| 1. Report No. UMTA/TX-91/1087-3F | 2. Government Accession No. | 3. Recipient's Catalog No. |
|---|---|---|

| 4. Title and Subtitle Automated Transit Ridership Data Collection Software Development and User's Manual | 5. Report Date September 1990 |
|---|---|
| | 6. Performing Organization Code |

| 7. Author(s) Kirk E. Barnes and Thomas Urbanik II | 8. Performing Organization Report No. Technical Report 1087-3F |
|---|---|

| 9. Performing Organization Name and Address Texas Transportation Institute Texas A&M University System College Station, Texas 77843-3135 | 10. Work Unit No. |
|---|---|
| | 11. Contract or Grant No. Study No. 2-11-87-1087 |

| 12. Sponsoring Agency Name and Address Texas State Department of Highways and Public Transportation; Transportation Planning Division P.O. Box 5051 Austin, Texas 78763 | 13. Type of Report and Period Covered Final - September 1986 August 1990 |
|---|---|
| | 14. Sponsoring Agency Code |

| 15. Supplementary Notes |
|---|
| Technical Assistance performed in cooperation with DOT, UMTA. Technical Study Title: Automated Transit Ridership Data Collection. |

16. Abstract

Transit providers must regularly collect ridership data not only for planning purposes but also to maintain federal funding. Traditionally, ridership data has been collected using paper and pencil and then coded into a database manually. The extensive amounts of data that this task can generate and the possibility of coding errors represents an obvious environment for the application of automated information processing.

Several automated data collection systems were reviewed and one was purchased. It was field tested and implemented at Citibus, the transit system in Lubbock, Texas. After careful evaluation, it was concluded that a more integrated, user-friendly data collection was necessary. This report documents the capabilities and operating instructions for the automated data collection system that has been developed. The package consists of three integrated programs, MAKESTOP, RIDER and TRSS, which require one portable or laptop computer and one desktop PC.

The minimal cost of the hardware and the frequency at which data must be collected make it unfeasible for the formation of an "equipment pool" for transit agencies to borrow from.

| 17. Key Words Automated Data Collection, Ridership Data, Transit | 18. Distribution Statement No restrictions. This document is available to the public through the National Technical Information Service 5285 Port Royal Road Springfield, Virginia 22161 |
|---|---|

| 19. Security Classif. (of this report) Unclassified | 20. Security Classif. (of this page) Unclassified | 21. No. of Pages 37 | 22. Price |
|---|---|---|---|

Form DOT F 1700.7 (8-69)

.

# AUTOMATED TRANSIT RIDERSHIP DATA COLLECTION

## Software Development and User's Manual

By

Kirk E. Barnes

Assistant Research Engineer

and

Thomas Urbanik II

Research Engineer

Technical Report Number 1087-3F

Study Number 2-11-87-1087

Sponsored by

Texas State Department of Highways and Public Transportation

In cooperation with

Urban Mass Transportation Administration

U.S. Department of Transportation

Texas Transportation Institute

The Texas A&M University System

College Station, Texas 77843-3135

September 1990

# METRIC (SI*) CONVERSION FACTORS

## APPROXIMATE CONVERSIONS TO SI UNITS

| Symbol | When You Know | Multiply By | To Find | Symbol |
|--------|---------------|-------------|---------|--------|

### LENGTH

| Symbol | When You Know | Multiply By | To Find | Symbol |
|--------|---------------|-------------|---------|--------|
| in | inches | 2.54 | centimetres | cm |
| ft | feet | 0.3048 | metres | m |
| yd | yards | 0.914 | metres | m |
| mi | miles | 1.61 | kilometres | km |

### AREA

| Symbol | When You Know | Multiply By | To Find | Symbol |
|--------|---------------|-------------|---------|--------|
| in² | square inches | 645.2 | centimetres squared | cm² |
| ft² | square feet | 0.0929 | metres squared | m² |
| yd² | square yards | 0.836 | metres squared | m² |
| mi² | square miles | 2.59 | kilometres squared | km² |
| ac | acres | 0.395 | hectares | ha |

### MASS (weight)

| Symbol | When You Know | Multiply By | To Find | Symbol |
|--------|---------------|-------------|---------|--------|
| oz | ounces | 28.35 | grams | g |
| lb | pounds | 0.454 | kilograms | kg |
| T | short tons (2000 lb) | 0.907 | megagrams | Mg |

### VOLUME

| Symbol | When You Know | Multiply By | To Find | Symbol |
|--------|---------------|-------------|---------|--------|
| fl oz | fluid ounces | 29.57 | millilitres | mL |
| gal | gallons | 3.785 | litres | L |
| ft³ | cubic feet | 0.0328 | metres cubed | m³ |
| yd³ | cubic yards | 0.0765 | metres cubed | m³ |

NOTE: Volumes greater than 1000 L shall be shown in m³.

### TEMPERATURE (exact)

| Symbol | When You Know | Multiply By | To Find | Symbol |
|--------|---------------|-------------|---------|--------|
| °F | Fahrenheit temperature | 5/9 (after subtracting 32) | Celsius temperature | °C |

* SI is the symbol for the International System of Measurements

## APPROXIMATE CONVERSIONS TO SI UNITS

### LENGTH

| Symbol | When You Know | Multiply By | To Find | Symbol |
|--------|---------------|-------------|---------|--------|
| mm | millimetres | 0.039 | inches | in |
| m | metres | 3.28 | feet | ft |
| m | metres | 1.09 | yards | yd |
| km | kilometres | 0.621 | miles | mi |

### AREA

| Symbol | When You Know | Multiply By | To Find | Symbol |
|--------|---------------|-------------|---------|--------|
| mm² | millimetres squared | 0.0016 | square inches | in² |
| m² | metres squared | 10.764 | square feet | ft² |
| km² | kilometres squared | 0.39 | square miles | mi² |
| ha | hectores (10 000 m²) | 2.53 | acres | ac |

### MASS (weight)

| Symbol | When You Know | Multiply By | To Find | Symbol |
|--------|---------------|-------------|---------|--------|
| g | grams | 0.0353 | ounces | oz |
| kg | kilograms | 2.205 | pounds | lb |
| Mg | megagrams (1 000 kg) | 1.103 | short tons | T |

### VOLUME

| Symbol | When You Know | Multiply By | To Find | Symbol |
|--------|---------------|-------------|---------|--------|
| mL | millilitres | 0.034 | fluid ounces | fl oz |
| L | litres | 0.264 | gallons | gal |
| m³ | metres cubed | 35.315 | cubic feet | ft³ |
| m³ | metres cubed | 1.308 | cubic yards | yd³ |

### TEMPERATURE (exact)

| Symbol | When You Know | Multiply By | To Find | Symbol |
|--------|---------------|-------------|---------|--------|
| °C | Celsius temperature | 9/5 (then add 32) | Fahrenheit temperature | °F |

°F
−40    32    98.6    212
−40    0   40   80   120   160   200
°C
−40  −20   0   20   40   60   80   100
37
°C
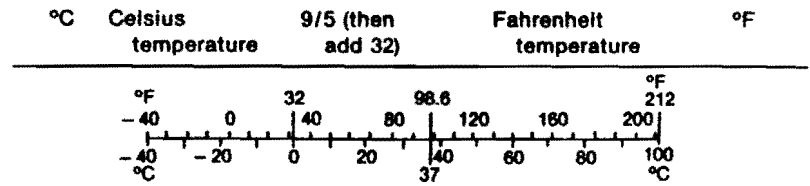
These factors conform to the requirement of FHWA Order 5190.1A.

## Implementation Statement

The findings of this study indicate that the concept of an automated bus ridership data collection system interested most transit providers. The study has shown that an automated system is an effective and timely means of collecting, storing and summarizing ridership data. The pilot test indicated that a better version of the automated system than initially purchased is necessary. The software that was developed during this phase of the study provides a simple to use, integrated and well documented package. The software, which includes the training, data collection and database modules, will be made available for distribution by the Texas State Department of Highways and Public Transportion. The hardware (computers and printer) required is a minor expenditure when compared to the savings in labor and improved ridership information that will be possible after implementation of the automated data system.

## Disclaimer

The contents of this report reflect the views of the authors who are responsibile for the opinions, findings and conclusions presented herein. The contents do not necessarily reflect the official views of the Texas State Department of Highways and Public Transportation or the Urban Mass Transportation Administration. This report does not constitute a standard or regulation.

