes. Total commuter rail usage also had a marginally significant increase. Post-strike survey information, however, indicated that a high proportion of those switching to rail decided to remain with their new mode.

Golden Gate Transit Strike

Employees of Golden Gate Transit began a 64-day work stoppage during April 1976. This strike resulted in the discontinuance of both basic and commuter services between downtown San Francisco and locations within Marin and Sonoma counties on the north. Local transit service within these two counties continued during the strike. The strike also caused service discontinuation on the San Francisco Municipal Railway.

In anticipation of the strike, several programs were organized to minimize the impact of the work stoppage. Some of these programs included the following:

1. Opening of a 24-hour switchboard to assist in forming car-pools.
2. Opening of exclusive bus lanes to automobile traffic.
3. Increased ferry service.
4. Opening of carpool parking lots in the downtown area.
5. Providing paratransit operations including private mini-buses.
6. Suspension of tolls on the Golden Gate Bridge for automobiles with three or more passengers during 6:00 a.m. to 10:00 a.m.

The preliminary findings include the following:

1. There was a significant increase in carpooling during the strike. Surveys indicated that a substantial portion of the increased carpooling would continue even after the strike is over.
2. A telephone interview survey of 291 households in the strike-affected area indicated that 23 percent reported a definite adverse impact due to the strike, 11 percent reported some inconvenience and 66 percent indicated that they suffered little or no inconvenience.

Purdue University Study of Transit Strikes

A study of 168 bus transit companies both public and private was conducted during 1976 by Purdue University researchers. Their analysis indicated that about 28 percent of these companies had service halted due to a strike within the last 15 years. The 47 companies experiencing work stoppages were analyzed to determine the effects of labor strikes on bus transit use.

One of the findings of the study was that there is a significant decrease in transit ridership immediately after a strike. The decline in ridership ranged from 8.7 percent to 25.8 percent. The analysis also indicated that the decrease varied with population size but not with management type. Another finding of the study is that after one year the system recovers a substantial portion of the lost ridership either through the return of former passengers or from new ridership. The system recovery was found to vary according to the size of the

system. Smaller systems tended to recover their lost ridership faster than larger systems and the reason appeared to be due to smaller systems' carrying more captive riders who returned to the system sooner than the choice riders.

Summary

The analyses of the consequences of the various transit strikes revealed several similarities. It was found that the service interruptions reduced post-strike ridership significantly. In addition, it was clearly evident that the group of people most affected by the transit strikes was the captive transit users, including the elderly, the young, the economically disadvantaged, and the handicapped. Many captive users were found to suppress their trips when transit service was not available.

CHAPTER 4

SURVEY AND DATA COLLECTION PROCEDURES

Survey Target Groups

In order to obtain timely or current information, the surveys for the transit strike study were conducted during and immediately after the strike. Thus, these surveys had to be organized and completed quickly. The basic strategy was to identify the groups of users and institutions that were most likely to be affected based on the information available from the transit study and personal experience of the investigators and then to focus on these selected groups. The target groups for analysis were stratified into four categories:

Transit users--Information regarding the impact of the transit strike on the user households was obtained through telephone interviews and mail questionnaire surveys administered both during and after the strike among the following user market segments.

- a. The elderly (age 65 and over) living in senior citizen complexes--both public and private.
- b. The economically disadvantaged transit users living in public housing.
- c. Express bus commuters working in the CBD area who were largely middle income, choice transit riders.
- d. Group of regular transit users selected at random from individuals residing in areas where transit ridership was known to be high.

Merchants, employers and institutions--Personal interviews were conducted during and after the strike with the owners/managers of establishments who rely on public transit as the primary mode of access for employees, shoppers and clients to their respective sites. The focus of this survey was on establishments located in the CBD area, which was expected to be most severely affected.

Auto commuters--Secondary data sources such as volume counts, vehicle occupancy counts, parking lot inventories and pedestrian counts were utilized to ascertain the degree to which former transit riders switched to automobile transportation and the impact of this change on traffic congestion and availability of parking. The emphasis was focused on roads leading to the CBD and utilization of parking space in the CBD and fringe areas.

Transportation operators--Personal interviews were conducted during and after the strike with transportation suppliers, such as private bus companies, taxi companies, social service agencies and the Knoxville Transportation Brokerage Service, to obtain information on the shifting of transit riders to their specific modal services. In addition detailed data were compiled on the ridership and revenue of KTC for time periods covering several weeks before and after the strike.

Table 4-1 provides a summary of the different impact surveys conducted. A more complete description of the major survey instruments follows.

TABLE 41
SUMMARY OF TRANSIT IMPACT SURVEYS

	Time Period		
	Before Strike	During Strike	After Strike
<u>Impacted Group</u>			
Transit Users			
Elderly		T.I.	T.I.
Economically Disadvantaged		T.I.	T.I.
General Transit User		T.I.	T.I.
Commuter		MQ	
KTC Ridership Counts	S		S
<u>Merchants-Employers-Institutions</u>			
CBD Merchants		P.I.	P.I.
Employers		P.I.	P.I.
Hospitals			
Government			
Commercial			
Institutions		P.I.	P.I.
Social Service Agencies			
Education			
<u>Auto Commuters</u>			
Volume Count	S	S	S
Pedestrian Count		O	O
Occupancy Count	O	O	O
CBD Parking Lot	S	O/S/P.I.	O/S/P.I.
CBD Parking Meters	S	S	S
Transportation Suppliers		P.I.	P.I.
Taxi		P.I.	P.I.
Knoxville Commuter Pool		P.I./O	P.I./O
Private Bus Operators		P.I.	P.I.
P.I. - Personal Interview T.I. - Telephone Interview M.Q. - Mail Questionnaire S. - Secondary Data O. - Field Source Observations			

Telephone Survey of Transit User Households

Three major transit user markets identified by the Transit Development Study included the elderly, economically disadvantaged individuals and commuter bus riders. Households representing the elderly and economically disadvantaged and a group of users of heterogeneous characteristics were contacted both during the strike and after the strike to determine the impact of the strike on travel behavior and modal choice decisions. Telephone interviews were used to contact these three groups.

The survey conducted during the strike was designed to determine the following information from each household:

1. The use of KTC service before the strike for different trip purposes.
2. Changes, if any, in travel characteristics during the strike.
3. Transportation modes that were utilized as substitutes for transit during the strike.
4. Difficulties, inconveniences, and hardships caused by the strike.
5. Basic demographic characteristics of the selected groups.

Fifty percent of the elderly, economically disadvantaged and general transit user households who were interviewed during the strike were contacted again within five weeks after the strike was settled. In all cases the same individuals were contacted who participated in the before survey. The information obtained included:

1. The use of KTC service after the strike for different trip purposes.
2. Other modes, if any, that are continuing to be used as an alternative to the bus.
3. Reasons for continuing to use other modes, if any.
4. The likelihood of changes in travel modes to continue.
5. Impact of the reduction in transit service hours and the increase in fare on the use of bus service.

Appendix A contains copies of the transit user survey instruments.

The sample sizes for elderly, economically disadvantaged and general transit user households were 101, 100 and 50 respectively. A transit user household was defined as one having at least one individual who usually made one or more trips per week by transit. Interviews with households not meeting the above definition were terminated. In order to identify transit user households of specific characteristics in a relatively efficient manner, contact was made with households in areas of known high transit usage. On-bus contacts could not be made since the bus service already had terminated. The search for elderly transit households focused on high-rise apartments designed for the elderly. Both public and private housing units were surveyed to obtain a mix of incomes and demographic characteristics. The apartment houses included in the survey were: (1) Cagle Terrace, (2) Northgate Terrace, (3) Guy B. Love Towers and (4) Isabella Towers.

The samples of economically disadvantaged households were selected primarily from public housing apartments in high transit usage areas. The public housing areas contacted were in northeast, northwest, and south Knoxville and included Montgomery Village, Walter P. Taylor Homes, Western Heights, College Homes, Austin Homes and Christenberry Heights.

The general transit user households were selected at random from addresses known to be on or near bus routes and included the areas of North Hills, Park City, Forest Hills, Lincoln Park, Sequoyah Hills, and south Knoxville east of Chapman Highway.

The Knoxville City Directory was used as a source of names and telephone numbers for contacting households. One special characteristic of the sample selection procedure was that a household selected for telephone contact was not known to be a transit user with any degree of certainty until a resident actually was reached. As mentioned earlier, the interview was continued only if one or more persons in the household were transit users. The household selection process continued until the sample sizes were reached.

Mail Survey of Transit Users

Mail questionnaires were sent to approximately one-half of TVA employees participating in the commuter transportation program.* The same questionnaires also were sent to all known UT regular and express

*The personnel involved with the TVA commuter transportation program provided assistance in obtaining the office addresses of express bus riders and also the distribution of questionnaires.

bus riders. Questions were asked similar in nature to the telephone interviews and a sample survey instrument is contained in Appendix A. A total of 331 usable responses were received including 259 TVA and 16 UT express bus riders and 53 TVA and three UT regular bus riders.

Survey of Transit Users Seeking Assistance

During the transit strike, 156 former transit users contacted the Knoxville Commuter Pool (KCP) seeking assistance in arranging alternative modes of travel to work. Specific requests were made to match individuals with others desiring to establish temporary carpools. Sixty individuals were contacted after the settlement of the strike to determine how they utilized the carpool matching data and their mode of travel during the strike, and whether the individual returned to transit afterwards. Most of the individuals contacted were living in east Knoxville and destined for employment in the CBD, UT area or west Knoxville. A sample of the survey instrument is contained in Appendix A.

Transit System Ridership and Revenue Data

To identify the temporal trend of aggregate transit usage as well as the impact of the strike, ridership and revenue information was compiled from KTC monthly worksheet records for regular and express bus routes for time periods both before and after the strike. Revenue data for the regular eight transit routes were tabulated for the first 22 weeks of 1976 and compared to the revenues for the first 22 weeks of 1977.

KTC express bus ridership was studied separately from the regular routes, as daily records of the number of passengers using the express buses was available. The analysis time period for express buses also covered the first 22 weeks of 1976 and 1977, respectively.

Vehicle and Pedestrian Traffic Counts

Vehicular traffic count data using automatic traffic counters were gathered at seven locations within the City. These seven locations are permanent count stations maintained by the Tennessee Department of Transportation's Bureau of Planning and Research. Five of these seven count stations were considered to be at locations where a measurable impact, if any, due to the strike could be observed. The other two locations were considered to be outside the probable impact area but were used as control stations to measure normal traffic fluctuations.

Pedestrian volume counts were conducted at three intersections on the fringe of the CBD both during and after the strike. The counts were conducted during the morning and afternoon in order to determine the number of commuters parking in fringe areas, such as Fort Sanders, and walking to offices in the CBD.

Parking Survey

During March 1977, soon after the transit strike began, personal interviews with parking lot attendants were conducted at 22 commercial parking lots in the Central Business District of Knoxville. The purpose of this survey was to gain information regarding how the

strike was affecting different types (short-term vs. long-term) of parking businesses. The sample of 22 lots represents about half of the 49 commercial lots located in the Knoxville CBD area.

Approximately six weeks after the strike had been settled, personal interviews were again conducted with three parking lot owners and managers. One of these was the manager of a commercial lot on Vine Avenue. The other two were with the managers of the two major commercial parking lot operators in the Knoxville area--Knox Allright, Inc. and Safety-Park. These two firms operate 44 of the 49 lots in the CBD. The following information was sought from the parking surveys:

1. How much was the business affected during the six-week bus strike?
 - a. cash take, vehicle counts, short-term vs. long-term patrons
 - b. employees (hours, layoffs, difficulty finding alternative transportation)
 - c. operations (hours, fee changes)
2. What changes occurred with the business since the strike ended?
 - a. cash take, vehicle counts, short-term vs. long-term patrons
 - b. employees (hours, layoffs, etc.)
 - c. operations (hours, fee changes)

A vehicle count and interviews with parkers were conducted at the Civic Coliseum Parking Garage on the fringe of the CBD. The objective

of the survey was to determine the use of this parking facility by former transit users. Appendix A contains a copy of the Parking Survey Instrument. Finally, city parking meter revenue data were analyzed to determine if there was any significant increase in revenues during the strike.

Survey of Business Community

To obtain information about the impact which the transit strike had upon the merchants in the Knoxville CBD, personal interviews were conducted both during and after the strike. One hundred and seven interviews were conducted with different merchants and other business operators located in downtown Knoxville. All of the businesses surveyed, except for Miller's Department Store on Henley Street, are in a contiguous area near Gay Street and the Market Square Mall. These areas were chosen because they are highly visible and accessible to pedestrians and KTC passengers. Most of the other areas of the Knoxville CBD contain primarily office or wholesale establishments or depend primarily upon access by automobile for their business.

The format of the interview and survey questionnaire form was structured around four basic questions which were supplemented with follow-up questions:

1. How much was the business affected during the six-week bus strike?
 - a. sales (percent and/or dollar amount, same period last year, projections)

- b. employees (hours, layoffs, quitting, tardiness, finding alternative ways to work)
 - c. operations (hours changed, days closed, special sales)
2. Did the business return to previous levels after the strike ended?
- a. sales (percent and/or dollar amounts)
 - b. employees (hours, rehiring, layoffs)
 - c. operations (hours, special sales)

In addition, contacts were made with a number of major employers, transportation providers, and institutions located outside the CBD area to determine the impact of the strike on their operations. The results of these surveys will be discussed in the following chapters.

CHAPTER 5

TRANSIT USER SURVEY RESULTS

The intent of the transit user household telephone survey was to determine the impact of the transit strike on three categories of transit users. These categories included the elderly, economically disadvantaged, and a third group of general transit users. These three categories may be expected to have different socioeconomic characteristics. However, an analysis of their demographic profiles revealed some similarities also. The most common similarity was household income. The majority of households in each group reported annual income of less than \$5,000. Another common characteristic was the household's dependence on public transit for transportation. Each household was classified as a non-captive or captive transit user. The definition used for a captive household in this analysis was a household that did not have an automobile in operating condition and/or a licensed driver. More than two-thirds of the households in each group were captive transit users. Two other similarities of the three groups were the age and sex of the person interviewed. The majority of persons interviewed in each group were females. Also, the majority of persons interviewed in each group were 65 years of age or older. The following portion of this chapter presents the results of the transit user household telephone survey. Appendix B, Tables B-1 through B-24, contains tabulations of the transit user household demographic and travel characteristics.

Elderly Households

The elderly group sampled consisted of 101 households representing 121 people. More than 90 percent of those interviewed were over 65 years of age and more than 85 percent interviewed were women. Thirty percent of the elderly group did not respond to the question regarding annual income, but of those responding to this question 100 percent had an annual income of less than \$5,000. Eighty percent of the households consisted of one member and the remaining 20 percent were two-member households. More than 90 percent of the elderly households had no operating automobiles and 81 percent had no member with a driver's license. Thus the group consisted primarily of individuals living alone without easy access to an automobile.

Impact on travel. The elderly group indicated that before the strike they averaged 2.11 trips per household per week, or 1.76 trips per person per week, by transit. The main uses of transit were for the purposes of shopping, medical reasons and personal business. Eighty of the 101 households reported using the bus for shopping trips. Other uses of transit were to visit friends and relatives, religious trips, travel to the place of work and trips for leisure and recreation.

Slightly over 32 percent of the trips that would have normally been made by the elderly households were cancelled because transit was not available. The trips most frequently suppressed included religious purposes, visits to friends and relatives, leisure and recreational trips and personal business trips.

In spite of the loss of transit services, nondiscretionary travel was made for shopping, medical and work purposes. Appendix Tables B-11 and B-12 present a summary of travel characteristics and modes used to travel in a typical week during the strike. The alternative modes of travel used most frequently were to ride either with family or friends in their car or to travel by taxi. Notably, almost 18 percent of the trips made by the interviewed elderly households during the strike were by "other" modes which included the minibus of Knoxville Community Development Corporation (KCDC), and a bus operated by the Knoxville Police Department.

Hardships caused by strike. The main hardship created by the transit strike for the elderly group was due to the fact that the bus was their usual means of transportation and alternative modes were either expensive or inconvenient to arrange. One elderly lady revealed that she had to use the taxicab two days a week to go to the doctor. She also indicated that this extra expense had been a real hardship when living on \$250 per month income and that due to this additional expense she had done very little shopping. The survey results indicated that while most individuals were able to make important trips, such as visiting doctors or going to the store, many other trips that were a part of their day-to-day life were not made. A portion of the sample group seemed to indicate that pride and a sense of dignity kept them from calling on friends and relatives for transportation until it became a necessity.

Only three of 101 households contacted expressed no inconvenience with the bus strike. These three households were contacted seven to

ten days after the strike began. One of these households was at Guy B. Love Towers where the KCDC minibuss and Police bus were offering transportation services during the strike. The two other households contacted indicated that they had taken care of their personal business and medical appointments in advance in anticipation of the strike and had thus far had no problems created by the strike.

Post-strike travel behavior. When asked during the strike if they would return to using the bus when the strike was settled, 100 percent of the elderly households indicated that they would. Yet five weeks after the strike was settled six individuals, representing 12 percent of the 50 households that were contacted again after the strike, had not returned to using the bus as frequently as before. Three of these six individuals indicated that they would return to transit when their health improved. Of the remaining three individuals, one used taxi service for a trip even after the bus service had resumed and indicated that she would return to using the bus. The other two individuals shifted to traveling with other persons in their cars to go shopping and also utilized a social service van to go to work. In both cases the individuals indicated that their new travel modes were more convenient and their shift from transit would continue as long as the new alternatives were available.

Economically Disadvantaged Households

A total of 100 economically disadvantaged households with at least one member being a regular transit rider were contacted by

telephone. More than 90 percent of those contacted were females. However, the individuals interviewed responded to the survey questions on behalf of the entire household. The age of the individuals interviewed was primarily in the two categories 45 to 65 years and over 65 years. Twenty-two percent of the interviewees did not respond to the question regarding the annual income of their household. However, of those reporting their annual income, 90 percent had family income of less than \$5,000 per year.

Forty-four percent of the economically disadvantaged individuals interviewed lived alone, 24 percent lived in two member households and the remaining 30 percent of the sample lived in households varying in size from three to eight members. Only 28 percent of the households had household members commuting to work regularly--20 percent with one household member commuting to work, and 8 percent with two household members commuting to work. Seventy-five percent of all households interviewed had no cars, and 60 percent of the households had no members with a valid operator's license. Thus, the economically disadvantaged group represented a high degree of transit dependency, which is a typical characteristic of regular KTC bus riders.

Impact on travel. The economically disadvantaged group indicated that before the strike they averaged 3.27 trips per household per week, or 1.60 trips per person per week by transit. The most frequently mentioned trip purpose was shopping as 75 percent of the households reported using transit for this purpose. Forty-three percent of the sample reported use of the bus to conduct personal

business and 11 percent to commute to work. Other trips made by transit were for the purposes of medical, school, visit friends and relatives, leisure and recreational, and religious.

The economically disadvantaged group interviewed did not make 11 percent of the trips they would have normally made because transit service was not available. The trips most frequently suppressed were of discretionary nature and included religious, visits to friends and relatives, and leisure and recreational trips. Thus, a larger segment of the economically disadvantaged group maintained their usual mobility in comparison with the elderly group. The trips that were made most frequently in spite of the loss of public transportation service include shopping, work, medical, personal business, and school purposes. Appendix Tables B-13 and B-14 present a summary of travel characteristics and alternative modes used for travel in a typical week during the strike. The majority rode with a relative or with another person in their car. About 15 percent of the trips were made by taxi. Another 8 percent of the trips were made by "other modes," which included the KCDC minibus, the Community Action Committee (CAC) van, the Knoxville Police Department bus, and a church bus.

Ten percent of the economically disadvantaged group interviewed indicated that the strike had caused their households no inconvenience. Two of these ten households had not made their usual bus trips, and seven households had switched to riding either with a relative or friend in their car. The remaining household used a taxi and reported no inconvenience.

