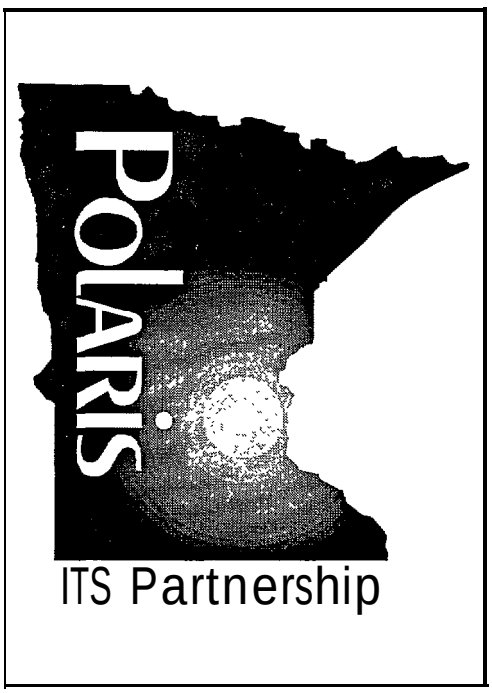
Minnesota Department of Transportation Agreement Number: 73807P

Minnesota Intelligent Transportation Systems




# Statewide Intelligent Transportation Systems As-Is Agency Reports for Minnesota

# Volume 4
# Metropolitan Council Transit Operations and Metro Mobility

Prepared for the Minnesota Department of Transportation by:

Lockheed Martin Federal Systems-Owego
Intelligent Transportation Systems
Mail Drop 0124
1801 State Route 17C
Owego, NY 13827-3998

SRF Consulting Group, Inc.
One Carlson Parkway North
Suite 150
Minneapolis, MN 55447-4443

August 1996

**Statewide ITS As-Is Agency Report for Minnesota**
**Volume 4**
**Metropolitan Council Transit Operations and Metro Mobility**

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**Appendices**

# 1. INTRODUCTION

The purpose of the Polaris Project is to define an Intelligent Transportation Systems (ITS) architecture for the state of Minnesota. An architecture is a framework that defines a complex system, in terms of a set of smaller, more manageable systems which are fully defined in terms of their individual boundaries, functions, physical components, and interfaces. They illustrate how each of the systems interrelate and contribute to the overall ITS objectives and requirements.

A well defined architecture provides many benefits for a complex system. It defines and optimizes the location of system functions. It identifies critical interfaces, and illustrates how associated systems can be integrated to share resources and information. It establishes standards for communications and physical components so that inter-operability can be maintained as the system evolves to incorporate new capabilities and technologies.

The Minnesota Statewide ITS Architecture is a tailored version of the National ITS Architecture. Tailoring incorporates the prioritized wants and needs of the state's transportation users and stakeholders, as well as its existing ITS infrastructure. The functional architecture, physical architecture, system requirements and implementation plan are fully documented in the following project deliverables:

*ITS Traveler Wants/ Needs* - Information obtained from Minnesota residents in ten end user sessions held across the state. Used to establish and prioritize end-user requirements.

*ITS Transportation Wants/ Needs* - Information obtained from ITS stakeholder institutions. Used to establish and prioritize ITS service provider requirements.

*ITS Wants/ Needs Analysis* - Final results and recommendations of the wants and needs research.

*Statewide ITS As-IsAgency Reports for Minnesota* - Information about existing transportation systems that establish the starting point for the Architecture Implementation Plan.

*ITS System Specification* - Incorporates the results of the functional and physical architectures into specification format. The specification will clearly identify ITS system level requirements for the identified Minnesota ITS services.

*ITS Component Specification* - Incorporates the results of the functional to physical allocation in specification format. The specification will clearly identify the Minnesota ITS component systems requirements.

*ITS Architecture Implementation Plan* - A recommended ITS deployment strategy for future state initiatives.

# 2. SCOPE

This document, *Statewide ITS As-Is Agency Reports for Minnesota,* consists of a collection of individual system survey reports related to transportation systems. The Polaris Project will use the survey information collected to derive the existing architectural framework. After the existing architectural framework is derived, this information will be used as the baseline for developing the Minnesota Statewide ITS Architecture.

Agencies identified and contributed to this document were:

- Minnesota Department of Transportation Office of Advanced Transportation Systems
- Minnesota Department of Transportation Traffic Management Center
- Minnesota Department of Transportation Metropolitan Division
- Minnesota Department of Transportation Electrical Services Section
- St. Paul Department of Public Works
- Minneapolis Department of Public Works
- Hennepin County Department of Public Works
- Ramsey County Department of Public Works
- Minnesota State Patrol
- Hennepin County Medical Center
- Metropolitan Council Transit Operations
- Metropolitan Airports Commission
- Gopher State One Call
- Minnesota Office of Tourism

## 2.1 Document Overview

This document presents the methods, assumptions and procedures used to collect the baseline information. The documentation of systems that were inventoried is presented in Section 3.

## 2.2 Methods, Assumptions, and Procedures

### 2.2.1 System Identification

Agency and system candidates were based upon several factors prior to survey. Through market research, the highest wants and needs priorities for traveler and transportation related agencies identified the functional areas to be improved (i.e. Travel Conditions). The Polaris Project took the functional wants and needs and associated the wants and needs functions to current Minnesota Agencies. Another factor that contributed to identifying the candidate agencies was the presence of existing Intelligent Transportation Systems infrastructure that has been deployed to support integrating open systems for travelers, inter-agency and intra-agency needs.

One hundred twenty one pre-survey candidate systems identified by the process described previously, are listed in Appendix A. The pre-survey candidate list represents systems that were known by members of the Polaris Architecture working team, Mn/DOT Guidestar, and SRF

Consulting Group, Inc. Of the 121 candidate systems, 38 system surveys were performed and included in this document. The 3 8 systems were selected as "best representatives" of the 121 pre-survey candidates and provided a diverse base of information to use for developing the Minnesota Statewide ITS Architecture.

### 2.2.2 Data Collection Guide

The survey of systems required that a standard data collection approach be applied for the *Statewide ITS As-IsAgency Reports for Minnesota*. A data collection guide was prepared to help this effort.

The data collection guide was developed to provide interviewers with an overview of relevant information that needed to be collected during the survey for each system. The data collection effort focused on the following:

- A block diagram of the system and interfaces to external users and systems.
- All hardware elements that are interconnected to form the bounds of the system.
- All software components used by the hardware elements.
- All system interfaces that connect hardware components together and external systems to the system.
- All personnel using the system.

The Data Collection Guide is presented in Appendix B.

### 2.2.3 Field Data Collection

The survey collection activities were completed by two teams of interviewers. Prior to an on-site interview, an agency or system contact person was briefed as to the nature of the survey. In some cases, generally where agencies knew little of the Polaris project, a follow-up letter was sent to further outline the desired level of information.

The on-site interview was generally a free format discussion of the specific system elements. The data collection guide was only used to ensure all components where discussed. The interviewers recorded the audio portion of the interview in order to help with the documentation of the system. Where possible, the actual system components were also recorded on videotape, again, to help with the system documentation. In some cases, written documentation from the agency was reviewed to help describe the system.

A report of the surveyed system followed a standard format and consisted of two basic parts: 1) a system block diagram and 2) a data collection template. The block diagram is intended to depict the system components and interfaces while the template thoroughly describes the system configuration. The template is organized to step through the system related personnel, hardware, software and interfaces. All systems documented for the project used this standardized approach. The system documentation was separated by agencies into eight volumes.

The system reports contained in this volume follow in Section 3.

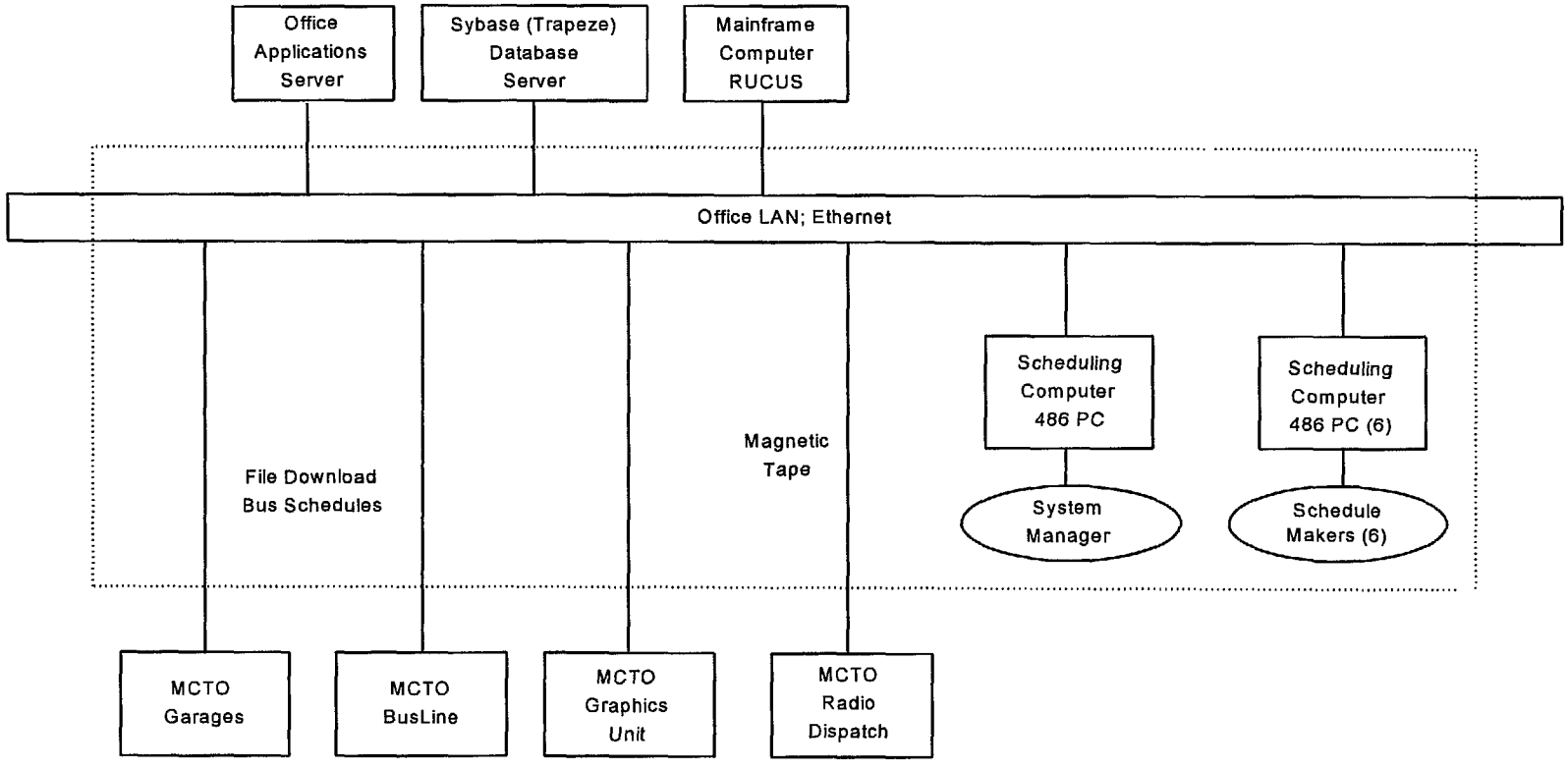
# 3. As-Is BASELINE SYSTEM DOCUMENTATION

## 3.4 METROPOLITAN COUNCIL TRANSIT OPERATIONS AND METRO MOBILITY

# 3.4.1 MCTO TRAPEZE SCHEDULING/PLANNING SYSTEM

POLARIS As-Is Baseline Data Collection

## MCTO Trapeze Scheduling/Planning System



# AS-IS DATA COLLECTION TEMPLATE

## 1.0 AGENCY "MCTO SCHEDULING AND PLANNING DEPARTMENT"

| | |
|---|---|
| - Agency Type | Transit Provider |
| - Agency Functions | Build transit schedules.. |
| - Agency Location(s) | MCTO Heywood Facility, 560 Sixth Avenue N., Minneapolis, MN 5541 l-4398 |
| - Recommended Improvements | MCTO needs an accurate GIS system which includes the roadways/streets their buses run on. The GIS map needs to accurately show the streets and roadways at a low level (city streets) with street attributes such as one ways and cul-de-sacs. |
| - Contacts | Dennis Tollefsbol, Manager of Service Analysis and Support, 349-7770 349-7675(fax) |

## 2.0 SYSTEM "MCTO TRAPEZE SCHEDULING/PLANNING SYSTEM"

| | |
|---|---|
| - Date of As-Is Data Collection | 2/5/96 |
| - Purpose | This system is used to build bus and driver transit schedules. |
| - Hours of Operation | M - F, normal business hours. The Novell network is up and running 7 days a week but Trapeze is normally not used on weekends. |
| - Geographic Coverage | 7 county area (Anoka, Hennepin, Ramsey, Dakota, Scott, Carver, Washington). |
| - Contacts | Dennis Tollefsbol, 349-7770 349-7675 (fax) |
| - Status | Existing. |
| - Policies | Trapeze is used to make schedules for private providers |
| - Constraints | 1) Labor agreements(Transit Union 1005). Drivers are limited to driving from 6.5 to 9.25 hours. This requires a mid-route driver change during some routes.<br>2) Schedule Makers must have some knowledge of the system to use Trapeze to schedule a route since the number of routes is high and the large number of variables involved in the system. |
| - Recommended Improvements | 1) MCTO would like a GIS system.<br>2) MCTO is thinking about creating a "Home Page" on the Internet or on an electronic bulletin board that would make transit schedules available to computer users in the next year or so. |
| - Block Diagram | See attached |

| | |
|---|---|
| - Typical Operational Scenario | 1) Scheduler writes a "Trip" from point A to point B with 10 - 20 intermediate time points between the origin and destination of the Trip. The Schedule Makers will write thousands of these Trips to cover the transit routes. Once they have these trips written, they put these Trips together in the most economical way for the vehicle to cover the Trips. Once the vehicles have been assigned to cover multiple Trips, then the Scheduler divides the vehicle work among Driver shifts.<br>2) MCTO makes minor changes to the system every week such as shifting trip times by a few minutes, changing the type of bus on a route, adding/deleting trips. MCTO makes the major system changes 4 times per year. For instance, of the 120 routes that MCTO controls, they will make major changes to 40 of these routes in April. Major changes may include a new route, new destinations within a route, changes in running times of buses along a route, assignment of drivers to a new route, etc.<br>3) A "Run" is a list of buses, locations, and times that a driver follows. A Trip is the movement of a vehicle from point A to point B and may be a revenue generating Trip, non-revenue generating Trip, or an interline Trip. An "interline" is a trip from one route to the next. A "Block" is the list of locations and times that a bus follows.<br>4) MCTO does the scheduling for virtually all of the Transit Service Providers. The private providers tell MCTO when they want a particular route to arrive/leave downtown, and MCTO will build the rest of the schedule using this constraint. |
| - Other | 750 buses in the MCTO fleet. Types of buses are: 60' 40', 30' (30' buses are being phased out), Articulated, buses equipped with a handicap lift. Service life of a bus is 12 years. MCTO buses log a total of 30 million miles a year. MCTO has 5 bus garages in the Twin Cities. Schedule covers 120 different bus routes. |

2.1 PERSONNEL "SYSTEM MANAGER"

| | |
|---|---|
| - Personnel Function | Manage service analysis and route scheduling |
| - Quantity | One |
| - Location | MCTO Heywood facility |
| - Workload | N/A |
| - Working hours | M - F, 40 hrs/wk. |
| - Status | Existing |

2.2 PERSONNEL "SCHEDULE MAKERS"

| | |
|---|---|
| - Personnel Function | Build transit schedules on a daily basis. |
| - Quantity | 6 full time people |
| - Location | MCTO Heywood facility |
| - Workload | N/A |
| - Working hours | 40 hours/week during normal business days. |
| - Status | Existing |
| - Recommended Improvements | No plans for adding people. |

2.3 PERSONNEL "SYSTEM SUPPORT PERSONNEL"

| | |
|---|---|
| - Personnel Function | Support MCTO's office networks including Trapeze, BusLine, AS400, Mainframe, Metropolitan Council network, general office LAN, etc. |
| - Quantity | 2 - 3 people |
| - Location | MCTO Heywood facility |
| - Workload | N/A |
| - Working hours | 40 hours/week during normal business days. |
| - Status | Existing |
| - Recommended Improvements | No plans for adding people. |
| - Other | Jim Pelecheck is the supervisor, has intimate knowledge of Applications and interfaces between systems. |

3.1 HARDWARE "TRAPEZE SERVER"

| | |
|---|---|
| - Hardware Type | Novell 3.11 network file server |
| - Functions | Stores the scheduling database and the Trapeze SW. |
| - Location | MCTO Computer Room |
| - Other | There are 3 servers in the MCTO network, one of the network servers is mostly dedicated as the Trapeze server. |

### 3.1.2 SOFTWARE "TRAPEZE FX"

| | |
|---|---|
| - Software Type | Current system is DOS based. |
| - Software Standards | Trapeze works out of a BTRIEVE database. MCTO takes the data out of the BTRIEVE database and exports it into a Sybase database. MCTO uses Crystal to create reports from the data in the Sybase database. |
| - Functions | Used to build transit schedules. Trapeze acts like a calculator in computing the time it will take to reach each schedule time point along a route. |
| - Application Language | C++ |
| - Status | Existing. Have had Trapeze for 2 years and have upgraded new versions 4 times. Version updates are installed by MCTO |
| - Policies | MCTO gets a 2 year warranty with the Trapeze SW., and can purchase a maintenance agreement after this time. |
| - Constraints | Requires each Scheduler's PC to have 600K of RAM available. The Trapeze SW is resident on the sever but is downloaded to each Scheduler's PC when they use the system. Trapeze SW is a proprietary, commercial product. The 600K of RAM is a problem under DOS, but the next version is supposed to use less memory. |
| - Issues | The Trapeze system is not a "black box" or a database that can produce the correct answer by simply doing a search.....The Schedule Makers must have some knowledge of the system to use Trapeze to schedule a route since the system is so big and the number of routes is high and the large number of variables involved in the system. |
| - Recommended Improvements | MCTO will do an upgrade to the software this spring. They are going through the acceptance testing of this new version now. This new version of Trapeze will be modular, therefore it won't require as much memory on the Scheduler's PCS to run. A Windows version of Trapeze is coming out in the fall of 1996, MCTO will probably move to this in the future. The newer versions of Trapeze will use a Sybase database. MCTO currently has 3 versions of Trapeze (current version, upgrade version, a version they are using to make bus driver contract changes). |
| - Contact | Dennis Tollefsbol |

| | |
|---|---|
| - Other | The old scheduling system was a mainframe based batch system that used RUCUS. Planning and Scheduling still fills the old RUCUS database with data from the Trapeze database (BTRIEVE) each week so that the Radio, TIC, and Payroll systems can get the data in the RUCUS format. RUCUS is a sequential database and is written in FORTRAN 4. TIC will move from RUCUS to Sybase as soon as MCTO is done acceptance testing. Then the utilization of Sybase database and Crystal as a report generator will grow dramatically. MCTO Finance Dept. uses some of the summary statistics generated using the Crystal report maker. Trapeze Software Inc. writes the Trapeze software. |

## 3.2 HARDWARE "SCHEDULING COMPUTER"

| | |
|---|---|
| - Hardware Type | 486 PC with 8 meg. memory |
| - Functions | User specific pieces of the Trapeze software reside on this PC. The operator downloads data from the Trapeze server database and runs the user definable software to build transit schedules. |
| - Location | MCTO Heywood facility - 5th floor offices |
| - Data Name/Contents | Creates bus vehicle schedules (Trips) and driver schedules (Runs). Data content includes the geographic points along a route (cross street) and the time of day when the bus should leave this point. The data is printed out on paper(Block Paddle) which the drivers use to keep on the time schedule. Constraint information pertaining to the garage parameters and allowable hours a driver can drive are retained on this PC. |
| - Data Type | Data - route numbers, dates, times, physical locations along a route. The travel time between route time points are obtained from MCTO planners, supervisors, and bus drivers. |
| - Status | Existing (6) |
| - Policies | All new personal computers that are purchased for MCTO are Pentium based with 1 gig. Hard drive, 16 meg. memory. |
| - Constraints | Cannot load Crystal report making SW when running trapeze on these PC's because RAM is not available. |
| - Other | There are six scheduling computers, in addition to the System Manager's PC which is tied into the network. |

### 3.2.1 SOFTWARE "SCHEDULING PC SOFTWARE"

| | |
|---|---|
| - Software Type | DOS based, user defined portions of the Trapeze SW. |
| - Software Standards | Trapeze is a proprietary software. |
| - Issues | MCTO Schedule Makers use a memory manager to make enough memory available for loading on the needed Trapeze SW. |

| | |
|---|---|
| 4.1 INTERFACE | TRAPEZE SERVER |
| - Connects to . . . | Connects scheduling PC's, MCTO garage PC's. |
| - Interface location | MCTO Heywood facility |
| - Interface Type | Ethernet - Novel network version 3.12 |
| - Interface Direction | Both |
| - Interface Component | Coax cable |
| - Protocol/Standard | IPX |
| - Information Type/Content | Trapeze schedule database - schedule times, route numbers, schedule time points, Trapeze program loading. |
| - Information Direction | Both |
| - Information Frequency | As needed while Schedule Makers work on system. |
| - Information Standards | Trapeze info. |

| | |
|---|---|
| 4.2 INTERFACE | TRAPEZE SERVER |
| - Connects to . . . | MCTO Garages |
| - Interface location | Garages |
| - Interface Type | Data - Sybase database |
| - Interface Direction | Trapeze system to Garage |
| - Interface Component | Network |
| - Protocol/Standard | N/A |
| - Information Type/Content | The MCTO garages get the Trapeze bus schedule data in a Sybase database format and use this data to create a checkout sheet. The checkout sheet contains the information about when the Driver should leave the garage to start a route, a schematic diagram of the garage with buses so that garage personnel can send a bus of the appropriate type (30', 40' etc) to a route. |
| - Information Direction | Trapeze to Garage |
| - Information Frequency | Weekly |

| 4.3 INTERFACE | TRAPEZE SERVER |
|---|---|
| - Connects to . . . | MCTO Radio System |
| - Interface location | MCTO Heywood facility |
| - Interface Type | Data - bus/driver schedules.. |
| - Interface Direction | Trapeze to radio dispatch |
| - Interface Component | Magnetic tape. |
| - Information Type/Content | Trapeze provides the following information to the radio system: Run data, shows bus and driver schedules and routes such as when the bus leaves the garage, when it is scheduled to leave each node on the route, type of bus. |
| - Information Direction | Trapeze to radio dispatch. |
| - Information Frequency | Once per week. |

| 4.4 INTERFACE | TRAPEZE SERVER |
|---|---|
| - Connects to . . . | Travlink System - this interface has been disabled. |
| - Interface location | MCTO Computer Room |
| - Interface Direction | One way - Trapeze to Travlink |
| - Information Type/Content | Trapeze provides data to the Travlink project showing where the routes are and the timing of those routes. |
| - Other | Trapeze outputs a database which is converted to Westinghouse format for its CAD/AVL system. Currently, Travlink is no longer being used and this interfaced has been disabled. |

| 4.5 INTERFACE | TRAPEZE SERVER |
|---|---|
| - Connects to . . . | MCTO shelter signs unit |
| - Interface location | MCTO Heywood facility |
| - Interface Type | Data - bus schedules |
| - Interface Direction | Trapeze to shelter sign unit |
| - Interface Component | Network |
| - Information Type/Content | Schedule data is exported from the BTRIEVE database to the Sybase database on the network and available to the MCTO personnel who produce pocket shelter signs. They load this into a Macintosh PC and make up the signs. |
| - Information Direction | Trapeze to shelter signs unit |
| - Information Frequency | Once per week. |