## Acknowledgments

## Summary

The vast volume of data needed for transportation planning and management functions represents an obvious environment for the application of automated information processing. This data must not only be collected, but also stored and summarized in a meaningful manner. This project was the culmination of an extensive evaluation process. A commercially available automated data collection system was purchased, field and pilot tests were conducted and enhanced documentation was developed prior to this final phase.

The existing automated system contained many repetitious, poorly explained and basically unsurmountable features. A decision to produce a new, more integrated automated data collection package resulted in the development of MAKESTOP, RIDER and TRSS, the pre-data collection, data collection and database packages, respectively. MAKESTOP is used on an MS-DOS based computer (either portable or desktop) to create a "stoplist" file that is used during data collection. RIDER is used on an MS-DOS based portable computer for data collection and TRSS is used on an MS-DOS based desktop computer as a database and reporting package. The output from MAKESTOP is used as input for RIDER. The input and output from RIDER are used as input for the TRSS package. Output from the TRSS package is a series of reports that depicts ridership and route adherence data for various routes, times and days.

A new user's manual was also developed to correspond with the new software packages. The manual describes precisely what will occur for each option presented to the user. A training module was also produced to aid the transit agency in training system users. The module displays the actual screens that appear when using both RIDER and TRSS. These screens also contain comments about the effect of selecting certain options.

The newly developed RIDER and TRSS packages should require little time to integrate into an existing transit system. The training module and user's manual should

answer most of the questions that new users have. An equipment "pool" for transit agencies to borrow the necessary hardware is not feasible due to the frequency at which data must be collected. The Texas SDHPT should provide the automated data collection system (MAKESTOP, RIDER, and TRSS) to interested agencies.

# TABLE OF CONTENTS

.

# Introduction

The vast volume of data needed for transportation planning and management functions represents an excellent opportunity for the application of automated information processing. Specifically, the purpose of this project was to develop an automated data collection and database system that could be used by transit providers. Bus ridership data is necessary to evaluate route performance and system effectiveness, as well as to predict future needs.

A manual ridership data collection system is repetitive and time-consuming. Furthermore, it presents many opportunities for the introduction of errors. An automated data collection system can replace this manual process by reducing multiple entries to a single point (a computer screen). This eliminates the manual entering of data into a database because the ridership data file is directly transferred into the database. Data is processed in a fraction of a second, the accuracy of the information is not compromised due to manual handling, and large quantities of data can be stored, retrieved and summarized quickly.

# Background

In an attempt to help improve the efficiency of small transit agencies in Texas, the Texas State Department of Highways and Public Transportation (SDHPT) contracted with the Texas Transportation Institute (TTI) to study the automated bus ridership data collection concept. First, TTI surveyed the transit agencies in small Texas cities (population less than 200,000) to determine their current methods of data collection, their data collection needs, and whether an automated data collection system would be used if available. A majority of those surveyed responded favorably toward the use of an automated system. A commercially available automated system was identified as the most versatile and cost effective for the transit agencies. This system used consumer grade equipment that could be purchased and serviced relatively inexpensively. The system,

produced by Multisystems Inc., was purchased and field tested by TTI personnel using bus routes of Citibus in Lubbock, Texas. The field testing revealed that better documentation was needed for both the data collection and database software. TTI next developed a "Supplemental User's Guide" for the automated data collection system and delivered that collection system to Citibus personnel for pilot testing. Training and assistance were provided during the implementation and set-up phases. The pilot testing by Citibus uncovered several system difficulties and awkward features. This final phase of the study was undertaken to overcome the identified problems.

## Objectives

The final phase of the study, documented in this report, included the development of an enhanced version of the data collection and database software to make it more user friendly and compatible with current computer standards. The enhanced system was then field tested and again improved. A computer illustrated training program was developed, as well as procurement specifications for the implementation of the automated data collection system.

## System Enhancements

One of the major drawbacks of the Multisystems automated data collection system was that it was developed as two separate packages. The data collection package was developed for use an EPSON HX-40 portable computer, a CPM operating system machine. When the automated system was developed, the EPSON was state-of-the-art; however, computer advances in the past few years have made it obsolete, and in fact it is no longer available. The EPSON had no disk drives, so file transfers had to be completed using a communications program. A wordprocessor was also necessary to produce a list of bus stops that could be used by the data collection software. On the other hand, the database and reporting package Transit Information Manager (TIM) was written for an MS-DOS computer. Ridership data had to be edited (using a word processor) and then loaded into

2

TIM. TIM was not particularly user friendly, information was not presented on the screens that guided the user and there were unnecessary repetitions of data entry. The user's manual was inadequate; it did not include a step by step process for implementation and relevant examples were lacking.

The enhanced automated data collection system was developed as an integrated package; the data collection software's input and output are used directly in the database and reporting software. Both the data collection and the database programs have text along the bottom of the screen to aid the user with the completion of necessary information. The user produces the stoplist using the data collection software itself, not a word processor. Ridership data is collected on a portable computer for a route, prompted by the computer using the appropriate stoplist. The output is then copied onto a disk and transferred onto the database computer (no communications program is necessary). Route identifying information is entered in the database software for each route, ridership data is loaded into the database and the reports are then produced.

## Equipment Description

The pre-data collection software for the automated system (named "MAKESTOP") is used to create the stoplists used in RIDER. "RIDER" is the name of the data collection software. Both of these were written with Turbo Pascal for a personal computer that uses an MS-DOS operating system. The data collection program (RIDER) needs to be executed on an MS-DOS based portable computer. The portable computer must be DC battery powered, have at least one disk drive, be as light-weight and compact as possible and have an internal clock and calendar. The battery should have an operating life at least as long as the user intends to collect ridership data for that day, and preferably it should be rechargeable. A disk drive is necessary to load the RIDER program and then to transfer the ridership data and stoplist file (RIDER and MAKESTOP output respectively) into the database computer. The user must carry the portable computer as data is collected aboard different buses; therefore, a light, compact unit is very desirable. Figure 1 shows the

3

portable computer that was purchased during this project for program development and testing. This portable computer, a Toshiba T1000, has a four hour DC rechargeable NiCad battery, an 80C88 processor, one 720 KB 3.5 in. disk drive, 512 KB RAM, an MS-DOS operating system, an additional 728 KB RAM card configured as a hard disk, one serial and one parallel port and a weight of slightly more than six pounds. The approximate cost for the portable computer is $900.
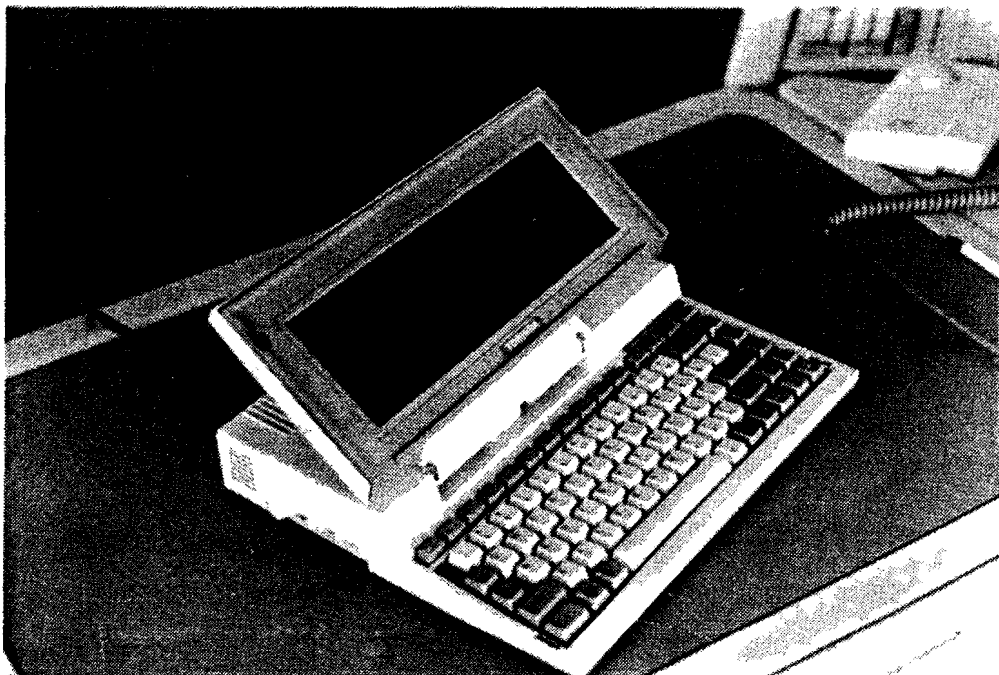


Figure 1. Toshiba T1000 Portable Computer

The enhanced database software for the automated system is named "TRSS" (Transit Ridership Summary Software). This software was written with Turbo Pascal and Turbo Magic (to produce the multi-colored menu screens) for a desktop personal computer using an MS-DOS operating system. The desktop PC needs to have at least one disk drive that is compatible with the one on the portable computer and a minimum 8088 processor. The PC also needs to have at least a 40 MB hard disk, which should be sufficient for one year's

worth of data in the database and a backup of the database. A color monitor is desirable since the TRSS software was developed using color screens, but a monochrome screen will suffice. An approximate cost for the minimum requirements listed above is $1300. A dot matrix printer is also the minimum necessary to print the summarization reports. Dot matrix printers may be purchased for approximately $400. The portable computer, a desktop PC and a dot matrix printer are the only pieces of equipment (hardware) necessary for the implementation of an automated bus ridership data collection system.