Hardships caused by strike. Those experiencing difficulties during the strike most frequently mentioned the inconvenience of their new travel arrangements. A hardship for the domestic workers was caused by their inability to go to work. Those who did find alternative means to go to work were not able to work as frequently due to the lack of regular transportation. One family faced an unusual hardship when a household member had to be admitted to a hospital for three weeks during the strike. One of their daughters had to take the mother to the hospital daily to visit the father because there was no bus service.

One lady indicated that she was forced to shop at businesses within walking distance of her home, and she complained that she had to pay higher prices for goods compared with what she usually did when she could travel to the downtown shopping area. A serious case of hardship and concern involved families with school age children. Four of the 100 households contacted reported that their children had to miss school. Three children from two households in East Knoxville missed three weeks of school (Catholic High School) before alternative transportation was arranged. One child attending a North Knoxville school (Van Gilder Elementary) was one hour late each day. One household had three children attending a South Knoxville school (Flenniken Elementary), and they indicated that the CAC van they were using for transportation sometimes did not pick them up in the afternoons.

As with the elderly, the economically disadvantaged also seemed to feel that calling on someone to give them transportation was an

imposition. This may explain why trips related to social life (religious, visits to friends and relatives, and leisure-recreational) were discontinued more than the essential trips (shopping, work, medical, personal business).

Post-strike travel behavior. When interviewed during the strike, 99 percent of the households indicated that they would return to KTC bus service when the service was resumed. Four weeks after the bus service was reinstated 84 percent of the 50 households contacted again had returned to the pre-strike usage of the bus. Two households did not make their usual trips after the strike was settled. One of these households indicated that it would continue to use the CAC van utilized during the strike as a substitute for the bus service. The other household did not need to use the bus as much as before but indicated that the bus service would be used when they needed to travel. Five households continued traveling with family members or friends in their auto and one household drove its own auto. The reasons stated by the eight households (16 percent of the sample) for continuing to use the substitute form of transportation were:

1. It is easier or more convenient to ride with a relative or friend (five households).
2. Reduction in service hours made the bus service inconvenient (one household).
3. Fare increase made the bus service inconvenient (one household).
4. The CAC van is more convenient (one household).

General Transit Users

A telephone interview survey of 50 randomly selected households living in residential areas near bus routes was performed to determine the impact on general transit users other than the two previously described groups of predominantly captive riders. However, it was found that the majority of this group (86 percent) also were females age 45 years and older. Fifty-six percent of this group did not respond to the question regarding their annual income, but of those responding, 77 percent had an annual family income of less than \$5,000.

Thirty-five percent of the households contacted in this sample were single member households. Forty-seven percent were two member households and the remaining 18 percent were three member households. Fifty-nine percent of the households reported having no regular work commuters.

Sixty-six percent of this group reported having no cars in operating condition in the household. Twenty-six percent reported one operating car and 8 percent had two operating cars in the household. With regard to the number of households with licensed drivers, 60 percent reported having no licensed drivers, 22 percent had one licensed driver, and 18 percent had reported two licensed drivers. When compared to the elderly and economically disadvantaged groups the general transit user group was less transit dependent. The car ownership of the general transit user group was much higher than that of

the elderly and economically disadvantaged groups. However, two-thirds of the general transit user households were still transit dependent.

Impact on travel. The general transit user group indicated that before the strike they averaged 3.01 trips per household per week, or 1.62 trips per person per week. The trip purposes mentioned most frequently for transit use were shopping and work trips. The general transit user group contained a greater proportion of commuters than did the elderly and public housing groups. Other trips made by transit included personal business, medical, school, and visits to friends and relatives.

The general transit user group postponed 10 percent of the trips they normally would have made because transit was not available, and these trips were primarily for shopping, work and personal business. In the case of other types of trips, an alternative mode of transportation was found as a substitute for the public bus service.

Appendix Tables B-15 and B-16 present a summary of travel characteristics and modes used for travel in a typical week during the strike. The alternative means used most frequently was to travel with a relative or a friend in their car. About 8 percent of the households traveled alone in their own car for trips that would have been made by a bus. No use of social service vehicles was identified by the general transit user group and a lower incidence of travel by taxi was reported.

Hardships caused by strike. Ninety-two percent of the general transit users contacted indicated that the transit strike had caused

their household some problems. However, most of the problems amounted to inconvenience. Perhaps the most notable difference in hardships between the general transit user group and the elderly and economically disadvantaged groups is that the "social" trips of the general transit user group were not affected by the strike.

The general transit user group did suffer some minor hardships due to the strike. There were some complications of children arriving very early or late for school. Individuals in several households had difficulty in arranging rides to work. One lady who had missed work indicated that she was going to buy a car. The idea of having to "impose" on others for transportation was mentioned by the general transit user group but not mentioned as frequently as in the elderly and economically disadvantaged sample. The four households that expressed no particular difficulty with the bus strike used the family car for transportation or traveled with someone else in their car.

Post-strike travel behavior. When asked during the strike if they would return to using the bus when the strike was settled, 100 percent indicated that they would. Yet five weeks after the strike was settled, 10 of the 25 (40 percent) households that were contacted again were not using transit service as frequently as before the strike. In the case of seven of the ten households the reasons for not using the bus service as frequently as before were related to health or the lack of a need to travel, and they were expected to return to their normal usage. The other three households (12 percent of sample) indicated that their switch from transit to another mode

would continue. Two households (4 percent) were driving their cars to make the trips they formerly made by bus. One individual was affected by the change in Sunday operating hours and had to travel by taxi to work.

The results indicate that many of the general users of transit service were able to make adjustments by using their own vehicles for travel. Of the three user groups surveyed, the transit strike had the least impact on the general transit user population.

Analysis of Surveyed Groups Based on Transit Dependency

The surveys performed in connection with the 1976 Transit Development Study found that more than 83 percent of the trips made on KTC's regular routes were made by transit dependents. The results from the telephone surveys were also analyzed in terms of captive versus non-captive riders, irrespective of other characteristics. For the purpose of this analysis, a transit captive or dependent household was defined as one that did not have a car in operating condition and/or a licensed driver.

Descriptions of demographic characteristics of the interviewed households and their answers to survey questions are contained in Appendix B, Tables B-18 through B-24. From the survey data the proportions of transit dependent households among the elderly, economically disadvantaged, and general transit users were found to be 93, 78, and 64 percent, respectively.

Suppression of travel. One of the most significant findings of the survey was that the elderly captive and non-captive group had to

suppress their travel to an appreciable extent--32 and 39 percent of their normal trips respectively. There was little difference in the percentage of trips cancelled by the captive and non-captive economically disadvantaged households as only 11 and 12 percent respectively of the trips these households normally made by transit were suppressed. The general transit captive and non-captive households suppressed 15 and 4 percent of the trips they would have normally made by transit.

Usage of alternative modes. The captive and non-captive households for all groups generally were found to have utilized the same substitute modes during the strike, with the exception of taxi trips. The non-captive transit users used taxi service less frequently than the captive users. Another difference was found in terms of a permanent adjustment. A higher proportion of the non-captive users--11.1 percent as compared with 8.2 percent of captive users--indicated to have permanently switched from transit to another mode after the strike.

Both the captive and non-captive transit users returned to transit after the strike for a variety of reasons including cost of the alternative mode, time saved by using the bus, and convenience of the bus when compared to the new travel arrangement. For most of the transit riders regardless of their characteristics, the transit system appeared to be providing a valuable service.

Commuter Travel by Tennessee Valley Authority and University of Tennessee Employees

During the transit strike, 259 out of an estimated 600 TVA and UT employees using the regular and express bus service completed a mail

questionnaire inquiring as to how they were traveling to work. As noted in Table 5-1, TVA-UT personnel could be categorized as highly mobile and choice transit riders.

TVA employees riding express bus. The analysis of the questionnaires completed by TVA express bus riders revealed that 35 percent of them formed a carpool of three or more members, 28 percent were driving with one other individual and 29 percent were driving alone. Five percent of the sample were able to use one of the private express buses which were operating during the strike. Interestingly, out of a potential 600 cars that could have been added on Knoxville's road system by TVA employees the increase in vehicles was actually about 300. Unlike the other groups of transit users discussed earlier, TVA employees used carpooling as the predominant substitute for KTC express bus service.

The main problem voiced against the new travel modes was the added travel expense. This comment was made regardless of the substitute travel mode selected. As noted in Table 5-2, other problems frequently mentioned were that the new travel arrangements caused parking problems, and they were inconvenient or were more time consuming. Over 90 percent of the respondents said that they would return to the bus when service was resumed, 5 percent were uncertain and 4 percent expressed full satisfaction with their substitute mode of transportation.

TVA employees riding regular bus. Similar to express bus riders, over 47 percent of the 54 regular bus riders who responded to the

TABLE 5-1
NUMBER OF OPERATING VEHICLES IN
EXPRESS BUS USER HOUSEHOLDS

Number of Vehicles	Number of Responses	Percent
0	4	1.6
1	103	40.3
2	121	47.4
3	19	7.5
4	6	2.4
5	2	0.8

TABLE 5-2
PROBLEMS INDICATED BY EXPRESS BUS USERS CAUSED BY
NEW TRAVEL ARRANGEMENTS

Ranking	Problem					
	More Expensive	Parking Difficulties	Inconvenient	More Time- Consuming	Family had to Adjust Schedule	Others Left Without Car
	Number Percent	Number Percent	Number Percent	Number Percent	Number Percent	Number Percent
First	91 12.8	36 5.1	39 5.5	25 3.5	17 2.4	14 2.0
Second	36 5.1	61 8.6	42 5.9	29 4.1	14 2.0	9 1.3
Third	25 3.5	36 5.1	42 5.9	31 4.4	11 1.6	5 0.7
Fourth	15 2.1	17 2.4	21 3.0	16 2.3	4 0.6	5 0.7
Fifth	2 0.3	9 1.3	3 0.4	9 1.3	8 1.2	8 1.1
Sixth	1 0.1	2 0.3	4 0.6	6 0.8	7 1.0	9 1.3
TOTAL	170 24.0	161 22.7	151 21.3	116 16.4	61 8.6	50 7.1

questionnaire drove or rode to work with another person and 4 percent began riding a private express bus. Thirty-seven percent of this group elected to drive alone and only 7 percent formed a carpool of three members or more. Increased cost of commuting was again stated as a major disadvantage of the new travel arrangements. Over 94 percent expressed interest in returning to the regular bus when service was resumed, while only 2 percent stated they would not return to the bus.

UT employees riding express buses. A small number of UT employees--approximately 16--used the express buses frequently. Although the express bus service is not tailored to UT's travel needs, this group utilized the TVA service through a convenient shuttle connection. All of these 16 employees were contacted and it was found that almost one-third elected to drive alone in their vehicle and 62 percent rode with one other person. No carpools were formed, but one individual joined a KCP vanpool. (Subsequently two more individuals joined a KCP vanpool.) A relatively high proportion of these employees--19 percent--stated they would not return to the bus once service was resumed.

Special remarks by TVA employees. Many comments were offered by TVA employees on the strike and the impact of the strike on their personal life. Most indicated a desire to end the strike and "get the buses rolling again." The strike was viewed as an inconvenience due to the additional time required to park an automobile, increased congestion in the downtown area, and need to rearrange schedules when

two family members had to use the same automobile. Several employees expressed a concern for the energy inefficiencies of the substitute modes. A few, however, found it more convenient without the buses and felt that there was less congestion on Gay Street, and no need to run after the bus at "quitting time" which enabled them to spend more time at work. In general, TVA employees felt no severe hardships, but minor irritations and inconveniences. All employees seemed to have found an acceptable substitute, mostly through carpooling. In fact, a number of persons stated that if bus fare were to increase as a result of the strike they would stay with their new carpool arrangements. One individual indicated purchasing a second car so that his wife could use the family auto during the workdays.

Summary

Household members of all three groups--the elderly, economically disadvantaged and the general transit user--averaged about the same number of trips per person per week. However, the economically disadvantaged and the general transit group had larger households than the elderly, and therefore averaged more trips per household by transit per week. A large percentage of all three groups of households were transit dependent. Ninety-three percent of the elderly, 78 percent of the economically disadvantaged and 66 percent of the general transit user groups fit the transit dependent category.

During the transit service stoppage the elderly group cancelled 32 percent of the trips they would have normally made because transit service was not available. The economically disadvantaged and the

general transit user groups had to cancel only 11 and 10 percent of their normal weekly trips. The main mode of transportation utilized in place of transit for all groups was traveling with relatives or friends. The elderly group used taxi service for more trips (18 percent) than either of the other two groups. Notably, the elderly and economically disadvantaged relied fairly heavily on social service vans for transportation during the strike. Nine percent of all elderly and 7 percent of all economically disadvantaged group trips made during the strike were by social service vans.

Most of the nondiscretionary trips such as shopping, medical, personal business, and work were completed during the strike by all groups. However, the elderly and the economically disadvantaged did not make many of their normal religious, social, and leisure-recreational trips. This indicates that they made the more "important" trips necessary for day-to-day activity. Many of the elderly and economically disadvantaged indicated they did not desire to impose on others for the "less important" trips.

Few cases of severe hardships were recorded other than inconveniences among all three groups. Those that had to adjust the most were school children and domestic workers who normally used the bus to travel to and from school and other destinations. As noted previously, others were able to make their essential trips.

Overall, for the three user groups contacted after the strike, 8 percent of the households indicated that they would no longer use transit service because they had found a new mode of travel more

convenient than the bus. Only 1.6 percent of households contacted after the strike were unable to travel by transit due to the reduction in service hours and only 0.8 percent were not using transit because of the fare increase. Clearly, the strike did much more to cause a decline in ridership than did the reduction in service hours or the fare increase.

TVA express bus riders compensated for loss of bus service by utilizing other ridesharing modes--carpools, private bus lines, etc. Only 29 percent elected to drive alone in their own vehicle. For regular KTC bus riders, usually having shorter commuter trips than the express riders, less reliance was placed on carpooling. Ninety percent of all employees who were contacted expected to return to the bus. Unlike TVA employees, UT employees using express bus service were less likely to return and relied more on driving alone.

CHAPTER 6

IMPACT ON KNOXVILLE TRANSIT CORPORATION REGULAR AND EXPRESS OPERATIONS

One of the major consequences of a transit strike is its impact on transit patronage levels and the financial condition of the transit operation. Discussed in this chapter are the effects of the strike on KTC ridership and revenue. Due to the different characteristics of the regular and express bus programs, these two services were analyzed separately.

Effect on Revenue of KTC Regular Routes

Ridership headcounts taken after the strike on regular routes of KTC by bus drivers were found to be inaccurate and could not be used for analysis purposes. Thus, the impact of the strike on patronage of regular bus routes could be analyzed only in terms of revenue. This, however, did not impair the analysis seriously because revenue is an appropriate surrogate of ridership.

The comparison of weekly revenues just prior to the strike with those after the strike was not sufficient by itself because of possible seasonal fluctuations within a year. For identifying seasonal variations the 1976 weekly revenue data were examined. Two additional sources of variation (the fare increase and reduction in service hours) had to be taken into account.

Reliable information on the impact of the fare increase on ridership was not available. In the revenue analysis performed as a part

of the Transit Development Study, a price elasticity value of -0.3 was used which implies that the approximate 33 percent overall increase in fare on the regular routes reduced ridership by 10 percent. However, telephone interview surveys with transit users indicated a minimal impact of the fare increase, and based on these responses a 10 percent decrease in ridership would seem to be a high estimate.

Nevertheless, this figure was used in the analysis to provide a conservative estimate of the impact of the strike on revenue and ridership. For this conservative estimate, the combined effect of the 33 percent fare increase and the consequent 10 percent drop in ridership was estimated to have resulted in a 20 percent increase in revenue, and the post-strike weekly revenues for the weeks after the fare increase, therefore, were reduced by dividing with the factor 1.2.

The effect of the reduction in service hours was ignored based on two considerations. First, ridership during the period from 9:00 p.m. to midnight was extremely low, and the post-strike telephone interviews found few cases in which frequency of transit usage actually decreased due to this reduction in service hours. There were a few cases where users indicated inconveniences due to the curtailment of service, but they had been able to complete their trips earlier.

It was decided that in addition to obtaining a conservative estimate, an analysis should be performed with the assumption that the fare increase had no effect on ridership, so that a probable range for the true value could be presented. For this second analysis, the post-strike weekly revenues after the fare increase were reduced by

dividing with the factor of 1.33. The estimate of revenue loss based on this adjustment represents the maximum impact. Recognizing the differences in user and travel characteristics during weekdays and weekend days, separate analyses were performed for these time periods.

The weekly weekday revenue data for 1976 and 1977 are presented in Table 6-1. To identify the strike's effect, the average of the adjusted weekly revenues for a seven-week period after the strike was compared with the average for a six-week period before the strike. The post-strike seven-week period selected for the comparison began three weeks after the strike was settled. The three-week period immediately after the strike was considered an adjustment period for the transit users. The average weekly weekday revenues for the post-strike period were found to be 11.3 percent and 19.9 percent lower than the corresponding value for the pre-strike period according to the conservative and maximum estimates respectively. However, an adjustment was made to reflect probable seasonal variations since a comparison of the revenue for the same two time periods during the year 1976 revealed a difference of 3.9 percent. Considering this variation, the net decreases in revenue for weekly weekdays due to the strike are 7.4 percent and 16.0 percent, respectively, according to conservative and maximum estimates. Similar calculations were completed for the weekend revenues (Table 6-2). Considering the increase of 4.0 percent in revenue during 1976, the net decreases in revenues for weekends due to the strike were found to be 5.3 percent and 15.0 percent, respectively, according to conservative and maximum estimates. The combined weekly averages for both weekday and weekend

TABLE 6-1

ANALYSIS OF WEEKLY WEEKDAY REVENUE FOR ALL REGULAR ROUTES

Week	Actual 1976 Revenue (\$)	Actual 1977 Revenue (\$)	Conservatively Adjusted 1977 Revenue (\$)	Maximum Adjusted 1977 Revenue (\$) (Actual ÷ 1.33)
1	15901	16027		
2	14887	13331		
3	10778	10940		
4	14393	10768		
5	13928	15685		
6	18288	14773		
	Avg: 14696	Avg: 13587		
7	13148	Strike		
8	14839	Strike		
9	15176	Strike		
10	13401	Strike		
11	15841	Strike		
12	13269	Strike		
13	14471	9516	9516	9516
14	18230	12049	12049	12049
15	19890	13713	11428	10311
16	14563	13329	11108	10022
17	14413	12461	10384	9369
18	16492	15301	12751	11505
19	13015	15828	13190	11901
20	13707	16065	13388	12079
21	14192	15267	12723	11479
22	12498	13042	10868	9806
	Avg: 14126	Avg: 14470	Avg: 12059	Avg: 10880

Fare increase began in week 15.

TABLE 6-2

ANALYSIS OF WEEKEND (SATURDAY AND SUNDAY) REVENUE FOR ALL REGULAR ROUTES

Week	Actual 1976 Revenue (\$)	Actual 1977 Revenue (\$)	Conservatively Adjusted 1977 Revenue (\$) (Actual ÷ 1.2)	Maximum Adjusted 1977 Revenue (\$) (Actual ÷ 1.33)
1	1688	634		
2	1815	1809		
3	1612	1798		
4	1807	1747		
5	1833	1400		
6	1952	1885		
7	1833	1711		
	Avg. = 1799		Avg. = 1569	
8	2009	Strike		
9	2051	Strike		
10	2206	Strike		
11	1872	Strike		
12	1824	Strike		
13	2029	Strike		
14	2448	1555	1555	1555
15	2168	1760	1760	1760
16	2348	1918	1598	1442
17	1884	1779	1483	1338
18	1813	1639	1366	1232
19	2138	2087	1739	1569
20	1728	1968	1640	1480
21	1847	1757	1464	1321
22	1476	1745	1454	1312
23	2214	2032	1693	1528
	Avg. = 1871		Avg. = 1548	Avg. = 1397

Fare increase began in week 16.

service are shown in Table 6-3. Based on these combined figures, the net reduction of revenue from KTC's regular service attributable to the strike is estimated to be in the range of 7.2 to 16.0 percent.