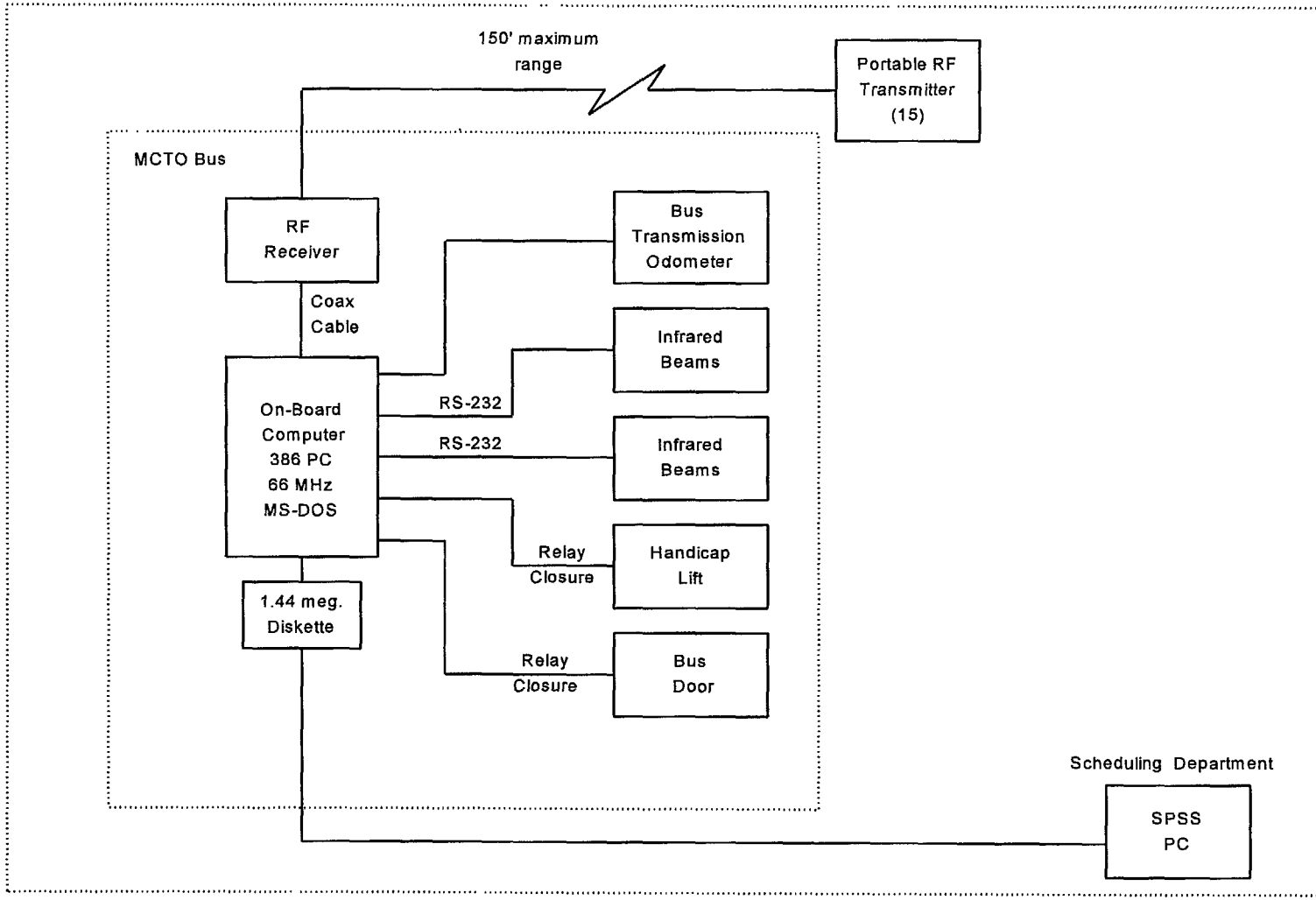
| 4.6 INTERFACE | TRAPEZE SERVER |
|---|---|
| - Connects to . . . | BusLine System |
| - Interface location | MCTO Heywood facility |
| - Interface Type | Data |
| - Interface Direction | Trapeze to BusLine |
| - Interface Component | LAN |
| - Information Type/Content | The BusLine system also gets schedule data from the Crystal reports. |
| - Information Direction | Trapeze to BusLine |
| - Information Frequency | Weekly |

| 4.7 INTERFACE | TRAPEZE SERVER |
|---|---|
| - Connects to . . . | Other MCTO systems |
| - Interface location | MCTO Heywood facility |
| - Interface Type | Data |
| - Interface Direction | Trapeze to other MCTO systems |
| - Interface Component | LAN |
| - Information Type/Content | The old scheduling system was a mainframe based batch system that used RUCUS. Planning and Scheduling still fills the old RUCUS database with data from the Trapeze database (BTRIEVE) each week so that the Radio, TIC, and Payroll can get the data in the RUCUS format. RUCUS is written in FORTRAN 4. TIC will move from RUCUS to Sybase as soon as MCTO is done acceptance testing. Then the utilization of Sybase database and Crystal as a report generator will grow dramatically. MCTO Finance Dept. uses some of the summary statistics generated using the Crystal report maker. Trapeze Software Inc. writes the Trapeze software. |

# 3.4.2 MCTO AUTOMATIC PASSENGER COUNTING SYSTEM

POLARIS As-Is Baseline Data Collection

## MCTO Automated Passenger Counting System



# AS-IS DATA COLLECTION TEMPLATE

## 1.0 AGENCY "MCTO SCHEDULING AND PLANNING DEPARTMENT"

| | |
|---|---|
| - Agency Type | Transit Provider |
| - Agency Functions | Build transit schedules. |
| - Agency Location(s) | MCTO Heywood Facility, 560 Sixth Avenue N., Minneapolis, MN 5541 l-4398 |
| - Recommended Improvements | MCTO needs an accurate GIS system which includes the roadways/streets their buses run on. The GIS map needs to accurately show the streets and roadways at a low level (city streets) with street attributes such as one ways and cul-de-sacs. |
| - Contacts | Dennis Tollefsbol, Manager of Service Analysis and support, 349-7770 349-7675(fax) |

## 2.0 SYSTEM "MCTO AUTOMATIC PASSENGER COUNTING SYSTEM"

| | |
|---|---|
| - Date of As-Is Data Collection | 2/5/96 |
| - Purpose | This system is used to collect bus ridership information on selected routes. The data is collected for use in planning bus schedules, vehicle needs, etc. |
| - Hours of Operation | 24 hours/day as needed. |
| - Geographic Coverage | Roadside units are portable, can be installed along any route in the 7 county Metro area to collect data as needed. Must assign equipped buses to route being studied. |
| - Contacts | Dennis Tollefsbol, 349-7770 (voice) - 349-7675 (fax) |
| - Status | Existing on 10 buses. Will have 35 buses equipped in near future. May equip up to 50 buses some day. |
| - Policies | Would not want to have this system on all buses and routes because the MCTO does not need all of the data that would be collected. Therefore this is used as needed to study route ridership/loading patterns. |
| - Constraints | Must physically move the 15 portable transmitters from poles along one route to the next route when they want to study a new route if location data is desired. Only have on 10 buses equipped at present time. |
| - Recommended Improvements | Would like to use GPS to replace the pole mounted transmitters. This would eliminate the need to manually relocate the portable RF transmitter from one route to the next. |

| | |
|---|---|
| - Typical Operational Scenario | Up to 15 small, portable transmitters are placed on poles along a bus route XX that needs to be studied. The MCTO Scheduling and Planning department notifies the MCTO Garage to put up to 10 buses equipped with the automatic passenger counters on Route XX. As these buses travel along Route XX and the bus gets approximately 150 feet from a portable transmitter, the receiver on the buses receives the Transmitter signal and marks the on-board database.<br>All bus loading and unloading activity is recorded and stored on a 1.44 megabyte diskette in the on-board PC. As the bus moves out of range of the Transmitter (150') another date/time stamp is made in the database. At the end of the week, the 1.44 megabyte diskette is removed from the on-board PC and used by the Scheduling department.<br>The Scheduling department takes the bus route XX schedule data and overlays onto the ridership data collected by this system and uses this data to make route/schedule changes, vehicle changes, etc.<br>The scheduling department uses SPSS PC (DOS based) to produce reports for statistical reporting. |

2.1 PERSONNEL "SCHEDULE MAKERS"

| | |
|---|---|
| - Personnel Function | Build transit schedules. Use data obtained from automatic passenger counters to make minor changes weekly to schedules and assigned vehicles. |
| - Quantity | 6 full time people - these people are using other systems besides this system to do their jobs. |
| - Location | MCTO Heywood facility |
| - Workload | N/A |
| - Working hours | 40 hours/week during normal business days. |
| - Status | Existing |
| - Recommended Improvements | No plans for adding people. |

### 3.1 HARDWARE "ON-BOARD COMPUTER"

- Hardware Type: 386 PC - Industrial Ziatectech
- Functions: Records and stores passenger loading information on route by time of day and bus stop location.
- Location: On board each of 10 equipped MCTO buses.
- Data Name/Contents:
  l)Time that bus comes within 150 feet of transmitter.
  2)Transmitter identification number.
  3)Time at stop.
  4)Time that bus leaves 150 foot range of Transmitter .
  5)Passenger loading information consisting of the number of passengers entering and exiting.
  6)Each time the doors open.
  7)Bus mileage.
  @Each time the handicap lift is used on equipped buses.
- Data Type: Database. Data is stored on a 1.44 megabyte diskette.
- Status: Existing on 10 buses. Will add this to 25 more buses in near future. Eventually would like to have 50 buses instrumented with this system.
- Contact: Dennis Tollefsbol

#### 3.1.1 SOFTWARE "ON-BOARD COMPUTER SOFTWARE"

- Software Type: Operating System
- Software Standards: MS-DOS
- Functions: Executes custom made "On-Board computer software"

#### 3.1.2 SOFTWARE "ON-BOARD COMPUTER SOFTWARE"

- Software Type: Application
- Software Standards: Custom made software for this application
- Functions: Monitors incoming data from infrared beams and records bus travel and loading activity.

### 3.2 HARDWARE "INFRARED PASSENGER COUNTER SENSORS"

- Hardware Type: Infrared sensor
- Functions: Senses a disturbance in zone (bus doorway) to count a passenger entering or exiting a bus.
  Use of multiple sensors allows discrimination between entering and exiting.
- Location: On board one of 10 equipped MCTO buses.
- Data Name/Contents: N/A
- Data Type: Event
- Status: Existing on 10 buses.
- Recommended Improvements: Will add to 25 additional buses shortly.
- Contact: Dennis Tollefsbol

3.3 HARDWARE "PORTABLE TRANSMITTER"

| | |
|---|---|
| - Hardware Type | RF Transmitter, battery powered |
| - Functions | Constantly emit an RF signal. This signal is recognized by Receivers on equipped buses. |
| - Location | Portable. 15 separate units placed on poles along a route that needs to be studied. |
| - Data Name/Contents | N/A |
| - Data Type | N/A |
| - Status | Existing - 15 units. |
| - Constraints | Units must be physically moved from route to route. 150 foot detection range from Transmitter to Receiver. |
| - Recommended Improvements | Would like to replace these portable transmitters with GPS system. This would eliminate the need to move transmitters from one route to another each week. |
| - Contact | Dennis Tollefsbol |
| - Other | Transmitters are powered by battery and solar cells. Transmitters have 9-10 dip switches that can be set to identify each Transmitter on the on-board computer database. |

3.4 HARDWARE "RF RECEIVER"

| | |
|---|---|
| - Hardware Type | RF Receiver |
| - Functions | Receives RF signal when bus is within 150 feet of Transmitter. |
| - Location | On 10 buses equipped with automated counting equipment. |
| - Data Name/Contents | N/A |
| - Data Type | N/A |
| - Status | Existing - 10 units. |
| - Contact | Dennis Tollefsbol |

| | |
|---|---|
| 4.1 INTERFACE | INFRARED PASSENGER COUNTER SENSORS |
| - Connects to . . . | On-Board Computer |
| - Interface location | On 10 equipped MCTO buses |
| - Interface Type | Data |
| - Interface Direction | Both |
| - Interface Component | RS-232 cables |
| - Protocol/Standard | RS-232 |
| - Information Type/Content | Sensor disturbance - infrared beam has been broken by a passenger. |
| - Information Direction | Sensor to PC |
| - Information Frequency | Whenever passenger passes through beam. |
| - Other | Each sensor is connected to a port in the on-board computer. The computer determines if the passenger is loading or unloading by the sequence that the multiple beams are broken. |

| | |
|---|---|
| 4.2 INTERFACE | ON-BOARD COMPUTER |
| - Connects to . . . | Handicap Lift, bus doors |
| - Interface location | On 10 equipped MCTO buses, located at entrance doors to bus |
| - Interface Type | Hardwire relay closure. |
| - Interface Direction | Door/Lift to the computer. |
| - Interface Component | Cable |

| | |
|---|---|
| 4.3 INTERFACE | PORTABLE TRANSMITTER RF INTERFACE |
| - Connects to . . . | Automatic passenger counter receiver |
| - Interface location | Roadside to bus. Usually at bus stop. |
| - Interface Type | RF signal. |
| - Interface Direction | One way - roadside Transmitter to bus receiver. |
| - Interface Component | N/A |
| - Information Type/Content | N/A |
| - Information Direction | N/A |
| - Information Frequency | Continuous signal emitted |
| - Information Standards | N/A |
| - Constraints | 150 foot range. Limited to spot locations where portable RF transmitters are located. |

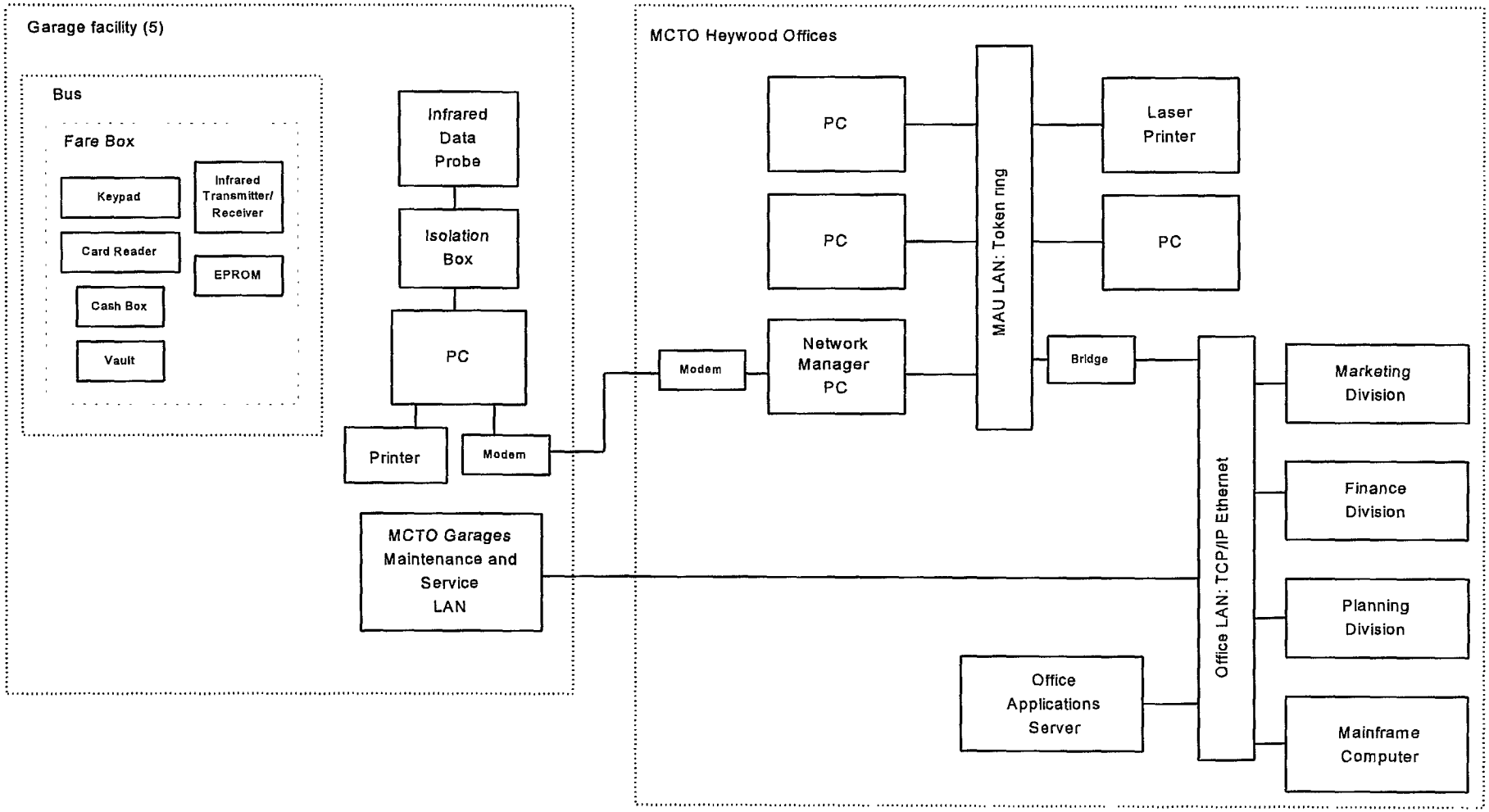
| | |
|---|---|
| 4.4 INTERFACE | RF RECEIVER |
| - Connects to . . . | On-Board Computer |
| - Interface location | On 10 equipped MCTO buses, from bus roof to computer. |
| - Interface Type | RF signal. |
| - Interface Direction | One way - antenna to computer. |
| - Interface Component | Coax cable |

| | |
|---|---|
| 4.5 INTERFACE | ON-BOARD COMPUTER |
| - Connects to . . . | Bus odometer |
| - Interface location | On 10 equipped MCTO buses. |
| - Interface Type | Data |
| - Interface Direction | Odometer to On-Board Computer. |
| - Interface Component | Cable |
| - Information Type/Content | The same electrical signal that goes from the bus transmission to the bus odometer is sent to a communications port on the On-Board Computer. |

# 3.4.3 MCTO ELECTRONIC FARE COLLECTIONSYSTEM

POLARIS As-Is Baseline Data Collection

## MCTO Electronic Fare Collection System




mcto_far pre
4-01-96

## 1.0 AGENCY "METROPOLITAN COUNCIL TRANSIT OPERATIONS (MCTO)"

| | |
|---|---|
| - Agency Type | Public Transit Provider |
| - Agency Functions | Plan and operate transit service within the Twin Cities Metro Area. |
| - Agency Location(s) | 560 Sixth Av. North<br>Minneapolis, MN 5541 l-4398 |

## 2.0 SYSTEM "MCTO ELECTRONIC FARE COLLECTION SYSTEM'

| | |
|---|---|
| - Date of As-Is Data Collection | 2/22/96 |
| - Purpose | Collect, review and distribute revenue and ridership data for MCTO. |
| - Hours of Operation | The electronic fare collection system is used on all buses and operates when buses are in operation. Data from the fare collection system is collected from the garage computers by office personnel Monday through Friday. |
| - Geographic Coverage | All MCTO buses |
| - Contacts | Lynn Wallace<br>Department Supervisor<br>Metropolitan Council Transit Operations<br>560 Sixth Avenue North<br>Minneapolis, MN 5541 l-4398<br>(612) 349-7308 (voice)<br>(612) 349-7675 (fax) |
| - Status | Existing |
| - Policies | The office is the official source for existing ridership data. |
| - Issues | There have been problems with receiving data from the garage facilities, they would like to have a direct connection with each of the garage facilities for data transfer. |
| - Block Diagram | See attached |

| | |
|---|---|
| - Other | 1) This documentation includes information collected on the magnetic stripe card reading system that will be in operation by July, 1996. The card reader is an add-on piece of equipment that is attached to the existing electronic fare box. The new card reader system will replace the current rider passes with debit cards. There will be three types of cards : 1) a stored value card in $10.00, $15.00 and $20.00 denominations; 2) a period pass card that will be valid for 3 1 consecutive days from the date of first use; 3) a transfer card. It was unclear on how the new card reader system would affect the driver interaction with the fare box. The new system will be able to log each transaction and it was not known at the time of the interview what, if any, changes to the overall data collection, manipulation and reporting system would be made. A new DOS or UNIX based database system will be implemented when the new magnetic stripe card reading system is in operation.<br>2) There are several other transit providers in the Twin Cities metropolitan area that are operating the same electronic fare collection system including Medicine Lake Lines and North Suburban. There is currently no communication of data between the transit providers. |

- Typical Operational Scenario

1) The driver enters the bus at the beginning of a route and logs into fare box using the key pad. The driver enters their driver number, the route number, the run number, the direction of travel and city (either Minneapolis or St. Paul). The fare box uses the preprogrammed fare structure which varies by the time of day.
2) As a passenger boards the bus along the route, they either deposit the correct fare or give the driver a rider pass. The driver keys the appropriate button on a keypad to designate what type of fare, whether there is any extra charge and/or passenger type.
3) The existing fare data collection system logs running totals on an hourly basis.
4) The driver at the end of their shift/route pulls into the garage where a route puller uses an infrared probe to download information to the garage computer. The route puller places the hand-held probe on the transmitter/receiver window on the farebox.
5) The puller also removes the cash vault and replaces it with an empty one.
6) The revenue supervisor runs standard reports on the daily data.
7) The network manager computer dials up each of the five garage computers every week night and uploads files from each garage containing the daily data on revenue collected, passenger, route and driver information.
8) The files are combined by the revenue balancer staff person for each garage and uploaded to the mainframe computer. The revenue balancer processes, edits and maintains data.
9) The office produces reports daily including security, maintenance, daily ridership, revenue and driver report.
10) The revised files are uploaded to mainframe for use by other departments and backup purposes. The revenue balancer only edits incorrect driver login data.
11) The revenue department uses the data collected to check revenues counted by the financial department and for billing to the suburban transit providers.
12) The information from the electronic fare collection system is also used to provide ridership information on specific routes and/or corridors for other MCTO departments or consultants.
13) Internal departments have access to data on the mainframe computer and produce their own reports.