A portable computer that included a 20 MB hard disk was evaluated to determine if one computer could be employed for both data collection and the database. The use of such a machine is not recommended for several reasons. These include the limited battery time on this machine (2 hours maximum), the larger size and weight and the possibility of damage or loss of data from the database in a portable environment.

Due to the frequency with which ridership data must be collected and the problem of the logistics involved with loaning hardware, an equipment pool is not feasible. The purchase of two low cost computers is not an unreasonable expenditure for transit providers, considering the potential labor reduction that this system offers.

## System Training

A computerized instructional program was developed to aid with the training of transit personnel in the use of this automated ridership data collection program. The program will also be available from the Texas State Department of Highways and Public Transportation. This instructional program is an extremely helpful computerized educational manual, displaying the exact screens and formats that are used in the MAKESTOP, RIDER and TRSS programs. The user simply initiates the training program and presses the appropriate keys to "page" forward or backward through the screens. (Note: this training manual is not an interactive program; that is, the user may only page through the document.)

# System Implementation

In order for a transit provider to implement this system of automated ridership data collection, storage and summarization, completion of the following steps are necessary (Figure 2. shows the steps involved in this process).

## Equipment Procurement

The transit provider must first obtain the necessary hardware, which includes a portable computer, a desktop PC and a dot matrix printer. The two software packages that comprise the automated ridership data collection package, RIDER and TRSS, and associated reference and tutorial material may then be obtained from the Texas State Department of Highways and Public Transportation.

## Development of Stoplist (MAKESTOP)

Once both the hardware and software have been secured, the transit provider should begin creating stoplists for the various bus routes on which it wishes to collect ridership data. A "stoplist" is a file created by the user on the portable computer that prompts the data collector with the stops along a bus route. The stoplist is created using part of the data collection software known as "MAKESTOP." MAKESTOP is a program that prompts the user for input such as a route number and bus stop names (intersecting street names).

## Collection of Ridership Data (RIDER)

Once a stoplist has been produced for a route, ridership data may be collected. The collector boards the bus with the portable computer and runs the RIDER program. This program prompts the user with each bus stop, allowing the user to enter the number of

INITIAL DATA
REQUIREMENTS:
MAP OF ROUTE
LIST OF STOPS

|
v

┌─────────────────────┐
│     MAKESTOP         │
└─────────────────────┘

BOARD BUS
TO BEGIN
DATA COLLECTION

TRANSFER
STOPLIST FILE TO
PORTABLE COMPUTER

┌─────────────────────┐
│       RIDER          │
└─────────────────────┘

TRANSFER
RIDER OUTPUT
AND STOPLIST FILE
TO DESKTOP PC

ENTER FULL
BUS STOP NAMES
TRAVEL TIMES
AND DISTANCES

┌─────────────────────┐
│       TRSS           │
└─────────────────────┘
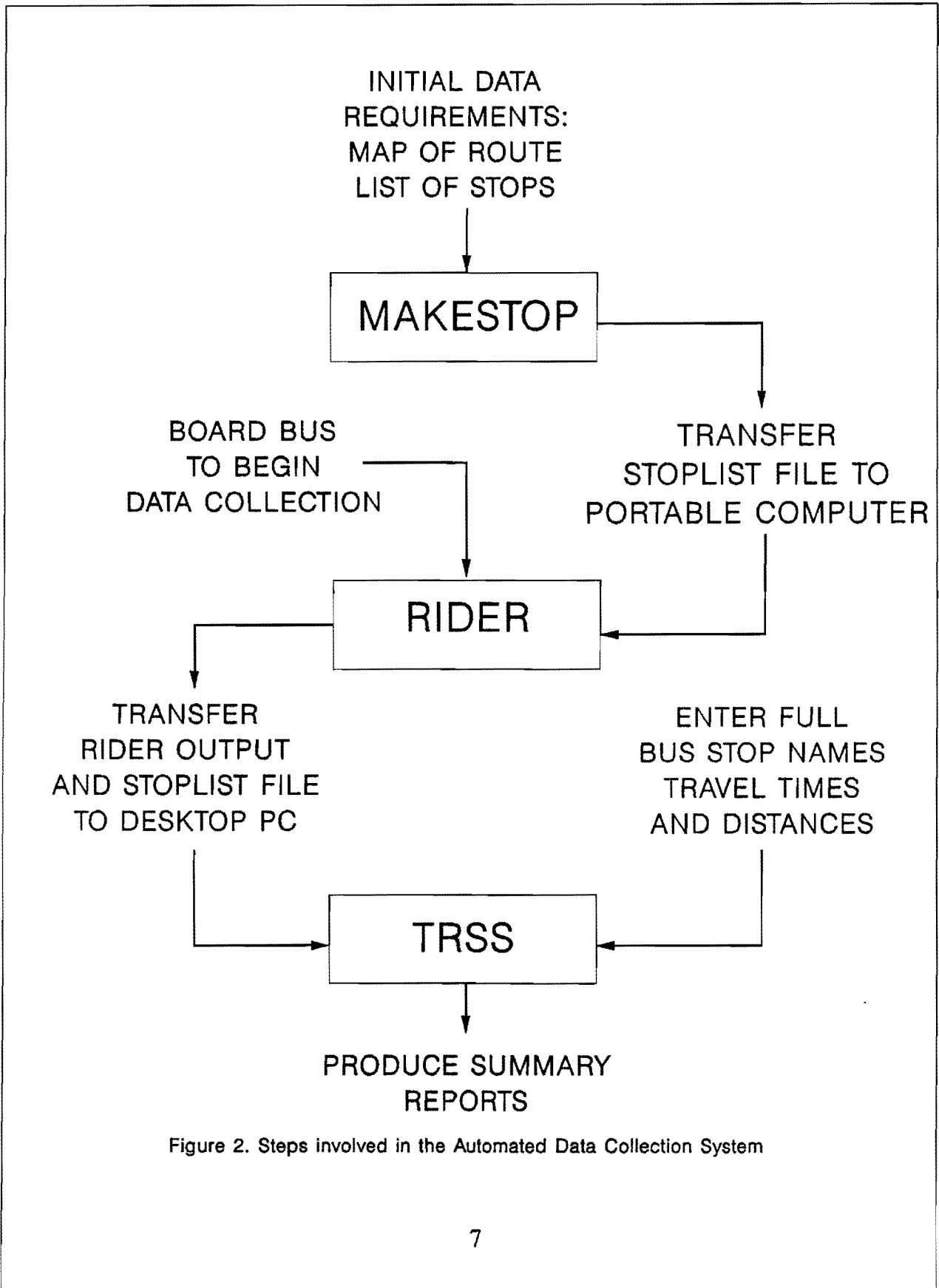
|
v

PRODUCE SUMMARY
REPORTS

Figure 2. Steps involved in the Automated Data Collection System

passengers boarding and alighting at the stop.

## Convert Stoplist (TRSS)

The ridership data and stoplist are then copied onto a diskette which, in turn, is copied onto the desktop PC where TRSS is resident. The user enters TRSS and "Converts a Stoplist," allowing the database to use the route information for reporting purposes. Full stop names, running times and distances are entered during this procedure.

## Load Ridership Data (TRSS)

The bus ridership data file is loaded into TRSS by choosing the appropriate option and entering the route number, the date of the collected data and the database name where data is to be stored.

## Print Reports (TRSS)

The data can then be summarized into seven different reports. Various routes, start times, and dates may be used as identifiers for the production of reports. A more detailed description of this step and the previous implementation steps can be found in Appendix A of the User's Manual.