Effect on KTC Express Bus Ridership

Presently there are 24 express bus routes operating in Knoxville. Of these, 13 are operated by KTC and 11 by private companies. There were a few changes in the assignment of routes for operation during and after the strike. One of the express bus routes, Gulf Park, which was operated by KTC before the strike, was transferred to private operators during the strike, and KTC began operating a new route called Cinema after the strike. In order to make ridership data before and after the strike compatible for analysis purposes, the ridership of the two routes of Gulf Park and Cinema was subtracted from the before and after ridership on KTC express buses.

The weekly ridership on KTC express routes for 1976 and 1977 for time periods both before and after the strike is shown in Table 6-4. No adjustments were made to the actual ridership for the increase in express bus fare from 50 cents to 60 cents per ride because, based on the trip purpose and the income characteristics of the express bus riders, the demand was considered to be highly inelastic with respect to fare. Also, it was assumed that the express bus riders did not go through an adjustment period immediately after the transit service was resumed.

The average weekly ridership for 10 weeks after the strike was compared with the average weekly ridership for six weeks before the

TABLE 6-3

ANALYSIS OF WEEKDAY AND WEEKEND REVENUE FOR ALL REGULAR ROUTES

Time Period	Actual 1976	Actual 1977	Conservatively Adjusted 1977 (Actual ÷ 1.2)	Maximum Adjusted 1977 (Actual ÷ 1.33)
Pre-Strike	14,696 +	13,587 +		
Six Week	1,799	1,569	-	-
=	16,495	15,156		
Post-Strike	14,126 +	14,470 +	12,059 +	10,880 +
Seven Week	1,871	1,858	1,548	1,397
(After 3 Weeks of Initial Adjust-ment) =	15,997	16,328	13,607	12,277

TABLE 6-4
ANALYSIS OF EXPRESS BUS RIDERSHIP

Week	Actual 1976 Ridership	Actual 1977 Ridership
1	6346	6164
2	6198	6115
3	5372	5925
4	5321	6272
5	5478	5671
6	5294	5630
	Avg. = 5668	Avg. = 5963
7	4577	Strike
8	5264	Strike
9	5482	Strike
10	5453	Strike
11	5587	Strike
12	5551	Strike
13	5625	4755
14	5520	4714
15	4816	4664
16	5041	4753
17	5170	4587
18	5286	4644
19	5201	4715
20	5374	4572
21	5236	4424
22	5343	4625
	Avg. = 5261	Avg. = 4645

strike. The average weekly post-strike ridership was found to be 22.1 percent lower than the average weekly pre-strike ridership.

A comparison of the ridership for the same two time periods during 1976 shows that the average weekly ridership for the 10-week period from week 13 through week 22 of 1976 was 7.2 percent less than that for the first six-week period. If this difference is attributed to seasonal fluctuation in transit usage, the net decrease due to the strike based on a "before and after" comparison is $22.1 - 7.2$ or 14.9 percent.

Overall Impact on KTC Revenue and Ridership

The analysis just presented indicated the adverse impact of the transit strike on the revenue generated by the regular and express KTC routes. Although the analysis was carried out for a relatively short period of time, covering 10 weeks after the resumption of service, the decline in revenue attributable to the strike appeared to continue, with the magnitude varying from week to week.

If the decline in ridership is indeed permanent, the long-range loss in revenue could amount to a large figure, depending on the time period for analysis. However, due to the inherent uncertainties related to future events, it is difficult to ascertain how long the loss of revenue will continue. As discussed in the review of literature, some transit operations experienced a recovery of ridership to the pre-strike level after about one year from the resumption of service. It is not clear, of course, whether this recovery is attributable to the return of lost riders or to a natural increase of

new riders. To the extent that the lost riders do not return there will be a latent loss, even if the ridership increases due to new riders.

For short-range planning purposes, it is customary to use a five-year planning horizon. A forecast of total annual revenues generated by the eight regular routes and by the express routes based on the trend prior to the strike indicates that KTC would have earned approximately \$4,657,000 and \$683,000, respectively, during the five-year period after the end of the strike.¹ The overall decline in revenue on regular bus service attributable to the strike was found to be within the range of 7.2 to 16.0 percent. Assuming the conservative value of 7.2 percent, the total revenue loss during this five-year period would be approximately \$335,000. The decline in express bus ridership of 14.9 percent over five years would generate a loss of approximately \$102,000. Therefore, the total potential revenue loss during the five-year period for the system would be approximately \$437,000. Of course, this estimate is based on the assumption that there would be a permanent loss in ridership as estimated.

In addition to the potential loss of revenue during this five-year period, revenue during the six weeks of the strike was lost totally. This loss, estimated to be \$158,000 (Table 6-5) was accompanied by savings in operating costs. The savings in operating costs (Table 6-6) are estimated to be \$228,000. This amount is higher than the revenue lost during the strike; thus there was a net savings in operating costs of approximately \$70,000 during the strike. This

TABLE 6-5
ESTIMATE OF REVENUE LOST DURING THE STRIKE

Month	1976 Revenue Per Day (\$)	Number of Days Not in Operation	Lost Revenue (\$)
February	4,126	14	57,757
March	3,720	27	100,441
		Total Lost Revenue	158,198

TABLE 6-6
ESTIMATE OF SAVINGS IN OPERATING COSTS DURING THE STRIKE

Month	Operating Costs 1976 (\$)	Operating Costs 1977 (\$)	Savings in Operating Costs During Strike (\$)
February	211,015	135,624	75,391
March	233,893	70,934	152,959
		Total Savings in Operating Costs	228,350

savings in operating costs will be offset by the estimated permanent loss in revenue due to the strike. However, ridership trends and characteristics of users in terms of the return of lost riders must be monitored to be able to arrive at a definite conclusion.

It is interesting to note that according to the findings of the Simpson and Curtin study, the decline in ridership due to a six-week strike would be 12 percent,³ whereas the overall decline in the revenue of the eight regular KTC routes is estimated to be within the range of 7.2 to 16.0 percent while express bus ridership is down by 14.9 percent. Both estimates are comparable to Simpson and Curtin's approximations.

CHAPTER 7

IMPACT ON OTHER TRANSPORTATION SUPPLIERS AND TRANSIT OPERATORS

One concern of the transit strike was the fact that over 7,000 daily KTC transit riders had to find alternative modes of travel. Such a large and sudden shift in mode of travel could easily surpass the capabilities of the private bus and paratransit operators and affect their ability to provide satisfactory service to their newly found riders as well as regular clients. Therefore, interviews were conducted with transportation suppliers to determine the impact of the six-week KTC strike on their operations.

Private Bus Operators

Five private bus operators were contacted. Two of these companies operate regularly scheduled service to outlying towns, and the other three provide charter transportation services.

Autrey Bus Lines. Autrey operates four regular runs each day between Knoxville and Gatlinburg. It also operates seven express bus runs daily to and from the TVA towers in downtown Knoxville (five to west Knoxville and two along Chapman Highway). Autrey was not hired to provide any additional services during the strike. Some of its drivers noticed a few extra passengers than normal during the strike yet Autrey was not noticeably affected by the strike. Autrey's dispatcher recorded some 20 phone calls from elderly people along Chapman Highway (mostly from the Colonial Village area) requesting service. The dispatcher had to refuse these requests as Autrey is not legally able to offer service within the Knoxville municipal limits.

B&C Bus Lines. B&C operates regular daily services between downtown Knoxville and the McGhee-Tyson Airport and the Maryville-Alcoa area. B&C was not affected by the strike in any way, but it was contacted by The University of Tennessee for providing service on the campus as a substitute for KTC service. However, B&C lost its bid to a competitor.

J. H. Cobble School Bus Line. J. H. Cobble is primarily a contract bus operator for school systems. It has no regularly scheduled routes other than those in its school contracts. Cobble was hired by one social service agency (the ACTION Foster Grandparent Program) to transport 35 of its 55 foster grandparents, who had been using KTC to visit their client foster grandchildren. This agreement was terminated before the strike was settled when the Foster Grandparent officials decided to purchase a van to avoid additional recurring expenses.

Robert Loy School Bus Lines. The Loy operation is similar to that of J. H. Cobble. Loy was hired by The University of Tennessee to operate two buses on its Agricultural Campus and Hill Loop routes. This arrangement existed for the duration of the strike as a substitute for the service usually provided by KTC.

Seymour Bus Lines. Seymour Bus Lines operates basically a charter service. During the strike, it was also hired by The University of Tennessee and it served the married student's apartments. KTC normally operates eight buses to serve the UT routes. However, Loy and Seymour were employed to run only three buses to serve these same

routes during the strike. As mentioned above, both contracts were terminated on March 28, 1977 when KTC resumed its regular operations.

Taxi Operators

Telephone surveys of the taxicab operators in the Knoxville area were conducted both during and after the strike. The first was conducted on Monday, February 22, 1977, one week after the strike and the second was conducted at the end of the strike in late March.

Several difficulties were encountered during the interviewing process. Many smaller operators were impossible to locate by phone as they primarily operated shared-ride or jitney type service in certain neighborhoods. In addition, several operators were not willing to divulge much information over the telephone for various reasons.

A list of cab operators was obtained from the transit study done in October 1976 by The University of Tennessee as well as the Yellow Pages listings in South Central Bell's Knoxville telephone directory. Twelve operators were contacted in the first survey done on February 21, 1977.

All of the companies contacted had anticipated a definite increase in demand during the early phase of the strike. However, the majority of these firms recorded no significant increase in the number of calls received during the first week of the strike. Two operators (Big Orange/Dixie and Smithwood) noticed a very slight increase for the first two days of the strike. However, this increase was not so large that it could be attributed directly to the transit strike. In the survey conducted after the strike almost all of the operators

contacted expressed surprise that the strike had not brought them more business. The individual 12 companies and their responses are listed below:

Burlington Cab. Burlington was able to handle only its regular customers. Therefore, it was not possible to associate any increase due to the strike. Its dispatcher did not believe the strike brought it any significant number of additional riders.

Big Orange/Dixie. This firm received a few additional calls during the first two days of the strike. Based upon the experience of the previous strike in Knoxville in 1967, no long-term benefit was expected from the strike. Operators decided to wait until after the strike had lasted for a few weeks before making any major adjustments. On an overall basis, the company gained some new business as a result of the strike--some 25 to 30 new customers. Also, more multiple pick-ups were recorded, especially during the week of March 2-9 when the number of phone calls was clearly above normal due supposedly to the arrival of Social Security checks.

Service/Yellow/Checker Cab. The owner of this company had been expecting a significant influx of calls for service but this did not happen. However, he did not expect any long-term effect upon business. Only a very limited increase in his business was noted.

College Cab. College Cab, which serves the black community primarily, did not record any increase in business after the strike had begun.

Lone Eagle Cab. This firm did not receive any increase in telephone calls for cab service during the strike.

Smithwood Cab. This operator experienced the same situation as Big Orange/Dixie Cab. No major changes were made to handle the increased demand. As in the case of the 1967 strike, operations returned to normal by the end of the first week of the strike.

Bearden/West Knox Cab. The service area for this company is west Knoxville, and no increase in business was experienced.

Knoxville Cab. The previous strike had benefited the business of this firm and, therefore, the same situation was expected for the 1977 strike. However, no increase in demand materialized.

University Cab. University Cab did not experience any noticeable changes in the demand for its services.

In summary, the transit operators did not encounter any significant increase in business due to the transit strike. The larger firms did receive some additional business, but it was below pre-strike expectations. The smaller firms did not benefit from the strike; this can be attributed partly to their limited operations, inaccessibility by telephone, and inability to easily expand capacity.

Social Service Agencies

A number of private and publicly supported social service agencies are involved directly in providing transportation. The strike was found to cause a significant increase in demand which, in certain cases, far exceeded agency resources. These situations were usually handled by maintaining or tightening eligibility requirements for services and by making other informal arrangements.

The Knoxville Community Development Corporation (KCDC), in addition to being the major provider of public housing in the Knoxville

area with 11 complexes, is a major provider of transportation services for the elderly, many of whom live in these complexes. KCDC operates four vans for its residents. Before the transit strike began, these vans were operating at about 60 to 75 percent capacity. The top priority of service is for trips made to The University of Tennessee Hospital and for other medical reasons. Trips for grocery shopping, arts and crafts, park visits, and entertainment have lesser priorities. Even though the KCDC vans provide most of the transportation services to KCDC's elderly residents, the bus strike did cause the overall demand for van usage to exceed capacity. In responding to this over-capacity situation, KCDC cut out services for lower priority reasons. Additionally, the residents' transportation needs were met by increased carpooling by social service workers, volunteers, and by the residents themselves. Many requests for transportation were received from other elderly and disadvantaged people who were ineligible because they were not residents of KCDC complexes.

The CAC Offices on Aging and the Senior Citizen Information and Referral Service both experienced slight effects due to the transit strike. Even though the Office on Aging runs a companionship service for the elderly with staff members who use their own automobiles, the strike did cause it to obtain an extra person to handle increased demand. The Senior Citizen Information and Referral Service recorded a slight increase (about 20 requests) for transportation information. These requests were referred to the Easter Seal Society.

The largest supplier of transportation for the handicapped individuals in the Knoxville area is the Easter Seal Society, which operates special lift-equipped vans on a pre-arranged schedule. Medical

trip purposes receive the highest priority. The Easter Seal Society did receive a slight increase in requests for service during the strike; however, most requests were not within Easter Seal Society's eligibility standards.

Finally, the Knoxville-Knox County Community Action Committee (CAC) provides transportation services on the basis of income, lack of access to transportation, and clients' need for or involvement in other CAC programs. Usually, service workers in these programs already know of their clients' transportation needs from personal relationships. The CAC offers its transportation services through two component programs: (1) its central office handles trips to social service agencies and medical facilities with one van and six station wagons, and (2) the Senior Nutrition Program provides transportation for senior citizens with one van for travel to food service centers. Normally, the demand for service rarely exceeds capacity. The KTC strike, however, caused a much greater demand, such that CAC's transportation operations were in a general state of confusion for about two weeks following the beginning of the strike. Subsequently, arrangements were made for additional labor and revised standard operating procedures. For the remainder of the strike, demand continued to surpass CAC's resources as CAC tightened the eligibility restrictions for the use of its transportation services.

On an overall basis, the transit strike clearly placed an extra burden on the social service agencies as they were requested to transport many former transit riders. Some agencies encountered operational problems due to the increased demand, but in many cases strict

eligibility standards forced these agencies to deny transportation services to many individuals with an expressed need.

Knoxville Commuter Pool

The Knoxville Commuter Pool (KCP) provides commuter brokerage service to individuals seeking to share transportation with others. Other 156 former transit users called the KCP office requesting assistance in establishing alternative travel arrangements for going to work just prior to and during the KTC strike. After the strike was settled 60 of the 156 individuals seeking assistance were contacted by telephone to determine their success in arranging alternative transportation. Sixty percent of the individuals called were licensed drivers and 50 percent lived in households with at least one automobile. Although all of these individuals had an expressed difficulty in finding convenient alternative commuting arrangements, about half the persons contacting KCP could be defined as "non-captives," based on their car ownership characteristics.

Typically, the KCP representative handling the telephone call would record the trip data and then manually match the caller's trip records with other callers on the master file of trip records maintained in the KCP office. The caller was then sent a "mailer" or list of other individuals interested in carpooling living in the same area, working at the same destination and traveling within half an hour of the time specified. It was then the responsibility of the caller to make the necessary contacts to arrange a carpool.

The brokerage service, which is unique to Knoxville, was able to respond in a number of cases to assist former transit patrons in

arranging alternative transportation during the strike. Thirty-one of the 60 individuals reached by telephone actually contacted one or more persons listed on the match list provided by KCP. As a result of these contacts, 12 individuals or 20 percent joined a carpool. Six of these individuals continued to carpool two to three months after the strike was settled. Of the other six, three returned to the bus, two decided to drive their own cars and one individual no longer made the work trip.

Of the 48 individuals not joining a carpool the majority, 39, rode with family or friends, eight drove their own cars, and one person used taxi service. All of the 60 persons responding indicated they were satisfied with the convenience and economics of their temporary transportation arrangements. Some expressed preference for the alternative mode because of door-to-door service, less cost, reduced travel time and the convenience of not having to wait for a bus. The hardships expressed by former transit riders included the cases of one individual who had to purchase a car during the strike and another individual who lost his job because of a lack of transportation.

Significantly, two months after the strike only 27 of these 48 individuals had returned to the bus. Ten individuals continued to drive their own cars and 11 either rode with a friend or with relatives. Interestingly, 85 percent of the captive riders among this group returned to the bus, while only 25 percent of the choice riders returned. These percentage figures did not seem to have any bearing with the mode of transport used during the strike. The KCP telephone

survey thus suggests that KTC lost significant commuter patronage (44 percent of those surveyed) particularly from the category of non-captive commuters. These individuals experimented with another mode of transportation during the six-week strike and elected not to return to the bus.

Summary

The interviews with private bus and paratransit operators revealed that some increased demand for service resulted during the transit strike. However, in many cases this demand was not as great as first expected. The social service agencies were limited in their ability to respond due to client eligibility requirements. It appears that a substantial portion of the community transportation needs had to be satisfied with private arrangements maintained between relatives and friends.

CHAPTER 8

IMPACT ON KNOXVILLE'S BUSINESS COMMUNITY AND OTHER INSTITUTIONS

The business community in Knoxville experienced a wide diversity of impacts upon sales and general business activity during the KTC transit strike. Some establishments whose clientele are primarily transit-dependent suffered up to a 75 percent decline in the level of retail sales. In other instances, sales were even better than expected, compared to the same period last year. Most of the major employers in the Knoxville area did not experience any significant difficulties with their employees getting to and from work.

This chapter will concern itself with the strike's impact upon the retail business and employment sectors in the Knoxville Central Business District as well as its effect upon selected major employers within the KTC service area. The methodology employed and the underlying assumptions made in collecting and analyzing the information presented here are covered in Chapter 4.

The first portion of this chapter is a review and summary of a special study made of retail merchants in the Knoxville CBD. This involved personal interviews conducted with over 100 merchants. The information obtained from these surveys includes three primary indicators: (1) sales during the strike, (2) sales recovery after the strike, and (3) employment levels during the strike. Additionally, other factors will be discussed including how the strike affected business operations exclusive of sales and merchants' concerns over long-term damages to their business. Due to the sensitive nature of

the questions asked in the survey, not all of the merchants and others interviewed gave specific or quantifiable answers. The answers that were received are summarized in this chapter and detailed tabulations are presented in Appendix C.

In general, detailed sales information was not available and information could only be obtained on percentage declines. The CBD retail merchant survey will be divided into nine types of businesses for clarification.

The nine groupings noted by letter from A through I are as follows:

- A. Specialty shops/jeweler/florist (33 establishments).
- B. Department store/furniture/major appliances (8 establishments).
- C. Liquor store/package store/bar/tavern (6 establishments).
- D. Bank/savings and loan/bail bonding/public utility (KUB) (12 establishments).
- E. Beauty shop/barber/hair styling salon (3 establishments).
- F. Supermarket/delicatessen/health foods/meats/variety/drug-store/dime store (9 establishments).
- G. Restaurant/grill/fast foods/delicatessen (10 establishments).
- H. Women's clothing/men's clothing/tailor/shoes (19 establishments).
- I. Miscellaneous (all others not listed above) (7 establishments).

Appendix C contains a list of the firms interviewed in each category. For each grouping a comparison will be made between the establishments located on Gay Street and those on Market Square Mall.

Impact on CBD Retail Sales

As a general rule, the decline in retail sales activity during the strike was the greatest adverse impact of the strike as compared to the other indicators of employees' inconvenience and layoffs or any lagging sales after the strike was settled. The majority of businesses in eight of the nine types of business categories experienced some decline in sales during the strike; however, the vast majority of all businesses were not plagued by a continued sales lag after the strike was settled.