2.1 PERSONNEL "DEPARTMENT SUPERVISOR"

| | |
|---|---|
| - Personnel Function | Oversees the daily operation and personnel of electronic fare collection system as well as other projects not related to the fare collection system. |
| - Quantity | 1 |
| - Location | MCTO Heywood offices |
| - Working hours | Normal workday |
| - Status | Existing |

2.2 PERSONNEL "REVENUE CLERK"

| | |
|---|---|
| - Personnel Function | Provides billing statements (including the revenue collected credits) and reports to suburban transit providers. |
| - Quantity | 1 |
| - Location | MCTO Heywood offices |
| - Working hours | Normal workday |
| - Status | Existing |

2.3 PERSONNEL "REVENUE/R.IDERSHIP ANALYST"

| | |
|---|---|
| - Personnel Function | Responsible for official revenue and ridership information/reports for distribution to other MCTO departments, consultants and the general public. |
| - Quantity | 1 |
| - Location | MCTO Heywood offices |
| - Working hours | Normal workday |
| - Status | Existing |

2.4 PERSONNEL "REVENUE BALANCER"

| | |
|---|---|
| - Personnel Function | Responsible for processing data from garage computer, editing erroneous login data (does not edit any of the summary transactional data), and maintaining database. Also responsible for generating daily reports for internal distribution. |
| - Quantity | 1 |
| - Location | MCTO Heywood offices |
| - Working hours | Normal workday |
| - Status | Existing |

2.5 PERSONNEL "TECHNICAL ASSISTANT"

| | |
|---|---|
| - Personnel Function | Provide support and back up to other staff personnel |
| - Quantity | 2 |
| - Location | MCTO Heywood offices |
| - Working hours | Normal workday |
| - Status | Existing |

2.6 PERSONNEL "INFORMATION SYSTEM PERSONNEL"

- Personnel Function: Provide computer support and upload files to mainframe computer system.
- Quantity: 1
- Location: MCTO Heywood offices
- Working hours: Normal workday
- Status: Existing

2.7 PERSONNEL "REVENUE SUPERVISOR"

- Personnel Function: Oversee garage fare collection computer system operation and personnel.
- Quantity: 1 per garage facility (5 total)
- Location: MCTO garage locations
- Status: Existing

2.8 PERSONNEL "ROUTE PULLER"

- Personnel Function: Remove and replace vault from the bus and operate probe to upload data from the fare box to the garage computer.
- Quantity: 1 per garage facility (5 total)
- Location: MCTO garage locations
- Status: Existing

2.9 PERSONNEL "FARE BOX TECHNICIAN"

- Personnel Function: Service and maintain fare boxes.
- Quantity: 1 per garage facility (5 total)
- Location: MCTO garage locations
- Status: Existing

2.10 PERSONNEL "MOBILE FARE BOX TECHNICIAN"

- Personnel Function: Service and maintain fare boxes in field.
- Quantity: 2 per garage facility (10 total)
- Location: MCTO garage locations
- Status: Existing

3.1 HARDWARE "FARE BOX"

- Hardware Type: Cabinet
- Functions: Houses electronic fare collection system components: keypad, card reader, cash box, vault, infrared transmitter/receiver and EPROM module.
- Location: On each bus
- Status: Existing
- Other: GENFARE Incorporated (GFI)
  Elk Grove Village, IL

## 3.2 HARDWARE "KEYPAD"

| | |
|---|---|
| - Hardware Type | Keypad |
| - Functions | Enables driver to login to the electronic farebox system and input passenger type and/or extra fare charge. See attachment for driver log on information and key pad button function. |
| - Location | On each bus |
| - Data Name/Contents | Driver login, extra fare charge |
| - Data Type | Data |
| - Status | Existing |
| - Other | GENFARE Incorporated (GFI)<br>Elk Grove Village, IL |

## 3.3 HARDWARE "CASH BOX"

| | |
|---|---|
| - Hardware Type | Cash box |
| - Functions | Collects and counts cash fares |
| - Location | On each bus |
| - Data Name/Contents | Cash fare collected |
| - Data Type | Data |
| - Status | Existing |
| - Other | GENFARE Incorporated (GFI)<br>Elk Grove Village, IL |

## 3.4 HARDWARE "VAULT"

| | |
|---|---|
| - Hardware Type | Vault |
| - Functions | Collects cash fares |
| - Location | On each bus |
| - Data Name/Contents | Vault number |
| - Data Type | Data |
| - Status | Existing |
| - Other | Each vault has its own serial number that fare box logs when inserted.<br>GENFARE Incorporated (GFI)<br>Elk Grove Village, IL |

### 3.5 HARDWARE "EPROM MODULE"

| | |
|---|---|
| - Hardware Type | EPROM module |
| - Functions | Has fare structure programmed and stores summary of hourly transactions. |
| - Location | On each bus |
| - Data Name/Contents | Fare structure by time of day, passenger type, payment type and driver information from keypad. |
| - Data Type | Data |
| - Status | Existing |
| - Constraints | Existing system memory limited to 100 records |
| - Other | It was not clear from the interview what changes might be made to the EPROM to enable system to save every transaction with the card reader system.<br>GENFARE Incorporated (GFI)<br>Elk Grove Village, IL |

### 3.6 HARDWARE "INFRARED TRANSMITTER / RECEIVER"

| | |
|---|---|
| - Hardware Type | Optical transmitter/receiver |
| - Functions | Transfers information from farebox to the data probe. |
| - Location | On each bus |
| - Data Name/Contents | Passenger type, payment type, payment amount and driver information. |
| - Data Type | Data |
| - Status | Existing |
| - Other | GENFARE Incorporated (GFI)<br>Elk Grove Village, IL |

### 3.7 HARDWARE "MAGNETIC STRIPE CARD READER"

| | |
|---|---|
| - Hardware Type | Magnetic stripe card reader |
| - Functions | Reads and writes information to card |
| - Location | On each bus |
| - Data Name/Contents | Fare collected/debited |
| - Data Type | Data |
| - Status | New |
| - Other | Three types of cards will be used:<br>1) Stored value card in $10.00, $15.00 and $20.00 increments.<br>2) Period pass card which will be valid for a 3 1 consecutive day period after the first use and is equal to 42 times the ride value.<br>3) Transfer card<br>GENFARE Incorporated (GFI)<br>Elk Grove Village, IL |

### 3.8 HARDWARE "INFRARED TRANSMITTER / RECEIVER PROBE"

| | |
|---|---|
| - Hardware Type | Optical transmitter/receiver |
| - Functions | Transfer information to/from the fare box infrared transmitter/receiver. |
| - Location | 2 per MCTO garage facility (10 total) |
| - Data Name/Contents | Passenger type, payment type, payment amount and driver information. |
| - Data Type | Data |
| - Status | Existing |
| - Other | GENFARE Incorporated (GFI)<br>Elk Grove Village, IL |

### 3.9 HARDWARE "ISOLATION BOX"

| | |
|---|---|
| - Hardware Type | Isolation box |
| - Functions | It was unclear from the interview what the function is of this piece of hardware. It appears that it supplies power to the data probe from a universal power supply. |
| - Location | 1 per MCTO garage facility (5 total) |
| - Data Name/Contents | Not applicable |
| - Data Type | Not applicable |
| - Status | Existing |
| - Other | GENFARE Incorporated (GFI)<br>Elk Grove Village, IL |

### 3.10 HARDWARE "PC"

| | |
|---|---|
| - Hardware Type | Personal computer |
| - Functions | 1) Runs GFI fare collection software<br>2) Receives call from network manager PC for data upload.<br>3) Other offce functions. |
| - Location | 1 per MCTO garage facility (5 total) |
| - Data Name/Contents | Passenger type, payment type, payment amount, driver information, route number, run number, direction and city. |
| - Data Type | Data |
| - Status | Existing |
| - Constraints | This computer system could not be connected to the garage local area network. It was not known by the contact person being interviewed whether this was a problem with the computer or the GFI software. |
| - Other | NEC 3 86-66Mhz |

### 3.10.1 SOFTWARE "GFI FARE COLLECTION SOFTWARE"

- Software Type: Application
- Software Standards: Proprietary - DOS based application
- Functions: Polls data from fare box, clears and stores information to the garage computer.
- Status: Existing

### 3.10.2 SOFTWARE "DOS - LATEST VERSION"

- Software Type: Operating system
- Software Standards: DOS
- Functions: 1) Control PC hardware resources
  2) Executes software applications
- Status: Existing

### 3.11 HARDWARE "PRINTER"

- Hardware Type: Printer
- Functions: Prints summary reports from the GFI software
- Location: 1 per MCTO garage facility (5 total)
- Data Name/Contents: Passenger type, payment type, payment amount, driver information, route number, run number, direction and city.
- Data Type: Data
- Status: Existing
- Other: Dot Matrix printer

### 3.12 HARDWARE "GARAGE MODEM'

- Hardware Type: Modem - 2400 BPS
- Functions: Enables communication over telephone line to network manager PC in MCTO Heywood office.
- Location: 1 per MCTO garage facility (5 total)
- Data Name/Contents: 4 ASCII files per garage with passenger type, payment type, payment amount, driver information, route number, run number, direction and city information.
- Data Type: Data
- Status: Existing

### 3.13 HARDWARE "MCTO HEYWOOD OFFICE MODEM'

- Hardware Type: Modem - 2400 BPS
- Functions: Enables communication over telephone line to each of the five garage computers.
- Location: MCTO Heywood office
- Data Name/Contents: 4 ASCII files per garage with passenger type, payment type, payment amount, driver information, route number, run number, direction and city information.
- Data Type: Data
- Status: Existing

### 3.14 HARDWARE "NETWORK MANAGER PC"

- Hardware Type: Personal computer
- Functions: 1) Runs GFI fare collection software.
  2) Makes calls to garage computer for data upload.
  3) Network manager.
  4) Other office functions.
- Location: MCTO Heywood office
- Data Name/Contents: Passenger type, payment type, payment amount, driver information, route number, run number, direction and city.
- Data Type: Data
- Status: Existing
- Other: 486 PC

### 3.14.1 SOFTWARE "GFI FARE COLLECTION SOFTWARE"

- Software Type: System management
- Software Standards: Proprietary - DOS based application
- Functions: 1) Enables communication to garage computers and uploads data.
  2) Prints standard and user specified GFI reports
- Status: Existing
- Other: GENFARE Incorporated (GFI)
  Elk Grove Village, IL

### 3.14.2 SOFTWARE "DOS - LATEST VERSION"

- Software Type: Operating system
- Software Standards: DOS
- Functions: 1) Control PC hardware resources
  2) Executes software applications
- Status: Existing

### 3.14.3 SOFTWARE "NETWORK SOFTWARE"

| | |
|---|---|
| - Software Type | Communication protocol |
| - Functions | Network interface |
| - Status | Existing |

### 3.15 HARDWARE "NETWORK PC"

| | |
|---|---|
| - Hardware Type | Personal computer |
| - Functions | 1) Runs GFI fare collection software.<br>2) Runs other software applications for generating reports.<br>3) Other office functions. |
| - Location | MCTO Heywood office |
| - Data Name/Contents | Passenger type, payment type, payment amount, driver information, route number, run number, direction and city. |
| - Data Type | Data |
| - Status | Existing |
| - Other | 1) These computers are used to generate reports using a variety of spreadsheet and database software including Quattro and Imagine.<br>2) Also used to generate billings and reports to suburban transit providers. |

### 3.16 HARDWARE "LASER PRINTER"

| | |
|---|---|
| - Hardware Type | Printer |
| - Functions | Prints reports from GFI and other software applications. |
| - Location | MCTO Heywood office |
| - Data Name/Contents | See attached examples |
| - Data Type | Text/graphics hard copy |
| - Status | Existing |

### 3.17 HARDWARE "BRIDGE"

| | |
|---|---|
| - Hardware Type | Bridge |
| - Functions | Allows communication between network manager PC and the office local area network. |
| - Location | MCTO Heywood office |
| - Data Name/Contents | Passenger type, payment type, payment amount, driver information, route number, run number, direction and city. |
| - Data Type | Data |
| - Status | Existing |

| | |
|---|---|
| 3.18 HARDWARE "IBM MAINFRAME" | |
| - Hardware Type | Minicomputer or mainframe |
| - Functions | Store electronic fare collection system information |
| - Location | MCTO Heywood office |
| - Data Name/Contents | ASCII file |
| - Data Type | Data |
| - Status | Existing |
| - Other | This piece of hardware and corresponding network is documented as part of System 3.5 - MCTO BusLine system. |
| 4.1 INTERFACE | Interfaces between fare box components are not documented. This is assumed to be one component of hardware for the purposes of an interface. |
| 4.2 INTERFACE | Farebox infrared transmitter/receiver |
| - Connects to . . . | Infrared data probe |
| - Interface location | MCTO garage locations |
| - Interface Type | Data |
| - Interface Direction | Both |
| - Interface Component | Infrared |
| - Protocol/Standard | Proprietary |
| - Information Type/Content | Driver data, route, passenger, fare collection and fare structure information. |
| - Information Direction | Both |
| - Information Frequency | Variable |
| - Information Standards | Proprietary |
| 4.3 INTERFACE | Infrared data probe |
| - Connects to . . . | Isolation box |
| - Interface location | MCTO garage locations |
| - Interface Type | Data |
| - Interface Direction | Both |
| - Interface Component | Unknown - but possible a coaxial cable |
| - Protocol/Standard | Proprietary |
| - Information Type/Content | Driver data, route, passenger, fare collection and fare structure information. |
| - Information Direction | Both |
| - Information Frequency | Variable |
| - Information Standards | Proprietary |

| | |
|---|---|
| 4.4 INTERFACE | Isolation box |
| - Connects to . . . | Garage PC |
| - Interface location | MCTO garage locations |
| - Interface Type | Data |
| - Interface Direction | Both |
| - Interface Component | Coaxial cable |
| - Protocol/Standard | Proprietary |
| - Information Type/Content | Driver data, route, passenger, fare collection and fare structure information. |
| - Information Direction | Both |
| - Information Frequency | Variable |
| - Information Standards | Proprietary |
| 4.5 INTERFACE | Garage PC |
| - Connects to . . . | Printer |
| - Interface location | MCTO garage locations |
| - Interface Type | Data |
| - Interface Direction | Both |
| - Interface Component | RS-232 |
| - Information Type/Content | Hard copy reports of driver data, route, passenger and fare collection information. |
| - Information Direction | output |
| - Information Frequency | As needed |
| - Information Standards | Standard GFI reports |
| 4.6 INTERFACE | Garage PC |
| - Connects to . . . | Garage PC modem |
| - Interface location | MCTO garage locations |
| - Interface Type | Data |
| - Interface Direction | Both |
| - Interface Component | RS-232 |
| - Information Type/Content | Daily summary of driver data, route, passenger and fare collection information |
| - Information Direction | output |
| - Information Frequency | Once per day |
| - Information Standards | ASCII files |

| | |
|---|---|
| 4.7 INTERFACE | Garage PC modem |
| - Connects to . . . | Network manager PC modem |
| - Interface location | MCTO garage location 1 MCTO Heywood office |
| - Interface Type | Data |
| - Interface Direction | Both |
| - Interface Component | Service provider |
| - Protocol/Standard | Public |
| - Information Type/Content | Daily summary of driver data, route, passenger and fare collection information |
| - Information Direction | output |
| - Information Frequency | Once per day |
| - Information Standards | ASCII files |

| | |
|---|---|
| 4.8 INTERFACE | Network manager PC modem |
| - Connects to . . . | Network manager PC |
| - Interface location | MCTO Heywood office |
| - Interface Type | Data |
| - Interface Direction | Both |
| - Interface Component | RS-232 |
| - Information Type/Content | Daily summary of driver data, route, passenger and fare collection information |
| - Information Direction | Input |
| - Information Frequency | Once per day |
| - Information Standards | ASCII files |

| | |
|---|---|
| 4.9 INTERFACE | Network manager PC |
| - Connects to . . . | MAU LAN |
| - Interface location | MCTO Heywood office |
| - Interface Type | Data |
| - Interface Direction | Both |
| - Interface Component | Token ring |
| - Information Type/Content | Driver data, route, passenger and fare collection information |
| - Information Direction | Both |
| - Information Frequency | As needed |

| | |
|---|---|
| 4.10 INTERFACE | Network PC |
| - Connects to . . . | MAU LAN |
| - Interface location | MCTO Heywood office |
| - Interface Type | Data |
| - Interface Direction | Both |
| - Interface Component | Token ring |
| - Information Type/Content | Driver data, route, passenger and fare collection information |
| - Information Direction | Both |
| - Information Frequency | As needed |

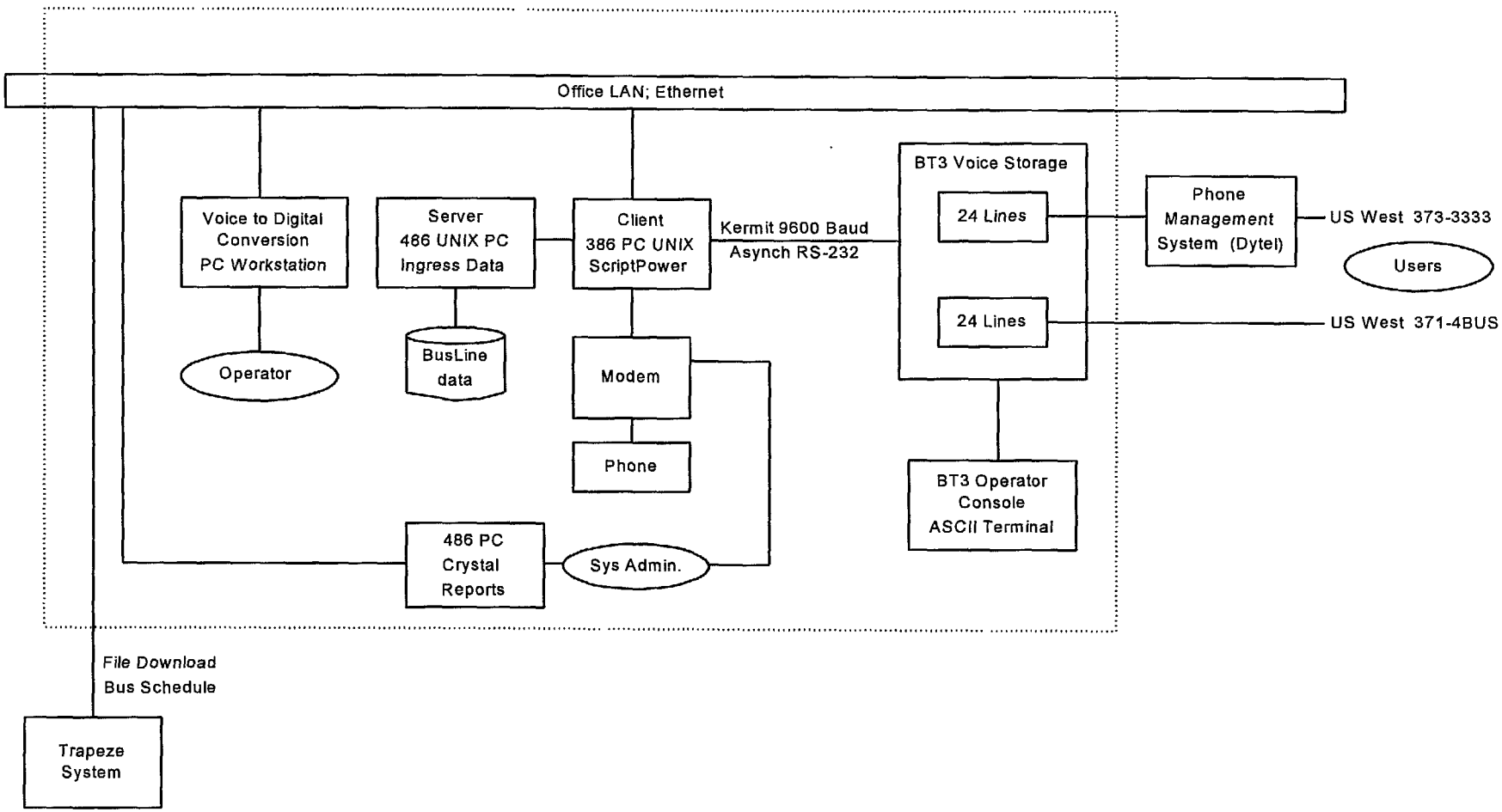
| | |
|---|---|
| 4.11 INTERFACE | MAU LAN |
| - Connects to . . . | Bridge |
| - Interface location | MCTO Heywood office |
| - Interface Type | Data |
| - Interface Direction | Both |
| - Information Type/Content | Variable |
| - Information Direction | Both |
| - Information Frequency | As needed |

| | |
|---|---|
| 4.12 INTERFACE | Office LAN |
| - Connects to . . . | MCTO garages maintenance and service LAN |
| - Interface location | MCTO Heywood office and MCTO garage locations |
| - Interface Type | Data |
| - Interface Direction | Both |
| - Interface Component | It was not stated in the interview how data was sent back to the garage facilities. On other system documentation, data was uploaded to the garage facilities by tape drives |
| - Information Type/Content | Variable |
| - Information Direction | output |
| - Information Frequency | As needed |

# 3.4.4 MCTO TIC BUSLINE SYSTEM

POLARIS As-Is Baseline Data Collection

**MCTO TIC BusLine System**






busline pre
1 August 1996

# AS-IS DATA COLLECTION TEMPLATE

## 1.0 AGENCY "MCTO TIC"

| | |
|---|---|
| - Agency Type | Transit provider |
| - Agency Functions | Communicate transit information via Busline system (audio-text) and live operator assisted trip planning system. |
| - Agency Location(s) | Metropolitan Council Transit Operations (MCTO)<br>Heywood Facility<br>560 Sixth Avenue N.,<br>Minneapolis, MN 5541 l-4398 |
| - Policies | Strong commitment to customer satisfaction. Its more important to give out high quality, useful information than to just handle a large quantity of calls. Distribute 7 million bus schedules per year. |
| - Constraints | Financial Shortages |
| - Contacts | Dee Molean, 349-7410, FAX 349-7612 |
| - Other | MCTO has 3 transit stores in the Twin Cities Metropolitan Area (TCMA) (downtown Minneapolis., downtown St. Paul, Mall of America) where bus riders can get schedules, bus passes, etc.<br>MCTO has 19000 bus stops in the TCMA with 13 00 bus shelters. |

## 2.0 SYSTEM "MCTO TIC BUSLINE SYSTEM"

| | |
|---|---|
| - Date of As-Is Data Collection | 1 /24/96 |
| - Purpose | 1) Provide people with audio bus scheduled departure times using the same node points as contained in the bus schedule.<br>2) Can use to plan a trip for a future day.<br>3) Also provide info. on public transit providers system. |
| - Hours of Operation | 24 Hours/day, 7 Days/week, except for approximately 1/2 hour daily at 3:00 AM. |
| - Geographic Coverage | Seven county metropolitan area. (Anoka, Hennepin, Ramsey, Dakota, Scott, Carver, Washington) |
| - Contacts | Dee Molean, 349-7410, FAX 349-7612, Manager and Art Brakob, Technical |
| - Status | Existing, Improve. This same service was purchased from CityLine for a year or so in 19860987. Then MCTO decided to put in their own system. |
| - Policies | Handle 2 million calls per year. Refresh the schedule information every Thursday with minor changes. Major schedule changes are made 4 times per year. |

| | |
|---|---|
| - Constraints | The system is "maxed out". On certain days all 48 Incoming lines are used....getting to be a problem. System is down for about 1 hour during the night for updates. Cannot do any trip planning because system only contains departure times of buses, and not arrival times so that if you have to make a transfer, you would not know when your initial leg bus would arrive at the transfer bus stop. Nothing set up for access to system via Internet, modem, etc. System is 5 years old. System clock loses time and needs to be reset each week. |
| - Recommended Improvements | They would like to upgrade the hardware and software. MCTO received approval for this upgrade 3/l 996. |
| - Block Diagram | See attached |
| - Typical Operational Scenario | A user calls into the system. When prompted he/she selects schedules for the same day or another day (if another day, which category of day), the bus route number, whether Minneapolis or St, Paul, which direction, which bus stop. The system lists the times at that stop on that bus in that direction. |
| - Other | System is used for special event info. like the State Fair, indicating which routes serve the State Fair area. System has the capability for the user to leave a message- haven't used. System can be used to do customer surveys. System is used to put bus re-route times when major snowstorms affect routes, This overwrites the normal route times. 95% of calls are for the "next bus departure time". Blind community uses the system a lot. System is capable of tracking how the system is used, i.e. what parts of the system the customers use most often, etc. Private provider schedules changes are sporadic and are made every couple weeks or so. This info. comes to MCTO from private providers in paper form. |