### Observations

The course of this project has varied from year to year. Originally it was designed to determine the needs of transit providers, purchase an existing automated data collection system, and evaluate that system. The project then turned toward improving the product documentation. A pilot test of the system was conducted by implementing the automated data collection system into the operations of an existing bus transit provider. The final phase, documented by this report had a more developmental aspect. New software was

developed for both data collection and database purposes. A new user's manual and training module were also produced.

The data collection software, named RIDER, was developed for a currently accepted IBM compatible MS-DOS portable computer. The database software, named TRSS, was developed for an IBM compatible MS-DOS desktop computer. The prospect of using only one computer was evaluated, resulting in the conclusion that two computers should be used instead of one. A hard-disk option is needed for the database package, and this would result in the data collection (onboard) computer being twice as heavy as a non-hard-disk computer with only half the battery life.

The new software packages RIDER and TRSS are user friendly programs that prompt the user with their immediate options. The packages are integrated in that the input and output from RIDER are used as input in TRSS. Separate databases may be created for each route, preventing the accidental erasure of the entire ridership data.

The computerized training module that was developed will aid transit providers in quickly training their employees in the use of the automated system. The module displays the exact screens that appear when each step is executed and describes the key inputs necessary to reach the next screen.

Due to the frequency at which ridership data must be collected and the logistics involved in circulating equipment, an equipment pool is not a feasible alternative. The minimal cost of the hardware required for implementation of this automated data collection system is considered to be an economical expenditure for transit providers, given the potential labor savings.

**Appendix A**

.

# A User's Manual for the
# Bus Ridership Data Collection Software
# and Transit Ridership Summary Software

An automated bus ridership data collection package was developed by the Texas Transportation Institute for the Texas State Department of Highways and Public Transportation. The following is a user's manual for the three individual programs that comprise the data collection/database package. The programs include: MAKESTOP.EXE (used to make a bus stoplist that can be displayed on a portable computer), RIDER.EXE (used on a portable computer to collect boardings and alightings at prompted stop names), and TRSS.EXE (used on a desktop PC as a database and reporting program for the collected bus ridership data).

---

## How to Read this Manual

| | |
|---|---|
| **Keys** | Keys to be pressed look like this:<br>**enter** |
| **Screen Text** | Screen output in the body of the manual looks like this:<br>*Enter Collector ID and press enter.* |
| **Input** | Keyboard input is in upper case and looks like this:<br>*C:RIDER.001* |
| **Steps** | The major steps included in the programs are indicated by a ⬜ |

---

The ridership data collection package contains two executable programs:

MAKESTOP.EXE    the program initially used to create a list of stops for each bus route.

RIDER.EXE          the actual ridership data collection program, it uses the list of stops from the MAKESTOP program and prompts the collector with each stop name so that he/she can enter the boardings and alightings at each stop.

## MAKESTOP SOFTWARE

Prior to the collection of ridership data, one must first construct a "stoplist" file for each bus route on which data is to be collected. This stoplist file is used by RIDER to prompt the collector with abbreviated stop names as they are encountered along the route. The stoplist file is an "ascii" or "text" file (i.e. it does not contain any control characters). Once a stoplist is constructed for a route, it can be used repeatedly, and there is no need to make another stoplist until the route changes. Prior to executing MAKESTOP, the user needs to have either a map indicating the possible stops along a route or a list of stops along a route.

### Transferring the MAKESTOP program to the desktop computer

MAKESTOP may be executed from a floppy diskette or a hard drive, from either the portable computer or a desktop PC. You will probably find it most convenient to run MAKESTOP on a desktop PC in the office environment, since this is where most preparatory work is conducted. Create a MAKESTOP directory on the hard drive of the PC and copy the MAKESTOP.EXE program into it.

To construct a stoplist, simply enter the command *MAKESTOP* and press **enter**. The title screen will appear. To continue, press **enter**.

You will be asked to enter the Route for this particular stoplist. Any combination of 1 to 3 characters is acceptable as a response for this entry(a transit system may use numbers or names to distinguish their routes and leading zeros are not necessary). For example if a route is identified by the name Route 14-Cherry Ridge, you could use "14", "014", "CHR", "CR" or any other 1-3 character identifier. Type in the Route and press **enter**. Next, use the **up/down** arrow keys to select the appropriate drive on which to save the stoplist file and press **enter**. An alternative method is to simply type the drive letter to select the appropriate drive. The stoplist file will automatically be named *STOPLIST.___*, with the route used as the extension. For example, if you are constructing a stoplist for route 012 and wish to save the stoplist file to drive C, first enter *012* for the route number and then *C* for the drive letter. The file created will be named *C:STOPLIST.012*.

(**NOTE:** If a stoplist for the route specified already exists on the drive specified, you will be asked if you wish to *Overwrite (Y/N)*. Simply enter "*Y*" to overwrite the stoplist or "*N*" if you do not wish to overwrite the stoplist. Answering "*Y*" to the overwrite question will delete the previous stoplist with this route identifier and store the new list of stops into a file with this name. Answering "*N*" to this question will allow you to return to the beginning of MAKESTOP and enter a new route identifier.)

The next screen is used to input the actual bus stops. Bus stops are identified by the nearest intersection. Enter a four letter abbreviation at the *Major Street* prompt (the street on which the bus is currently traveling) and press **enter**. Four letter stop abbreviations are used to conserve the limited memory of the portable computer. Next, enter the cross street

name nearest to that stop at the *Cross street* prompt and press **enter**. The screens used to enter the stops are numbered consecutively to aid you in entering the stops. Continue entering stop names for all stops on that particular route. Press **F10** at the *Major Street:* prompt when finished. *Verify FINISHED (Y/N)?* will be displayed, and, if finished, enter "Y".

(**NOTE:** If you press **F10** at the *Cross Street:* prompt, the last stop entered will not be saved. You must enter the last Cross Street in the list and press **enter**. Then, at the next screen when there are no entries in the Major Street or Cross Street positions press **F10**.)

The next screen shown will display the filename under which the stoplist has been saved. Simply press **enter** at this screen.

The next screen will allow you to create another stoplist or quit (exit) the MAKESTOP program. Highlight the preferred operation using the **up/down arrow** keys and press **enter**, or simply press "*C*" to create another new stoplist or "*Q*" to quit.

MAKESTOP may be executed using the portable computer or the desktop computer. In either case, make sure the MAKESTOP output file (STOPLIST.___) is resident on the drive and in the directory from which RIDER will be executed on the portable computer.

# RIDER SOFTWARE

The following is a step by step guide for the execution of the RIDER software on a portable computer. The RIDER software was developed to automate the collection of ridership data that transit providers must routinely collect.

☐        <u>Transferring RIDER and the stoplist files to the portable computer</u>

If RIDER is to be executed on a portable computer, such as a Toshiba T1000, it is recommended that a RAM card be installed and configured as a hard disk. This configuration allows for a minimum use of the portable's battery and allows for longer data collection periods. A "RIDER" directory should be created on this RAM/hard disk, and the RIDER.EXE program should be copied into it.

Any stoplist files from the MAKESTOP program (STOPLIST.___) on which data will be collected should also be copied into this "RIDER" directory.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Prior to the execution of RIDER, make sure the time and date are set correctly on the portable computer.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

☐        <u>Execution of RIDER</u>

To execute the RIDER program so that bus ridership data can be recorded, enter the command *RIDER* and press **enter**. The title screen will be displayed. To continue, press **enter**.

☐ The next screen asks to *Enter the drive letter that contains the stoplist files.* There are four acceptable responses *"A", "B", "C", or "D."* Lower case letters may also be used. Once the appropriate drive letter has been typed, press **enter.** The letter selected will be determined by hardware selection and by the location of the stoplist file.

☐ The stoplists available on that drive are then displayed at the top of the screen. You will next be asked to *Enter a route.* The route corresponds to the extension of the stoplist file name (ex: *STOPLIST.NNN* refers to the stoplist for route NNN). Enter the route of the desired stoplist (leading zeros must be entered if shown on screen) and press **enter.**

☐ You are then asked to *Enter a 2 character Collector ID number* and press **enter.** This entry identifies each individual data collector and allows the transit administrators to better identify the source of the ridership data. Any 2 character entry is acceptable as a response. For example, the collectors two initials or a two digit identifying number may be used. Enter the collector's identification and press **enter.**

☐ Next you are asked to *Enter the scheduled start time for this run.* This is to be a 4-digit number which indicates the time the bus is <u>scheduled</u> to start this route (this is not necessarily the actual time the bus leaves the first stop). The time is in military time and is to be input in the form of *HHMM* (a 2 digit hour and a 2 digit minute). For example, 8:15 a.m. would be entered as 0815. Enter the start time and then press **enter.**

(**NOTE:** If a run has already occurred on the same date and with the same start time and route as selected, you will be asked if you wish to *Overwrite (Y/N)* the old file. Enter *"Y"* if you wish to overwrite the file or *"N"* if you do not. This is simply a check by the software to determine if any data will be lost if you use the currently input parameters. Typically this overwrite check should not occur, unless the date and time on the portable computer are incorrect or the previous year's data is in the directory. Once data has been collected and

18

transferred to the TRSS database software, you may delete that rider output file, or you may wish to make a copy of the data for backup purposes. In either instance, the old RIDER output files need to be deleted from the RIDER directory so that they will not be overwritten and lost. The RIDER output file names do not include a year indicator, so you must be conscious of ridership data file names, database names and the corresponding year.)