Business Type A. Thirty-three establishments in the category of the first grouping of businesses (specialty shops, florists, jewelers, and a print shop) were surveyed. Most of them sell small and low-priced goods which can be purchased quickly, and transit patrons often purchase these items while waiting for or transferring between buses. These businesses were affected most severely of all by the strike.

Of the 33 businesses, five reported 50 percent or more reductions in sales during the strike with eight others exceeding a 30 percent decrease and 12 others having more than 10 percent loss in business. Only five businesses, a pawn shop, a watch repair/jeweler, a bookstore, a clothing goods shop and a florist, indicated that they had experienced no sales decline during the strike. Four of these added that their clientele consists primarily of people who rarely use the

KTC system. No businesses reported an increase in sales during the strike period. Of the 28 establishments reporting a sales decrease, about one-half of the group experienced a loss in sales of more than 25 percent.

The Market Square Mall and Gay Street areas were about equally affected for this type of business. Twelve of the 33 businesses are located on the Mall and the impact ranged from a 75 percent reduction to no impact. Of the 21 businesses on Gay Street, the overall range and distribution of impact were similar but not quite as severe. Three businesses experienced no effect while one reached a 60 percent drop. The majority of merchants on Market Square Mall can be classified into business Type A, unlike the businesses on Gay Street which represent a much wider diversity of business types. This indicates that the Mall area as a whole was more seriously affected.

Concerning the continuing effects, if any, after the strike was settled, a majority of the merchants indicated that their sales had returned or had "almost" returned to normal, pre-strike levels. Of the 33 businesses, 19 had re-established their normal sales levels within one month after the strike and another six were nearly normal. Four of the remaining eight were in 80 to 95 percent of normal range and no information was revealed by the other four. Nine establishments indicated that in their opinion, the strike had caused permanent damage to their business to some degree.

A breakdown between the Mall and Gay Street reveals similar data. On Gay Street, 12 of the 21 merchants had completely recovered their

sales volume and another five had nearly recovered. Seven of the 12 retailers on Market Square Mall were back to normal.

Business Type B. The second group of businesses that were surveyed included eight establishments--department stores and others selling large items, such as furniture and major appliances. These included Miller's (on Henley Street with a small branch on Market Square Mall), the Boston Store, J. C. Penney's, Rolen Furniture Store, Fielden's Furniture Store, Sterchi Brothers, Fowler's, and Woodruff's.

All of these stores, except for Miller's, are located on Gay Street. Miller's Department Store is located between Locust and Henley Streets two blocks west of the Market Square Mall and three blocks west of Gay Street in the Knoxville CBD. The lack of transit service during the strike did not significantly affect Miller's in any way. Minor problems for a few employees getting to work were solved fairly easily. And despite the fact that this department store is served directly by five of KTC's eight regular routes, retail sales during the strike exceeded that of the previous year. The Mall branch was slightly, but not significantly, affected. Woodruff's also enjoyed sales increases during the strike. It is reasonable to assume here that the strike in itself was not a major reason for the sales increases and that these two businesses do not depend primarily upon transit riders for customers.

Two of the four furniture stores reported sales declines of over 70 percent. And when interviewed approximately one month after the settlement, both had a continuing sales lag of 20 to 25 percent. Not surprisingly, both merchants also believed that the strike had caused

permanent damage to their business activity. The other two furniture stores experienced no change in business, but they did report complaints from their customers who had difficulties finding parking spaces. As confirmed by other sources, the strike apparently did increase the demand for all-day parking in the Knoxville CBD and in some locations made it difficult for shoppers to park. Neither of these stores had any notable inconveniences with their employees getting to work.

The two remaining stores in the group, the Boston Store and Penney's, experienced sales slumps in the ranges of 20 to 25 percent and 10 to 15 percent, respectively. The manager of Penney's added that he was not sure if all of his sales decline could be attributable to the strike because the inclement weather also could have affected sales. Both of these stores improved their sales soon after the strike but there seemed to be a lingering lag. Penney's and the Boston Store are similar in characteristics, both being located on Gay Street near bus stops, and their merchandise and clientele also are similar. Their similarities probably explain the like effects on them due to the strike.

The group of eight larger stores revealed a wide diversity of impact. Despite some similarities in location and product lines, the consequences of the strike for these stores were to a large extent influenced by the mode of access and affluence of their customers.

Business Type C. Taverns, bars, and liquor/package stores compose the third grouping of six establishments that were surveyed. Five

of these establishments can be considered bars or taverns with the package store being the sixth business. During the strike four of these, including the package store, reported sales slumps of at least 40 percent. The other two bars were hardly affected at all as they did not consider themselves dependent upon bus riders.

Within one month after the strike was settled, four of the businesses had completely recovered previous sales levels. Sales were still lower by 10 percent and 25 percent at the remaining two stores, respectively. The managers of these two stores believed that lasting damage had occurred to their sales as a result of the transit strike.

The package store and one of the five bars are located on Market Square Mall. Both of these lost 50 percent of their sales during the strike and, as a group, suffered more and recovered less quickly than the four bars on Gay Street, three of which had completely returned to normal with one still being off by only 10 percent.

Business Type D. The fourth group of businesses in the survey consisted of 10 financial institutions (banks, savings and loan associations, consumer finance companies), a bail bonding company and the Gay Street office of the Knoxville Utilities Board. The various types of institutions within this group were affected by the strike in distinctly different ways, with the consumer finance companies being the most impaired. Because all these organizations are located on Gay Street, no locational comparisons can be made with the Market Square Mall.

Most banks were not significantly hurt during the strike in the financial sense. They did experience noticeable decreases in pedestrian traffic in their lobbies, especially in early March after Social

Security checks had been received by bank customers. One Park National Bank official described his lobby on March 3, 1977, as a "ghost town." He added that about 40 percent of the downtown branch's walk-in customers were regular bus riders but that cash-flow-wise his branch was far more hurt by Knoxville's severe winter weather than by the transit strike. A head teller at the Gay Street branch of City and County Bank observed no decline in cash flow during the strike except on a decline in small change business which increased after the strike had been settled.

The two savings and loan associations included in the survey noticed declines in walk-in and on-street pedestrian traffic. However, their business was not affected and there was no change in cash flow.

Most of the six consumer finance companies surveyed are in the 600 and 700 blocks of South Gay Street. Four of these had noticeable declines up to 20 percent in new business, but all except one revealed that their greatest problem was due to customers not being able to make loan payments. This problem was attributed almost entirely to the lack of transportation due to the strike, although it was mentioned that some of these customers had been laid off from their jobs due to the strike as well as the cold weather. One manager specifically remembered several of his customers as being KTC employees who found it difficult to make payments during the strike. One loan company manager noted that some customers complained about the decreased availability of parking.

Johnson Bonding Company was the only financial organization of its type in the CBD area. An employee related that the strike had no

effect upon his bonding business whatsoever, due mainly to the fact that most of the customers for bonding services come from the Knox County Courthouse across the street.

The main office of the Knoxville Utilities Board on Gay Street sometimes processes some 1500 in-person transactions during a single business day. It is the destination for a sizable number of trips made to the Knoxville CBD. Yet, according to KUB's head cashier, this office experienced no significant decrease in either pedestrian traffic or cash flow during the transit strike. On March 4, 1977, the day after many KUB customers received their Social Security checks, 1,229 business transactions occurred. This was approximately a 25 percent increase over the same day over one year earlier. However, this figure represents a 12 percent decline from the first three months of 1977. Some of this decrease, according to KUB officials, can be attributed to natural fluctuations and the inclement weather. Also, by noting that 75 to 80 percent of KUB's payments are made by other means (branch banks and by mail), these officials were not surprised that no real downturn occurred at its main office. Likewise, once the strike was settled, business transactions at KUB's downtown location did not markedly increase.

The financial community in Knoxville CBD clearly was affected by the strike only in those areas which rely on transit captives for business. Banks continued their pre-strike levels of business activity. Savings and loans institutions, the bail bonding company and the KUB office were scarcely affected. It is only the loan companies,

which cater to many transit riders, that endured collection problems and some loss in new business.

Business Type E. The smallest of all the groupings was comprised of only three businesses--two hair styling salons and one beautician school. All three of these establishments are located on Gay Street. According to the managers of the hair styling salons, the strike did not cause any problems other than parking inconveniences for some customers. At one of these places, however, a slight decline in the number of children customers was noticed and it was attributed to the fact that many of them come downtown for their haircuts. Yet neither of these two establishments ever deal with transit patrons to any large extent. The beautician school did experience a major decline in business of approximately 33 percent. This establishment is much more dependent upon bus riders for its customers. After the strike was ended, its business quickly returned to previous levels despite some permanent damage which was expected to occur.

Business Type F. The sixth grouping consisted of supermarkets, delicatessens, variety and drug stores, and specialty food stores (i.e., meats, health foods, etc.), and a total of nine businesses in this category was surveyed. In general, these businesses were seriously affected from a loss of customers. Except for one health food store which had a 5 percent increase in sales, all of these suffered sales slumps of at least 10 percent with four exceeding 40 percent. Two meat markets and Vernon's, a drug/variety store, reported a sales decline of at least one-half of their pre-strike sales. Of the other

four establishments, three experienced a loss of business in the 10 to 15 percent range, while the fourth one lost 30 percent.

Once the strike had been settled, three of these nine reported complete recovery and five others indicated that they "almost" had recovered. The worst of these had returned to about 90 percent of its normal sales level after the buses had been running again for four weeks. In commenting about the long-term effects of the strike upon sales, most of the managers expressed at least some concern for negative residual effects. This included two businessmen who expected their recoveries to take from three to nine months. The manager of Vernon's concluded that the lost business could never be replaced.

The most seriously affected businesses in this group are located in Market Square Mall, all four reporting sales declines of at least 40 percent. The losses of the three Gay Street stores were in the range of 10 to 30 percent. Both areas were able to rebound by a similar extent after the strike although the Gay Street merchants were slightly more concerned about the long-term effect.

Further evidence that this group of businesses were among those most seriously impacted is indicated by several additional events. Four of these stores closed earlier during the business days with one manager cutting hours primarily for the convenience of his employees, and two of these even closed entirely on Saturdays. Two stores resorted to special sales, one during and one after the strike. One variety/drug store manager on Gay Street commented that experience with a previous transit strike in 1968 prepared him to accurately

forecast the 10 percent drop in his business. Interestingly, however, the profit margin did not drop as much as sales in that particular store because refill prescription sales remained steady and less labor was needed in the absence of the many transit-dependent customers who purchase lower cost items while waiting for buses. On the other hand, Kress' manager stated that the strike had hurt the Easter layaway business and that his home office supervisors were quite surprised that a transit strike could affect store sales so sharply. Finally, he emphasized that the Kress store on Gay Street simply had to have the existing KTC system running in order to survive.

The food, variety, and drug stores can be clearly identified as one of the business groups most greatly harmed by the lack of transit service. Evidence from both locational sub-areas illustrates again a somewhat greater impact upon merchants in Market Square Mall, although those on Gay Street also had serious problems which could not have been coped with on a continuing basis. As in previous cases reported, many of these businesses deal primarily with transit-captive customers.

Business Type G. The seventh of the nine business groupings included 10 establishments of restaurants, grills, and fast food stores. All except one of these lost sales during the strike. Three were slightly affected, three others had a decline of 20 to 33 percent of their sales, and the last three had at least a 40 percent drop with one reaching to a 75 to 80 percent loss.

When interviewed one month after the strike had been settled, five of these 10 businesses had returned to pre-strike sales levels

and another two had almost recovered. A coffee shop, which had dropped 75 to 80 percent during the strike, was still off 40 percent and another had regained 20 percent of its sales but was still only 80 percent of normal.

On a locational basis, all but one of the five Market Square Mall businesses suffered more sales decline during the strike, ranging from 33 to 80 percent declines, than did their counterparts on Gay Street. The only exception was a Mall sandwich shop, which caters mainly to office workers in the downtown area. The two aforementioned businesses, which were still off 20 percent and 40 percent one month after the strike, are both located in the Market Square Mall.

Among the Gay Street merchants of this group, the maximum decline in business was 20 to 25 percent during the strike. And, virtually all of these had recovered from strike period sales levels one month later. The manager of Arby's Restaurant on Gay Street did not believe that his operation was adversely affected for the long term.

Taken as a group, the 10 restaurants in the study area were seriously affected by the strike but the impact was limited primarily to the duration of strike. For the most part, these businesses depend upon transit patrons for much of their business, since they are located near bus stops and stores frequently used by bus riders.

Business Group H. The eighth group was composed of 19 clothing and shoe stores. The effect which the strike had upon their sales ranged from an increase of 6 percent to a decrease of 70 to 80 percent. Five of these 19 businesses indicated that their levels of

sales did not change during the strike, although one manager commented that sales in his store would have improved somewhat over the previous year if the strike had not occurred. Five other businesses experienced sales downturns in the range of 15 to 25 percent, the decline for four was in the 50 to 60 percent range, and an additional four reported losses exceeding 70 percent.

Recovery from the strike in sales levels was generally very good compared to most of the other business groups. Twelve businesses reported normal sales had been reached one month after the strike. Three others had returned to at least 90 percent of their normal sales. Two businesses, which had dropped at least 70 percent during the strike, were still about 20 percent off when interviewed. The only business which enjoyed a sales increase during the strike lost a small degree of business when the strike was settled. A ladies clothing store was able to open its doors for an extra evening when the buses were running again. Another women's clothing store manager on Gay Street was especially glad to see the KTC system in normal operation because about one-half of her customers regularly use the bus.

Twelve of these 19 businesses were concerned about the potential long-term losses of customers. Several managers agreed that bus riders' shopping habits can easily be broken by a transit strike as long as six weeks. Gay Street and Mall merchants expressed these concerns in equal proportions.

The shops in this group located on Gay Street were slightly less affected during the strike when compared to those on the Mall. However, both areas recovered roughly equally. This indicates that the

Market Square Mall stores regained a greater percentage of their sales in the same period of time.

Business Type I. The survey's final grouping of businesses contains a miscellaneous collection of seven establishments of which none were greatly affected by the strike. This includes three wholesale businesses, a charitable organization, a print shop, a hotel, and an intercity bus terminal. The wholesale businesses were involved in beauty supplies, food service equipment, and optical supplies. None of these noticed any change in business activity as a result of the strike except for the food service equipment wholesaler which experienced a very slight downturn in business.

The Andrew Johnson Hotel did not lose any business although it did have problems with 20 percent of its employees getting to work. As an enterprise which deals with other businesses primarily, the print shop recorded no changes during the strike. The same effect was encountered at the Volunteer Helpers Rescue Mission whose level of activity did not fluctuate at all. The manager of the Trailways Bus Terminal noted no changes except that some drivers had mentioned that they had picked up a few new customers on the outskirts of the Knoxville area.

All of these businesses are located on Gay Street. None of them had any decline in business activity to recover from except the food equipment wholesaler where business rose slightly after the strike. Even as a diverse group, these examples can indicate that the wholesale sector was not influenced by the strike.

Impact on CBD Retail Employment

The same survey used to gain information from CBD retail merchants about the effect of the strike upon sales was used to gain similar data for the strike's effect upon retail employment in downtown Knoxville. In comparison with retail sales, employment in the CBD during the strike was much less of an issue. Thirty-four of the 107 businesses surveyed made some adjustments with their employees during the strike. However, most of these changes were of a minor nature such as rearranging work schedules, slight cutbacks in employee hours, and promoting informal carpooling among employees. Of the few employees which were laid off, most were rehired after the strike was settled.

Business Type A. Of the 33 specialty shops, florists, and jewelers in the survey, exactly two-thirds made no changes with their employees. In the remaining 11, four employees from three stores were forced to find alternative forms of transportation to work. Eight employees in five stores were laid off due to the strike, yet most of them were hired back afterwards. Of the remaining three stores, two cut hours of operation slightly and the other one reduced hours by 30 percent.

Business Type B. This category includes all of the department, furniture, and large appliance stores in downtown Knoxville. As mentioned previously, all of these are located on Gay Street except for Miller's. Three of these stores were not affected by the strike in their employee arrangements. Two others adjusted the pay-hours of employees--J. C. Penney's cut its total employee hours by 10 percent

and the Boston Store released 15 of its 60 employees. One furniture store also had to make work hour cuts. The latter and two other stores, including Miller's, found it necessary to help form carpools and ridesharing arrangements for a small minority of its employees.

Business Type C. The six package stores, bars, and taverns were not affected appreciably by the strike in regard to employees. Only one of these six establishments made any employee changes. In this case, one employee was cut three hours per day.

Business Type D. This grouping includes a variety of financial institutions, a bail bonding firm, and KUB, a public utility company. KUB had no problems with its office and service personnel getting to work. All of its office workers own automobiles and servicemen are required to have their own transportation as a condition of employment as they remain "on call" for emergencies. None of the banks in the survey had significant problems with their employees. No bank employees were laid off due to a lack of business. The bonding company on South Gay Street conducts no business related directly to a transit-dependent clientele and none of its employees were inconvenienced as a result of the transit strike.

The loan companies were the only type of business in this group where the strike had any impact upon employees. Four of the six finance companies encountered no problems but the two others had to temporarily lay off one employee in each establishment due to the loss of business.

Business Type E. All three of the barber/beautician shops interviewed were on Gay Street. Two of these, which are men's hair styling

salons, were not affected. However, the third establishment, a beautician school, was forced to lay off a few of its employees.

Business Type F. The sixth business group is composed of a variety of retail food stores, drugstores and variety stores. Revco Drug Store reported that most of its 15 employees regularly used KTC buses to get to work but all of them were able to be at work with only minor adjustments and none of them had to be released on account of the strike. Three other businesses indicated no changes in their employee situation. Three establishments, however, chose to make reductions in total employee hours, but no personnel were laid off. The manager of a second drug store found it necessary to bring two of his nine employees personally to work; again, none were laid off. The most serious situation involved the Kress Variety Store where four of its 25 employees were terminated during the strike. Six of its employees had regularly used the KTC system to come to work.

Business Type G. Ten restaurants, grills, and fast food establishments are included in this business type. The Mall and Gay Street areas were about equally affected. Four businesses, two in each area, reported no changes with their employee operations. However, a total of seven people were laid off in this business category. Seriously impacted by the strike were the two restaurants on Gay Street which released six employees.

Business Type H. Fourteen of this group of 19 men's and women's clothing and shoe stores reported no employee changes due to the strike. However, 10 employees were released from three businesses

located on Gay Street, and seven of them were laid off from a single store with only 14 employees. In addition, two other shops on the Mall reduced employee hours. Even though there were two shops on Gay Street with severe employee cuts, the majority of businesses in both areas were not affected by the strike in terms of their employees.

Business Type I. This category included a mixture of different types of establishments. The Trailways Bus Terminal, two wholesale supply firms, a cinema, and a charitable organization were not affected in terms of their employees. Andrew Johnson Hotel, however, laid off nine of its 50 employees during the strike and some were not rehired after the strike. Also, a wholesale optical supply firm was forced to lay off two of its 14 employees not because of any decrease in business but since they were unable to find any means to get to work. All the firms in this group are located on Gay Street.

Impact on Employment Outside the CBD

Surveys were also conducted of selected institutions, hospitals and manufacturing plants to investigate the impact of the strike upon the personnel of major employers outside of the Central Business District.

Educational institutions. The Knox County School System provides school bus services for its pupils who live further than one and one-half miles from their schools. Operating funds are provided by the State of Tennessee and these funds cannot by law be used to serve pupils who live within the one and one-half mile radius. The Knoxville City School System does not operate school buses because many of

its pupils are within walking distance of their schools and municipal school systems in Tennessee are not eligible to be reimbursed by the state for any regular school bus operations. However, the Knoxville City School System does contract for some services with the Transportation Superintendent of the Knox County System. This contract has been in effect since 1963 when the City of Knoxville annexed certain areas of Knox County. It is these areas plus a few other areas within the City which are more than one and one-half miles from a school and are served by a school bus by the Knox County System. KTC buses also are used by many Knoxville school children for travel to and from school.