## 2.1 PERSONNEL "SYSTEM ADMINISTRATOR"

| | |
|---|---|
| - Personnel Function | Maintain the database |
| - Quantity | 1 |
| - Location | MCTO Heywood Facility |
| - Workload | Update the system l/week on Thursday |
| - Working hours | Normal working hours |
| - Status | Existing |
| - Contact | Art Brakob 349-7423 |

## 2.2 PERSONNEL "SYSTEM OPERATOR"

| | |
|---|---|
| - Personnel Function | Record voice messages |
| - Quantity | 1 |
| - Location | MCTO Heywood Facility |
| - Workload | Update the system l/week on Thursday |
| - Working hours | Normal working hours |
| - Status | Existing |
| - Contact | Art Brakob |

## 3.1 HARD WARE "BT3"

| | |
|---|---|
| - Hardware Type | Telephone audio-text processor and telephone line selector. |
| - Functions | Process audio-text responses and controls telephone line off-hook, on-hook. |
| - Location | MCTO Heywood Facility |
| - Data Name/Contents | Audio-text responses |
| - Data Type | Digitized voice. |
| - Status | Existing |
| - Constraints | None. There is room for expansion on the existing hardware.<br>24 phone lines come into BT3 directly from the Busline # (341-4287), and 24 phone lines come in from the phone management system(by Dyte1)(373-3333). |
| - Contact | Art Brakob 349-7423 |
| - Other | Runs on RSX operating system (from Perception Technologies)<br>All the voice messages are stored on the BT3, and the server requests the message to be played based on the touch tone phone number pressed by the user.<br>Schedule data is downloaded to the server from the Trapeze system, through a conversion program on the RUCUS system, every Thursday. The data that gets updated each week includes adding nodes and minor time changes. The voice messages can be updated any time, but they are usually needed at the same time as a major schedule change, which occurs approximately quarterly. |

### 3.1.1 SOFTWARE "RSX"

| | |
|---|---|
| - Software Type | Operating System |
| - Software Standards | Proprietary to Perception Technology. |
| - Functions | Manage operation of the BT3 |
| - Status | Existing |
| - Contact | Art Brakob |

### 3.2 HARDWARE "CLIENT WORKSTATION"

| | |
|---|---|
| - Hardware Type | 386 PC Computer (25 MHz) |
| - Functions | The application software for the Busline system is stored & executed on this machine. At the User's touch tone phone prompt, the client decides what function to process next, searches database for bus schedule time and directs BT3 to playback the voice recorded message about the route and departure time to the User. |
| - Location | MCTO Computer Room |
| - Constraints | Client and Server machines are at capacity. Experiencing a lot of problems due to the speed of these two machines. |
| - Issues | No capacity to handle additional machines. |
| - Recommended Improvements | MCTO received approval to upgrade this PC 3/l 996. |

### 3.2.1 SOFTWARE "UNIX"

| | |
|---|---|
| - Software Type | Operating System |
| - Software Standards | UNIX |
| - Functions | Executes software applications and controls hardware. |

### 3.2.2 SOFTWARE "SCRIPTPOWER"

| | |
|---|---|
| - Software Type | Application software |
| - Software Standards | Custom written software. |
| - Functions | Manages user requests and information response. Takes the incoming requests from the user (touch tone phone) and determines what information should be given back to the user, searches the database for the correct data, commands the BT3 to play appropriate messages. |
| - Constraints | Scriptpower requires Ingress database. Described as "clunky" software. |
| - Recommended Improvements | Will be upgraded to WriteOne software. (From Digital DataVoice Co.- Eagan, MN) MCTO received approval to upgrade this software 3/1996 |
| - Other | MCTO has a contract with Digital Data Voice for all of Busline equipment support. They also wrote the application software. |

### 3.3 HARDWARE "DATA SERVER"

| | |
|---|---|
| - Hardware Type | 486 PC |
| - Functions | Database for Busline resides on this PC. |
| - Location | MCTO Computer Room |
| - Data Name/Contents | Bus schedule times. |
| - Data Type | Bus schedule times. |
| - Status | Existing |
| - Constraints | Client and Server machines are at capacity. Experiencing a lot of problems due to the speed of these two machines MCTO received approval to upgrade this PC 3/l 996. |

#### 3.3.1 SOFTWARE "UNIX"

| | |
|---|---|
| - Software Type | Operating System |
| - Software Standards | UNIX |
| - Functions | Executes S/W applications and controls hardware. |

#### 3.3.2 SOFTWARE "INGRESS"

| | |
|---|---|
| - Software Type | Database. |
| - Functions | Stores bus schedule route data and stores address locations of voice messages in the BT3. |
| - Recommended Improvements | MCTO received approval to upgrade this software to Sybase database 3/1996. |

### 3.4 HARDWARE "VOICE STORAGE PC"

| | |
|---|---|
| - Hardware Type | PC - 386 Intel |
| - Functions | Operator records voice messages to PC's hard disk by an analog to digital voice card. Voice files are transferred to the Client via a file transfer protocol, then downloaded to the BT3. |
| - Location | MCTO building. - not in computer room. |
| - Data Name/Contents | Voice messages. |
| - Data Type | Data |
| - Status | Existing |
| - Other | DOS operating system. Other office application software like WordPerfect and spreadsheets are used on this PC. |

#### 3.4.1 SOFTWARE "DSR"

| | |
|---|---|
| - Software Type | Application software |
| - Software Standards | Custom written software. Proprietary to Perception Technologies. |
| - Functions | Convert human voice to digital. |
| - Status | Existing |
| - Constraints | This software must run on a 386 PC. |

### 3.5 HARDWARE "SWITCHBOARD (DYTEL)"

| | |
|---|---|
| - Hardware Type | Telephone line voice response unit. |
| - Functions | Directs incoming phone calls from users to the Busline System when the user presses the appropriate number on a touch tone phone. |
| - Location | MCTO Heywood facility |
| - Data Type | Telephone calls - audio |
| - Status | Existing |
| - Constraints | Currently 48 separate phone lines come into the MCTO - this capacity is reached during busy periods. |

### 3.6 HARDWARE "486 PC"

| | |
|---|---|
| - Hardware Type | PC |
| - Functions | System Administrator uses this PC to create bus schedule reports using RUCUS. |
| - Location | MCTO building. - not in computer room. |
| - Data Name/Contents | RUCUS reports. |
| - Data Type | Data. |
| - Status | Existing |
| - Other | DOS operating system. |

### 3.6.1 SOFTWARE "RUCUS"

| | |
|---|---|
| - Software Type | Application software |
| - Software Standards | Custom written software. Proprietary to Perception Technologies. |
| - Functions | Schedule reports using the data from the Trapeze system. |
| - Status | Existing |

### 4.1 INTERFACE

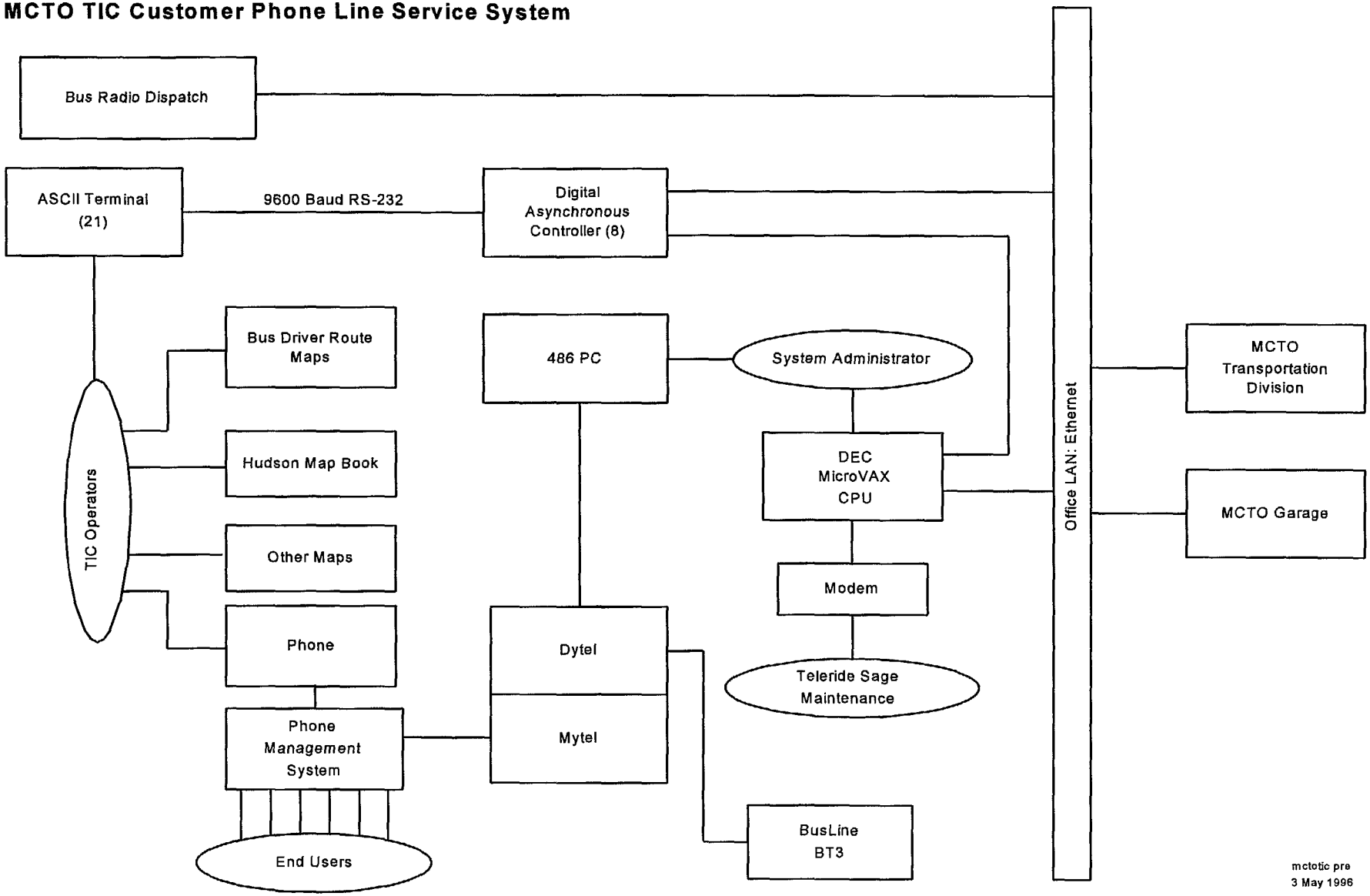
| | |
|---|---|
| | BT3 |
| - Connects to . . . | Client workstation |
| - Interface location | MCTO Computer Room. |
| - Interface Type | 9600 Baud A-Synchronous |
| - Interface Direction | Both |
| - Protocol/Standard | RS-232 |
| - Information Type/Content | Voice files are downloaded from Client to BT3 via Kermit. |
| - Information Direction | Client to BT3. |
| - Information Frequency | Weekly - as schedule changes are made which require new messages. |

| | |
|---|---|
| 4.2 INTERFACE | OFFICE LAN |
| - Connects to . . . | Connects office computers, also is LAN for Interface between office computers and Busline computers. |
| - Interface location | MCTO building. |
| - Interface Type | Ethernet - Novell network and TCP/IP - use TCP/IP for Busline. |
| - Interface Direction | Both |
| - Interface Component | Coax cable. |
| - Protocol/Standard | Novell, TCP/IP |
| - Information Type/Content | Various info. contents. |
| - Information Direction | Both |
| - Information Frequency | Whenever schedule changes are made. |
| 4.3 INTERFACE | BT3 |
| - Connects to | Switchboard and to U.S. West |
| - Interface location | MCTO Heywood facility |
| - Interface Type | Audio |
| - Interface Direction | Both |
| - Interface Component | Telephone twisted pair wire |
| - Information Type/Content | Audio recorded messages containing bus schedule departure time goes to User. |
| - Information Frequency | As needed by User call in demand |
| - Other | 24 phone lines come into BT3 via the Switchboard, 24 come into the BT3 via the direct Busline number. |
| 4.4 INTERFACE | TRAPEZE SYSTEM |
| - Connects to . . . | Busline System - Data Server |
| - Interface location | MCTO Heywood facility |
| - Interface Type | Data |
| - Interface Direction | Both |
| - Interface Component | via Novell network |
| - Protocol/Standard | Rucus database format |
| - Information Type/Content | The Trapeze bus route schedule information is converted into a Rucus database and downloaded to the Busline system. |
| - Information Direction | Trapeze to Busline |
| - Information Frequency | Weekly - minor changes. Major changes quarterly. |

# 3.4.5 MCTO TIC CUSTOMER PHONE LINE SERVICE SYSTEM

POLARIS As-Is Baseline Data Collection

**MCTO TIC Customer Phone Line Service System**




mctotic pre
3 May 1996

# AS-IS DATA COLLECTION TEMPLATE

## 1.0 AGENCY "MCTO TIC"

| | |
|---|---|
| - Agency Type | Transit provider |
| - Agency Functions | Communicate transit information via Busline system (audiotext) and live operator assisted trip planning system. |
| - Agency Location(s) | MCTO Heywood Facility<br>560 Sixth Avenue N.,<br>Minneapolis, MN 5541 l-4398 |
| - Policies | Strong commitment to customer satisfaction. Its more important to give out high quality, useful information than to just handle a large quantity of calls. Distribute 7 million bus schedules per year. |
| - Constraints | Financial Shortages |
| - Contacts | Dee Molean, 349-7410, FAX 349-7612 |
| - Other | MCTO has 3 transit stores in the TCMA (downtown Mpls., downtown St. Paul, Mall of America) where bus riders can get schedules, bus passes, etc.<br>MCTO has 19000 bus stops in the TCMA with 1300 bus shelters. |

## 2.0 SYSTEM "MCTO' TIC CUSTOMER PHONE LINE SERVICE SYSTEM"

| | |
|---|---|
| - Date of As-Is Data Collection | l/24/96 |
| - Purpose | Provide personalized trip planning assistance via phone to users of the transit system. |
| - Hours of Operation | M - F 6:30 AM - 9:00 PM<br>Sat. 7:00 - 4:30<br>Sun. 9:00 - 9:00 |
| - Geographic Coverage | 7 County Metro Area (Hem-repin, Ramsey, Anoka, Dakota, Washington, Scott, Carver) |
| - Contacts | Dee Molean, Art Brakob. |
| - Status | Existing |
| - Policies | Handle 750,000 calls per year. Quality of service provided is more important than quantity of calls handled. |
| - Constraints | Manual system today, no GIS system available to help plan trips automatically.<br>Proprietary system made by Teleride, Sage Ltd. Canada. |
| - Issues | Have just recently cut back hours due to funding.<br>Peak usage time is during the midday. |

| | |
|---|---|
| - Typical Operational Scenario | User calls into the system (373-3333) and selects audiotext option. From initial prompt, options are:<br>1) Talk with a bus information representative<br>2) Busline<br>3) Customer service<br>4) Mn Rideshare or travel demand management representative<br>The operator asks the user information about the trip they would like to take via the bus system (i.e. origin/ destination)and plans out the trip by giving the user the bus route number and departure/arrival times of each leg of the trip, including information about transferring from one route to the next such as walking direction information from one bus stop to the next. |
| - Other | Metro Mobility uses a trip planning system - the mapping is done by Lawrence Map. Tidewater was mentioned as a good trip planning system. |

2.1 PERSONNEL "SYSTEM ADMINISTRATOR"

| | |
|---|---|
| - Personnel Function | Maintain the database |
| - Location | MCTO Heywood Facility |
| - Working hours | Normal working hours |
| - Status | Existing |
| - Contact | Art Brakob |

2.2 PERSONNEL "TIC OPERATOR"

| | |
|---|---|
| - Personnel Function | Assist bus system users who call in to plan a complete trip from their origin to destination. |
| - Quantity | 37 full-time + 4 part-time, currently staff from 6 to 21 operators throughout the day. |
| - Location | MCTO Heywood Facility |
| - Workload | Very heavy - wait times to get an operator can be as high as 15- 20 minutes. |
| - Working hours | Normal working hours. Start in the AM with a staff of 6 operators, gradually staff up to 21 operators during midday when system usage is at peak, gradually staff down to 6 operators in evening. |
| - Status | Existing |
| Policies | Rigorous training of operators |

### 3.1 HARDWARE "DEC MICROVAX"

| | |
|---|---|
| - Hardware Type | Central Processing Unit |
| - Functions | Stores bus route and schedule information.<br>Displays information on ASCII terminals as requested |
| - Location | MCTO Computer Room. |
| - Data Name/Contents | Bus route and schedule information:<br>1) Bus route numbers<br>2) Bus route stops<br>3) Schedule departure times from stops<br>4) Detour information |
| - Data Type | Data |
| - Status | Existing |
| - Other | VAX, VMS MicroVax 3100<br>From Sage Ltd., Canada<br>Microvax II, 16 MB Memory, VMS 5.2, Unlimited users,<br>Detour information is put into the system by Transportation Section of MCTO(Dick Loeffler). |

#### 3.1.1 SOFTWARE "TELERIDE SOFTWARE"

| | |
|---|---|
| - Software Type | Database display software. |
| - Software Standards | Proprietary |
| - Functions | Converts the bus schedule file from the Trapeze system(BTRIEVE) to a RUCUS database format.<br>TIC operators use this data to identify the bus route, bus stop locations, departure time and arrival times to plan a trip from the customers origin to destination. |
| - Constraints | Proprietary to Sage, Ltd. |

### 3.2 HARDWARE "ASCII TERMINAL"

| | |
|---|---|
| - Hardware Type | PC Terminal |
| - Functions | Allows TIC Operators to view bus route, schedule and detour information. |
| - Location | TIC Operations Room, Heywood facility |
| - Data Name/Contents | Bus route and schedule information:<br>1) Bus route numbers<br>2) Bus route stops<br>3) Schedule departure times from stops<br>4) Detour information |
| - Data Type | Data |
| - Status | Existing |
| - Other | 21 Operator stations/terminals Wyse Terminals |

3.3 HARDWARE "PHONE"

- Hardware Type: Telephone (headset)
- Functions: Provide voice communication between operator and customer.
- Location: TIC Operations Room, Heywood facility
- Data Name/Contents: Interactive voice communications for desired trip by customer and planned route from operator.
- Data Type: Voice
- Status: Existing
- Other: 21 Operator stations/terminals

3.4 HARDWARE "DIGITAL ASYNCHRONOUS CONTROLLER "

- Hardware Type: Multiplexor
- Functions: Asynchronous multiplexor ports, provides for data transfer between the DEC Microvax and the operator terminals.
- Location: MCTO Computer Room, Heywood facility
- Data Name/Contents: Bus route and schedule information:
  1) Bus route numbers
  2) Bus route stops
  3) Schedule departure times from stops
  4) Detour information
- Data Type: Data
- Status: Existing
- Other: 8 - DEC server 200/MC machines

3.5 HARDWARE "486 PC "

- Hardware Type: Personal Computer
- Functions: Monitor and record customer phone call activity.
- Location: MCTO Heywood facility
- Data Name/Contents: Customer phone call statistics such as:
  1) number of calls receive
  2) time of calls
  3) length of calls
  4) the time the customer spent waiting for an operator
  5) number of calls taken by each operator
  6) time each operator spends per call
- Data Type: Data
- Status: Existing

3.6 HARDWARE "DYTEL"

- Hardware Type: Phone answering machine, call routing.
- Functions: 1) Monitors the customer call statistics such as the time
  2) Routes call to next available operator or to the Busline system.
- Location: MCTO Heywood facility
- Data Type: Voice

3.1 HARDWARE "MYTEL "

- Hardware Type: Phone answering machine, call routing
- Functions: When a call comes in, this plays a standard message to the customer about the options available via the system and routes the call to Dytel for an operator or Busline for audiotext.
- Location: TIC Operations Room, Heywood facility
- Data Type: Voice

3.8 HARDWARE "BUS DRIVER ROUTE MAPS"

- Hardware Type: Map
- Functions: Map of the bus route that a driver is to follow showing bus stop locations.
- Location: TIC Operations Room, Heywood facility
- Issue: Maps used by operators are at different scales which makes it more difficult to relate geographic information from map to map when planning a customer's route.

3.9 HARDWARE "HUDSON MAP BOOK"

- Hardware Type: Map book
- Functions: TIC operators use this to locate addresses of customer origins/destinations in relation to bus routes.
- Location: TIC Operations Room, Heywood facility

3.10 HARDWARE "OTHER MAPS"

- Hardware Type: Maps
- Functions: TIC operators use this to locate addresses of customer origins/destinations and landmarks in relation to bus routes.
- Location: TIC Operations Room, Heywood facility

3.11 HARDWARE "MODEM"

- Hardware Type: Modem
- Functions: Allows the personnel from Teleride Sage to call into system to perform remote maintenance activities if needed.
- Location: TIC Operations Room, Heywood facility
- Other: This system is described as very stable, therefore this is not heavily used.