☐ The file name to which the run will be saved is then displayed. Simply press **enter** when you are ready to continue. The file name contains the month, date, starting time and route number of the ridership data to be collected.

☐ Next, you will be asked to *Enter the number of passengers that are already on board* the bus at the first stop of the bus route (there may be passengers remaining on board from the previous route). Enter the number of passengers already on board and press **enter**.

☐ The next screen will display the stop name (the intersection of two streets), the number of passengers that have boarded or alighted at that stop, and a menu of the key functions for RIDER. Passengers may board (get on) the bus and alight (get off) the bus at the any stop. When the bus is at a bus stop, the screen indicates this by displaying *Press F2 to Depart.* As passengers board, press the *ON* (**right arrow**) key, and if a mistake is made (i.e., too many passengers are added) it can be corrected by pressing the *-ON* (**ctrl-right arrow**) key. As passengers alight, press the *OFF* (**left arrow**) key. If a mistake is made (i.e., too many passengers are removed) it can be corrected by pressing the *-OFF* (**ctrl-left arrow**) key. After the passenger boardings and alightings have been recorded and the bus begins to pull away from the stop, press the *DEPART* (**F2**) key.

☐ After the *DEPART* (**F2**) key has been pressed, the next stop is displayed, the on and off displays are zeroed, the cumulative onboard figure is updated, and *Press F1 to Arrive* is shown on the screen. When the bus reaches the next stop press *ARRIVE* (**F1**). You may then remove and add passengers. Press *DEPART* (**F2**) when the bus leaves the stop. If the bus passes by a stop and does not stop to pick up any passengers, press *PASS W/O STOPPING* (**F3**). The screen will then display the next stop contained in the stoplist. This process continues until the last stop is reached. When the bus arrives at the last stop press the *ARRIVE* (**F1**) key, enter the alighting passengers, and press *QUIT* (**F10**). Any erroneous entries into the program will produce a beep by the computer.

(**NOTE:** If at any time during the bus run you wish to quit the program without saving the data, simply press the *QUIT* (**F10**) key. RIDER will display the menu described below.)

☐ After the route is finished the screen displays a set of options that will allow you to:

> *"C" Continue with this stoplist*
> *"S" Select a new stoplist*
> *"Q" Quit*

If *"C"* is selected, RIDER will continue to use the same stoplist as before and will return you to the screen where the Collector ID is entered. If *"S"* is selected, RIDER will prompt you to enter the drive that contains the available stoplist files and a route number. If *"Q"* is selected, RIDER is terminated and the cursor returns to the DOS prompt. Select one of the options by pressing the corresponding key.

You should now copy all the output files (data that has just been collected) onto the floppy disk for transfer to the desktop computer containing the TRSS database program.

The output files will be identified by month, date, starting time and route identifier respectively. For example, data collected on August 15 at 4:00 PM on route 028 will have a file name "AU151600.028." After the data is successfully loaded into TRSS, the data needs to be deleted from the RIDER directory of the portable computer (because of the limited storage capability and the possibility of overwriting data).

**Transit Ridership Summary Software (TRSS)**

Once bus ridership data has been collected using the RIDER software, the responsible agency may use the TRSS software to check, store, and summarize the data. The following explains the features of the TRSS package and provides guidance as the package is used.

<u>Transferring the TRSS Program to the desktop database computer</u>

The first step is to make a directory on the hard disk of the desktop PC for the TRSS package and copy the TRSS.EXE file into it.

<u>Transferring the RIDER output and stoplist files to the desktop database computer</u>

Copy the RIDER output and stoplist files onto a floppy diskette and then transfer them into the TRSS directory on the desktop PC.

<u>Execution of TRSS</u>

To begin the TRSS Package, at the DOS prompt *C:\TRSS*, type *TRSS* and then press **enter**. After the TRSS title screen appears, press **enter again**. You will be asked to select the type of printer to be used for printing the reports. Highlight the appropriate type of printer using the [**up/down arrow**] keys, then press **enter**. The Main Menu screen will appear.

TRSS Main Menu


*SELECT AN OPTION*

*A:*    *Directory of Files*

*B:*    *Convert a Stoplist*

*C:*    *Edit a Converted Stoplist*

*D:*    *Load a RIDER Data File*

*E:*    *Delete a Record from the Database*

*F:*    *Reports*

*G:*    *Quit*


To select an option, use the [**up/down arrow**] keys to highlight the desired option and press **enter**. The first letter of the option (*A-G*) may also be used to select the corresponding option. The last line appearing on the screen lists a short definition of the highlighted operation.

The Main Menu Options are listed in the order of intended execution. For example: After the user has collected the ridership data using RIDER and has transferred the ridership data file and stoplist file to the database PC (where TRSS is resident), he may view the contents of any directory. To do so, you select *Option A: Directory of Files*. The first step in storing and summarizing the data is to select *Option B: Convert a Stoplist*. This procedure converts the RIDER stoplist file into information that can be used by the TRSS database. If any changes need to be made to the converted stoplist, you may choose *Option C: Edit a Converted Stoplist*. Changes may be made to the time and distance entry for each stop. These entries are used for the calculations of on-time performance and other route statistics. The ridership data, collected using RIDER, may then be loaded into the TRSS database using *Option D: Load a RIDER Data File*. If the removal of some of the ridership data from the TRSS database is necessary, you can use *Option E: Delete a Record from the Database*. Finally, summary reports may be printed for various routes or days by using *Option F: Reports*. A more detailed description of each option follows.

**Option A: Directory of Files**

This option is invoked by highlighting the *A: Directory of files* line in the Main Menu and pressing **enter**, or by simply typing an *A*. You will be asked to select a drive letter for viewing. To do so, use the [**up/down arrow**] keys to move the highlighted box, then press **enter** at the appropriate drive letter. Alternately, you may simply press the corresponding drive letter (*A-D*). You will next be asked to pick a directory from which to list the content files. The default value for this entry is *.* and can be selected by pressing **enter**. The directory of files for the selected drive and directory is then displayed. Pressing **enter** returns you to the main menu.

(**NOTE:** If at any time in the TRSS package you wish to abort a screen, press the **F10** key and answer *Y* to the "Verify Abort?" question.)

The remainder of the options are arranged in the order of their usual execution.

**Option B: Convert a Stoplist**

This option converts the RIDER stoplist file into a form that is used by the database. The stoplist file in the RIDER program contains an abbreviated list of stop names in the order of arrival. Option B is used to transform these into full stop names and adds running times and distances between stops for use in the database. This option is used to simplify the entry of route information into TRSS. Once a stoplist is converted, it does not have to be converted again, unless some aspect of that route changes (stops arranged, differently, other stops added or distances between stops changes).

This option is invoked by highlighting the *B: Convert a Stoplist* line in the Main Menu and pressing **enter**, or by simply typing a *B*, TRSS will ask for the stoplist route to convert. The stoplist route number is the 1 to 3 character stoplist filename extension (Ex. STOPLIST.XXX). Enter the stoplist route to convert and press **enter**. TRSS will then ask for the drive letter of the computer on which the stoplist file to convert resides. Highlight the drive letter and press **enter** or simply press the drive letter. Next, enter the drive letter which contains the TRSS database by again highlighting the appropriate drive letter and pressing **enter**, or by simply pressing the drive letter. If this is the first stoplist that is converted and a database does not yet exist, then enter the drive letter where the database will reside. The drive letter options were added to accommodate the numerous computer hardware configurations that are possible.

(**NOTE:** If the stoplist you enter has been previously converted, TRSS will ask if you wish to *Overwrite (Y/N)*. Enter "Y" to overwrite the old converted file, or enter "N" to return to the main menu.)

The next screen identifies the file name to which the converted stoplist will be saved, this cannot be changed. Simply press **enter** at this screen.