The Knox County Schools' transportation office received about 10 to 15 calls per day during the first few weeks of the strike, including some 100 calls from parents. These requests for additional service could not be accommodated for the aforementioned legal reasons. Many students were left without transportation and the strike, combined with the severe winter weather, did contribute to absenteeism.

Knoxville Business College experienced problems in getting some of its 58 staff people to work. With some rearranged schedules and other adjustments, this situation was essentially alleviated. Unfortunately, however, 45 students (or 6 percent of the student body) were forced to drop out of their courses due to the strike. A normal dropout rate is about 1 percent or less. An additional 30 percent of the student body encountered great difficulty in reaching early classes. A few carpools were formed which helped only a minority of these students. It was not until the schedules of the school became more

flexible that most of the students for early classes could solve their transportation problems.

The University of Tennessee (UT) hired two private bus operators to replace the KTC Contract Service terminated during the strike. The service, although not as comprehensive or frequent as the KTC service, was judged to be adequate. Three buses were used during the strike, whereas usually six KTC buses serve the campus. Special low cost parking passes were available for former transit riders electing to drive to UT. Very few of these passes were requested. No major dislocations in the functioning of the University were identified. Most employees previously riding the buses were able to arrange carpools.

Hospital employment. The six primary hospitals in the Knoxville area were contacted by telephone in mid and late April 1977. These hospitals are: Eastern State, Park West, Baptist, Fort Sanders Presbyterian, St. Mary's, and the University of Tennessee Hospital. All of the hospitals reported having only a small proportion of employees who used the KTC system to get to work and one hospital reported no interface with the transit system at all.

Eastern State Hospital has about 1,300 employees of which only 25 to 35 used the bus regularly before the strike. Two employees may have quit due to difficulties of gaining access to work. The strike caused a slight increase in taxi usage as well as carpooling. Some carpoolers expressed a newfound preference for ridesharing due to its relative convenience as well as the KTC fare increase. Even though this location is served by the Lyons View route, the strike reportedly

had no noticeable effect upon the overall employee transportation situation.

Park West Hospital is not served by any of KTC's regular routes. It has about 400 employees, none of whom have any contact with KTC on a continuing basis. Hospital officials indicated that the strike affected them in no way whatsoever. They added also that carpooling among employees was not common.

Baptist Hospital is located along KTC's number 3 and number 4 routes and has a total of about 1,100 employees. Ten to 15 employees have been noticed using the KTC system regularly but odd hours on certain shifts preclude the use of local transit by most of the employees. Continued parking problems for the employees were recently alleviated by the purchase of a new employee parking lot. An informal carpooling program already existed but future growth of this is limited due to the wide dispersal of the employee's homes in rural areas. The Director of Personnel summarized that the transit strike caused minor inconveniences for a few employees, but not to the extent that he had to take any action.

Fort Sanders Presbyterian Hospital employs about 1,200 people. It is served directly by one KTC route and is in close proximity to two others. Most of its employees, however, either walk to work or drive alone or carpool. The employee parking situation is currently adequate but another parking garage is proposed for the long term. The bus strike caused no significant problems at all.

As in other cases, many employees of the University of Tennessee Hospital are not able to use public transit because of odd shift

hours. Several carpools and one KCP vanpool currently exist. The UT Hospital, with its 1,500 employees, is served by the Fort Sanders route. The Personnel Manager reported that there were a few employees who were inconvenienced by the strike but they were able to find other ways to get to work without much difficulty.

Twenty-five to 30 of St. Mary's 1,450 employees were reported to be patrons of the KTC system. The strike did not cause anyone to quit a job but several complaints were received with regard to the lack of bus service. The current parking situation is somewhat tight and informal carpools already exist on a departmental basis. The assistant personnel director mentioned that any permanent cessation of KTC bus service to the hospital could have serious implications with employees.

These six hospitals as a group were not seriously affected by the transit strike. In most cases where a facility is served by KTC, approximately two dozen employees normally use public transportation for their work trips, and they were temporarily able to cope with the inconvenience of the strike.

Manufacturing plant employment. Almost all of the larger factories in the greater Knoxville area were contacted in a telephone survey to determine what effect the strike may have caused their employees. The firms contacted: (1) Standard Knitting Mills, (2) Levi Strauss, (3) Robertshaw Controls, (4) Dempster, (5) Palm Beach, (6) Rohm & Haas, (7) Tennessee Department of Transportation, (8) South Central Bell, and (9) Selecto Packing. None of the personnel officials at any of these plants contacted reported any significant problems due to the strike. Plant managers seemed much more concerned

about the harsh winter temperatures and the shortage of natural gas than the KTC strike. Plant workers at these locations generally have not been users of the KTC system because their plants were not within walking distance of the routes and because of the variance of their shift hours. Also, carpooling has been becoming more common as the price of gasoline has risen. Finally, because of the large numbers of employees at most of these locations, temporary arrangements were fairly easy to make for those transit riders who had been displaced.

Impact on Social Welfare Programs

Because many patrons of a public transit system are in lower income brackets and are disadvantaged in some form or another, the governmental and private agencies providing social services are a necessary source of information to assess the impact of a transit strike upon former transit users as well as the operations of these agencies themselves.

In the Knoxville area, four public agencies provided information about their clients who were affected by the strike: (1) the Tennessee Department of Employment Security, (2) the Tennessee Department of Human Services (which administers Aid to Families with Dependent Children [AFDC] program locally), (3) the ACTION Vista Foster Grandparent Program, and (4) the Knoxville Community Development Corporation (KCDC).

From a survey of all the agencies involved, the transit strike severely affected the operations of only a few agencies. Welfare clients and other disadvantaged individuals are sensitive to personal and community crises and the transit strike no doubt caused traumatic

problems for certain individuals. Unfortunately, these situations are generally difficult to discover and document.

The nature of the transportation inconveniences caused by the strike is illustrated in the following cases. Staff members at the Tennessee Department of Human Services reported that the strike had "virtually no effect in the overall demand for AFDC, Medicare, and Medicaid payments." Their office handles about 225 requests per month normally and there was no substantial change in this figure. However, 10 AFDC applications were noted as a result of employment lost due to the bus strike. In addition, it was noted that several applicants under the WIN (work incentive) Program had difficulty in getting to the offices of the Tennessee Department of Employment Security, where a decline in the number of in-person visits was noticed for persons seeking employment who had been AFDC recipients. At this same office, no significant increase in demand was recorded for unemployment compensation requests. It should be noted here that a lack of transportation to work is no legal basis in itself for a person to claim and receive unemployment compensation, according to Tennessee law. Therefore, information supplied by these agencies indicates that the transit strike had no significant impact upon the demand for public assistance.

The KTC strike did have an indirect but adverse effect upon the function of two area agencies. The Senior Citizen Home Aid Service itself is not in the transportation business but it is a home visitation and companionship service. Of its 60 or so volunteer aides,

eight do not have their own transportation and, therefore, were inconvenienced during the strike. Since the strike has ended, these persons have resumed using the KTC system.

Also, the ACTION Vista Foster Grandparent Program had difficulties in transporting 35 of its 55 clients (foster grandparents) for visits to their foster grandchildren. In order to continue its program, the agency director found it necessary to contract for transportation services with a local private firm, J. H. Cobble School Bus Company, soon after the strike began. This endeavor was quite expensive for the Foster Grandparent Program, placing a severe strain on its annual budget. In addition, a new van was purchased "to avoid allowing the program to be left without transportation in the future" and another van was borrowed temporarily from the Senior Nutrition Program. Therefore, all services here were continued, at a greater financial burden.

For those public assistance clients who are supported by the various services of the Tennessee Department of Human Services, individual transportation needs are referred to case aides or service workers who in turn use their own automobiles and are reimbursed for the mileage later. During the period of the transit strike, 11 of the 35 welfare recipients who received transportation services in this manner indicated that their trips could have been made on the KTC system or that the strike in some manner caused the need for those trips.

Reports from a sample of social service agencies indicate that based on commonly accepted measures like unemployment levels and the

demand for public assistance, the transit strike caused no highly significant aggregate impact upon those who depend on services from these agencies. Undoubtedly, those individuals traumatically affected by the strike suffered in ways difficult to ascertain and were not evident in the information supplied by these agencies.

Summary

The data from the above described surveys indicated that retail merchants in the Knoxville Central Business District did experience noticeable declines in the level of their business activity as a group during the strike and to a lesser degree afterwards. The lack of access of transit dependents to downtown Knoxville by public transportation definitely affected businesses selling smaller and low-priced items more adversely than larger and more exclusive stores. This latter group, in some cases, was indirectly affected by the shortage in parking due to an increase in all-day parking in the CBD.

The specialty shops, clothing and shoe stores, restaurants, and food/drug/variety stores, being more dependent upon pedestrian access and a less affluent clientele, were the hardest hit. And in terms of spatial location in the CBD, the businesses in Market Square Mall were as a group more adversely impacted because most of them cater to transit patrons. The stores on Gay Street tend to have a wider diversity of customer income and business type, but some of them also relied heavily on transit users.

The only significant employee layoff problems were faced by the downtown retail establishments which temporarily laid off 73 individuals in the 107 firms interviewed. Retail merchants, however, did

not add to the unemployment rolls in proportion to the loss in sales because many merchants were able to compensate for lost sales by reducing work hours and not the number of employees. Most of the difficulties encountered by former transit-riding retail employees in gaining access to their downtown jobs were alleviated through car-pooling. The same follows true for almost all of the major employers in the Knoxville area where, based upon the data obtained here, it can be concluded that the KTC strike did not cause any large-scale unemployment. Additional factors, such as the very cold winter, the shortage of natural gas, and even the date of Easter in 1977 undoubtedly cloud the accuracy of the quantitative data; but the general conclusions remain the same. It seems that public transportation in Knoxville as provided by KTC is critically important to certain sectors of the community, particularly the downtown retail establishments.

CHAPTER 9

DOWNTOWN PARKING AND TRAFFIC VOLUME ANALYSIS

Effect on Parking in the Central Business District

One of the consequences that can be expected to occur as a result of a transit strike is an increase in automobile trips and demand for parking. Based on the fact that most of the transit travel in Knoxville is oriented to the CBD where parking supply relative to demand usually is lower than that in other areas, it was expected that the impact of the transit strike on parking, if any, would be felt in the CBD area. Therefore, surveys were conducted both during and after the transit strike to identify any increase in parking demand in the CBD area that may be attributable to the strike.

CBD parking survey. According to a parking study conducted by Kimley-Horn and Associates, a transportation engineering consulting firm, in November 1976, the Knoxville CBD contains 7,667 parking spaces composed of 589 curb (on-street) spaces and 7,078 off-street spaces. Of these 7,078 off-street spaces, the majority (4,815) are in commercial lots, while 116 are public and free, 782 are for private employees, 196 are for customers of various businesses, 33 are for residential purposes and the remaining 1,136 are for general purposes.⁴ The 589 curb spaces include 396 metered spaces and 193 free spaces.

It was anticipated that the commuters who shifted to automobile usage during the strike would be looking for all-day parking in the commercial lots. There are 49 commercial lots in the Knoxville CBD and 44 of these are operated by two enterprises--Safety-Park and Knox

Allright, Inc., with 24 and 20 lots, respectively. During the strike 32 of these lots were surveyed. The Safety-Park management indicated that they experienced an overall increase of 10 to 15 percent in business during the strike and that no changes in fees, hours of operation and/or number of employees were made in any of their lots. The operators of Allright, Inc., revealed that four of their lots had increased all-day patronage soon after the strike had begun, and the increase in demand apparently was due to TVA employees who had been denied express bus service during the strike. The parking fee increased at one of these lots located at the corner of Wall and Walnut Streets near the TVA office complex. The all-day rate was raised shortly after the strike. The increased rates have been continued even after the settlement of the strike at this lot. The majority of commercial parking lots that were surveyed were found to have experienced the usual level of short-term business.

Figure 9-1 identifies the responses given by individual parking lot attendants. Also noted on the map is the predominant use of the lot--short-term versus long-term. Increased usage of the long-term lots was observed particularly in the vicinity of the TVA employment complex. Prior to the strike some lots were already full and remained so during the strike. No decreased usage of any downtown parking facilities was observed. The parking operators were contacted again after the strike. Safety-Park reported that their business declined slightly. In most cases, however, there seemed to have been little change in patronage. The lots that had experienced an increase in

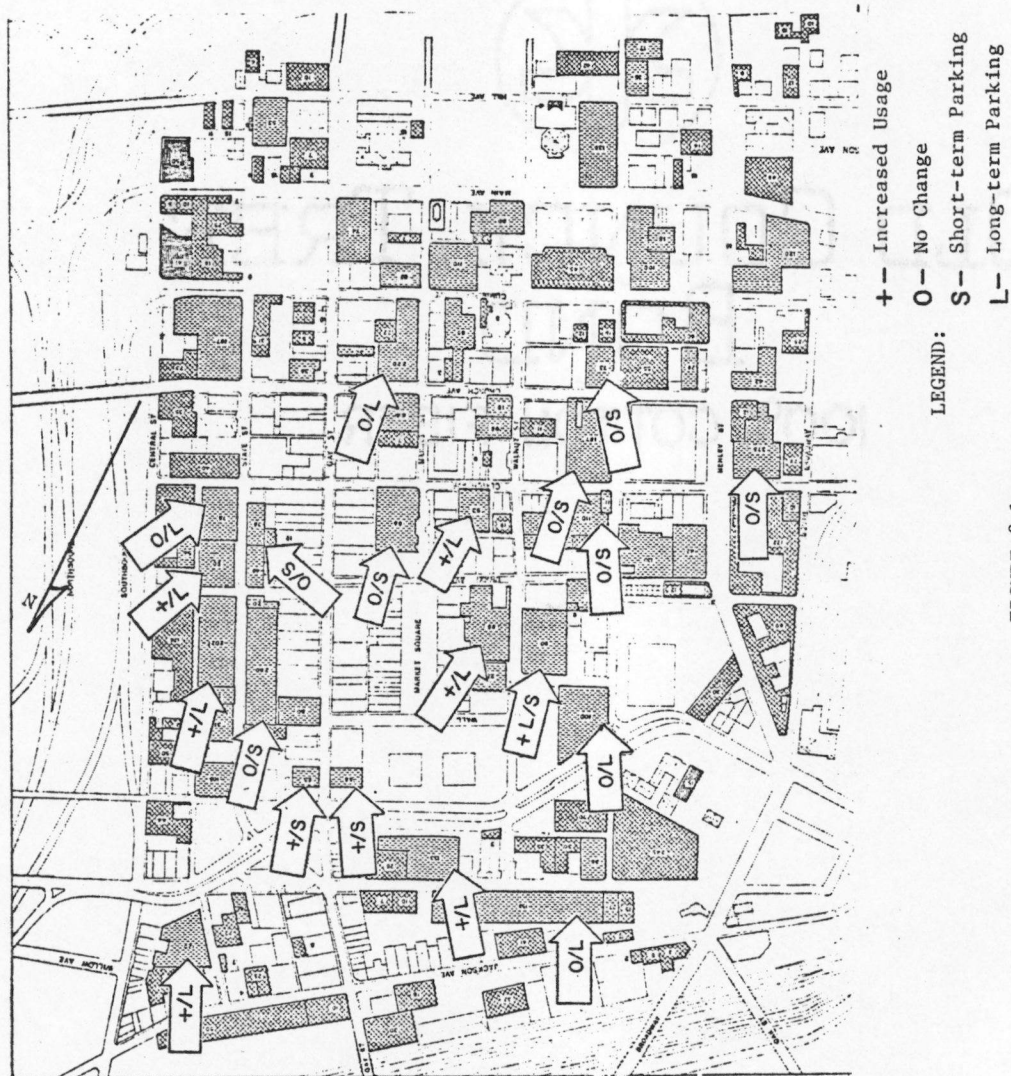


FIGURE 9-1

PARKING LOT USAGE CHANGES DURING TRANSIT STRIKE

demand during the strike continued the higher level of patronage even after the strike.

Parking in the coliseum garage. The parking garage for the Civic Coliseum, which is located approximately 2,000 feet east of the center of the CBD, has a large number of parking spaces that are not utilized fully during the working hours of weekdays. The cost of parking also is very low--only 50 cents per day or \$5.00 per month. Considering the attractiveness of the garage in terms of cost and availability of space, it was anticipated that in spite of its distance from major employment centers in the CBD, many of the former transit patrons who shifted to automobile usage might be using the garage for parking.

A parker-interview survey was conducted at the parking garage during the transit strike to determine the impact of the strike, if any. The questionnaire for the survey, which is included in Appendix A, was designed to identify if any of the parkers at the Coliseum were former transit riders. The interviews were conducted from 7:00 a.m. to 9:00 a.m. on Friday, March 4, 1977, which was 18 days after the strike had begun. During this two hour period 409 cars carrying 432 persons were found to enter the garage, and 149 drivers were interviewed. The observed average occupancy of the cars entering the garage was 1.06 and 13 of the 149 drivers, representing 8.7 percent of the total, indicated that they were forced to drive their cars and park at that location due to the transit strike. Seven of these former transit riders were TVA employees and the others worked in different places. Four of the 13 drivers had one other passenger with

them who also worked in the CBD. It should be pointed out that the car occupancy information represents the drivers and passengers actually entering the garage. It is thus conceivable that some passengers were dropped off near their place of work before the drivers brought the car to the garage.

A follow-up traffic count was made at the entrances of the garage after the transit strike was settled during the same hours of 7:00 a.m. to 9:00 a.m. on Thursday, April 14, 1977. The count revealed 412 cars entering the garage with an average occupancy of 1.08. Thus, there was no apparent decrease in the use of the parking garage after the strike. It should be pointed out that no conclusive statements can be made regarding an actual increase or decrease in the number of parkers because the difference was not substantial and may be explained by the normal daily and weekly variations in commuter travel patterns.

Effect on Metered Parking Revenue

The City of Knoxville operates approximately 640 metered parking spaces in the Central Business District and surrounding fringe area. The time limits on these meters range from 15 minutes (short-term parking) to 10 hours (long-term parking). The charges for metered parking range from 5 cents for 15 minutes to 50 cents for 10 hours. It was anticipated that some of the additional automobiles parked in the downtown area during the strike would be stored at metered parking spaces. An analysis was therefore performed to identify the impact of the strike on parking meter revenue. Parking revenue data were obtained for three time periods--"before," "during" and "after" strike--for two years, 1976 and 1977. The "before" period covers weeks one

through six, the "during" period covers weeks seven through twelve, and the "after" period weeks thirteen through twenty-four.

The average weekly revenue for 12 weeks after the strike was \$2,311 as compared with the average weekly revenue during the six-week strike of \$2,408. This reflects a decrease in revenue after the strike of 4.0 percent. The average weekly revenue for six weeks prior to the strike was \$1,986. This reflects an increase in revenue during the strike of 21.3 percent (Table 9-1).

A comparison of revenues for the same time periods during 1976 indicates that the average weekly revenue for the 12-week "after" period was 7.0 percent lower than for the "during" period of the year. Also, revenues for the "during" strike period of 1976 were 11.7 percent higher than revenues for the "before" strike period of 1976.

The percentage difference in revenues for the three time periods of 1976 can be attributed to seasonal fluctuations in metered parking revenue. Thus, the net increase in revenue during the strike based on a comparison of "before" and "during" revenue is $(21.3 - 11.7)$ or 9.6 percent. Similarly, the net decrease in revenue after the strike based on a comparison of "after" and "during" revenues is $(-4.0 - 7.0)$ or -11.0 percent.