3.12 HARDWARE "PHONE MANAGEMENT SYSTEM'

- Functions: Routes incoming phone calls to Busline, TIC operators, and MCTO office personnel.
- Location: TIC Operations Room, Heywood facility
- Data Type: Voice

| | |
|---|---|
| 4.1 INTERFACE | ASCII TERMINAL |
| - Connects to . . . | Digital Asynchronous Controller |
| - Interface location | MCTO Heywood facility |
| - Interface Type | Data |
| - Interface Direction | Both |
| - Interface Component | RS-232, 9600 baud |
| - Information Direction | To ASCII Terminal |
| - Information Frequency | As needed. |
| - Information Standards | RS-232 |

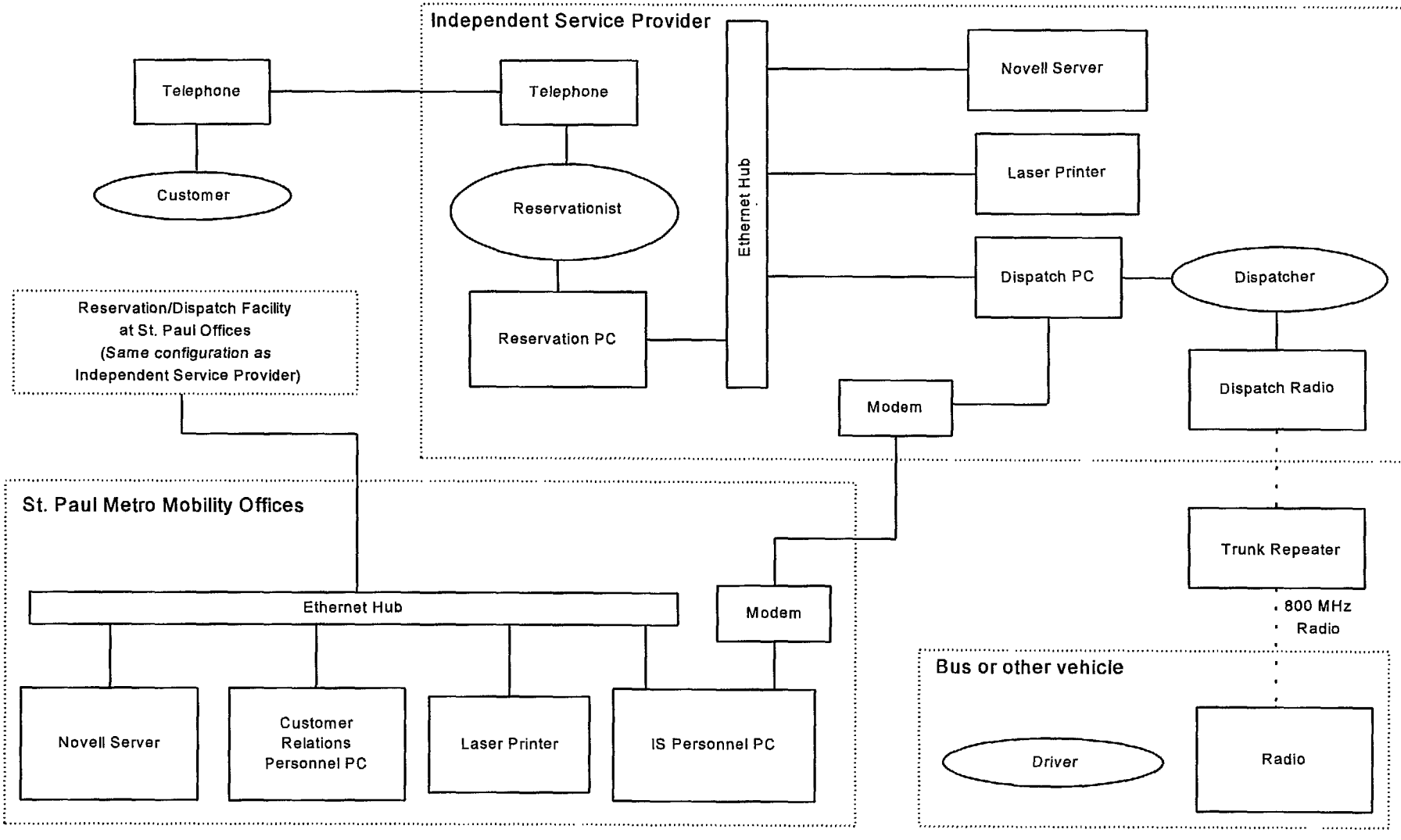
| | |
|---|---|
| 4.2 INTERFACE | DYTEL |
| - Connects to . . . | Busline BT3 |
| - Interface location | MCTO Heywood facility |

| | |
|---|---|
| 4.3 INTERFACE | DEC MICROVAX |
| - Connects to . . . | Bus Radio Dispatch |
| - Interface Direction | Both |
| - Interface Component | LAN - Ethernet |
| - Information Direction | From DEC to radio dispatch |
| - Information Frequency | As needed |

# 3.4.6 METROPOLITAN COUNCIL METRO MOBILITY RESERVATION/SCHEDULING/DISPATCH SYSTEM

POLARIS As-Is Baseline Data Collection

## Metropolitan Council Metro Mobility Reservation/Scheduling/Dispatch System

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1 August 1996

# AS-IS DATA COLLECTION TEMPLATE

## 1.0 AGENCY "METROPOLITAN COUNCIL"

| | |
|---|---|
| - Agency Type | Regional planning organization |
| - Agency Functions | Responsible for planning and oversight of metropolitan area services including transit. |
| - Agency Location(s) | 245 East 6th Street, Suite 200<br>St. Paul, MN 55101 |

## 2.0 SYSTEM "METRO MOBILITY RESERVATION/SCHEDULING/DISPATCH"

| | |
|---|---|
| - Date of As-Is Data Collection | March 13, 1996 |
| - Purpose | Metro Mobility provides transit services for people with disabilities in the Minneapolis/ St. Paul area and selected suburbs. This system receives requests from pre-approved customers, creates pick-up and drop-off schedules, and provides near-real-time tracking and communication with transit vehicles. Requests for service may be made from one to 4 days in advance. |
| - Hours of Operation | Reservations are taken from 6:00 a.m. to 5:00 p.m. daily for Mayflower, Metro Ride Interzone and Handicabs; 8 a.m. to 5 p.m. Monday through Friday for county programs.<br>First daily pick-up can be scheduled no earlier than 5:00 a.m., last daily pick-up can be scheduled no later than 12:30 a.m. |
| - Geographic Coverage | See attached map |
| - Status | Existing |
| - Recommended Improvements | Metro Mobility would like to add Automatic Vehicle Location (AVL) equipment to its vehicles, but no firm plans are in place to do so. |
| - Block Diagram | See attached |

- Typical Operational Scenario

A person wishing to use Metro Mobility's transit services must first go through a certification process, which is handled by the Metro Mobility Service Center in St. Paul. Eligibility is based on Americans with Disabilities Act (ADA) criteria. Exact criteria were not gathered during the interview. Once certified, a rider is assigned to a service provider based on place of residence. The service providers are:

1) Mayflower
2) Metro Ride
3) Handicabs

The same provider is called to make reservations for all trips. When a trip reservation is made, the operator at the service provider will ask for the following information:

1) Name
2) Day and date of trip
3) Pick-up address (must be an address, not a place name (i.e. "200 Constitution Ave." not "State Capitol").
4) Phone number at pick-up address
5) Pick-up time
6) Drop-off address (see above)
7) Time of return trip
8) Any location specific information that might assist the driver (building entrance, etc.)
9) Any information regarding guests or attendants that will also need to use a Metro Mobility vehicle
10) Special boarding requirements (for passengers who use scooters)
11) Steps at pick-up and drop-off (for passengers who use wheelchairs)

This information is entered into PASS, a commercial software package which is designed specifically to schedule and dispatch passenger trips for transit systems.

| | |
|---|---|
| - Operational Scenario Cont. | PASS generates a list of possible vehicle trips for the new passenger trip based on its "subscription service" list. "Subscription service" is trips that are repeated at the same time at least three times a week on the same day every week. An operator "reservationist" then either adds the passenger trip to an existing vehicle run or if no run will accommodate the trip, fills out a form called a "manual ticket". The passenger is informed that a trip cannot be scheduled at that time, but that Metro Mobility will attempt to fit the request into a run and the passenger will be notified at least three days prior to the date of a requested trip if the trip cannot be accommodated on any vehicle run. The manual ticket is given to a scheduler who reviews pick-up/drop-off manifests and attempts to fit manual ticket trips onto existing vehicle runs.<br>The PASS system automatically generates manifests for drivers and prints them in chronological order of pick-up/drop-off. A driver checks in with the dispatcher before beginning a run via radio system, and also calls in to report status of the run every second or third pick-up/drop-off. The dispatcher keys in time reports and schedule status from drivers to check against scheduled times on the manifest. A report is generated showing deviations from scheduled times at the end of each run.<br>On a daily basis, a person from Metro Mobility Service Center will use a PC remote control package (PC Anywhere) to dial into one of the PCS via a modem at each of the service providers. Files that have the current day as the creation date, are transferred to a drive at Metro Mobility Service Center in St. Paul. Once the files are at the St. Paul office, a variety of reports are generated from the data using Clarion database reporting software.<br>Hard copies of the reports are brought to the St. Paul office by the managers of the independent service providers for a monthly meeting. |

| | |
|---|---|
| - Operational Scenario Cont. | In addition to the seven service providers, the Metro Mobility Service Center also has reservation, scheduling, and dispatch facilities.<br>Each service provider deals only with those trips which begin and end in their respective areas.<br>Those trips that begin in one service providers's geographic area and end in another provider's area, called interzonel trips and are serviced by a separate fleet, in effect a interzonel-specific service provider. |

2.1 PERSONNEL "RESERVATIONIST"

| | |
|---|---|
| - Personnel Function | Takes calls from passengers and enters reservation information into PASS system |
| - Quantity | Approximately 30 at independent service providers. |
| - Location | At each of the independent service providers. |
| - Workload | Reservationists work full time with this system |
| - Working hours | Reservations are taken from 6:00 a.m. and 5:00 p.m. daily |
| - Status | Existing |

2.2 PERSONNEL "DISPATCHER"

| | |
|---|---|
| - Personnel Function | Communicates with driver to receive time checks and send schedule updates. |
| - Quantity | Approximately eight at independent service providers. |
| - Working hours | First daily pick-up can be scheduled no earlier than 5:00 a.m., last daily pick-up can be scheduled no later than 12:30 a.m. Dispatchers must be on duty prior to and after these times. |
| - Status | Existing |

2.3 PERSONNEL "DRIVER"

| | |
|---|---|
| - Personnel Function | Operates transit vehicles and reports status of run to dispatchers |
| - Quantity | Approximately 260 at independent service providers. |
| - Working hours | First daily pick-up can be scheduled no earlier than 5:00 a.m., last daily pick-up can be scheduled no later than 12:30 a.m. |

2.4 PERSONNEL "INFORMATION SYSTEMS (IS) STAFF"

| | |
|---|---|
| - Personnel Function | Downloads PASS system (i.e. reservation and dispatch) data from independent service providers.<br>Creates reports for Metro Mobility's managerial staff. |
| - Quantity | One |
| - Location | Metro Mobility Service Center, St. Paul |

2.5 PERSONNEL "CUSTOMER RELATIONS STAFF"

| | |
|---|---|
| - Personnel Function | Record customer complaints about service and researches driver logs. |
| - Location | Metro Mobility Service Center, St. Paul |

3.1 HARDWARE "TELEPHONE"

| | |
|---|---|
| - Hardware Type | Multi-line, multi-extension communications system |
| - Functions | Communications with Metro Mobility customers wishing to make reservations. These can either be direct calls or, in the case of an interzonel trips, calls transferred from another service provider to the interzone system. |
| - Data Name/Contents | Reservation information (see Operational Scenario) |
| - Data Type | Voice |
| - Status | Existing |

3.2 HARDWARE "RESERVATION PC"

| | |
|---|---|
| - Hardware Type | Intel-based PC |
| - Functions | Data entry into the PASS system |
| - Location | At each of the service provider offices. |
| - Data Name/Contents | See operational scenario |
| - Data Type | Data |
| - Status | Existing |

### 3.2.1 SOFTWARE "DOS"

- Software Type: PC operating system
- Software Standards: 16 bit DOS
- Status: Existing

### 3.2.2 SOFTWARE "PASS (RESERVATION MODULE)"

- Software Type: Transit trip reservation, scheduling, and management software. The reservation module is run on these PC's
- Functions: Accepts information as specified in section 2.0's operational scenario. Information from the reservation module is sent to the PASS scheduling module. Which runs on the server.
- Status: Existing

## 3.3 HARDWARE "NOVELL SERVER"

- Hardware Type: Intel based server
- Functions: Serves files to clients on LAN
- Location: At each of the service providers
- Data Name/Contents: Reservation information for PASS scheduling
  Time check information entered by dispatchers.
  Time check reporting information for customer relations.
- Data Type: Data
- Status: Existing
- Issues: The LAN is part of the contract specification from Metro Mobility. Each independent service provider must conform to the specification to be awarded a contract.

### 3.3.1 SOFTWARE "NOVELL NETWARE 3.12"

- Software Type: Network operating system.
- Functions: Acts as a file server in a client/server network environment.
- Status: Existing

### 3.3.2 SOFTWARE "PASS (SCHEDULING MODULE)"

- Software Type: Transit trip reservation, scheduling, and management software. The scheduling module is run on the server.
- Functions: Receives reservation data from each of the reservation PC's and uses proprietary algorithms to create schedules for vehicles and generate pick-up/drop-off manifests
- Status: Existing

### 3.4 HARDWARE "LASER PRINTER"

| | |
|---|---|
| - Hardware Type | Hewlett-Packard plain paper laser printer |
| - Functions | Prints pick-up/drop-off manifests<br>Prints reports from PASS system. |
| - Location | At each service provider |
| - Data Type | Data |

### 3.5 HARDWARE "DISPATCHER PC"

| | |
|---|---|
| - Hardware Type | Intel based PC |
| - Functions | Displays pick-up/drop-off manifests for each run<br>Accepts dispatcher input for time checks |
| - Location | At each service provider's dispatch facility |

#### 3.5.1 SOFTWARE "DOS"

| | |
|---|---|
| - Software Type | PC operating system |
| - Software Standards | 16 bit DOS |
| - Status | Existing |

#### 3.5.2 SOFTWARE "PASS (DISPATCHING MODULE)"

| | |
|---|---|
| - Software Type | Transit trip reservation, scheduling, and management software. The dispatching module is run on these PC's |
| - Functions | Displays manifests for vehicles on runs<br>Accepts input from dispatchers for time checks<br>Generates predefined reports |
| - Status | Existing |
| - Other | This software is run basically "off the shelf' without custom modifications |

#### 3.5.3 SOFTWARE "PC ANYWHERE"

| | |
|---|---|
| - Software Type | PC remote control software |
| - Functions | This software allows a user at Metro Mobility Service Center to control a PC at the service provider's office, in effect "becoming" that PC, with all the LAN connections intact. Once a remote user is connected, file transfer is a simple DOS copy operation.<br>PC Anywhere is used to transfer PASS files that have been changed since the previous day to the Novell server at the Metro Mobility Service Center. |
| - Status | Existing |
| - Recommended Improvements | Metro Mobility is interested in a solution which would allow continuous real-time or near-real-time access to PASS scheduling and dispatch data at the independent service providers, No specific solution has yet been identified, but any real-time connection would probably make this software obsolete. |

### 3.6 HARDWARE "ETHERNET HUB"

| | |
|---|---|
| - Hardware Type | Multi-port hub for Ethernet LAN |
| - Functions | Controls network traffic |
| - Location | At each service provider |
| - Data Name/Contents | See above descriptions |
| - Data Type | Data |
| - Status | Existing |

### 3.7 HARDWARE "MODEM"

| | |
|---|---|
| - Hardware Type | Dial-up serial communications device |
| - Functions | Allows Metro Mobility Service Center to download data from each service provider LAN. |
| - Location | At each service provider |
| - Data Name/Contents | Any files which have changed from the previous day (these are identified by the file date). |
| - Data Type | Data |

### 3.8 HARDWARE "DISPATCH RADIO"

| | |
|---|---|
| Hardware Type | 800 MHZ radio transmitter/receiver (part of trunked system in section 3.9) |
| - Functions | Communications between the dispatchers and the drivers. |
| - Quantity | Five total, one at each dispatch station plus power supply. |
| - Location | At each service provider |
| - Data Name/Contents | Time checks and any special information/ instructions |
| - Data Type | Voice |
| - Status | Existing |

### 3.9 HARDWARE "TRUNK REPEATER"

| | |
|---|---|
| - Hardware Type | 800 MHZ leased trunked radio repeater system. |
| - Functions | Scans, receives and rebroadcasts radio messages to and from Metro Mobility vehicles. |
| - Data Name/Contents | Voice |
| - Data Type | Voice |
| - Other | Leased system |

### 3.10 HARDWARE "IN-VEHICLE RADIO"

| | |
|---|---|
| - Hardware Type | 800 MHZ radio transmitter/receiver |
| - Functions | Communication to/from dispatchers |
| - Quantity | 150 units |
| - Location | In each Metro Mobility vehicle |
| - Data Name/Contents | Voice |
| - Data Type | Voice |
| - Status | Existing |

### 3.11 HARDWARE "MODEM"

| | |
|---|---|
| - Hardware Type | Dial-up serial communications device |
| - Functions | Data transfer from each of the service providers to the Metro Mobility Service Center. |
| - Location | Metro Mobility Service Center, St. Paul |
| - Data Name/Contents | Any PASS system data files which have changed since the previous day |
| - Data Type | Data |
| - Status | Existing |

### 3.12 HARDWARE "INFORMATION SYSTEMS (IS) PERSONNEL PC"

| | |
|---|---|
| - Hardware Type | Intel based PC |
| - Functions | Download data from service provider computers<br>Run PASS reports<br>Run Clarion programs to generate reports |
| - Location | Metro Mobility Service Center, St. Paul |
| - Data Type | Data |
| - Status | Existing |

### 3.12.1 SOFTWARE "DOS"

| | |
|---|---|
| - Software Type | PC operating system |
| - Software Standards | 16 bit DOS |
| - Status | Existing |

### 3.12.2 SOFTWARE "CLARION"

| | |
|---|---|
| - Software Type | 4th generation language |
| - Functions | Allows IS personnel to create custom programs and reports from the PASS system data |
| - Status | Existing |
| - Constraints | At this time only one person at Metro Mobility is able to write Clarion programs. |

### 3.12.3 SOFTWARE "PC ANYWHERE (REMOTE)"

| | |
|---|---|
| - Software Type | PC remote control software |
| - Functions | This software allows a user at the St. Paul office to control a PC at the service provider's office, in effect "becoming" that PC, with all the LAN connections intact. Once a remote user is connected, file transfer is a simple DOS copy operation.<br>PC Anywhere is used to transfer PASS files that have been changed since the previous day to the Novell server at Metro Mobility Service Center. |
| - Status | Existing |
| - Recommended Improvements | Metro Mobility is interested in a solution which would allow continuous real-time or near-real-time access to PASS scheduling and dispatch data at the independent service providers. No specific solution has yet been identified, but any real-time connection would probably make this software obsolete. |

## 3.13 HARDWARE "LASER PRINTER"

| | |
|---|---|
| - Hardware Type | Hewlett Packard plain paper laser printer |
| - Functions | Prints reports from PASS and Clarion programs |
| - Location | Metro Mobility Service Center, St. Paul |
| - Data Type | Data/text |
| - Status | Existing |

## 3.14 HARDWARE "CUSTOMER RELATIONS PERSONNEL PC"

| | |
|---|---|
| - Hardware Type | Intel based PC |
| - Functions | Allows customer relations personnel access to vehicle logs containing pick-up/drop-off, time, customer, driver, and vehicle information. |
| - Location | Metro Mobility Service Center, St. Paul |
| - Data Name/Contents | See Functions |
| - Data Type | Data |
| - Recommended Improvements | Metro Mobility would like to make real-time information regarding vehicle run status (i.e. time and stop information) available to its customer relations personnel. This would necessitate a continuous link between the Metro Mobility Service Center and each of the service providers. There is no current plan to add this functionality. |

### 3.14.1 SOFTWARE "DOS"

| | |
|---|---|
| - Software Type | PC operating system |
| - Software Standards | 16 bit DOS |
| - Status | Existing |

### 3.14.2 SOFTWARE "PASS (UNKNOWN MODULE)"

| | |
|---|---|
| - Software Type | Transit trip reservation, scheduling, and management software. A module which permits users to see the previous day's manifests with time-check information is run on these PC's |
| - Functions | Access to manifests and time-check data for response to customer complaints/ inquiries. |
| - Status | Existing |

## 3.15 HARDWARE "NOVELL SERVER"

| | |
|---|---|
| - Hardware Type | Intel based network file server |
| - Functions | Stores information gathered from service provider systems.<br>Makes information available to users (information system (IS) and customer relations) for reporting |
| - Location | Metro Mobility Service Center, St. Paul |
| - Data Name/Contents | Files received from service provider systems are in DBASE format. These tables contain pick-up/drop-off manifests, time check information from dispatchers, and revenue/finance information. |
| - Data Type | Data |
| - Status | Existing |

### 3.15.1 SOFTWARE "NOVELL NETWARE 3.12"

| | |
|---|---|
| - Software Type | Network operating system. |
| - Functions | Acts as a file server in a client/server network environment. |
| - Status | Existing |

### 3.15.2 SOFTWARE "PASS"

| | |
|---|---|
| - Software Type | Transit trip reservation, scheduling, and management software. The scheduling module is run on these PC's |
| - Functions | Receives reservation data from each of the reservation PC's and uses proprietary algorithms to create schedules for vehicles and generate pick-up/drop-off manifests |
| - Status | Existing |

3.16 HARDWARE "ETHERNET HUB"

| | |
|---|---|
| - Hardware Type | Multiport Ethernet hub |
| - Functions | Manages network traffic |
| - Location | Metro Mobility Service Center, St. Paul |
| - Data Name/Contents | Ethernet data packets/ see HARDWARE 3.15 |
| - Data Type | Data |
| - Status | Existing |

| | |
|---|---|
| 4.1 INTERFACE | Metro Mobility customer |
| - Connects to | Reservationist at service provider |
| - Interface Type | Voice |
| - Interface Direction | Both |
| - Interface Component | US West voice grade telephone line |
| - Information Type/Content | See operational scenario |
| - Information Direction | Both |
| - Information Frequency | As needed |

| | |
|---|---|
| 4.2 INTERFACE | Ethernet Hub |
| - Connects to . . . | Reservation PC<br>Novell Server<br>Laser Printer<br>Dispatch PC |
| - Interface location | At each service provider |
| - Interface Type | Data |
| - Interface Direction | Both |
| - Interface Component | 10 BaseT Ethernet |
| - Information Type/Content | Reservation PC: Data is entered for reservations and stored on server. Server sends "subscription" run suggestions to be offered to a customer.<br>Novell Server: Receives data from the reservation PC to be stored and used in the scheduling algorithms. Also receives time check data from the Dispatch PC. Novell Server sends subscription run information to the Reservation PC and sends pick-up/drop-off manifests to the Dispatch PC.<br>Laser Printer: PASS predefined reports and pick-up/drop-off manifests to be distributed to drivers.<br>Dispatch PC: Receives manifest information from the Novell Server and sends time-check information back to the Server |
| - Information Direction | Both |
| - Information Frequency | Continuous |

| | |
|---|---|
| 4.3 INTERFACE | Dispatch (or other Novell client PC) |
| - Connects to . . . | Modem |
| - Interface location | At each service provider |
| - Interface Type | Data |
| - Interface Direction | Both |
| - Interface Component | RS-232 Serial cable |
| - Information Type/Content | Any PASS (.DBF) system files that have changed from the previous day. |
| - Information Direction | output |
| - Information Frequency | Once Daily |

| | |
|---|---|
| 4.4 INTERFACE | Dispatch Radio |
| - Connects to . . . | Trunk Repeater |
| - Interface Type | Voice |
| - Interface Direction | Both |
| - Interface Component | 800 MHZ leased trunk radio repeater transmission |
| - Information Type/Content | Time checks approximately every third pick-up or drop-off. Also any special instructions or other communications. |
| - Information Direction | Both |
| - Information Frequency | As needed |

| | |
|---|---|
| 4.5 INTERFACE | Trunk Repeater |
| - Connects to . . . | Radio (in vehicle) |
| - Interface Type | Voice |
| - Interface Direction | Both |
| - Interface Component | 800 MHZ leased trunk radio repeater transmission |
| - Information Type/Content | Time checks approximately every third pick-up or drop-off. Also any special instructions or other communications. |
| - Information Frequency | As needed |