The following screen will ask for the route name of the stoplist route you wish to convert. The route name is only used in the title of the reports. Enter an alphanumeric route name (maximum of 20 characters) and press **enter**.

The next set of screens that are displayed are used to expand the abbreviated bus stop locations. The first 8 character stop code from the stoplist file is shown in the form XXXX & XXXX. Enter the main street (*Major Street*) on which the bus is traveling (maximum of 10 characters) and press **enter**. When the cursor moves to the next line, enter the *Cross Street* nearest to the bus stop (also maximum of 10 characters) and press **enter**. The cursor again moves down to the next line where the time is entered in minutes

and seconds (MM:SS) from the previous bus stop to the present one. If this is the first stop on the route, enter 00:00, or simply press **enter**. Next, enter the distance in miles from the previous stop to the present stop and press **enter**. Again, if this is the first stop on the route, enter 0.0 or simply press **enter**.

After the mileage from the previous stop is entered, the stop code for the next bus stop on this route will be displayed. Enter the requested data as described in the above paragraph, and continue until all stops have been completed. When the last mileage entry is completed for the last stop, the converted stoplist will be saved and the screen will return to the Main Menu. At this point, TRSS has just produced a file with the name TRSSSTOP, using the route number as an extension. This file will be used later in the *D: Load a RIDER Data File* option in order to load data into the database, and in the *C: Edit a Converted Stoplist* option if you later wish to edit the converted stoplist.

## C: Edit a Converted Stoplist

This option may be used to make changes or update a converted stoplist file. For example, if you wish to change the distance or time between 2 stops, or change the name of a street, this option can be used to avoid re-entering all of the data using Option B.

This option is invoked by highlighting the *C: Edit a Converted Stoplist* line in the Main Menu and pressing **enter**, or by simply typing a *C*. You will be asked for the stoplist route number to edit. Enter the 1 to 3 character route identifier (XXX) and press **enter**. Next, enter the drive letter which contains the TRSS database by highlighting the appropriate drive letter and pressing **enter**, or by simply pressing the drive letter. TRSS will retrieve the converted stoplist file named TRSSSTOP.XXX and allow the user to begin editing.

The next screen displays the file name to which the converted stoplist will be saved.

26

Simply press **enter** at this screen.

The next screen shows the 8 character abbreviated stop code from the stoplist file, the major street, cross street, time (HH:MM) from the last stop, and distance (miles) from the last stop that was entered earlier using option *B: Convert a Stoplist*. The cursor is located on the *Major Street* line. If necessary, change the Major Street and press **enter**. If you do not wish to make a change, simply press **enter**. The cursor will then move down to the *Cross Street* line. Changes to this entry may be made as described above. The cursor will then move down to the time from last stop line and then to the distance from last stop line. Continue through the stops until all of the changes on all of the stops have been completed. Pressing the **ESC** key scrolls the user sequentially through the stop codes (bus stops). After the necessary data is edited, press the **ESC** key to scroll to the end of that stoplist. The file will automatically be saved, and you will return to the main menu.

## D: Load a RIDER Data File

After a stoplist has been converted, the RIDER software output data may be loaded into a database. Choose this option by highlighting the *D: Load a RIDER Data File* line in the Main Menu and pressing **enter**, or simply type a *D*.

When this option is invoked, TRSS will ask for the drive which contains the RIDER output data files. Highlight the appropriate drive letter and press **enter**, or simply press the drive letter. Next, enter the 1 to 3 character route identifier of the RIDER data file (file name extension) to load and press **enter**, then enter the date that the RIDER data was collected in the form MM/DD/YY and press **enter**. You must then enter a drive and database name. All reports are developed from specific databases. It is possible to have only one database for an entire bus system, or individual databases for each route. Individual databases for each route is a safer configuration. Highlight the appropriate drive and press **enter**, or simply press the drive letter. Then enter the filename to which you

27

wish to save the database and press **enter**. (**NOTE:** DO NOT ADD AN EXTENSION TO THE FILENAME! TRSS automatically adds its own extension to the file.)

If creating a new database file, TRSS will indicate that the database file is not found and will ask if you wish to *Create a new one (Y/N)*. Simply enter *"Y"* to create a new database file. Entering *"N"* will return you to the screen that asks you under which database filename the data should be saved.

On the next screen, TRSS will ask if you wish to load data from one of the RIDER data files that match the date and route entered previously. The filename displayed is composed of a 2 character month abbreviation, a 2 digit day, a 4 digit start time, and the route of the data collected as the extension. (Example: If data was collected on July 17, 1990, at a start time of 23:45 on route 03A, the filename would be *JL172345.03A*.) Simply enter *"Y"* to load this file and *"N"* if you do not wish to load this file. The next RIDER data file that matches the above date and route will be shown. Enter *"Y"* or *"N"* again depending on whether or not that file is to be loaded. This process will continue until all files which match the above information have been either loaded or skipped. Again, the year is not tagged on the RIDER output file names, so you must be careful to remove data from the previous year.

### E: Delete a Record From the Database

If any information is to be removed from the database, use the *E: Delete a Record from the Database* option. This option is invoked by highlighting the *E: Delete a Record from the Database* line in the Main Menu and pressing **enter**, or by simply typing an *E*. Enter the route identifier (1 to 3 characters) of the data to delete and press **enter**. Next, enter the date (MM/DD/YY) of the data to delete and press **enter**, then enter the scheduled start time (HH:MM) of the data to be deleted and press **enter**. Select the drive containing the database by highlighting the appropriate drive letter and pressing **enter**, or

by simply pressing the drive letter. Finally, enter the filename of the database containing the data to be deleted and press **enter**. The data specified by the above items will then be deleted from the database.

☐ **F: Reports**

When the report option is invoked by highlighting the *F: Reports* line in the Main Menu and pressing **enter** or by simply typing an *F*, another menu will display the 7 reports (A-G) that can be produced from each database. Each of these are discussed and shown on the following pages.

(**NOTE:** To exit the Reports Menu into the Main Menu press the **ESC** key.)

☐ **G: Quit**

When the quit option is invoked by highlighting the *G: Quit* line in the Main Menu and pressing **enter** or by simply typing an *G*, TRSS will be exited and you will be returned to the DOS prompt.

☐                           <u>Backing up the Databases</u>

We highly advise the periodic backup of all of the databases used by the transit provider (even if each route has its own database). This may be accomplished using the DOS "COPY" command. Two files make up the database, and <u>both</u> files need to be backed up. These consist of a file with a .JDL extension and a file with a .NDX extension. For example, to back up a database named ROUTE1 simply type *COPY ROUTE1.JDL ROUTE1.JBK* and then type *COPY ROUTE1.NDX ROUTE1.NBK*. This will create a backup copy of the ROUTE1 database named ROUTE1.JBK and ROUTE1.NBK. If these backup

files are ever needed, simply copy the files back to their original names. Using our above example, type *COPY ROUTE1.JBK ROUTE1.JDL* and then *COPY ROUTE1.NBK ROUTE1.NDX.* This will restore the files so that they may again be used with TRSS.

## Report Option A: Basic Route Report

The Basic Route Report is a report or summary covering a single route on a single day for a single start-time.  An example of this report is shown below.

```
08/13/1991              **********************           page: 1
                        * BASIC ROUTE REPORT *
                        **********************
ROUTE: CR1  CHERRY RIDGE
START TIME: 12:00
DATE: 08/13/90
```

| LOCATION | | TIME | BOARD INGS | ALIGHT INGS | ON BOARD |
|---|---|---|---|---|---|
| THOSE ALREADY ONBOARD | | | 0 | 0 | 5 |
| BROADWAY | & AVE H | 15:02:55 | 0 | 0 | 5 |
| BROADWAY | & AVE G | 15:03:15 | 5 | 2 | 8 |
| BROADWAY | & AVE F | 15:03:29 | 4 | 3 | 9 |
| BROADWAY | & AVE E | 15:03:55 | 5 | 8 | 6 |
| AVE E | & 13TH ST. | 15:04:10 | 0 | 0 | 6 |
| AVE E | & 14TH ST. | 15:04:29 | 0 | 6 | 0 |
| AVE E | & 15TH ST. | 15:04:41 | 15 | 0 | 15 |
| AVE E | & 16TH ST. | 15:04:55 | 10 | 5 | 20 |
| AVE E | & 17TH ST. | 15:05:20 | 12 | 20 | 12 |
| 17TH ST. | & AVE D | 15:05:55 | 5 | 6 | 11 |
| 17TH ST. | & AVE C | 15:06:20 | 15 | 6 | 20 |
| 17TH ST. | & AVE B | 15:06:43 | 2 | 5 | 17 |
| 17TH ST. | & AVE A | 15:07:00 | 0 | 0 | 17 |
| AVE A | & 18TH ST. | 15:07:26 | 4 | 3 | 18 |
| 19TH ST. | & AVE A | 15:07:47 | 0 | 0 | 18 |
| 19TH ST. | & BIRCH | 15:08:10 | 3 | 14 | 7 |
| BIRCH | & 20TH ST. | 15:08:44 | 0 | 4 | 3 |
| CEDAR | & 20TH ST. | 15:09:06 | 7 | 3 | 7 |
| CEDAR | & 21ST ST. | 15:09:27 | 0 | 7 | 0 |
| THOSE REMAINING ONBOARD | | | 0 | 0 | 0 |
| TOTAL | | | 87 | 92 | |

To produce a Basic Route Report, highlight this title and press **enter**, or simply type an A.  Enter the route identifier (1 to 3 characters) for the report and press **enter**.  Enter the date (MM/DD/YY) for the report and press **enter**, then enter the scheduled start time (military time, HH:MM) and press **enter**.  Enter the drive and database filename where the data is stored and press **enter**.  TRSS will "think" (find the necessary information) and then the report will be printed.