The two estimates of the percentage change in revenue at metered downtown parking areas are 9.6 and 11.0 percent, respectively. These two values may be considered as the range within which the true value lies. The average of these two values, 10.3 percent, may be used as an estimate of the true value of increased parking meter revenue due to the transit strike. This amounts to approximately \$1,400 to \$1,500

TABLE 9-1
COMPARISON OF AVERAGE WEEKLY REVENUES FROM METERED PARKING

Time Period	1976		1977		Net Change
	Average Weekly Revenue	Change from Previous Revenue	Average Weekly Revenue	Change from Previous Revenue	
Weeks 1 to 6 (6 weeks be- fore strike)	\$1771	-	\$1986	-	
Weeks 7 to 12 (6 weeks during strike period)	\$1978	+11.7%	\$2408	+21.3%	+9.6%
Weeks 13 to 25 (13 weeks after strike period)	\$2116	+7.0%	\$2311	-4.0%	-11.0%

additional revenue during the strike. This increase occurred even though the Mayor allowed free parking on three Saturdays at metered locations in the downtown area.

Effect on Vehicular Traffic Volumes

Traffic volume counts were conducted to check if an increase in traffic would be observed along Knoxville's major travel arteries. Seven permanent count stations maintained by the Tennessee Department of Transportation Bureau of Planning and Programming were studied.⁵ The locations of these stations are noted on Figures 9-2 and 9-3. Five of the six locations were judged to have the potential of being affected by the strike because they were located in areas of high transit ridership. The other location was used as a control station. In addition, four supplemental count locations were maintained on routes providing access to the CBD but, unfortunately, due to a lack of long-term trend data at these four sites, the daily fluctuations in traffic volumes made this data unsuitable for use.

The traffic volumes were studied during the 7:00 a.m. to 9:00 a.m. period. A comparison was made between volumes observed two weeks just prior to and two weeks after the strike with volume counts made during the strike--two weeks after the strike started and two weeks just prior to settlement. No seasonal adjustments were applied due to the close proximities of the count period.

The analysis, summarized in Table 9-2, suggests that no noticeable variation in traffic volumes attributable to the strike could be identified.

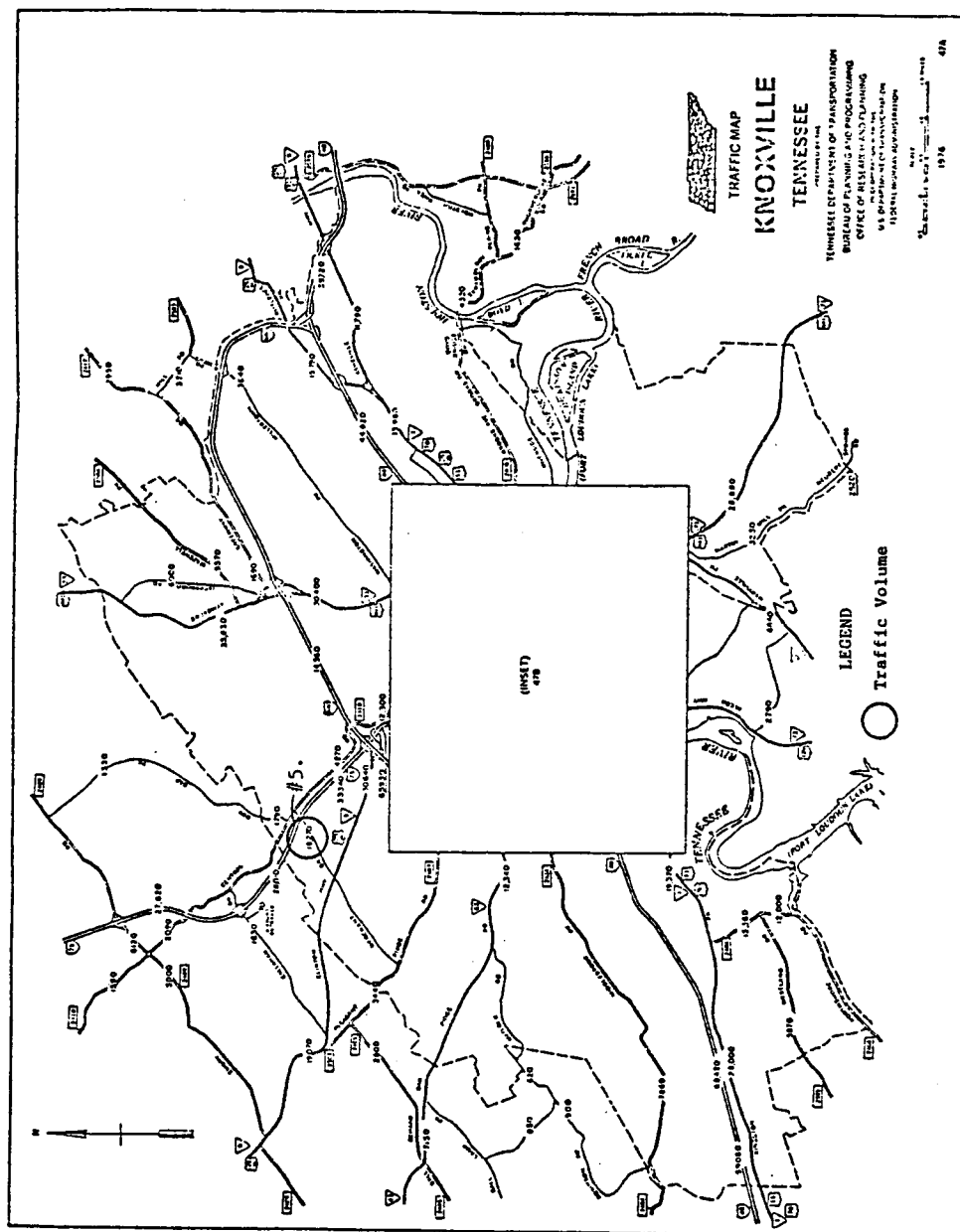


FIGURE 9-2
LOCATION OF TRAFFIC VOLUME AND VEHICLE OCCUPANCY COUNTS

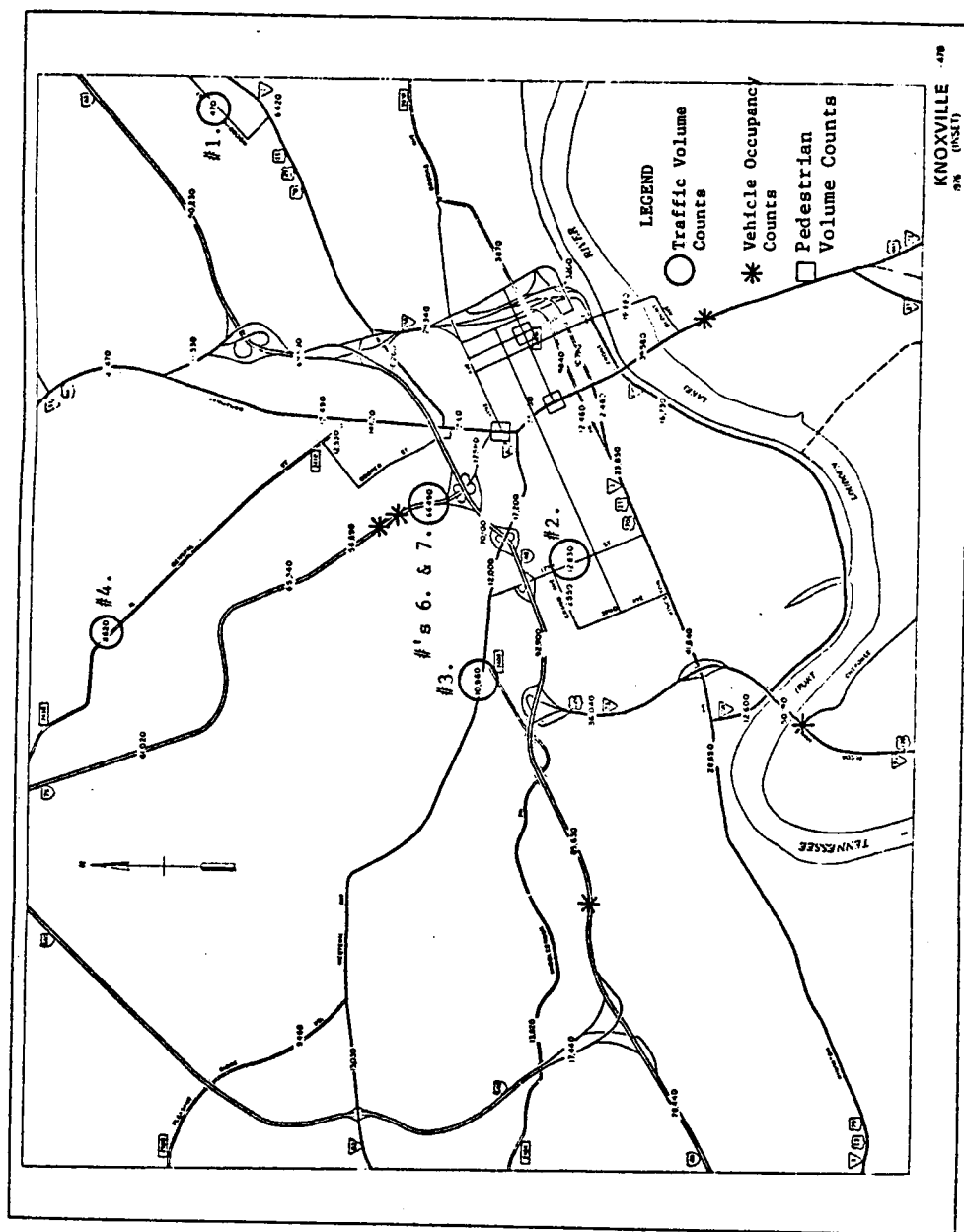


FIGURE 9-3
LOCATION OF TRAFFIC VOLUME, VEHICLE OCCUPANCY, AND PEDESTRIAN VOLUME COUNTS

TABLE 9-2

VARIATION IN WEEKDAY DAILY TRAFFIC
7:00 a.m. to 9:00 a.m.

Location	Two weeks just before strike vs. first two weeks of strike January 31-February 11 vs. February 14-February 25	Two weeks just before settlement vs. two weeks just after settlement. March 14-March 25 vs. March 28-April 8
1. Woodbine near Olive	+ 6.6%	-18.3%
2. Seventeenth near Highland	+ 1.0%	+31.4%*
3. Western near Webster	+ 7.6%	- 5.0%
4. Central near Emerald	+25.3%	+13.9%
5. Merchants near I-75	+ 7.1%	+ 6.3%
6. I-75 North (North of I-40)	+24.5%	Data Not Available
7. I-75 South (North of I-40)	+ 2.0%	Data Not Available

Source: Tennessee Department of Transportation

*Data influenced by class schedules at The University of Tennessee

Traffic volumes did increase after initiation of the strike, but the same trend was observed for the control stations. Two weeks after settlement of the strike, reduced traffic volumes were observed at two of the five locations. However, without control data, it was impossible to generalize the finding. The analysis suggests that no discernable trends in traffic volumes attributed to the strike could be identified and the data available was inconclusive.

Major Arterial Vehicle Occupancies

Vehicle occupancy counts were conducted during April and October of 1976 and during the strike of February 1977. The counts were reviewed to ascertain if there was any significant change before and during the strike. The counts were made at four locations within the city and at one location in the county (see Figure 9-3). The location on Alcoa Highway in the county was used as a control to measure seasonal fluctuations in vehicle occupancy. This site was selected since KTC service is not available on this route.

Table 9-3 summarizes the results of the freeway counts. The table lists the count location, time of day, average occupancy, and percentage of people ridesharing. Also shown is a comparison of the difference in results between percentage of people ridesharing and average occupancy during the four survey periods.

The results for the four occupancy check locations in the city indicate an increase in occupancy and percentage of people ridesharing during the strike. The average vehicle occupancy for February 1977 was 1.40 person-per-vehicle compared to 1.39 for April 1976 and 1.31

TABLE 9-3
FREEWAY FREQUENCY COUNTS

Location	April 1976			October 1976			Difference (Apr-Oct)			February 1977			Difference (Oct-Feb)			Difference (Apr-Feb)		
	Percent	People R/S	Avg. Occ.	Percent	People R/S	Avg. Occ.	Percent	People R/S	Avg. Occ.	Percent	People R/S	Avg. Occ.	Percent	People R/S	Avg. Occ.	Percent	People R/S	Avg. Occ.
Chapman Highway (p.m.)	55.7		1.44	52.4		1.40	-3.3		-0.04	51.2		1.40	-1.2		0.00	-4.5		-0.04
*Alcoa Highway (a.m.)	38.1		1.26	36.3		1.24	-1.8		-0.02	33.5		1.21	-2.8		-0.03	-4.6		-0.05
*Alcoa Highway (p.m.)	50.3		1.42	45.3		1.33	-5.0		-0.09	45.4		1.34	0.1		0.01	-4.9		-0.08
I40 @ Papermill (a.m.)	--		--	37.4		1.26	--		--	41.7		1.30	4.3		0.04	--		--
I40 @ Papermill (p.m.)	49.7		1.39	45.3		1.33	-4.4		-0.06	61.5		1.52	16.2		0.19	11.8		0.13
I75 @ 5th Avenue (a.m.)	39.8		1.28	37.6		1.25	-2.2		-0.03	41.7		1.30	4.1		0.05	1.9		0.02
I75 @ Heiskell Ave. (p.m.)	52.6		1.44	--		--	--		--	54.6		1.46	--		--	2.0		0.02
Total-all but Alcoa	49.5		1.39	43.2		1.31	-3.3		-0.04	50.1		1.40	5.9		0.07	2.8		0.03
Total-Alcoa	44.2		1.34	40.8		1.29	-3.4		-0.06	39.5		1.28	-1.4		-0.01	-4.8		-0.07

*Control Location

for October 1976. During the strike, the average vehicle occupancy decreased at the control location on Alcoa Highway. The vehicle occupancy at this location fluctuated from 1.34 in April 1976 to 1.29 in October of 1976, and then to 1.28 in February 1977. These figures suggest that the higher value for the vehicle occupancy at the other four locations cannot be attributed to seasonal fluctuations and it is likely that some former transit riders have shared rides with others during the strike rather than drive alone.

The count location displaying the least impact was Chapman Highway. The location registering the largest increase in vehicle occupancy was I-40 at Papermill Road where the average occupancy during the afternoon rush (4:00 p.m. to 6:00 p.m.) was 1.52 during the strike compared with 1.39 and 1.33 during April 1976 and October 1976, respectively. The average occupancy at this location increased by 0.19 person-per-vehicle from October 1976 to February 1977, which is equivalent to a ridesharing percentage increase of 16.2 percent. The average vehicle occupancy increase for all locations between April 1976 and February 1977 was 0.13 person-per-vehicle. The reason for a larger increase at I-40 and Papermill Road may be attributed to former TVA express bus riders who shared rides.

The counts at the control location (Table 9-3) indicated a decline in vehicle occupancy and percentage of people ridesharing during February 1977 when compared to April and October of 1976. Therefore, it appears that some former peak period transit riders, particularly in the west Knoxville corridor, shared rides with others.

Effect on Pedestrian Volume

Pedestrian volume counts were conducted at three intersections on the fringe of the Central Business District during the strike and after the bus service was resumed. The purpose of the counts was to identify changes, if any, which may have been caused by bus riders forced to use automobiles and park in the fringe areas. The three intersections analyzed were Henley Street at Western Avenue, Henley Street at Clinch Avenue, and State Street at Church Avenue (see Figure 9-3). The two intersections on Henley Street were selected because of the availability of no cost on-street parking in the Fort Sanders residential area west of Henley Street. It was anticipated that former regular and express bus riders working in the CBD might park their cars in the Fort Sanders area and walk to their destinations on the east side of Henley Street. Since Western Avenue and Clinch Avenue provide the only direct access to the CBD from Fort Sanders, every person parking in Fort Sanders and walking to the CBD has to pass through these intersections. The intersection of State Street with Church Avenue was selected because Church Avenue connects the CBD with the Civic Coliseum parking garages. Former express and regular transit riders who were driving to work could park in these parking garages at a relatively low cost compared to the cost of parking in the CBD, and those actually parking there have to walk through the intersection of Church Avenue and State Street to reach the CBD.

The pedestrian volume counts were conducted during the morning from 7:00 to 8:45 a.m. and in the afternoon from 4:00 to 5:45 p.m. The counts were made on the same day of the week under similar weather

conditions during and after the strike. The method used was to count the number of pedestrians on each approach at 15-minute time intervals.

Analysis of Pedestrian Volume Data

The greatest variation in pedestrian volumes occurred at the intersection of Henley Street and Western Avenue. Two hundred forty-six pedestrians entered the intersection during the morning count period during the strike. Only 179 pedestrians entered the intersection during the morning count period after the strike was settled. This represents a 27.2 percent decline in the total number of pedestrians entering the intersection. A decline of 71 persons alone occurred on the eastbound approach along Western Avenue.

The comparison of afternoon pedestrian counts at this intersection yielded similar results to the morning count. The total number of pedestrians entering the intersection in the afternoon count period during the strike was 249. After the strike was settled 163 pedestrians were found to enter the same intersection. This represented a 34.5 percent decline in the number of pedestrians using the intersection. The Western Avenue westbound approach had 85 fewer pedestrians after the strike during the afternoon count period. The results for both count periods indicate a substantial decrease in the number of pedestrians traveling to and from the Fort Sanders area after the strike.

Pedestrian counts at the intersections of Henley Street with Clinch Avenue and State Street with Church Avenue were different from the results obtained from the intersection of Henley Street with

Western Avenue. Increases in the total number of pedestrians entering these two intersections were observed after the strike.

In conclusion, only one of the three intersections indicated a marked decline in pedestrian activity after the strike. The decline in pedestrian volumes at Henley Street and Western Avenue was significant both in the morning and afternoon counts. The difference in the results of the three intersections can be explained by their locational characteristics. The intersection of Henley Street with Western Avenue is located very close to TVA and other downtown offices, which represent the largest employee concentration in the CBD, and the potential parking areas in Fort Sanders are within walking distance from the intersection. In the case of the other two intersections the potential parking areas were farther away and it is likely that these parking areas were less utilized. Another implication of these results is that the majority of former transit users who worked in the CBD and drove their cars to work must have parked in the CBD area proper.

Summary

Parking and traffic volume analyses identified certain impacts which can be related to the transit strike. One of the noticeable changes was the increased use of downtown parking spaces. Most of the spaces receiving higher usage were long-term parking lots located in the vicinity of the TVA complex. Also, pedestrian counts suggest an increased use of free curb parking in the Fort Sanders residential area adjacent to downtown. Revenues from on-street parking meters

also increased, clearly due to long-term parkers utilizing fringe metered areas, and probably also by short-term parkers being squeezed out of off-street parking lots by commuters. A number of merchants indicated that their patrons complained about the difficulty of finding parking spaces during the strike. Surprisingly, a large-size low-cost parking garage, the Coliseum parking complex, received no noticeable increase in utilization.

No noticeable increases in vehicular traffic volume were identified. However, increased vehicle occupancies were observed during the peak periods on the major roadways. It seems likely that with increased carpooling, it became economic for commuters to find convenient parking in the CBD area, even at higher prices than fringe areas such as the Coliseum garage. Informal observations indicate the magnitude of illegal parking also increased in the vicinity of the CBD area. The parking and traffic volume study suggests that the strike did add to the burdens of an already overtaxed downtown parking supply. Commuters responded primarily by increasing vehicle occupancies and seeking long-term parking spaces that are easily accessible to major employment centers. Also, the available supplies of free parking in residential areas close to employment concentrations became attractive.

CHAPTER 10

CONCLUSIONS

The transit strike impact study has shown that the temporary loss of transit service for six weeks in a medium-sized city can have an adverse impact on the community and its citizens. As expected, the strike most decidedly affected those segments of the population that directly rely on public transportation as the principal means of mobility. For captive transit riders, this loss of mobility resulted in a reduction in trip-making and a forced shift in travel modes and destinations. The group of captives most affected was the elderly living in senior citizen complexes. These individuals had to suppress almost one-third of their normal travel. To a large extent, the impact on the elderly group was more severe than the other captive groups because the elderly persons contacted by this study expressed a reluctance to ask others for transportation assistance except for the essential trips, considering that other requests might be an imposition.