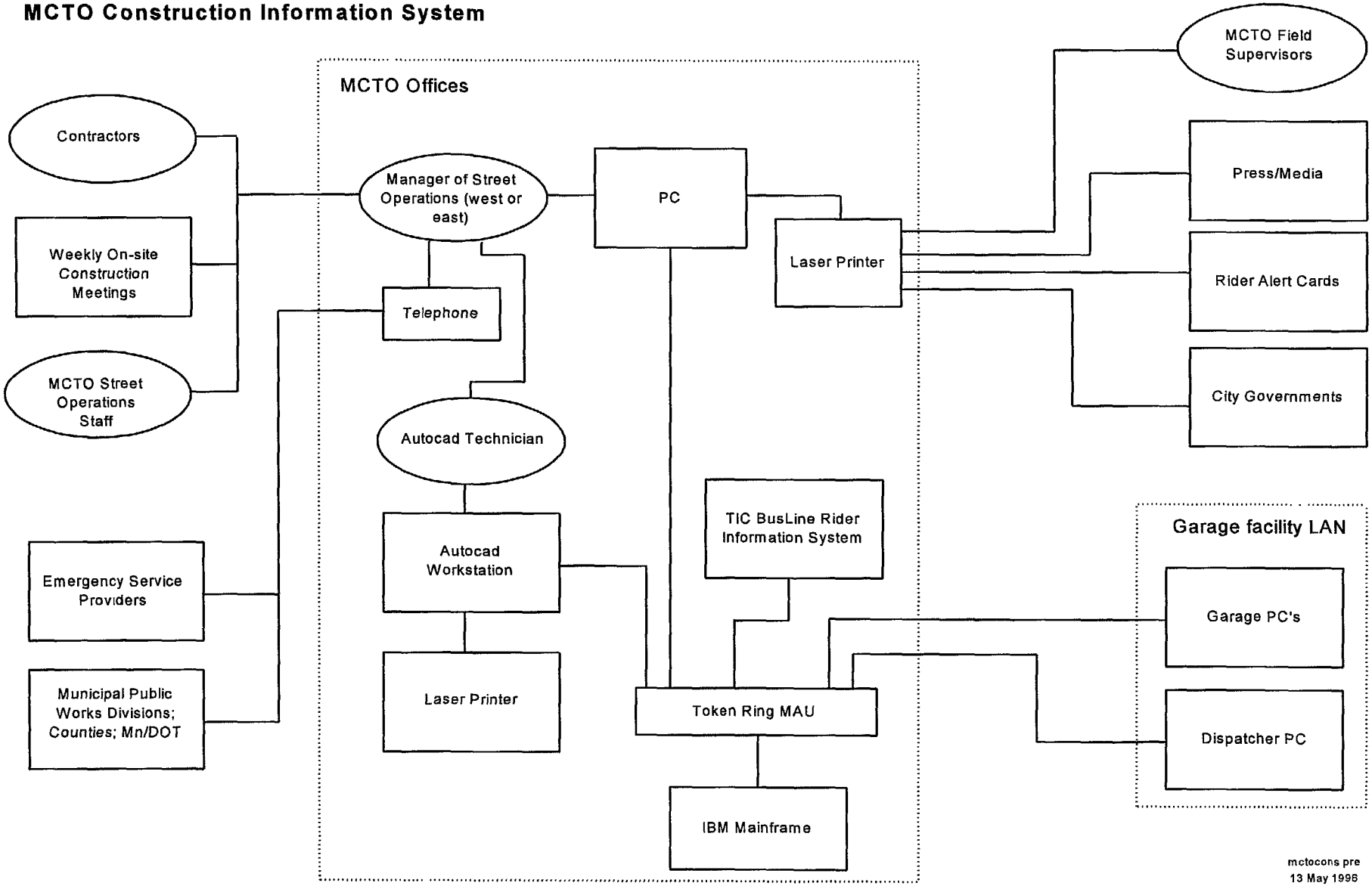
| | |
|---|---|
| 4.6 INTERFACE | Modem (at service provider) |
| - Connects to . . . | Modem (at Metro Mobility Service Center, St. Paul) |
| - Interface Type | Data |
| - Interface Direction | Both |
| - Interface Component | US West voice grade telephone line |
| - Information Type/Content | Any PASS (.DBF) system files that have changed from the previous day. |
| - Information Direction | output |
| - Information Frequency | Once daily |

| | |
|---|---|
| 4.7 INTERFACE | Ethernet Hub |
| - Connects to . . . | Novell Server<br>Customer relations PC<br>Laser Printer<br>IS Personnel PC<br>St. Paul office reservation/dispatch facilities |
| - Interface location | Metro Mobility Service Center, St. Paul |
| - Interface Type | Data (Ethernet data packets) |
| - Interface Direction | Both |
| - Interface Component | 1 O BaseT Ethernet cable |
| - Information Type/Content | 1) Novell server<br>• Receives and stores daily PASS files. updates from the IS personnel computer.<br>• Sends run time-check information to customer service PC.<br>• Sends manifests for drivers and PASS reports to laser printer.<br>2) Customer relations PC<br>• Receives time check information from the Novell server<br>3) IS Personnel PC<br>• Receives data for custom Clarion reports.<br>• Sends daily PASS file updates.<br>4) Laser Printer<br>*Prints daily manifests for drivers.<br>*Prints PASS and Clarion reports for management staff |
| - Information Direction | Both |
| - Information Frequency | Continuous |

# 3.4.7 MCTO CONSTRUCTION INFORMATION SYSTEM

POLARIS As-Is Baseline Data Collection

**MCTO Construction Information System**




mctocons pre
13 May 1996

# AS-IS DATA COLLECTION TEMPLATE

## 1.0 AGENCY "METROPOLITAN COUNCIL TRANSIT OPERATIONS (MCTO)"

| | |
|---|---|
| - Agency Type | Public Transit Provider |
| - Agency Functions | Plan and operate transit service within the Twin Cities Metro Area. |
| - Agency Location(s) | 560 Sixth Av. North<br>Minneapolis, MN 5541 l-4398 |

## 2.0 SYSTEM "MCTO CONSTRUCTION INFORMATION SYSTEM"

| | |
|---|---|
| - Date of As-Is Data Collection | February 29, 1996 |
| - Purpose | 1) Gather information about incidents and construction projects that may impact bus routing.<br>2) Provide information about alternate routing to drivers and passengers. |
| - Geographic Coverage | All MCTO Routes |
| - Contacts | Dick Loeffler<br>Manager of Street Operations, West Metro<br>Metropolitan Council Transit Operations<br>560 Sixth Avenue North<br>Minneapolis, MN 5541 l-4398<br>(612) 349-7308 (voice)<br>(612) 349-7675 (fax) |
| - Block Diagram | See attached |

| | |
|---|---|
| - Typical Operational Scenario | Information enters this system from a variety of sources but generally comes from a phone contact with an agency performing construction that may affect a bus route, or an emergency service provider (fire or police) in the case of a major fire, demonstration, etc. Construction information is gathered from preconstruction meetings (when MCTO staff is invited) and from direct contact with construction contractors in the form of plan sheets of the construction project. Throughout the course of projects, MCTO staff attend weekly on-site construction progress meetings. Construction information is reported to either the east or west metro Manager of Street Operations, who, in consultation with the 22 member street operations staff, decides on appropriate bus route and service changes. Once a change in routing has been planned, the change is mapped by a technician using Autocad. If the change is not to take effect immediately, the documentation (including the map) is retained in a hard-copy clipboard system until it becomes effective. The information about the change is then entered into a mainframe computer. Once in the mainframe, information about changes is available to bus riders through the automated TIC (documented as syetm 3.5), as well as dispatchers and other users in the MCTO garages through PC's attached to a wide area network. Drivers are given hard-copy directions and maps of detours and hard-copy notifications called "Rider Alerts" are posted at bus stops along the route. Notices of planned route changes are also sent to the local media as press releases. Field Supervisors are notified through interoffice mail and city governments are either faxed or mailed a hard copy. |

## 2.1 PERSONNEL "MANAGER OF STREET OPERATIONS"

| | |
|---|---|
| - Personnel Function | Oversees daily operation of transit vehicles and approves detours/route changes. |
| - Quantity | Two |
| - Location | One at Minneapolis MCTO office, one at St. Paul MCTO office. |
| - Workload | Spend roughly 50 percent of total time on route changes/detours |
| - Working hours | Regular workday (8:00am to 5:00pm) and as needed |
| - Status | Existing |

## 2.2 PERSONNEL "STREET OPERATIONS STAFF"

| | |
|---|---|
| - Personnel Function | 1) Attend various preconstruction and project planning meetings<br>2) Visually inspect affected routes and identify detours/alternate routes<br>3) Report information to Manager of Street Operations<br>4) Place "Rider Alert" signs at bus stops |
| - Quantity | 22 |
| - Location | MCTO offices |
| - Working hours | Regular working day (8:00 am to 5:00 pm) |

## 2.3 PERSONNEL "AUTOCAD TECHNICIAN"

| | |
|---|---|
| - Personnel Function | Create maps of bus detours/route changes for distribution. |
| - Quantity | 1 |
| - Location | MCTO Minneapolis offices |
| - Working hours | Regular working day (8:00am to 5:00pm) |
| - Status | Existing |
| - Other | See attached example |

## 3.1 HARDWARE "TELEPHONE"

| | |
|---|---|
| - Hardware Type | Standard voice telephone |
| - Functions | Communications with emergency service providers and with anyone performing unplanned (i.e. emergency repairs) construction. |
| - Location | MCTO Minneapolis offices |
| - Data Name/Contents | Location (as a street address) and nature of construction or other obstruction that may affect bus routes |
| - Data Type | Voice |
| - Status | Existing |

## 3.2 HARDWARE "PC"

| | |
|---|---|
| - Hardware Type | Intel-based personal computer |
| - Functions | The Manager of Street Operation (or one of the staff) enters a description of the planned detour/route change on a PC. It is stored on the IBM mainframe and can be printed on a laser printer for hard-copy distribution. |
| - Location | MCTO Minneapolis offices |
| - Data Name/Contents | Exact description of planned detours using street names. See attached example |
| - Data Type | Data (text) |
| - Status | Existing |

### 3.3 HARDWARE "AUTOCAD WORKSTATION"

| | |
|---|---|
| - Hardware Type | Intel-based PC |
| - Functions | Creates maps of the alternative routes/ detours |
| - Location | MCTO Minneapolis offices |
| - Data Name/Contents | DXF files which canting a map of the route |
| - Data Type | Data |
| - Policies | Existing |

### 3.4 HARDWARE "LASER PRINTER"

| | |
|---|---|
| - Hardware Type | HP Laser Jet plain paper laser printer |
| - Functions | These printers are used for many MCTO functions. Those directly related to this system are:<br>1) Descriptions of planned route detours for interoffice distribution<br>2) Press releases for local media<br>3) Maps of detours when Manager of Street Operations determines they are appropriate. |
| - Location | MCTO Minneapolis offices |
| -Quantity | Total unknown, but more than two |
| - Data Name/Contents | See attached examples |
| - Data Type | Text/graphics hard copy |
| - Status | Existing |

### 3.5 HARDWARE "IBM MAINFRAME"

| | |
|---|---|
| - Hardware Type | Minicomputer or mainframe |
| - Functions | Stores information (i.e. text descriptions and maps) about current detours. Acts as a file server to PC's on the MCTO's Token Ring LAN, thus making this information available to a variety of users |
| - Location | MCTO Minneapolis offices |
| - Data Name/Contents | See attached example |
| - Data Type | Data |
| - Policies | Only current detours are stores on this hardware. Detours which are planned but not yet in effect are stored on a clipboard system until they become effective. This is largely because detours may be revised many times before they are actually used. Keeping planned detours physically separate from the computerized system avoids delivery of inaccurate information to drivers/riders. |
| - Other | Very little information was available about this component. All that is known about the physical hardware is that it is an IBM computer and that it connects to other components through a Token Ring LAN. |

3.5.1 SOFTWARE "UNKNOWN IBM MAINFRAME OPERATING SYSTEM'

| | |
|---|---|
| - Software Type | Operating system |

3.6 HARDWARE "TIC BusLine RIDER INFORMATION SYSTEM"

| | |
|---|---|
| - Hardware Type | See system documentation 3.5 "TIC BusLine Information System" |

3.7 HARDWARE "GARAGE FACILITY LAN (GARAGE PC'S, DISPATCHERS)"

| | |
|---|---|
| - Hardware Type | No information was available about the LAN/WAN system used by the garages other than that they are able to assess information |

3.13.1 SOFTWARE "DOS"

| | |
|---|---|
| - Software Type | Operating system on garage PC's. No other information available |
| - Software Standards | DOS 16-bit |

| | |
|---|---|
| 4.1 INTERFACE | Manager of Street Operations |
| - Connects to . . . | 1) City project staff at meeetings<br>2) Special event planning staff at meetings<br>3) Contractors<br>4) On-site construction staff at weekly meetings<br>5) Street operations staff |
| - Interface Type | Person to person contact |
| - Interface Direction | Both |
| - Interface Component | Voice/notes/other hard-copy documentation (such as maps and plan sheets) |
| - Information Type/Content | Extent and affected areas of construction projects. This information is generally given as street addresses |

| | |
|---|---|
| 4.2 INTERFACE | Telephone (Manager of Street Operations) |
| - Connects to . . . | 1) Emergency service providers<br>2) Municipal public works divisions<br>3) County public works divisions<br>4) Mn/DOT |
| - Interface Type | Voice |
| - Interface Direction | Both |
| - Interface Component | Voice grade telephone line |
| - Information Type/Content | This interface is generally used for notification of emergency street repairs and usage. This can be fire emergencies, public demonstrations, or as a result of such mechanical problems as a water main break. All of these circumstances require immediate transit detours. |
| - Information Direction | Both |

| | |
|---|---|
| 4.3 INTERFACE | Manager of Street Operations |
| - Connects to . . . | Autocad Technician |
| - Interface location | MCTO Minneapolis offices |
| - Interface Type | Person to person contact |
| - Interface Direction | Both |
| - Interface Component | Text and voice |
| - Information Type/Content | 1)Location (as street address) of construction acticities or events that might disrupt transit service.<br>2)Estimated start and end dates of detour. |
| - Information Direction | Both |
| - Information Frequency | As needed. Mapping is only done when the Manager of Street Operations determines it is necessary. |

| | |
|---|---|
| 4.4 INTERFACE | Autocad Workstation |
| - Connects to . . . | Token Ring MAU (hub) |
| - Interface location | MCTO Minneapolis offices |
| - Interface Type | Data |
| - Interface Direction | Both |
| - Interface Component | Token Ring. Probably using twisted pair cable, but physical configuration was not available during the interview |
| - Information Type/Content | Autocad maps (DXF) format to be stored on the mainframe for access by other users on the LAN/WAN |
| - Information Direction | Both |
| - Information Frequency | As needed |

| | |
|---|---|
| 4.5 INTERFACE | PC'S |
| - Connects to . . . | Token Ring MAU (hub) |
| - Interface location | MCTO Minneapolis offices |
| - Interface Type | Data |
| - Interface Direction | Both |
| - Interface Component | Token Ring. Probably using twisted pair cable, but physical configuration was not available during the interview |
| - Information Type/Content | Descriptions of current detours |
| - Information Direction | Both |
| - Information Frequency | As needed |
| 4.6 INTERFACE | TIC |
| - Connects to . . . | Token Ring MAU (hub) |
| - Interface location | MCTO Minneapolis offices |
| - Interface Type | Data |
| - Interface Direction | Both |
| - Interface Component | Token Ring. Probably using twisted pair cable, but physical configuration was not available during the interview |
| - Information Type/Content | See documentation for system 3.5 "TIC BusLine" system |
| - Information Direction | Both |
| - Information Frequency | As needed |
| 4.7 INTERFACE | IBM Mainframe |
| - Connects to . . . | Token Ring MAU (hub) |
| - Interface location | MCTO Minneapolis offices |
| - Interface Type | Data |
| - Interface Direction | Both |
| - Interface Component | Token Ring. Probably using twisted pair cable, but physical configuration was not available during the interview |
| - Information Type/Content | This interface carries all types of data concerning detours, including:<br>1) Maps of detours<br>2) Text descriptions of detours<br>Any special messages for MCTO staff regarding detours (e-mail) |
| - Information Direction | Both |
| - Information Frequency | As needed |

| | |
|---|---|
| 4.8 INTERFACE | Garage PC |
| - Connects to . . . | Token Ring MAU (hub) |
| - Interface location | MCTO Minneapolis offices |
| - Interface Type | Data |
| - Interface Direction | Both |
| - Information Direction | Both |
| - Information Frequency | As needed |
| - Other | Details regarding connections to external systems (those not located at the MCTO Minneapolis Office) were not available through the interview. Through information gathered while surveying other MCTO systems, it appears that each of the four external garages have their own LANs, so it is likely that there is some type of bridge in use between these systems and the MCTO Minneapolis office. However, no specific information was available about how these systems communicate with each other, only that information stored on the IBM Mainframe was available at remote locations through PC access. |

| | |
|---|---|
| 4.9 INTERFACE | Dispatch PC's |
| - Connects to . . . | Token Ring MAU (hub) |
| - Interface location | MCTO Minneapolis offices |
| - Interface Type | Data |
| - Interface Direction | Both |
| - Information Direction | Both |
| - Information Frequency | As needed |
| - Other | Details regarding connections to external systems (those not located at the MCTO Minneapolis office) were not available through the interview. Through information gathered while surveying other MCTO systems, it appears that each of the four external garages have their own LANs, so it is likely that there is some type of bridge between these systems and the MCTO Minneapolis office. However, no specific information was available about how these systems communicate with each other, only that information stored on the IBM Mainframe was available at remote locations through PC access.<br>There may be additional information regarding this interface under System 3.1 "Trapeze Scheduling Planning System" |

| | |
|---|---|
| 4.10 INTERFACE | TIC BusLine System |
| - Connects to . . . | Passengers |
| - Interface Type | Voice |
| - Interface Direction | Both |
| - Interface Component | Voice grade telephone line |
| - Information Type/Content | Locations and schedules of alternate bus stops during detours |
| - Information Direction | Both |
| - Information Frequency | As needed |
| - Other | See system documentation 3.5 “TIC BusLine Information System” |

| | |
|---|---|
| 4.11 INTERFACE | Laser Printers |
| - Connects to . . . | Press/Media (local newspapers and television/radio stations),City Governments |
| - Interface Type | Hard-copy text and graphics |
| - Interface Direction | output |
| - Interface Component | USPS Mail Service |
| - Information Type/Content | Press releases containing the location of detours and alternate bus stops stop times. This information is released as maps and text. |
| - Information Direction | output |
| - Information Frequency | As needed |

| | |
|---|---|
| 4.12 INTERFACE | Laser Printer |
| - Connects to . . . | Field Supervisors |
| - Interface Type | Hardcopy text and graphics |
| - Interface Direction | output |
| - Interface Component | Interoffice mail |
| - Information Type/Content | See attached examples. Any special information not included in the attached examples may be included as text |
| - Information Direction | output |
| - Information Frequency | As needed |

| | |
|---|---|
| 4.13 INTERFACE | Laser Printer |
| - Connects to . . . | Rider Alert Cards |
| - Interface Type | Printed cards |
| - Interface Direction | output |
| - Interface Component | Physically carried to bus stops and placed on busses operating on affected routes. |
| - Information Type/Content | Locations of alternate bus stops during detours (given as street addresses) |
| - Information Direction | output |
| - Information Frequency | As needed |
| - Other | These are the direct communications to passengers regarding route changes/detours. Approximately 18,000 Rider Alert Cards are photocopied and hand placed at bus stops and on busses annually. This is a very labor intensive part of this system. |

| | |
|---|---|
| 4.15 INTERFACE | Dispatcher PC's |
| - Connects to . . . | Drivers |
| - Other | See additional information regarding this interface under System 3.1 "Trapeze Scheduling Planning System" |

# APPENDIX A

As-Is Agency Reports
Pre-Survey Candidate Systems List

## PRE-SURVEY CANDIDATE SYSTEMS

Traffic Signal Control Systems
- City of St. Paul Computran traffic signal control system
- City of St. Paul traffic signal intersection hardware (field equipment)
- City of Minneapolis Fortran traffic signal control system
- Mn/DOT Metro Division/District traffic office closed loop traffic signal system(s)
- County closed loop traffic signal systems (Hennepin, Ramsey, etc.)
- City closed loop traffic signal systems
- Video detection/control of signal system (T.H. 65 & 53rd, Lyndale and Franklin Ave)
- Pre-emption of traffic signals for emergency vehicles (EVP)
- Pre-emption of traffic signal at fire stations
- Pre-emption of traffic signals at railroad crossings (20 locations in Metro area)
- Minneapolis AUSCI operational test

Freeway Management System
- Mn/DOT TMC ramp meter system
- Mn/DOT TMC video surveillance system
- Mn/DOT TMC CMS control system
- KBEM radio broadcast system
- Mn/DOT TMC cable TV information system - (Triple Vision system)
- Mn/DOT Metro Division/District portable changeable message signs
- TMC traffic history database (volume and occupancy data)
- TMC incident log database
- U of M Autoscope incident detection system
- Genesis operational test
- Trilogy operational test
- Mn/DOT workzone traffic management system operational test

Transit Management Systems
- MCTO “Trapeze” scheduling/planning system (creates bus/driver schedules)
- MCTO “radio” system (computer assisted radio system, 7 channels)
- MCTO automatic passenger counters (on some buses)
- MCTO electronic fare collection boxes (on all buses)
- MCTO TIC BusLine system (voice responses system, customer service system)
- MCTO customer service system for route/schedule planning (live telephone operators)
- MCTO transportation section (provides construction information to MCTO)
- MCTO bus stop database (contains the attributes of each bus stop)
- MCTO Police crime/incident tracking system
- MCTO Opticom emitters (EVP on 80 buses)
- MCTO speed light system (ramp meter pre-emption on selected ramps)
- MCTO Route-0-Matic system - vectors around incidents and congestion
- Metropolitan Council Rideshare system (Mn dial-a-ride)
- MCTO funded paratransit systems
- Metropolitan Council Metro Mobility passenger registration system
- Metropolitan Council Metro Mobility passenger reservation system
- U of M transit management
- Southwest Transit
- Minnesota Valley Transit
- Plymouth Metrolink
- School bus dispatch systems

Incident Management Program
- Mn/DOT TMC Highway Helper program (including AVL system)
- Private tow contracts
- U of M police incident management
- St. Paul DIVERT operational test

Electronic Fare Payment Systems
- City of Minneapolis Parking fare collection (smart card)
- City of Minneapolis electronic parking meter maid system
- Smart Darts operational test

**PRE-SURVEY CANDIDATE SYSTEMS (CONTINUED)**

Electronic Toll Collection Systems
- Toll road proposals (5 proposals in MN)
- Congestion Pricing Study
- Mileage based tax study

Multi modal Traveler Information Systems
- Travlink operational test

Administrative Systems
- Mn/DOT Electrical Services maintenance management system
- Mn/DOT Electrical Service gopher state one-call access system
- Mn/DOT TIS
- Mn/DOT automatic traffic recorder system
- Mn/DOT ISTEA management systems
- MnDOT CVO administrative systems
- DPS CVO administrative systems
- City of Minneapolis sign database

Other nformation Systems
- Airline flight arrival/departure information - NW
- Airport rental car kiosk - Hertz
- MN Office of Tourism travel information center kiosks
- Mn/DOT TMC road weather information system access
- Mn/DOT Metro Division weather information access
- Mn/DOT Aeronautics weather information system
- Mn/DOT statewide road weather information telephone information
- Mn/DOT Pavement Condition and Weather Reporting System - future
- Internal distribution system Distribution of T M C loop data via the Internet
- RWIS - Mn/DOT future Road/Weather Information system

Emergency Response Systems
- Motorist call box system
- Mobile Data Terminals (MDT) in all State Patrol cars
- Laptop PC's in State Patrol cars to replace MDT's - pilot project in 1996
- Emergency 911 log system at State Patrol
- State patrol information desk
- State Patrol South St. Paul information desk
- State Patrol access to drivers license information. via 911 center
- Mn/DOT Mayday operational test
- Demand response dispatch systems - numerous standalone systems

Parking Management Systems
- Metropolitan airports commission parking management
- City of Minneapolis parking management systems
- U of M parking management
- St. Paul Advanced Parking Information System operational test

Miscellaneous
- Mn/DOT portable traffic management system
- City of Minneapolis police special event management
- City of St. Paul special event management
- U of M special event management
- Mn/DOT pilot differential GPS broadcast base station
- Mn/DOT maintenance vehicle AVL
- MnlDOT Metro Division/District maintenance dispatch
- Hennepin County Medical Center emergency vehicle dispatch
- MN Pollution Control Agency air quality monitoring sites
- Met. Council Forecasting models - uses data from Mn/DOT TIS database
- U of M traffic management system proposal

Interagency Systems
- ICTM - Integrated Corridor Traffic Management System operational test (includes Autoscope)
- ARCTIC - operational test in Virginia, MN

## PRE-SURVEY CANDIDATE SYSTEMS (CONTINUED)

CVO Systems
- List of s stems from MN Guidestar
- CVO calll-in number
- State Patrol toll free Information number

Construction Information/Notification Systems
- Gopher State One Call system for utility locations
- Mn/DOT construction information dissemination
- Counties' systems (Hennepin County)
- Counties' systems (Ramsey County)
- City system (Minneapolis)

Communications Systems
- Mn/DOT TMC Fiber optic data communications system
- Mn/DOT Microwave communication System
- Mn/DOT T1 system
- Mn/DOT Wide Area Network
- MNET (STARS)
- Voice radio - State Patrol, Mn/DOT Maintenance, DNR
- 800 MHZ Trunked Radio system (Metro area)
- Internet Communications
- Traffic Signal Interconnect systems
- RBDS - Radio Broadcast Data Systems
- Mn/DOT Video Conferencing

# APPENDIX B

As-Is Agency Reports
Data Collection Guide


## Minnesota Guidestar

# As-Is Transportation Systems Inventory Data Collection Guide

LORAL
Federal Systems-Owego

# POLARIS As-Is Transportation Systems Inventory
# Data Collection Guide

## PURPOSE

The purpose of this document is to provide information about the Polaris As-Is Transportation Systems Inventoy Template. Information provided by this guide is representative but not inclusive as to the amount or all the types of information that may be found during a Polaris survey.