(**NOTE:**  If the printer is off-line or out of paper, a warning line will appear, giving you the option of *readying* the printer and attempting to print again or *Exiting* to the main menu.)

## Report Option B: Summary Route Report

The Summary Route Report is a summary of a specific route and start time for a range of dates. An example of this report is shown below.

```
08/13/1991              *************************              page: 1
                        * SUMMARY ROUTE REPORT *
                        *************************
ROUTE: CR1   CHERRY RIDGE
START TIME: 14:00
DATES: 08/12/90 TO 08/19/90

-------------------------    -----  -----  ------   -----
                             OBSVD  BOARD  ALIGHT    ON
            LOCATION         STOPS  INGS    INGS    BOARD
-------------------------    -----  -----  ------   -----
THOSE ALREADY ONBOARD          1      0      0        3
BROADWAY     & AVE H           1      0      0        3
BROADWAY     & AVE G           1     10      3       10
BROADWAY     & AVE F           1      5      3       12
BROADWAY     & AVE E           1     12      7       17
AVE E        & 13TH ST.        1     10      3       24
AVE E        & 14TH ST.        1      0     11       13
AVE E        & 15TH ST.        1      4      4       13
AVE E        & 16TH ST.        1      5     13        5
AVE E        & 17TH ST.        1     10      3       12
17TH ST.     & AVE D           1      0      0       12
17TH ST.     & AVE C           1      6      7       11
17TH ST.     & AVE B           1      0     11        0
17TH ST.     & AVE A           1     35      0       35
AVE A        & 18TH ST.        1      2     10       27
19TH ST.     & AVE A           1      1     13       15
19TH ST.     & BIRCH           1      4     15        4
BIRCH        & 20TH ST.        1      7      4        7
CEDAR        & 20TH ST.        1      0      0        7
CEDAR        & 21ST ST.        1      0      7        0
THOSE REMAINING ONBOARD        1      0      0        0
                                    -----  ------   -----
TOTALS:                              111    114      230
```

To produce a Summary Route Report, highlight this title and press **enter**, or simply type a *B*. Enter the route identifier (1 to 3 characters) for the report and press **enter**. Enter each date (MM/DD/YY) in the range of dates for the report and press **enter**, then enter the scheduled start time (HH:MM) and press **enter**. Enter both the drive letter where the database is located and the file name and press **enter**. TRSS will "think" (find the necessary data), and the report will begin printing.

32

## Report Option C: Daily Route Report

The Daily Route Report is a summary of the data that was collected on a single route and on a single day for a range of start times. If data for several trips on a single day was collected, this report could be used to examine and compare the ridership data collected on that day. An example of that report follows.

```
***********************
* DAILY ROUTE REPORT *
***********************
```

ROUTE: CR1 CHERRY RIDGE
DATE: 08/13/90
START TIMES: 12:00 TO 14:00

| starttimes ------> | | 12:00 | | | 14:00 | |
|---|---|---|---|---|---|---|
| LOCATION | ON | OFF | LOB | ON | OFF | LOB |
| THOSE ALREADY ONBOARD | 0 | 0 | 5 | 0 | 0 | 3 |
| BROADWAY & AVE H | 0 | 0 | 5 | 0 | 0 | 3 |
| BROADWAY & AVE G | 5 | 2 | 8 | 10 | 3 | 10 |
| BROADWAY & AVE F | 4 | 3 | 9 | 5 | 3 | 12 |
| BROADWAY & AVE E | 5 | 8 | 6 | 12 | 7 | 17 |
| AVE E & 13TH ST. | 0 | 0 | 6 | 10 | 3 | 24 |
| AVE E & 14TH ST. | 0 | 6 | 0 | 0 | 11 | 13 |
| AVE E & 15TH ST. | 15 | 0 | 15 | 4 | 4 | 13 |
| AVE E & 16TH ST. | 10 | 5 | 20 | 5 | 13 | 5 |
| AVE E & 17TH ST. | 12 | 20 | 12 | 10 | 3 | 12 |
| 17TH ST. & AVE D | 5 | 6 | 11 | 0 | 0 | 12 |
| 17TH ST. & AVE C | 15 | 6 | 20 | 6 | 7 | 11 |
| 17TH ST. & AVE B | 2 | 5 | 17 | 0 | 11 | 0 |
| 17TH ST. & AVE A | 0 | 0 | 17 | 35 | 0 | 35 |
| AVE A & 18TH ST. | 4 | 3 | 18 | 2 | 10 | 27 |
| 19TH ST. & AVE A | 0 | 0 | 18 | 1 | 13 | 15 |
| 19TH ST. & BIRCH | 3 | 14 | 7 | 4 | 15 | 4 |
| BIRCH & 20TH ST. | 0 | 4 | 3 | 7 | 4 | 7 |
| CEDAR & 20TH ST. | 7 | 3 | 7 | 0 | 0 | 7 |
| CEDAR & 21ST ST. | 0 | 7 | 0 | 0 | 7 | 0 |
| THOSE REMAINING ONBOARD | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTALS ----> | 87 | 92 | | 111 | 114 | |

To produce a Daily Route Report, highlight this title and press **enter,** or simply type a *C.* Enter the route identifier (1 to 3 characters) for the report and press **enter,** then enter the date (MM/DD/YY) for the report on and press **enter.** Enter each scheduled start time (HH:MM) in the range of scheduled start times for the report and then press **enter.** Enter the drive letter where the database is located and then the file name. Press **enter.** TRSS will "think" (find the necessary data), and the report will begin printing.

## Report Option D: Average Route Report

The Average Route Report summarizes the data for a specific route for a range of days and range of start times. The average boardings and alightings for the selected dates and times are given numerically as well as graphically in a histogram. An example of this report is shown below.

```
08/13/1991                         *****************************              page: 1
                                   * AVERAGE ROUTE REPORT *
                                   ****************************

ROUTE: CR1 CHERRY RIDGE
DATES: 08/12/90 TO 08/19/90
START TIMES: 08:00 TO 23:00

 NUMBER OF TRIPS = 2      AVERAGE                       SCALE (PASS/*) = 2
------------------------  --- --- ---          AVERAGE PASSENGERS ON BOARD AFTER STOP
        LOCATION          ON OFF OBD   0    20    40    60    80   100   120   140
------------------------  --- --- ---   +---------+---------+---------+---------+---------+---------+---------+
THOSE ALREADY ONBOARD      0   0   4   **
BROADWAY   & AVE H         0   0   4   **
BROADWAY   & AVE G         7   2   9   ****
BROADWAY   & AVE F         4   3  10   *****
BROADWAY   & AVE E         8   7  11   *****
AVE E      & 13TH ST.      5   1  15   *******
AVE E      & 14TH ST.      0   8   6   ***
AVE E      & 15TH ST.      9   2  14   *******
AVE E      & 16TH ST.      7   9  12   ******
AVE E      & 17TH ST.     11  11  12   ******
17TH ST.   & AVE D         2   3  11   *****
17TH ST.   & AVE C        10   6  15   *******
17TH ST.   & AVE B         1   8   8   ****
17TH ST.   & AVE A        17   0  26   *************
AVE A      & 18TH ST.      3   6  22   ***********
19TH ST.   & AVE A         0   6  16   ********
19TH ST.   & BIRCH         3  14   5   **
BIRCH      & 20TH ST.      3   4   5   **
CEDAR      & 20TH ST.      3   1   7   ***
CEDAR      & 21ST ST.      0   7   0
THOSE REMAINING ONBOARD    0   0   0
                         --- ---
   T O T A L S ------->    99 103
```

To produce an Average Route Report, highlight this title and press **enter,** or simply type a *D*. Enter the route identifier (1 to 3 characters) for the report and press **enter**. Enter each date (MM/DD/YY) in the range of dates for the report and press **enter**. (**NOTE:** If you wish to report on only 1 date, you may simply press **enter** at the second date prompt.) Enter each scheduled start time (HH:MM) in the range of scheduled start times for the report and then press **enter**. (**NOTE:** If you wish to report on only on 1 start time, you may simply press **enter** at the second start time prompt.) Enter the drive letter where the database is located and then the file name. Press **enter**. TRSS will "think" (find the necessary data), and the report will begin printing.