The captive group as a whole was able to find alternative arrangements for essential travel by relying in most cases on relatives and friends. However, discretionary trips previously made by transit--religious trips, visits to friends and relatives, leisure-recreational and personal business trips--were cancelled in many cases. Thus, most shopping, work, school and medical trips continued to be made. Among the 251 persons interviewed by the study staff, few

severe hardships were caused by the strike. Besides private arrangements, captive riders were able, under certain circumstances, to rely on social service agencies and to a lesser extent on the taxi service. Social service agencies providing transportation were not able to accommodate all the demand for service due to an inadequate supply of vehicles and staff, and the need to meet strict eligibility requirements.

Captive riders indicated they would return to transit once service was resumed and generally they did. For example, with 84 percent of the regular route riders being classified as captive riders, the net reduction of revenue from KTC regular routes attributable to the strike is estimated to be in the range of 7.2 to 16.0 percent. This range represents a minimum and maximum impact of the strike on regular route ridership revenues. On the other hand, many express bus commuters who are almost 95 percent choice riders relied on carpools and did not return to the bus once service was resumed. It was estimated that the express bus ridership dropped by 13.3 percent due to the strike. The 20 percent increase in express bus fare was assumed not to have had any effect on the ridership.

With a shift in the travel pattern of the transit users due to the strike, downtown merchants, particularly those located in the Mall and catering to transit dependents, lost substantial amounts of business. A number of firms reported drops in sales of 50 to 80 percent, forcing reduced operating hours and the layoff of sales personnel. The downtown business establishments that were affected most seriously

were specialty shops, clothing and shoe stores, restaurants and fast food/drug/variety stores. Interviews with store managers, however, revealed that sales returned to normal levels within two months after the strike was settled. Interestingly, many CBD merchants felt only minor repercussions ranging from no loss to a 5 to 10 percent decline in sales during the strike. In the case of many of these merchants, the patrons were automobile-oriented or commuters.

Most of the major Knoxville employers reported little difficulty in having their employees get to work during the strike. The strike forced less adjustment than the severe winter and natural gas curtailment. Some special accommodations were required but, in most cases, these were worked out with little difficulty.

No evidence was encountered to suggest excessive traffic congestion. Only in the CBD area was parking mentioned as a problem. The strike forced commuters to park their vehicles on long-term parking lots or residential streets in the Fort Sanders area. The addition of an estimated 300 commuter automobiles in an already tight parking situation made it more difficult for shoppers to find a short-term parking space. Fortunately, this impact was partly mitigated by increased automobile occupancies. Yet a parking garage located only 2,000 feet from the CBD and charging one-third the rate of long-term lots in the CBD proper recorded no significant increase in usage.

The transit system itself felt the most adverse impact from the strike with system-wide ridership declines of 9 to 12 percent continuing even five months after the strike was settled. This loss in

ridership represents about 6,400 to 8,500 transit trips per week. System-wide fare increases, which were anticipated to increase revenue by a minimum of 20 percent, have resulted in a gain of only 10 percent over the 1976 revenue. Although some operating costs were deferred during the strike, the loss of revenue during the strike and the subsequent loss of ridership due to the strike will soon offset any savings. All parties involved with the Knoxville Transit Corporation strike--the City officials, the operating company, labor, the labor union, and the consumers--would have been much better off to have averted the strike or at least to have attempted to limit its duration. The loss in ridership almost nullified the gain from the fare increase that had been scheduled prior to the strike. Prevention of the work stoppage could have kept many choice regular and express route transit users from switching to another mode.

The six-week KTC strike has shown that transit is a significant element of the public services provided by the community. Since most captives and choice riders returned to transit, this suggests that transit was judged to be superior in terms of cost and convenience to the alternative modes utilized during the strike.

Also, the total transportation system has shown extensive capability and flexibility in responding to crisis. Few severe hardships were reported by former transit users outside of general inconveniences and irritations. Most individuals were able to satisfy their travel needs through informal arrangements with relatives and friends. These arrangements were negotiated without public involvement or

initiative, and it is significant to note the role and strength of such informal services usually are not recognized. Unfortunately, captive riders, largely due to less overall automobile availability, had less opportunity to participate in these informal transportation relationships and encountered more difficulty with the strike. It is not clear if these trends would persist if the strike was of even longer duration.

LIST OF REFERENCES

LIST OF REFERENCES

1. Wegmann, Frederick J. et al., The Knoxville Metropolitan Area Public Transportation Study. Transportation Center, University of Tennessee, Knoxville, Tennessee, 1976.
2. Chatterjee, Arun., Mauldin, Howard Don., Stokey, Stanley R., and Wegmann, Frederick J., 1976. An Employer-Based Commuter Ride-Share Program in a Medium Size Urban Area. Traffic Engineering, January 1976 (pp. 19-24).
3. Brachman, Mitchell E., Sinha, Kumares C., and Pustay, Michael W. The Effects of Labor Strikes on Bus Transit Use. Purdue University, West Lafayette, Indiana, 1976.
4. Knoxville CBD Parking Needs and Feasibility Study, Kimley-Horn and Associates, Inc., Knoxville, Tennessee, 1977.
5. Tennessee Department of Transportation. Monthly Summary Sheets on Continuous Automatic Traffic Recorder Station Numbers 512, 514, 516, 556, and 564. January, February, March, April 1977.

APPENDICES

APPENDIX A

SURVEY INSTRUMENTS USED

INSTRUMENT A-1

USER GROUP DURING STRIKE SURVEY

_____ date _____ #

_____ time _____
Ind. & Location

Good _____, my name is _____ and I am with The University of Tennessee. We are conducting a survey about the impact of the transit strike on the citizens of Knoxville. Could I have a few minutes of your time to ask some questions?

1. Have you seen or heard anything about the Knoxville Transit Strike?

_____ yes _____ no If no, terminate

2. Before the strike did you or any member of your household routinely (regularly) travel by bus service?

_____ yes _____ no If no, has strike had any impact on you or your family? (If so, describe.)
If no, terminate.

3. Generally, how many times a week did you or any member of your household ride a city bus?

_____ (2-way movement)

4. What purpose do you or any member of your household ride a city bus for?

1. _____ religious

2. _____ visit friends or relatives

3. _____ leisure/recreational

4. _____ shopping

5. _____ work related

6. _____ medical

7. _____ personal business (bank, lawyer, paying bills, etc.)

8. _____ other (specify)

5. For _____ trips how did you travel last week when city bus service was not available?
1. _____ drove alone in car
 2. _____ traveled with family member in their car
 3. _____ traveled with other person in their car
 4. _____ walked
 5. _____ taxi
 6. _____ Carpool
 7. _____ Did not make trip
 - a. _____ because transit was not available
 - b. _____ did not have need to travel
 8. _____ Other (Specify)
6. For _____ trips. What kinds of problems has the bus strike caused for you or any member of your household?
1. _____ the new form of travel is more expensive
 2. _____ the new form of travel arrangement is more time-consuming
 3. _____ the new travel arrangement is inconvenient
 4. _____ other member of family had to adjust schedule
 5. _____ other family member left without a car
 6. _____ other (specify)

7. Will you return to using the bus service when the strike is over?
____ yes ____ no
8. If no, what will be your new arrangement?
9. How many cars in operating condition do you have at your residence? _____
10. How many licensed drivers are there in your household? _____
11. How many persons live in your household? _____
12. How many persons in your household commute to work regularly? _____
13. To what age group do you belong? Are you
____ under 20 ____ 45-65
____ 20-44 ____ 65 or over
14. What is the combined annual income of all members of your household?
____ less than \$5,000 ____ \$10,000 - 14,999 ____ \$25,000 and over
____ \$5,000 - \$9,999 ____ \$15,000 - 24,999
15. Would you like to make any comments about the transit strike?

Thank you for your time and attention, and we would like to
call back when the strike is settled.

Sex ____ M ____ F

INSTRUMENT A-2

USER GROUP AFTER STRIKE SURVEY

_____ date _____
_____ time _____
Ind. & Location

AFTER SURVEY

Good _____, my name is _____ and I am with The University of Tennessee. We talked earlier about the bus strike and your transportation problems. Since the strike is over, we would like to know how you are now traveling. May I have a few minutes of your time?

1. Have you used the bus since the service was resumed?

_____ No

_____ Yes
2. You indicated during the strike that you and members of your household rode a city bus for (the following purposes)
 - a. _____ religious
 - b. _____ visit friends or relatives
 - c. _____ leisure/recreational
 - d. _____ shopping
 - e. _____ work related
 - f. _____ medical
 - g. _____ personal business (bank, lawyer, paying bills, etc.)
 - h. _____ other (specify)

3. For _____ trips how did you travel last week when bus service was again available?

- a. _____ rode bus
- b. _____ drove alone in car
- c. _____ traveled with family in our car
- d. _____ traveled with other person in their car
- e. _____ walked
- f. _____ taxi
- g. _____ carpool (3 or more riders)
- h. _____ did not make trip
 - i. _____ did not need to go
 - ii. _____ strike influenced need, or plan, and found other arrangement

4. If h(1) is checked (that is, if did not need to go), are you going to make the trip in the future?

- _____ Yes
- _____ No

If yes, how are you going to travel?

_____ (specify)

5. For _____ trips are you using bus service as frequently as before the strike?

- _____ Yes
- _____ No

6. If yes, has the reduction in service hours or proposed increase in fare influenced your use of bus service in any way?

- _____ Yes
- _____ No
- _____ Will at a later date

(Then go to the last question)

7. If no, what is the other alternative you are using along with bus?

a. ☐ drove alone in car

b. ☐ traveled with family in our car

c. ☐ traveled with other person in their car

d. ☐ walked

e. ☐ taxi

f. ☐ carpool (3 or more riders)

g. ☐ did not make trip

☐ did not need to go

☐ strike influenced needs, or plan, and found other arrangement

h. ☐ Other (specify)

8. For ☐ trips, why are you not using transit as often as before (or, why did you prefer the alternative mode)?

9. Do you feel these changes that you have made will continue?

☐ Yes

☐ No

Now let me ask you a few general questions.

10. Has the reduction in service hours had anything to do with your not using the bus as much as you did before? (No service after 9 p.m. Mon. thru Sat. and service on Sundays 9 a.m. to 9 p.m. only)

_____ Yes

_____ No

11. Has the proposed increase in fare influenced your decision not to use the bus as much as you did before? (30 cents to 40 cents beginning April 11)

_____ Yes

_____ No

_____ Will at a later date

12. Did the strike cause you additional hardships that we didn't talk about?

Thank you for your help.

INSTRUMENT A-3
EXPRESS BUS USER SURVEY
TRANSIT STRIKE IMPACT SURVEY

February, 1977

The University of Tennessee in cooperation with TVA is analyzing the impact of the current transit strike in Knoxville. As a rider of the KTC bus service, you have been selected randomly for a survey. We will appreciate your assisting us by answering the following questions. Your replies will be kept totally confidential.

1. Did you use the Regular or Express bus for traveling to and from work before the transit strike?

☐ Regular Bus Line

☐ Express Bus

2. How frequently did you use the bus service before the strike?

☐ One day each week

☐ Two or three days each week

☐ Almost every day each week

3. How are you traveling to and from work now (during strike)?

☐ Driving alone in your car

☐ Traveling with another person in your or his car

☐ Formed a new carpool (with 3 or more persons)

☐ Riding with an already existing carpool

☐ Riding with a vanpool

☐ Shifted to one of the private bus lines - - ☐ Regular Bus Line

☐ Express Bus

☐ Other arrangements: _____
(please mention)

4. What kinds of problems has the bus strike caused for you and/or your family? Please check the relevant problems and rank them using 1 for the most severe problem, 2 for the next most severe problem and so on.

☐	Other family members are left without a car during the day	Rank _____
☐	The new travel arrangement is more expensive	_____
☐	The new travel arrangement is more time-consuming	_____
☐	The new travel arrangement has caused parking difficulties	_____
☐	The new travel arrangement is inconvenient	_____
☐	Other family members had to adjust their schedule	_____
☐	Other problems: _____ (please state) _____	

5. Will you return to using the bus service when the strike is over?

☐ Yes ☐ No

6. a. How many persons are in your household including yourself?

Number of Persons

- b. How many persons in your household commute to work regularly?

Number of Persons

7. How many vehicles in operating condition usually are garaged in your house?

Number of Vehicles

8. What is the general location of your home?

Zip Code and Name of Subdivision or Apartment Complex

9. Would you like to make any comments about the impact of the transit strike?

INSTRUMENT A-4

TRANSIT USERS SEEKING ASSISTANCE
FROM THE KNOXVILLE COMMUTER POOL SURVEY

Hello, my name is _____ and I am with The University of Tennessee. May I please speak to _____. Hello _____ some time ago you were provided with a list of potential carpoolers and now we would like to ask you some questions about it.

1. Did you contact anyone on the list about forming or joining a carpool?
☐ Yes (skip to 3) ☐ No (go to 2)
2. a. Is there any reason why you chose not to contact anyone?
☐ inconvenient match ☐ changed mind
☐ needed car at work ☐ haven't acted yet
☐ moved
☐ changed jobs ☐ other (specify) _____
- b. If you did not carpool then how did you get to work during the strike?
☐ taxi ☐ drove family car
☐ drove own car ☐ rode with relatives
☐ rode with friends
- c. How did this alternative travel compare to the bus in terms of convenience?
☐ easier ☐ other
☐ less expensive
3. As a result of this contact was ridesharing arranged with someone on the match list?
☐ No Why didn't it work out?
☐ schedule differences ☐ no one willing to drive
☐ Yes ☐ destination differences ☐ other (go to 2b then 4)
4. How are you now getting to work?
☐ taxi ☐ drove family car
☐ drove own car ☐ rode with relatives
☐ rode with friend
5. Are you continuing to carpool now?
☐ Yes ☐ No, Then how are you getting around now?
☐ own car ☐ family car ☐ bus

6. Has the reduction in service hours had anything to do with your not using the bus as much as you did before?
- _____ Yes _____ No
7. Has the proposed increase in fare influenced your decision not to use the bus as much as you did before?
- _____ Yes _____ No
8. How does carpooling compare with bus service in terms of convenience, time, and cost?

Are you a licensed driver? No Yes

How many vehicles are owned by your household?

0 1 2 3 or more.

INSTRUMENT A-5

CIVIC COLISEUM PARKING SURVEY

Date _____ Location _____
 Time _____ PARKER
 INTERVIEW Occupancy _____

1. What is the purpose of your trip?

☐ Work

☐ Medical

☐ Shop

☐ Other _____
 (Specify)

2. Where do you work? _____

3. How long do you intend to park here?

☐ All day

☐ Other _____
 (Specify)

☐ Half-a-day

4. (a) Are you driving your automobile and/or parking in this area because of the bus strike?

☐ Yes

☐ No

(b) If yes, how did you travel for this purpose before the bus strike?

☐ Traveled by bus

☐ Traveled by auto but parked in a different area

☐ Other _____
 (Specify)

(c) If no, how often did you park in this area for this purpose before the strike?

☐ Regularly

☐ Occasionally

☐ Never

5. (If auto occupancy is more than one) How many of the other persons in your car are riding with you because of the bus strike?

☐ None

☐ Other _____
 (Specify)

6. What inconveniences, if any, has the bus strike caused for you?

☐ None

☐ Parking cost has increased

☐ Finding a parking place has become more difficult

☐ Roads are more congested

☐ Have to park further away from destination

☐ Other _____
 (Specify)

☐ Have to drive and park instead of riding the bus

APPENDIX B

USER GROUP DATA

TABLE B-1
AGE OF HOUSEHOLD MEMBER INTERVIEWED

Age Range	Elderly		Economically Disadvantaged		General Transit User	
	Number of Responses	Percentage	Number of Responses	Percentage	Number of Responses	Percentage
Under 20 years					2	4
20 - 44 years			20	20	5	10
45 - 64 years	8	8	37	37	15	31
65 and over	93	92	43	43	27	55
No Response					1	

TABLE B-2

HOUSEHOLD INCOME

	Elderly		Economically Disadvantaged		General Transit User	
	Number of Responses	Percentage*	Number of Responses	Percentage*	Number of Responses	Percentage*
Less than \$5,000	71	100	69	90	17	77
\$5,000 - \$9,999			6	8	1	5
\$10,000 - \$14,999			2	2	3	14
\$15,000 - \$24,999					1	4
\$25,000 and over						
No Response	30		22		28	

*Percentage given for those responding

TABLE B-3
NUMBER OF OPERATING CARS IN HOUSEHOLD

Number of Cars In Household	Elderly		Economically Disadvantaged		General Transit User	
	Number of Responses	Percentage	Number of Responses	Percentage	Number of Responses	Percentage
0	94	93	78	78	33	66
1	7	7	16	16	13	26
2	-	-	6	6	4	8

TABLE B-4

NUMBER OF LICENSED DRIVERS IN HOUSEHOLD

Number of Licensed Drivers	Elderly		Economically Disadvantaged		General Transit User	
	Number of Responses	Percentage	Number of Responses	Percentage	Number of Responses	Percentage
0	89	88	62	62	30	60
1	11	11	31	21	11	22
2	1	1	5	5	9	18
3	-	-	2	2	-	-

TABLE B-5

NUMBER OF HOUSEHOLD MEMBERS

Number of Household Members	Elderly		Economically Disadvantaged		General Transit User	
	Number of Responses	Percentage	Number of Responses	Percentage*	Number of Responses	Percentage
1	81	80	44	44	17	34
2	20	20	24	24	23	46
3			4	4	10	20
4			4	4		
5			5	5		
6			4	4		
7			4	4		
8			1	1		
No Response			10	3		
TOTAL PERSONS		121		205		93

*Percentage given for those responding

TABLE B-6

NUMBER OF HOUSEHOLD MEMBERS REGULARLY COMMUTING TO WORK

Number of Household Members	Elderly		Economically Disadvantaged		General Transit User	
	Number of Responses	Percentage	Number of Responses	Percentage	Number of Responses	Percentage*
0	96	95	71	72	29	59
1	5	5	20	20	13	27
2			8	8	6	12
3					1	2
No Response			1		1	

*Percentage given for those responding

TABLE B-7

RESPONSE TO THE QUESTION "FOR WHAT PURPOSE DO
YOU OR ANY MEMBER OF YOUR HOUSEHOLD RIDE A CITY BUS?"