## ORGANIZATION

Organization of this document is based on the Polaris As-Is Transportation Systems Inventory Template. For each template page in the Polaris As-Is Transportation Systems Inventory Template, a section in this document, will list the types of information to be collected, a description of how the data will be collected, recommended answers for known entities, and miscellaneous note area for unstructured items. The following list contains this documents sections:

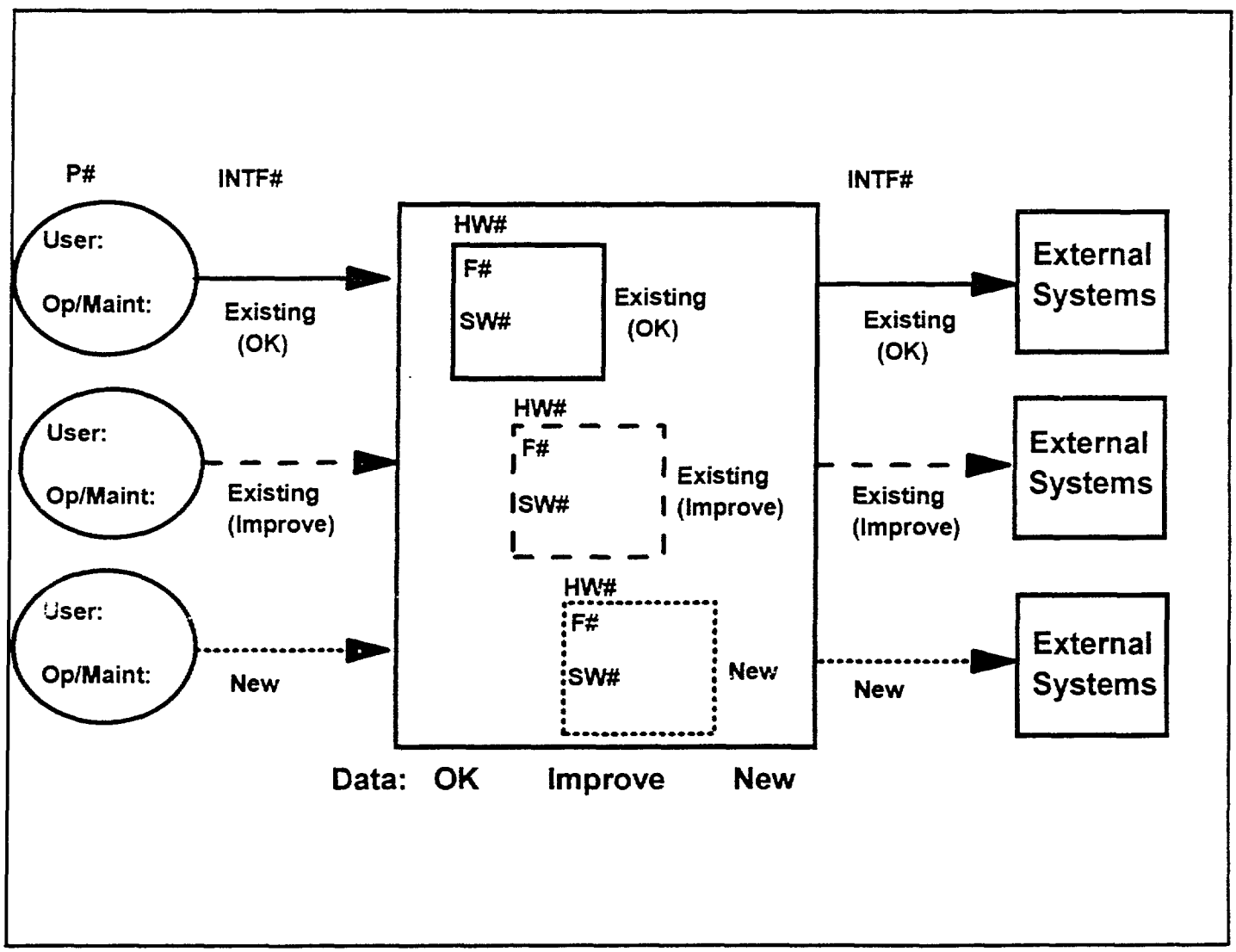
1.0 Systems
1.1 Hardware Components
1.2 Software Components
1.3 Software Interfaces
1.4 System Personnel
2.0 Agency
2.1 Agency Interfaces
2.2 Agency Systems

## About the Template Document

The Polaris As-Is Transportation Systems Inventory Template is a document intended to assist the data collector in the field perform their task more expediently. The document is a collection of 8 sections that are identical to the sections in this document. Seven of sections are on one sheet of paper. One section expanded to two sheets of paper. The theory of the document structure was to duplicate each document section numerous until the entire system, or what ever thing you are collecting data on is captured on the templates.

# 1.0 Systems

In order to understand the system being surveyed, the surveyor shall draw the system in block diagram format. The block format shall conform to the following example. Template Page #1 is where the system block diagram shall be drawn.



# 1.1 Hardware Components

The purpose of Hardware Components, Template Page #1, is to list all the various hardware elements that are interconnected to form the bounds of the system to be described. For each hardware element, an identifier, HW#, shall be created and associated with hardware element graphic drawn in the System Block Diagram, Template Page #1 .

Template Page #1 contains the following columns to be completed during the survey process. Definitions for each column is provided to assist in providing consistency in collecting data. Where possible, suggested recommendations for collecting data is provided.

HW# — identifier for each component on the System Block Diagram (drawing). Each identifier used with the System Block drawing shall be unique for each System Block Diagram.

Hardware Name — A generic name for identification purposes within the user community. If no name is provided, then the Manufacturer and Model number is acceptable.

Hardware Type — Classifies the identifier, HW#, into a generic group.

If the type of component is not known, then Make and Model will be required.

Recommended choices for this column may be selected from the following list:

1. Computer Processors
2. Workstations
3. Telecommunication Devices
   a. Hubs
   b. Routers
   c. Transmitters
   d. Receivers
   e. Modems
   f. Decoders/Encoders
4. Peripherals
   a. Printers
   b. Displays

c. Barcode Readers
d. Magnetic Stripe Readers
e. Punch Cards
f. Magnetic Tape
g. Diskette
h. CD ROM
i. Cartridge Tape

5. Telephones
   a. Wire Based
   b. Wireless
6. Two way Radio Transmitters/ Receivers
7. Radio Receivers
8. Traffic Signals
9. Video Cameras
10. Loop Detectors
11. Message Signs
12. Temperature Sensors
13. Optical Transmitters / Receivers
14. Microwave

Functions - (F#)

Describes the major functions of the system. For each major function, a new entry lines shall be used for writing the description. For each function, the F# is associated to the respective HW# on the System Block Diagram, Template Page #1. The following list contains some recommended functions that may be used to describe a component.

1. Process
2. Control
3. Store
4. Communicate
5. Signal
6. Log
7. Record
8. Speak
9. Write
10. Print
11. Messaging
12. Locate
13. Search

Location

States where geographically the HW# is located.

| | |
|---|---|
| | Considerations should be given for : Multiple buildings within one community, multiple cities, multiple states, countries and other Agencies or private sector. Try to limit the information to Building Name and relevant geographic location versus room number or address. Detailed information is not required unless there is multi-jurisdictional or multi-organizations within one building. |
| Data Name / Content | A brief description of the data or information is processed and stored by the HW#. Some examples are:<br>1. Database of System Users<br>2. Database of construction projects<br>3. Collect incident information and reformat the data |
| Data Type | Classifies the data into a generic group. Choices for this group are:<br>1. Voice<br>2. Data<br>3. Video<br>4. Paper<br>5. Other _(Specify) _____ |
| Status | An indicator about the existence, transition, or non-existence of the HW#:<br><br>E=Existing (Currently in place, No modifications planned)<br>D=Deleted (An agency has plans to delete this element in the future, but at the time of survey the element existed.)<br>I=lmprove (Currently in place, but requires modification due to element not meeting user needs, or system needs)<br>N=NEW (New system planned for future deployment, but at the time of survey is not currently deployed.) |
| Policies | List agency policies that are practiced with respect to the Hardware components. Listed below are a couple of examples of what would belong in this topic.<br><br>1. Maintenance of the radio equipment<br>2. Agency X requires all PC's to be hardware locked and anchored to a non-removable building structure. |
| Constraints / Restrictions | List agency constrained and/or restrictions with respect to |

Hardware Components

1. The hardware is outdated and can no longer be upgraded.

2. Hardware maintenance is not available for the equipment because it is too old.

Issues — List any issues that are related to this specific componenet. If the issue is global to the system, then is only needs to be stated once.

Recommended improvements / Planned Changes

List any system or component recommended improvement that the contact person discusses. State whether the improvement is planned or a “wish” and explain why they system and component is being improved. If the improvement is global to the system, then is only needs to be stated once.

Contacts / Phone Numbers

List the contact person from which you recieved this information and their phone number.

Other — List anything else that may be relevant about the system, but does not fit in the above columns.

# 1.2 Software Components

SW# — [Same description as HW# in Section 1.1]

Software Name — [Same description as Hardware Name # in Section 1.1]

Software Type — Classifies the identifier, SW#, into generic groups

1. Transportation Software Applications
2. Operating Systems
3. Communication Protocols
4. Database
5. Data Interchange
6. User Interface
7. System Management
8. Office Applications
9. Controller Programs
10. Firmware

Software Standards — Specify for each software type the associated product or standard. The following list is organized with the standards listed within software type.

1. Transportation System Applications
   a. Urban Traffic Control Sofware (UTCS)
   b. Sindney Control Adaptive Device Software (SCADS)
   c. SCOOTS
   d. 170 Software -WAPITI
   e. National Electrical Materials Association (NEMA) Software
   f. TRAPEZE
   g. AVL

2. Operating System
   a. DOS
   b. WINDOWS
   c. WINDOWS FOR WORKGROUPS
   d. WINDOWS95
   e. UNIX

f. OS/2
g. WINDOWS NT
h. Macintosh / System 7
i. OS/400
j MVS
k. VM
l. VSE
m. VMSNSE
n. Other

3. Communication Protocols
   a. TCP/IP (UNIX, IBM, Microsoft, Beamon Whiteside, Exceed, FTP)
   b. SNA (IBM)
   c. IPX/SPX (Novell)
   d. OSI
   e. DECnet (Digital Equipment)
   f. BISYNC
   g. Frame Relay
   h. x.25
   i. FDDI
   j. ATM
   k. NetBios (IBM, Microsoft)
   l. Other
4. Data base
   a. Oracle
   b. Sybase
   c. Informix
   d. Database 2
   e. FoxPro
   f. Microsoft Access
   g. Other
5. Data Interchange
   a. GIS
   b. Image
   c. Vector
   d. Vector Graphics
   e. Images
   f. Printing (PostScript, PCL, AFP)
   g. Computer Aided Logistics (CALS)
   h. Electronic Data Interchange (EDI)
   i. Electronic Mail (Email)
   j. Electronic Documents

k. Traffic Messaging
l. Weather Messaging
m. Location Messaging
n. Construction Messaging
o. Other

6. User Interface
   a. Windows (Microsoft)
   b. Windows for WorkGroups (Microsoft)
   c. X-windows (UNIX)
   d. Presentation Manager (IBM OS/2)
   e. Character Based
   f. Other
7. System Management
   a. Network
   b. Computer Devices
   c. Data
   d. Other
8. Office Applications
   a. Word Processors (WordPerfect, MS Word, DisplayWrite)
   b. Spreadsheets (123, Excel, Quattro Pro)
   c. Graphics (Corel Draw, MS PowerPoint, Freelance)
   d. Multimedia (Video Conferencing)
   e. Project Scheduling (Microsoft Project, Primivera)
   f. Other

Function — [Same description as Function in Section 1.1]

Application Language — This field is only applicable for Software Types of Transportation Software Applications when there is a software application that has been custom designed and coded for a specific need or requirements. (ie. There is only one or few software applications in existence) Then the programming language of the software application should be determined. The following list provides some of programming languages that may have been used:

1. C++
2. Visual C++
3. C
4. Visual C
5. Basic
6. Visual Basic

7. Pascal
8. COBOL
9. FORTRAN
10. Assembler
11. Ada
12. Other

Status — [Same description as Status in Section 1.1]

Policies — List agency policies that are practiced with respect to Software Components. Listed below are a couple of examples of what would belong in this topic.

1. Agency X does not permit any non-business related software to be installed on PC's .

2. Agency X requires all PC's Operating Systems to have password protection to prevent unauthorized system access to the networks.

Constraints / Restrictions — List agency constrained and/or restrictions with respect to Software Components

1. The software is outdated and can no longer be upgraded.

2. Software maintenance is not available for the equipment because it is too old.

Issues — List any issues that are related to this specific componenet. If the issue is global to the system, then is only needs to be stated once.

Recommended Improvements / Planned Changes

List any system or component recommended improvement that the contact person discusses. State whether the improvement is planned or a "wish" and explain why they system and component is being improved. If the improvement is global to the system, then is only needs to be stated once.

Contacts / Phone Numbers

List the contact person from which you recieved this information

| | |
|---|---|
| | and their phone number. |
| Other | List anything else that may be relevant about the system, but does not fit in the above columns. |

# 1.3 System Interfaces

The purpose of System Interfaces, Template Pages #5-7, is to list all the various interfaces that connect the Hardware Components together and External Systems to the system being surveyed. For each Hardware Component, HW#, listed, the interface, INTF#, between the two components shall be listed individually until all the interfaces between Hardware Components are covered. For Systems outside the boundary of the system being surveyed, their respective interfaces shall be listed.

| | |
|---|---|
| INTF# | [Same description as HW# in Section 1.1] |
| External System Name | [Same description as Hardware Name in Section 1.1] |
| Interface Locations | States which locations the interfaces are located. If the interface is co-located in the same location, then only one location is required. |
| Interface Type | Classifies the interface into a generic group. Choices for this group are:<br>1. Audio<br>2. Data<br>3. Video<br>4. Paper<br>5. Other ____(specify) _____ |
| Interface Direction | Three choices are available for this item. Circle the applicable item.<br>Input — Flow of information is coming in to the surveyed system or component being described<br>output — Flow of information is going towards another component or external system.<br>Both — Flow of information is going both directions. |
| Interface Component | A name of the physical entity in which the interface is established. The following list contains some more popular types of Interface Components: |

1. Wire Based
   a. Token Ring
   b. Ethernet
   c. FDDI
   d. SONET
   e. Arcnet
   f. Applenet
   g. ATM
   h. ISDN
   i. RS-232
   j. RS-422
   k. SDLC
   l. Modems (Bell 202, 212, 213, V.24, V.32 V.34)
   m. Other _____
2. Wire Based Media (cabling), if there is an external network geographically located.

   For wire based media (cabling), the wire/fiber count should be captured to
   a. Level 3 Unshielded Twisted Pair (UTP), (Telephone Voice / Data 2 MB)
   b. Level 4 Unshielded Twisted Pair,(UTP) [Data 10 MB]
   c. Level 5 Unshielded Twisted Pair,(UTP) [Data 100 MB]
   d. Shielded Twisted Pair (STP) [Data rate at 10 MB]
   Shielded Twisted Pair (STP) [Data rate at 100 MB]
   f. Multimode Fiber
   g. Single Mode Fiber
   h. Service Provider (ie. US West)
   i. Other _____
3. Wireless Based
   a. FM (ie. Two way / Broadcast)
   b. AM (ie. Broadcast)
   c. CDPD (ie. Digital Cellular Data Network)
   d. Ardis (ie. Digital Cellular, Two way paging)
   e. AMP (ie. Cellular Telephone)
   f. Microwave
   g. Other

Protocol / Standard — The interface should have a protocol or other standard

associated with how it operates. In some instances there will be multiple protocols and standards associated with the interface. All protocols and standards shall be listed. The following list identifies some of the protocols / standards that may be found.

a. TCP/IP (UNIX, IBM, Microsoft, Beamon Whiteside, Exceed)
b. SNA (IBM)
c. IPX/SPX (Novell)
d. OSI
e. DECnet (Digital Equipment)
f. BISYNC
g. Frame Relay
h. X.25
i. FDDI
j. ATM
k. NetBios (IBM, Microsoft)
l. Video (ie. Manchester Code Based)
m. Other

Information Type / Content

A description of the information that is being passed through the interface. (ie. road conditions, Traffic congestion, road construction information)

Information Direction

Three choices are available for this item. Circle the applicable item.

| | |
|---|---|
| Input | Flow of information is coming in to the surveyed system or component being described |
| output | Flow of information is going towards another component or external system. |
| Both | Flow of information is going both directions. |

Information Frequency

Specify what rate the data is exchanged between components

Information Standards

List any standards that are identified with the information being processed. Some areas where standards may be present presented listed in the following list:

1. If location information is provided, what is the units or other location attributes provided?
   a. Street Names of the nearest intersections
   b. Mile Markers
   c. Latitude / Longitude
   d. Addresses
   e. Internal Travel Interchange Standard
   f. State / Plane Coordinate
   g. Links / Nodes
   h. Other
2. Traffic Messaging
3. Weather Messaging
4. Location Messaging
5. Construction Messaging
6. Mapping Standards (GIS)
   a. Image
   b. Vector
7. Electronic Mail (Email)
8. Electronic Data Interchange (EDI)
9. Computer Aided Logistics (CALS)

Policies

List agency policies that are practiced with respect to System Interfaces. Listed below are a couple of examples of what would belong in this topic.

1. Agency X only operates the interface with System A Monday - Friday, 8AM - 5PM.
2. Agency Y requires authorization to use Agency X interfaces to their systems.

Constraints / Restrictions

List agency constraints and/or restrictions with respect to System Interfaces:

1. The interface hardware is outdated and can no longer be upgraded.
2. The maintenance of the interface is only supported by a vendor specializing in RF transmitters.

Issues

List any issues that are related to this specific componenet If

the issue is global to the system, then is only needs to be stated once.

Recommended Improvements / Planned Changes

List any system or component recommended improvement that the contact person discusses. State whether the improvement is planned or a "wish" and explain why they system and component is being improved. If the improvement is global to the system, then is only needs to be stated once.

Contacts / Phone Numbers

List the contact person from which you recieved this information and their phone number.

Other

List anything else that may be relevant about the system, but does not fit in the above columns.

# 1.4 System Personnel

The purpose of System Personnel, Template Page #9, is to capture the interaction a human being with the system being surveyed. For each type of personnel using the system, a P## shall be created on the System Block Diagram to identify the personnel and where they interface with the system.

P# — [Same description as HW# in Section 1.1]

Personnel Role — A description of the personnel interfacing with the system. Some examples of a role are:

1. System Maintainer
2. Data Input
3. Data Analysis
4. Data Collector
5. User
6. Other

Quantity — Approximate quantity of personnel who perform this particular role. A individual may have more that one personnel role in working with the system, therefore may be counted more that once.

Location — [Same description as HW# in Section 1.1]

Workload — Approximate amount of time per week the personnel spends interfacing with the system. The amount should be estimated on the total quantity of personnel for each role. Circle the appropriate designator on the template. Each designator is described in the following list.

E Extensive Use = 90-100% Utilization
H High - average hours are >70 - 120 per week
M Medium - average hours are 30 -60 per week
L Low - average hours are <20 per week

Status — [Same description as Status in Section 1.1]

Policies — List agency policies that are practiced with respect to System

Personnel. Listed below are a couple of examples that may be found in this topic.

1. Agency X only operates the System A with the System Administrator, Monday - Friday, 8AM - 5PM.
2. Educational requirements to operate System B is experience with UNIX.

Constraints / Restrictions — List agency constraints and/or restrictions with respect to Systems Personnel.

1. The personnel do not have the skills to maintain the system.

Issues — List any issues that are related to this specific componenet. If the issue is global to the system, then is only needs to be stated once.

Recommended Improvements / Planned Changes

List any system or component recommended improvement that the contact person discusses. State whether the improvement is planned or a “wish” and explain why they system and component is being improved. If the improvement is global to the system, then is only needs to be stated once.