## Report Option E: Passenger Statistics Report

The Passenger Statistics Report presents the total boardings, passenger-miles and passenger-hours of service for the ridership data that was collected for a specific route and a range of dates and start-times. This report may be extremely helpful in completing the ridership data necessary for federal funding. An example of this report is shown below.

```
08/13/1991                   ******************************            page: 1
                             * PASSENGER STATISTICS REPORT *
                             ******************************
ROUTE: CR1 CHERRY RIDGE
DATES: 08/12/90 TO 08/19/90
START TIMES: 08:00 TO 20:00

           --------  -----  ---------  ---------  ---------
                     OBSVD   TOTAL     PASSENGER  PASSENGER
            DATE     STOPS  BOARDINGS    MILES      HOURS
           --------  -----  ---------  ---------  ---------
           08/13/90    2      198        82.65     2:32:03
                             ---------  ---------  ---------
           TOTALS --->        198        82.65     2:32:03
```

To produce a Passenger Statistics Report, highlight this title and press **enter** or simply type an *E*. Enter the route identifier (1 to 3 characters) for the report and press **enter**. Enter each date (MM/DD/YY) in the range of dates for the report and press **enter**. (**NOTE:** If you wish to report on only 1 date, you may simply press **enter** at the second date prompt.) Enter each scheduled start time (HH:MM) in the range of scheduled start times for the report and press **enter**. (**NOTE:** If you wish to report on only 1 start time, you may simply press **enter** at the second start time prompt.) Enter the drive letter where the database is located and then the file name. Press **enter**. TRSS will "think" (find the necessary data) and the report will begin printing.

## Report Option F: Section 15 Report

The Section 15 Report presents the data necessary to complete a large portion of the UMTA Section 15 Report. The data that is summarized includes: Passengers Boarded, Bus Trip Distance, Passenger Miles, Trips in Sample, Unlinked Passengers per Trip, and Passenger Miles per Trip for a certain route and range of days. An example of this report is shown below.

```
08/13/1991                              ***********************
                                        * Section 15 Report *
                                        ***********************
ROUTE: CR1  CHERRY RIDGE
DATE RANGE: 08/13/90 TO 08/13/90
```

| ITEM | AM PEAK 08:00-12:00 | MIDDAY 12:01-18:00 | PM PEAK 18:01-23:00 | OTHER | TOTALS |
|------|---------------------|--------------------|--------------------|-------|--------|
| Passengers Boarded | 87 | 111 | 0 | 0 | 198 |
| Passengers on Board  * | 92 | 114 | 0 | 0 | 206 |
| Bus Trip Distance | 3.4 | 3.4 | 0.0 | 0.0 | 6.9 |
| Passenger Miles | 39.6 | 43.0 | 0.0 | 0.0 | 82.6 |
| Trips in Sample | 1 | 1 | 0 | 0 | 2 |
| SAMPLE AVERAGES | . | | | | |
| Unlinked Passengers per Trip | 87.00 | 111.00 | 0.00 | 0.00 | |
| Passenger Miles per Trip | 39.60 | 43.05 | 0.00 | 0.00 | |

* Includes passengers already on board before the start of the route.

To produce a Section 15 Report, highlight this title and press **enter**, or simply type an *F*. Enter the route identifier (1 to 3 characters) for the report and press **enter**. Enter each date (MM/DD/YY) in the range of dates for the report and press **enter**. (**NOTE:** If you wish to report on only 1 date, you may simply press **enter** at the second date prompt.) Enter each peak start time range (HH:MM) for the report and then press **enter**. (**NOTE:** The ending time for one peak period must be different from the beginning time of the next period. Example: A.M. peak range 6:00 - 9:00 and Midday peak range 9:01 - 14:00.) Enter the drive letter where the database is located and then the file name. Press **enter**. TRSS will "think" (find the necessary data), and the report will begin printing.

# G: Time Analysis Report

The Time Analysis Report analyzes departure times for a specific route for a range of days and range of start times. This is particularly useful for determining route on time performance. An example of this report is shown below.

```
08/13/1991              ************************          page: 1
                        * TIME ANALYSIS REPORT *
                        ************************
ROUTE: CR1 CHERRY RIDGE
DATES: 08/13/90 TO 08/13/90
START TIMES: 12:00 TO 20:00
NUMBER OF TRIPS IN SAMPLE: 2
```

| LOCATION | | SCHEDULED RUN TIME (mm:ss) | AVERAGE RUN TIME (mm:ss) | | MAX RUN TIME (mm:ss) | MIN RUN TIME (mm:ss) |
|---|---|---|---|---|---|---|
| BROADWAY | & AVE H | 0:00 | 0:00 | (+ 0:00) | 0:00 | 0:00 |
| BROADWAY | & AVE G | 0:20 | 0:20 | (+ 0:00) | 0:20 | 0:20 |
| BROADWAY | & AVE F | 0:15 | 0:12 | (+ 0:03) | 0:14 | 0:11 |
| BROADWAY | & AVE E | 0:25 | 0:24 | (+ 0:01) | 0:26 | 0:23 |
| AVE E | & 13TH ST. | 0:15 | 0:15 | (+ 0:00) | 0:15 | 0:14 |
| AVE E | & 14TH ST. | 0:20 | 0:20 | (+ 0:00) | 0:21 | 0:19 |
| AVE E | & 15TH ST. | 0:18 | 0:15 | (+ 0:03) | 0:18 | 0:12 |
| AVE E | & 16TH ST. | 0:20 | 0:18 | (+ 0:02) | 0:22 | 0:14 |
| AVE E | & 17TH ST. | 0:30 | 0:26 | (+ 0:04) | 0:27 | 0:25 |
| 17TH ST. | & AVE D | 0:35 | 0:35 | (+ 0:00) | 0:35 | 0:35 |
| 17TH ST. | & AVE C | 0:25 | 0:23 | (+ 0:02) | 0:25 | 0:21 |
| 17TH ST. | & AVE B | 0:25 | 0:23 | (+ 0:02) | 0:23 | 0:23 |
| 17TH ST. | & AVE A | 0:25 | 0:21 | (+ 0:04) | 0:24 | 0:17 |
| AVE A | & 18TH ST. | 0:23 | 0:24 | (- 0:01) | 0:26 | 0:22 |
| 19TH ST. | & AVE A | 0:25 | 0:20 | (+ 0:05) | 0:21 | 0:18 |
| 19TH ST. | & BIRCH | 0:30 | 0:23 | (+ 0:07) | 0:23 | 0:23 |
| BIRCH | & 20TH ST. | 0:25 | 0:30 | (- 0:05) | 0:34 | 0:26 |
| CEDAR | & 20TH ST. | 0:20 | 0:15 | (+ 0:05) | 0:22 | 0:07 |
| CEDAR | & 21ST ST. | 0:25 | 0:18 | (+ 0:07) | 0:21 | 0:16 |
| ROUTE TOTAL ------> | | 7:01 | 6:21 | | 6:57 | 5:46 |

To produce a Time Analysis Report, highlight this title and press **enter**, or simply type a **G**. Enter the route identifier (1 to 3 characters) for the report and press **enter**. Enter each date (MM/DD/YY) in the range of dates for the report and press **enter**. (**NOTE:** If you wish to report on only 1 date, you may simply press **enter** at the second date prompt.) Enter each scheduled start time (HH:MM) in the range of scheduled start times for the report and press **enter**. (**NOTE:** If you wish to report on only 1 start time, you may simply press **enter** at the second start time prompt.) Enter the drive letter where the database is located and then the file name. Press **enter**. TRSS will "think" (find the necessary data), and the report will begin printing.