Trip Purpose	Elderly		Economically Disadvantaged		General Transit User	
	Number of Responses		Number of Responses		Number of Responses	
Religious	4		2		-	
Visit Friends/Relatives	5		6		1	
Leisure/Recreation	1		3		-	
Shopping	80		75		29	
Work Related	4		17		11	
Medical	34		27		7	
Personal Business	32		43		8	
School	-		9		3	
Other	9		-		2	
TOTAL	169		182		61	

TABLE B-8

COMPARISON OF AVERAGE NUMBER TRIPS PER PERSON PER WEEK
BETWEEN DURING STRIKE TELEPHONE SURVEY AND AFTER STRIKE TELEPHONE SURVEY

Group	Average Number Trips Per Person Per Week	
	During Strike	Call Back Survey
Elderly	1.8	1.6
Economically Disadvantaged	1.6	1.5
General Transit User	1.6	1.7

TABLE B-9
COMPARISON OF AVERAGE NUMBER TRIPS PER HOUSEHOLD PER WEEK
BETWEEN DURING STRIKE TELEPHONE SURVEY AND AFTER STRIKE TELEPHONE SURVEY

Group	Average Number Household Per Person Per Week	
	During Strike	Call Back Survey
Elderly	2.1	1.8
Economically Disadvantaged	3.3	3.3
General Transit User	3.0	3.0

TABLE B-10

COMPARISON OF HOUSEHOLD SIZE
BETWEEN DURING STRIKE TELEPHONE SURVEY AND AFTER STRIKE TELEPHONE SURVEY

Group	Average Number Persons Per Household	
	During Strike	Call Back Survey
Elderly	1.2	1.2
Economically Disadvantaged	2.1	2.2
General Transit User	1.9	1.8

TABLE B-11

TRAVEL DURING STRIKE BY TRIP PURPOSE--
ELDERLY GROUP

Response	Number of Trips Weekly for Each Trip Purpose									
	Religious	Visit Friends Relatives	Leisure Recreational	Shopping	Work Related	Medical	Personal Business	School	Other	Total
Did not make trip because did not need to travel	1	1		7		9	15		4	37
Did not make trip because transit not available	2	4	1	20		6	10		3	46
Trips made by an alternative mode	1			62	3	22	8		1	97
Total trips made or that would have been made if transit had been available	3	4	1	82	3	28	18		4	143
Percentage of trips postponed that needed to be made	67	100	100	24		21	56		75	32

TABLE B-12
ALTERNATE TRANSPORTATION MODES USED--
ELDERLY GROUP

Alternate Transportation Mode	Number of Trips Weekly for Each Trip Purpose						
	Religious	Visit Friends Relatives	Leisure Recreational	Shopping	Work Related	Medical	Personal Business School Other Total Percentage
Drove alone in car				2			1 3 3
Traveled with family in their car				18	1	4	5 1 29 30
Traveled with other person in their car	1			12	1	2	16 16
Walked				4		1	1 6 6
Taxi				15		10	1 26 27
Carpool							
Other				11	1	5	17 18
Total	1			62	3	22	8 1 97 100

TABLE B-13

TRAVEL DURING STRIKE BY TRIP PURPOSE---
ECONOMICALLY DISADVANTAGED GROUP

Response	Number of Trips Weekly for Each Trip Purpose									
	Religious	Visit Friends Relatives	Leisure Recreational	Shopping	Work Related	Medical	Personal Business	School	Other	Total
Did not make trip because did not need to travel				1		8	5			14
Did not make trip because transit not available	1	3	1	14	10	2	5			36
Trips made by an alternative mode	1	4	1	75	81	17	41	65		285
Total trips made or that would have been made if transit had been available	2	7	2	89	91	19	46	65		321
Percentage of trips postponed that needed to be made	50	43	50	16	11	11	11			11

TABLE B-14

ALTERNATE TRANSPORTATION MODES USED--
ECONOMICALLY DISADVANTAGED GROUP

Alternate Transportation Mode	Religious	Visit Friends Relatives	Leisure Recreational	Number of Trips Weekly for Each Trip Purpose					Other	Total	Percentage
				Shopping	Work Related	Medical	Business	School			
Drove alone in car				4		1			5	2	
Traveled with family in their car		2		19	5	7	17	20	70	25	
Traveled with other person in their car	1	1		21	58	1	9	20	111	39	
Walked			1	12	5		5	10	33	11	
Taxi				13	13	6	10		42	15	
Carpool											
Other		1		6		2		15	24	8	
Total	1	4	1	75	81	17	41	65	285	100	

TABLE B-15

TRAVEL DURING STRIKE BY TRIP PURPOSE---
GENERAL TRANSIT USER GROUP

Response	Number of Trips Weekly for Each Trip Purpose							
	Religious	Visit Friends Relatives	Leisure Recreational	Shopping	Work Related	Medical	Personal Business	Other Total
Did not make trip because did not need to travel.				7	4		3	14
Did not make trip because transit not available				28	57	9	4	121
Trips made by an alternative mode	1							
Total trips made or that would have been made if transit had been available	1			35	61	9	7	135
Percentage of trips postponed that needed to be made				20	7		43	10

TABLE B-16

ALTERNATE TRANSPORTATION MODES USED--
GENERAL TRANSIT USER GROUP

Alternate Transportation Mode	Religious	Visit Friends Relatives	Leisure Recreational	Number of Trips Weekly for Each Trip Purpose							Other	Total	Percentage
				Shopping	Work Related	Medical	Business	School					
Drove alone in car		1		3	10	1	2			17	14		
Traveled with family in their car				10	5	2	1	10		28	23		
Traveled with other person in their car				9	35	4	1	5	2	56	46		
Walked				2	5			5		12	10		
Taxi				4	2	2				8	7		
Carpool													
Other													
Total		1		28	57	9	4	20	2	121	100		

TABLE B-17
TRANSIT DEPENDENCY INDEX

<u>Method of Determination</u>		
Is there an auto in operating condition within your household	Is there a licensed driver within your household	Transit Dependent
Yes	No	Yes
No	Yes	Yes
No	No	Yes
Yes	Yes	No

TABLE B-18
TRANSIT DEPENDENCY

Group	Captive Percentage	Non-captive Percentage
Elderly	93	7
Economically Disadvantaged	78	22
General Transit User	64	36

TABLE B-19

PERCENTAGE OF HOUSEHOLDS THAT
HAD NO TRANSPORTATION PROBLEMS DURING STRIKE

Group	Elderly	Economically Disadvantaged	General Transit User	All Groups
Captive	0%	12%	9%	6%
Non-captive	0%	4%	6%	4%

TABLE B-20
PERCENTAGE OF HOUSEHOLDS THAT SWITCHED TO
ALTERNATE MODES DUE TO STRIKE

Group	Elderly	Economically Disadvantaged	General Transit User	All Groups
Captive	4%	13%	9%	8%
Non-captive	0%	18%	7%	11%

TABLE B-21
TRAVEL DURING STRIKE BY TRIP PURPOSE:
ALL GROUPS--CAPTIVE

Response	Religious	Visit Friends Relatives	Number of Trips Weekly for Each Trip Purpose							School	Other	Total
			Leisure Recreational	Shopping	Work Related	Medical	Personal Business					
Did not make trip because did not need to travel	1	1		8		14	19			4	47	
Did not make trip because transit not available	3	6	2	30	5	6	14			3	77	
Trips made by an alternative mode	2	4	1	136	94	38	41	40		3	359	
Total trips made or that would have been made if transit had been available	5	10	3	171	103	44	55	40		6	437	
Percentage of trips suppressed due to strike	60	60	67	18	5	14	26			50	18	

TABLE B-22
ALTERNATE TRANSPORTATION MODES USED:
ALL GROUPS--CAPTIVE

Alternate Transportation Mode	Religious	Visit Friends Relatives	Number of Trips Weekly for Each Trip Purpose							Other	Total	Percentage
			Leisure Recreational	Shopping	Work Related	Medical	Business	School	Personal			
Drove alone in car												
Traveled with family in their car		2		39	9	9	18	5	2	83		23
Traveled with other person in their car	2	1		35	61	6	7	20	1	135		38
Walked			1	16	10	1	6	15		49		14
Taxi				30	13	15	9			67		18
Carpool												
Other		1		16	1	7				25		7
Total	2	4	1	136	94	38	41	40	3	359		100

TABLE B-23

TRAVEL DURING STRIKE BY TRIP PURPOSE:
ALL GROUPS--NON-CAPTIVE

Response	Number of Trips Weekly for Each Trip Purpose							
	Religious	Visit Friends Relatives	Leisure Recreational	Shopping	Work Related	Medical	Personal Business	Other Total
Did not make trip because did not need to travel						3	1	4
Did not make trip because transit not available		1		6	5	2	4	18
Trips made by an alternative mode		1		29	47	10	12	144
Total trips made or that would have been made if transit had been available		2		35	52	12	16	162
Percentage of trips postponed that needed to be made		50		17	10	17	25	11

TABLE B-24
 ALTERNATE TRANSPORTATION MODES USED:
 ALL GROUPS--NON-CAPTIVE

Alternate Transportation Mode	Number of Trips Weekly for Each Trip Purpose										Total	Percentage
	Religious	Visit Friends Relatives	Leisure Recreational	Shopping	Work Related	Medical	Business	School	Other	Total		
Drove alone in car		1	9	10	10	2	3		25	17		
Traveled with family in their car				8	2	4	5	25	44	31		
Traveled with other person in their car				7	33	1	2	5	48	34		
Walked				2					2	1		
Taxi				2	2	3	2		9	6		
Carpool												
Other				1				15	16	11		
Total		1	9	29	47	10	12	45	144	100		

APPENDIX C

BUSINESS COMMUNITY DATA

EXHIBIT C-1

LISTING OF RETAIL BUSINESSES SURVEYED IN THE
KNOXVILLE CENTRAL BUSINESS DISTRICT

Gay Street

- | | |
|-------------------------------------|--------------------------------------|
| 1. Johnson Bonding Co. | 36. The Smart Shop |
| 2. Andrew Johnson Hotel | 37. Lerner Shops |
| 3. Gateway Bookstore | 38. Boston Store |
| 4. Continental Trailways | 39. Butler's Shoes |
| 5. Instant Printing & Copy Service | 40. Quality Jewelers |
| 6. Hendrix-Beeson, Inc. | 41. Miles Music Store |
| 7. Acme Loan Co. | 42. Clark-Jones Music |
| 8. Lion's Den Styling Salon | 43. Radio Shack |
| 9. Blazer Financial Services | 44. American Loan Pawn Shop |
| 10. City Finance Co. | 45. C.I.T. Loans |
| 11. House of David | 46. Max Friedman Jewelers |
| 12. Baum's Florists | 47. Tennessee School of Beauty |
| 13. Knoxville Utilities Board | 48. Lockett's Novelties |
| 14. Avco Financial Services | 49. Fielden's, Inc. |
| 15. Knoxville Optical Supply | 50. Dixie Loans |
| 16. American Federal Savings & Loan | 51. Hideaway Lounge |
| 17. Spencer's Men's Clothing | 52. "205" Club |
| 18. VAC Finance Co. | 53. Busch United Loan |
| 19. City & County Bank | 54. Knoxville Adult Book Mart |
| 20. Knox Federal Savings & Loan | 55. Norris Loans Pawn Shop |
| 21. Nan Denton's | 56. Knox Jewelry & Loan |
| 22. Shriver's | 57. East Tennessee Jewelers Exchange |
| 23. Todd & Armistead | 58. People's Studio |
| 24. Gus' Restaurant | 59. Harold's Foods |
| 25. Park National Bank | 60. Mill Agent Store |
| 26. Zales Jewelers | 61. Rolen Furniture |
| 27. National Shirt Shop | 62. C. M. Dukes Watch Repair |
| 28. Revco Drug | 63. Green Food Equipment Co. |
| 29. Arby's Roast Beef | 64. Duchess Beauty Supply |
| 30. Woodruff's | 65. Bonus Good Food |
| 31. Gay Clothing | 66. Hollywood Studio |
| 32. Fowler's | 67. Sterchi Brothers Furniture |
| 33. S. H. Kress | 68. Gay Jewelers |
| 34. Crown Wig Shop | 69. The Club Cigar Shop |
| 35. J. C. Penney | 70. Volunteer Helpers Rescue Mission |

Market Square Mall Area (including Wall Street)

- | | |
|-----------------------------------|--------------------------------|
| 71. Town & Resort Short | 89. Tucker's Record Shop |
| 72. The Card Shop | 90. Mavis Shoes |
| 73. Vernon's Health & Beauty Aids | 91. Jilly's Ladies Wear |
| 74. Ken & Mac's Meat Market | 92. Mr. Sans Health Foods |
| 75. Coffee Shop | 93. The Mall Package Store |
| 76. Brylen's Deli | 94. Martin's Shoes |
| 77. White Store | 95. Star Bar |
| 78. Woody's Meat Market | 96. Hope's Florist |
| 79. Large & Half Sizes Dress Shop | 97. Bebe's Boutique |
| 80. J. Fred Peters Store | 98. Fuller's Famous Brands |
| 81. Watson's | 99. Bargain Box |
| 82. Glen-More Clothes | 100. Mini Deli |
| 83. Song's Variety Store | 101. Honest John's Record Shop |
| 84. O'Ray's Ladies Wear | 102. Johnny's Restaurant |
| 85. Oscar's | 103. Trophies by Rufus |
| 86. The Hang Up | 104. The Coin Shop |
| 87. Mulryans' Deli | 105. John Linkous Jewelers |
| 88. Nan Denton's | 106. Garden Craft Plants |

Outside the Gay Street and Market Square Mall Study Areas

107. Miller's Department Store (including Miller's Shoes on Market Square)

EXHIBIT C-2

INVENTORY OF BUSINESSES CONTACTED BY TYPE
KNOXVILLE CBD

<u>No.</u>	<u>Type of Business</u>
1	Hotel
1	Printshop
13	Bank/savings and loan/loan co./bonding co.
3	Supermarket/deli/health foods/meats
2	Liquor/package store
5	Bar/tavern
5	Shoes
5	Variety/drugstore
7	Clothing, women's
7	Clothing, men's/tailor
3	Florist
7	Jeweler
14	Restaurant/grill/deli/fast food
3	Beauty shop/barber/styling
5	Furniture/major appliances
3	Wholesale supply (misc.)
1	Charitable organization
1	Intercity bus terminal
1	Public utility (KUB)
3	Department store
1	Cinema
<u>22</u>	Specialty shops (total for list below)

Specialty Shops by Type

2	Records
1	News/tobacco
1	Novelty
1	Trophies
1	Coins
2	Sheet music/band instruments
1	Stereos/radios
1	Wigs
1	Cards
5	Pawnshop
2	Watch repair
1	Adult books
1	Portrait studio
1	Cloth
<u>1</u>	Bookstore
<u>22</u>	

TABLE C-1
DATA SUMMARY OF SURVEY OF INDIVIDUAL CBD MERCHANTS---
PERCENT DECREASE IN RETAIL SALES DURING STRIKE
BY BUSINESS TYPE AND LOCATION

Firms	Type of Business																	
	1		2		3		4 ^b		5		6		7		8		9 ^c	
	Mall	Gay	Mall	Gay	Mall	Gay	Mall	Gay	Mall	Gay	Mall	Gay	Mall	Gay	Mall	Gay	Mall	Gay
1	-	-	No	-	50	-	No	-	No	-	15	8-10	-	NA	-	-	No	5
2	5	-	Obs	-	50	10	Obs	5	Obs	NA	40	10	33	5	-	-	Obs	-
3	10-15	-	10-15	-	50	40	-	-	33	-	50	30	40	5-10	10-15	-	-	-
4	20	5	20-25	-	50	50	-	-	-	-	50	20	50	20	15-20	-	-	-
5	20	0-10	75	-	-	-	20	-	-	-	50	50	75-80	20-25	33	NA	-	-
6	20-25	5-10	90	-	-	-	20	-	-	-	50	50	50	20-25	33	NA	-	-
7	25	10	+11-43	-	-	-	-	-	-	-	50	50	50	20-25	33	NA	50	40
8	25	10-15	-a	-	-	-	-	-	-	-	50	50	50	20-25	33	NA	50	40
9	40	15	-	-	-	-	-	-	-	-	50	50	50	20-25	33	NA	50	40
10	50	15	-	-	-	-	-	-	-	-	50	50	50	20-25	33	NA	50	40
11	60-70	20-25	-	-	-	-	-	-	-	-	50	50	50	20-25	33	NA	50	40
12	75	25	-	-	-	-	-	-	-	-	50	50	50	20-25	33	NA	50	40
13	30	30	-	-	-	-	-	-	-	-	50	50	50	20-25	33	NA	50	40
14	30	30	-	-	-	-	-	-	-	-	50	50	50	20-25	33	NA	50	40
15	30-35	30-35	-	-	-	-	-	-	-	-	50	50	50	20-25	33	NA	50	40
16	30-35	30-35	-	-	-	-	-	-	-	-	50	50	50	20-25	33	NA	50	40
17	35	35	-	-	-	-	-	-	-	-	50	50	50	20-25	33	NA	50	40
18	40	40	-	-	-	-	-	-	-	-	50	50	50	20-25	33	NA	50	40
19	40	40	-	-	-	-	-	-	-	-	50	50	50	20-25	33	NA	50	40
20	50	50	-	-	-	-	-	-	-	-	50	50	50	20-25	33	NA	50	40
21	60	60	-	-	-	-	-	-	-	-	50	50	50	20-25	33	NA	50	40
n	33		8		6		6		3		9		10		19		8 ⁴	

Notes

- All figures above (except with +') are negative percentage values
Capital letters above columns represent the business types described
in the text
NA = no answer *uncooperative respondent) or information not available
-Z no noticeable change in sales
- ^a Answer for Miller's Dept. Store (located outside of the two study areas)
^b Column lists answers for loan companies only (others of this type in the text)
^c This business closed during surveying
^d All businesses in column "9" (the misc. business type) are on Gay Street

TABLE C-2

DATA SUMMARY OF SURVEY OF INDIVIDUAL CBD MERCHANTS--
PERCENT DECREASE IN RETAIL SALES AFTER STRIKE
BY BUSINESS TYPE AND LOCATION

Firms	Type of Business																	
	1		2		3		4 ^b		5		6		7		8		9 ^c	
	Mall	Gay	Mall	Gay	Mall	Gay	Mall	Gay	Mall	Gay	Mall	Gay	Mall	Gay	Mall	Gay	Mall	Gay
1	0/N	0/N	NONE	0/N	50/25	0/N	NONE	0/N	NONE	0/N	15/N	10/A	0/N	NA/N	0/N	0/N	NONE	NA ^d
2	5/N	0/N	0/N	0/N	50/N	10/N	5/NA	5/NA	NA/N	0/N	40/A	10/A	33/N	5/N	NA/N	0/N	NA	NA
3	15/A	0/N	15/A	15/A	40/N	40/N	10/N	10/N	33/N	33/N	50/N	30/10	40/20	10/NA	NA/NA	0/N	5/NA	5/NA
4	20/N	5/N	25/NA	25/NA	50/10	50/10	10/NA	10/NA	20/N	20/N	50/A	50/A	50/A	20/N	15/N	20/N	+5/NA	+5/NA
5	20/10	5/NA	75/25	75/25			20/N	20/N			50/A	50/A	75/40	25/A	20/N	40/NA	NA	NA
6	25/N	10/NA	90/20	90/20			20/N	20/N			+5/N				33/N	75/20 ⁴	NA	NA
7	25/N	10/N	+11-43/N	+11-43/N			NA/N ^a	NA/N ^a							50/5	NA/NA	NA	NA
8	25/N	15/N													60/N	+6/N	NA	NA
9	40/15	15/NA													70/20			
10	50/15	15/N													75/10			
11	65/N	25/A																
12	75/NA	25/NA																
13	30/N																	
14	30/N																	
15	35/NA																	
16	35/N																	
17	35/20																	
18	40/N																	
19	40/A																	
20	50/A																	
21	60/A																	
22																		
N =	33		8		6		6 ^b		3		9		10		19		8	

Notes

Capital letters above columns represent the 9 business types described in Chapter VIII.

All figures to the left of each slash (/) above represent individual sales declines during strike.

All figures to the right of each slash (/) above represent individual sales lags one month after strike settled.

N = sales returned to normal

A = sales "almost" returned to normal "verbal subjective interview response"

NA = no answer, uncooperative respondent, or data not available

0 = no change in sales

^a National Shirt Shop, Gay Street

^b Column lists answers for loan companies (other institutions in this group described in text)

^c All type "9" firms (misc.) are located on Gay Street.

^d Business closed during transit strike and survey

VITA

Samuel L. Parnell, Jr. was born in Murfreesboro, Tennessee, on April 1, 1952. He attended Kittrell School and graduated from Murfreesboro Central High School in May 1970. The following September he entered The University of Tennessee at Knoxville. In June 1975 he received a Bachelor of Science degree in Civil Engineering with a major in transportation.

While in school he participated in The University of Tennessee Cooperative Engineering program working for the City of Knoxville Department of Traffic Engineering. Upon graduation he accepted a position as a Design Engineer with the Department. The author then served as Traffic Engineer in charge of the Signal Division and is presently Assistant Director in charge of Operations and Investigations.

He is a member of the Institute of Transportation Engineers, the American Society of Civil Engineers, and Chi Epsilon.