Contacts / Phone Numbers

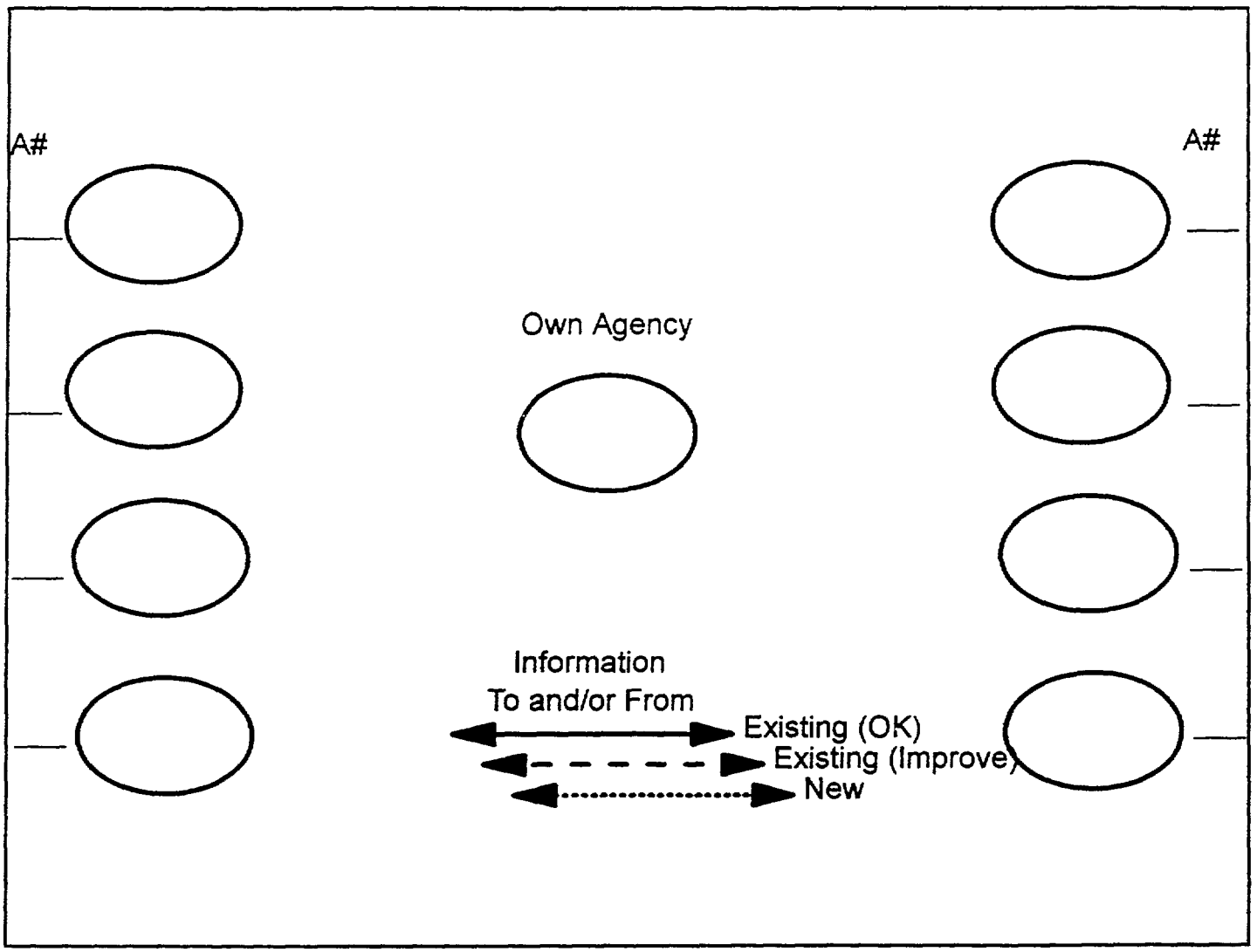
List the contact person from which you recieved this information and their phone number.

Other — List anything else that may be relevant about the system, but does not fit in the above columns.

# 2.0 Agency

Information about the organization which contains the system being surveyed is collected in this section. The purpose of this section is to identify any other systems or interfaces that an a agency has an established method for communicating.

Template Page #9 is a graphical view of who agencies have relationships with other agencies. For each agency surveyed, identify the external agencies by assigning an A# identifier, and placing the name of the external agency inside the oval. Indicate the type of interface between the agencies, by the legend in Template Page #7.



# 2.1 Agency Interfaces (Internal I External)

The purpose of Agency Interface, Template Page #1 1, is to further understand the type of relationship that is established with an external organization.

A# — [Same description as HW# in Section 1.1]

Location — [Same description as Location in Section 1.1]

Information Content — This column is a summary of the information exchanged between the agencies. An few examples of the how to complete this item would be: Road Weather Information, Road Construction, and Incident Reporting

Interface Method — How is the information being exchanged today? Some recommended methods are presented in the following list:

1. Telephone
2. Fax
3. Mail
4. Computer Information Network
   a. Internet
   b. America Online
   c. Compuserve
   d. Prodigy
   e. Bulletin Board Service
   f. Other
   g. Two Way Radio
   h. Television
5. Radio Broadcast
6. Visual
7. Newspaper
8. Hardcopy Handouts (ie. Flyers, pamphlets)

Frequency — The frequency of information exchange shall be expressed in some type of units over a time period.

1. One time / minute
2. One time / hour
3. One time / day

4. One time /week
5. One time / month
6. One time / year
7. As needed
8. Post unplanned event (ie. traffic accident)
9. Other

Status — [Same description as Status in Section 1.1]

Policies — List agency policies that are practiced with respect to the environment. Listed below are a couple of examples that may be found in this topic.

1. Agency X only operates the System A with the System Administrator, Monday - Friday, 8AM - 5PM.

2. Educational requirements to operate System B is experience with UNIX.

Constraints / Restrictions — List agency constraints and/or restrictions with respect to Systems Personnel.

**1.** The personnel do not have the skills to maintain the system.

Issues — List any issues that are related to this specific componenet If the issue is global to the system, then is only needs to be stated once.

Recommended Improvements / Planned Changes

List any system or component recommended improvement that the contact person discusses. State whether the improvement is planned or a "wish" and explain why they system and component is being improved. If the improvement is global to the system, then is only needs to be stated once.

Contacts / Phone Numbers

List the contact person from which you recieved this information and their phone number.

Other — List anything else that may be relevant about the system, but does not fit in the above columns.

# 2.2 Agency Systems and Programs

Template Page #13 is Collecting all the systems that an agency being surveyed is using. It is intended that for each system listed, a set of templates in Section 1 is completed.

# APPENDIX C

As-Is Agency Reports
System Documentation Attachments

### 3.4.3 MCTO Electronic Fare Collection System

## FAREBOX LOG-IN: Pull-outs, Reliefs, Bus changes

1. Press # for log-in mode.
2. Enter fare code (see sticker on farebox), then press #.
3. Enter direction code for pull-out, pull-in and each trip (1=N, 2=S, 3=E, 4=W), then press #.
4. Enter route number, then press #.
5. Enter run (rucus) number, then press #.
6. Enter city code (1=Mpls, 2=St. Paul), then press #.
7. Enter driver number.
8. Press dump (green button) for money mode.

**Press keys firmly and double check entries for accuracy.**

## FAREBOX UPDATE: All Buses when entering DT Zone

1. Press # for log-in mode.
2. Press *.

## FAREBOX UPDATE: Terminals, Double-overs

1. Press # for log-in mode.
2. Press # until item you wish to change appears (Route number, direction, etc.)
3. Press # to accept existing info or enter new info.
4. Press # to scroll to additional field or press dump to return to money mode.

## END OF SHIFT: LOG OUT

1. Press # for log-in mode.
2. Press # until "driver" appears.
3. Press 0.

## END OF SHIFT: LOG OUT (cont.)

4. Press Dump.
5. Display reads "No Drive".

## GENERAL INFORMATION

1. The farebox has two modes: money (running) and log-in.
2. The farebox must be in log-in mode to log in or update (farebox must be in log-in mode before pull-out time).
3. From money mode, press # for log-in mode.
4. From log-in mode, press dump (green button) for money mode.
5. For time, date and day of week, press and hold dump while pressing * once for time, twice for date and three times for day of week.
   **NOTE:** time is on 24 hour clock; days are numbered, Sunday=1, etc.
6. The farebox automatically adjusts fares at the beginning and end of peak hours on weekdays. You will hear a long beep as the fare changes.
7. If you make a mistake when logging in or updating, press # to scroll until the item reappears; enter the correct info.
8. Farebox will not operate unless info is correctly logged in.
9. You must log-out at the end of each piece of work upon pull-in or relief.
   **NOTE:** (PM pull-in) log off before the farebox is probed.
10. When customer overpays, farebox displays amount overpaid. Press dump to clear.
11. Do not use screwdrivers, hammers or any foreign objects to clear jammed farebox.
12. You must obtain farebox technician or supervisor's OK to put farebox in by-pass.

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LOWER FARES THAN PRESET, FAREBOX MISCOUNTS & UNAUTHORIZED FREE RIDES

PRESS *ONCE* FOR 25¢ PEAK
PRESS *TWICE* FOR 50¢ EXPRESS

| | | |
|---|---|---|
| YOUTH **1** CASH ONLY | DT ZONE **2** CASH ONLY | SENIOR/ LIMITED MOBILITY **3** CASH ONLY |
| PUNCH TICKETS **4** | LOWER FARES THAN PRESET **5** CASH ONLY | EXTRA CHARGE **6** CASH ONLY |
| FREE RIDE **7** MCTO AUTHORIZED | TRANSFERS RECEIVED **8** | SAMPLE **9** |
| MONTHLY/ DAY PASS * | HOLD TO OBSERVE FARE **0** | LOG IN FUNCTION # |

10 RIDE TICKETS, STUDENT & SENIOR PUNCH CARDS.

DUMP BUTTON (GREEN)

**PRESET FOR EXPECTED FARE**

| | | | |
|---|---|---|---|
| LOCAL & LIMITED STOP BUSES | OFF PEAK | 1 | $1.00 |
| | PEAK | 2 | $1.25 |
| EXPRESS BUSES | OFF PEAK | 3 | $1.50 |
| | PEAK | 4 | $1.75 |
| METRO-DOME SHUTTLE | | 5 | |
| STATE FAIR | | 6 | |
| OPEN/ SPECIAL | | 7-10 | |

GFI CANNED REPORT

BUS HISTORY REPORT FOR 19 - 21 FEB 1996
REVENUE RIDERSHIP MGR.

23 FEB 1996 12:53 PM PAGE 1

FOR: NICOLLET

Options selected: Report will be printed in sequence by probe time.
Print Revenue, Fare and Key Count totals for each bus and route/run record. Print all alarms & driver numbers
Print Coin, Token, Ticket and Pass totals for each bus and route/run record. Print bus diagnostic data.

Report includes all probings during the selected time period for bus(es): 1423

## REVENUE, FARE AND KEY COUNTS

| PRB # | BUS # | PROBE TIME | FBX # | FBX TIME | R/R CNT | TO-DATE REVENUE | CURRENT REVENUE | UNCLSD. REVENUE | DUMP CNT | FARE SET | FARE CNT | KEY 1 | KEY 2 | KEY 3 | KEY 4 | KEY 5 | KEY 6 | KEY 7 | KEY 8 | KEY 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DATA FOR 19 FEB 1996 FOR NICOLLET | | | | | | | | | | | | | | | | | | | | |
| 1 | 1423 | 17:21 | 38645 | 17:21 | 17 | 175.36 | 20.98 | 3.25 | 7 | | 13 | 0 | 0 | 1 | 23 | 1 | 0 | 1 | 19 | 0 |
| 16 FEB | | 18:55 | Rt 0 | Rn 0 | Tr 0 | 0.00 | 0.00 | 0.00 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 18:55 | CASHBOX # 43630 WAS REMOVED. | | | | | | | | | | | | | | | | | |
| | | 18:55 | Rt 0 | Rn 0 | Tr 0 | 0 | 0.00 | 0.00 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 18:55 | CASHBOX # 42879 WAS SENSED PROPERLY IN PLACE. | | | | | | | | | | | | | | | | | |
| | | 18:55 | Rt 0 | Rn 0 | Tr 0 | 0 | 0.00 | 0.00 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 FEB | | 00:00 | MIDNIGHT. | | | | | | | | | | | | | | | | | |
| | | 00:00 | Rt 0 | Rn 0 | Tr 0 | 0 | 0.00 | 0.00 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18 FEB | | 00:00 | MIDNIGHT. | | | | | | | | | | | | | | | | | |
| | | 00:00 | Rt 0 | Rn 0 | Tr 0 | 0 | 0.00 | 0.00 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 FEB | | 00:00 | MIDNIGHT. | | | | | | | | | | | | | | | | | |
| | | 00:00 | Rt 0 | Rn 0 | Tr 0 | 0 | 0.00 | 0.00 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 06:00 | Rt 0 | Rn 0 | Tr 0 | 0 | 0.00 | 0.00 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 07:01 | DRIVER # 1369 ENTERED. | | | | | | | | | | | | | | | | | |
| | | 07:01 | Rt 1094 | Rn 965 | Tr 3 | 3 | 4.75 | 1.25 | 2 | 4 | 2 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 9 | 0 |
| | | 09:00 | Rt 1094 | Rn 965 | Tr 3 | 3 | 0.00 | 0.00 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 13:01 | AUTOMATIC FAREBOX LOGOFF. | | | | | | | | | | | | | | | | | |
| | | 13:01 | Rt 0 | Rn 0 | Tr 0 | 0 | 0.00 | 0.00 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 14:09 | DRIVER # 1027 ENTERED. | | | | | | | | | | | | | | | | | |
| | | 14:09 | Rt 1004 | Rn 256 | Tr 1 | 1 | 0.00 | 0.00 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 15:01 | Rt 1004 | Rn 256 | Tr 1 | 1 | 5.50 | 0.00 | 0 | 1 | 5 | 0 | 0 | 1 | 7 | 0 | 0 | 0 | 3 | 0 |
| | | 15:30 | Rt 1004 | Rn 256 | Tr 1 | 1 | 1.25 | 0.00 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 15:54 | Rt 1004 | Rn 256 | Tr 2 | 2 | 7.98 | 1.75 | 4 | 2 | 4 | 0 | 0 | 0 | 2 | 1 | 0 | 1 | 1 | 0 |
| | | 16:28 | Rt 1004 | Rn 256 | Tr 2 | 2 | 1.50 | 0.25 | 1 | 2 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 6 | 0 |
| | | 17:07 | Rt 1004 | Rn 256 | Tr 1 | 1 | 0.00 | 0.00 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 17:21 | DRIVER LOGGED OFF. | | | | | | | | | | | | | | | | | |
| | | 17:21 | Rt 0 | Rn 0 | Tr 0 | 0 | 0.00 | 0.00 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DATA FOR 20 FEB 1996 FOR NICOLLET | | | | | | | | | | | | | | | | | | | | |
| 2 | 1423 | 18:23 | 38645 | 18:23 | 29 | 204 91 | 29.55 | 2.80 | 9 | | 21 | 0 | 1 | 0 | 48 | 0 | 0 | 2 | 27 | 0 |
| 19 FEB | | 17:21 | Rt 0 | Rn 0 | Tr 0 | 0 | 0.00 | 0.00 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

FOR: NICOLLET

## REVENUE, FARE AND KEY COUNTS

| PRB # | BUS # | PROBE TIME | FBX # | FSX TIME | R/R CNT | TO-DATE REVENUE | CURRENT REVEUE | UNCLSD. REVENUE | DUMP CNT | FARE SET | FARE CNT | KEY 1 | KEY 2 | KEY 3 | KEY 4 | KEY 5 | KEY 6 | KEY 7 | KEY 8 | KEY 9 | KEY * |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 17:21 | CASHBOX # 42879 WAS REMOVED | | | | | | | | | | | | | | | | | | |
| | | 17:21 | Rt 0 | Rn 0 | Tr 0 | 0.00 | 0.00 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 17:21 | CASBBOX # 40560 WAS SBNSBD PROPERLY IN PLACES. | | | | | | | | | | | | | | | | | | |
| | | 17.21 | Rt 0 | Rn 0 | Tr 0 | 0.00 | 0.00 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 17:30 | Rt 0 | Rn 0 | Tr 0 | 0.00 | 0.00 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 18:30 | Rt 0 | Rn 0 | Tr 0 | 0.00 | 0.00 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | FEB | 00:00 | MIDNIGHT | | | | | | | | | | | | | | | | | | |
| | | 00:00 | Rt 0 | Rn 0 | Tr 0 | 0.00 | 0.00 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 06:00 | Rt 0 | Rn 0 | Tr 0 | 0.00 | 0.00 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 06:45 | DRIVER # 258 ENTERED. | | | | | | | | | | | | | | | | | | |
| | | 06:45 | Rt 1004 | Rn 605 | Tr 1 | 1.25 | 0.00 | 0 | 2 | 1 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 1 | 0 | 4 | |
| | | 07:00 | Rt 1004 | Rn 605 | Tr 1 | 5.55 | 0.55 | 2 | 2 | 4 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 6 | |
| | | 07:07 | Rt 1004 | Rn 605 | Tr 1 | 1.50 | 0.25 | 1 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 13 | 0 | 0 | |
| | | 07:30 | Rt 1004 | Rn 605 | Tr 1 | 0.00 | 0.00 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | |
| | | 07:52 | Rt 1004 | Rn 605 | Tr 2 | 0.00 | 0.00 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 08:00 | Rt 1004 | Rn 605 | Tr 2 | 13.00 | 0.50 | 2 | 2 | 10 | 0 | 0 | 0 | 11 | 0 | 0 | 2 | 0 | 0 | 4 | |
| | | 08:30 | Rt 1004 | Rn 605 | Tr 2 | 0.00 | 0.00 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 08:31 | Rt 1004 | Rn 605 | Tr 2 | 1.75 | 0.00 | 0 | 2 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 12 | 0 | 13 | |
| | | 09:00 | Rt 1004 | Rn 605 | Tr 2 | 0.00 | 0.00 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 09:00 | Rt 1004 | Rn 605 | Tr 2 | 0.00 | 0.00 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 10:00 | Rt 1004 | Rn 605 | Tr 2 | 0.00 | 0.00 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 11:00 | Rt 1004 | Rn 605 | Tr 2 | 0.00 | 0.00 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 12:00 | Rt 1004 | Rn 605 | Tr 2 | 0.00 | 0.00 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 13:00 | Rt 1004 | Rn 605 | Tr 2 | 0.00 | 0.00 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 13:01 | AUTOMATIC FAREBOX LOGOFF. | | | | | | | | | | | | | | | | | | |
| | | 13:01 | Rt 0 | Rn 0 | Tr 0 | 0.00 | 0.00 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 15:30 | Rt 0 | Rn 0 | Tr 0 | 0.00 | 0.00 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 16:10 | DRIVER # 456 ENTERED | | | | | | | | | | | | | | | | | | |
| | | 16:10 | Rt 1035 | Rn 606 | Tr 2 | 0.00 | 0.00 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 16:30 | Rt 1035 | Rn 606 | Tr 2 | 0.00 | 0.00 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 17:00 | Rt 1035 | Rn 606 | Tr 2 | 4.75 | 1.00 | 2 | 2 | 3 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 8 | |
| | | 17:30 | Rt 1035 | Rn 606 | Tr 2 | 0.00 | 0.00 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 18:00 | Rt 1035 | Rn 606 | Tr 2 | 1.75 | 0.50 | 2 | 2 | 1 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 1 | 0 | 3 | |
| | | 18:22 | DRIVER LOGGED OFF. | | | | | | | | | | | | | | | | | | |
| | | 18:22 | Rt 0 | Rn 0 | Tr 0 | 0.00 | 0.00 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| DATA FOR 21 FEE 1996 FOR NICOLLET | | | | | | | | | | | | | | | | | | | | | |
| 2 | 1423 | 18:25 | 38645 | 18:25 | 34 | 226.71 | 21.80 | 1.30 | 3 | | 11 | 0 | 2 | 0 | 30 | 1 | 8 | 0 | 7 | 0 | 32 |
| 20 | FBB | 18:23 | Rt 0 | Rn 0 | Tr 0 | 0.00 | 0.00 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 18:23 | CASHBOX II 40560 WAS REMOVED. | | | | | | | | | | | | | | | | | | |
| | | 18:23 | Rt 0 | Rn 0 | Tr 0 | 0.00 | 0.00 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 18:23 | CASHBOX # 42653 WAS SENSED PROPERLY IN PLACE. | | | | | | | | | | | | | | | | | | |
| | | 18:23 | Rt 0 | Rn 0 | Tr 0 | 0.00 | 0.00 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

FOR: NICOLLET

## REVENUE, FARE AND KEY COUNTS

| PRB # | BUS # | PROBE TIME | FBX # | FBX TIME | R/R CNT | TO-DATE REVENUE | CURRENT REVENUE | UNCLSD. REVENUE | DUMP CNT | FARE SET | FARE CNT | KEY 1 | KEY 2 | KEY 3 | KEY 4 | KEY 5 | KEY 6 | KEY 7 | KEY 8 | KEY 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 18 30 | Rt 0 | Rn 0 | Tr | 0 | 0.00 | 0.00 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 18:30 | Rt 0 | Rn 0 | Tr | 0 | 0.00 | 0.00 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 21 FEB | 00:00 | MIDNIGHT. | | | | | | | | | | | | | | | | | |
| | | 00:00 | Rt 0 | Rn 0 | Tr | 0 | 0.00 | 0.00 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 05:14 | DRIVER # 1700 ENTERED. | | | | | | | | | | | | | | | | | |
| | | 05:14 | Rt 1087 | Rn 1431 | Tr | 1 | 0.00 | 0.00 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 05:30 | Rt 1087 | Rn 1431 | Tr | 1 | 0.00 | 0.00 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 06:00 | Rt 1087 | Rn 1431 | Tr | 1 | 0.00 | 0.00 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 06:00 | Rt 1087 | Rn 1431 | Tr | 1 | 1.75 | 0.00 | 0 | 4 | 1 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 |
| | | 06:18 | Rt 1087 | Rn 1431 | Tr | 2 | 0.00 | 0.00 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 06:30 | Rt 1087 | Rn 1431 | Tr | 2 | 1.25 | 0.00 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | | 06:40 | Rt 1087 | Rn 1431 | Tr | 1 | 3.50 | 0.00 | 0 | 4 | 2 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 |
| | | 07:00 | Rt 1087 | Rn 1431 | Tr | 1 | 0.00 | 0.00 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 07:09 | Rt 1087 | Rn 1431 | Tr | 1 | 0.00 | 0.00 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 07:30 | Rt 1087 | Rn 1431 | Tr | 1 | 0.00 | 0.00 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 08:00 | Rt 1087 | Rn 1431 | Tr | 1 | 0.00 | 0.00 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 08:30 | Rt 1087 | Rn 1431 | Tr | 1 | 0.00 | 0.00 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 09:00 | Rt 1087 | Rn 1431 | Tr | 1 | 0.00 | 0.00 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 09:00 | Rt 1087 | Rn 1431 | Tr | 1 | 0.00 | 0.00 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 10:00 | Rt 1087 | Rn 1431 | Tr | 1 | 0.00 | 0.00 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 11.00 | Rt 1087 | Rn 1431 | Tr | 1 | 0.00 | 0.00 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 12:00 | Rt 1087 | Rn 1431 | Tr | 1 | 0.00 | 0.00 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 13:00 | Rt 1087 | Rn 1431 | Tr | 1 | 0.00 | 0.00 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 13:01 | AUTOMATIC FAREBOX LOGOFF. | | | | | | | | | | | | | | | | | |
| | | 13:01 | Rt 0 | Rn 0 | Tr | 0 | 0.00 | 0.00 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 15:30 | Rt 0 | Rn 0 | Tr | 0 | 0.00 | 0.00 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 15:40 | DRIVER # 1303 ENTERED. | | | | | | | | | | | | | | | | | |
| | | 15:40 | Rt 1094 | Rn 842 | Tr | 3 | 0.00 | 0.00 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 16:00 | Rt 1094 | Rn 842 | Tr | 3 | 6.80 | 1.30 | 3 | 4 | 2 | 0 | 0 | 0 | 5 | 0 | 8 | 0 | 0 | 0 |
| | | 16:30 | Rt 1094 | Rn 842 | Tr | 3 | 0.00 | 0.00 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 17:00 | Rt 1094 | Rn 842 | Tr | 3 | 0.00 | 0.00 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 17:00 | Rt 1017 | Rn 842 | Tr | 2 | 0.00 | 0.00 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 17:30 | Rt 1017 | Rn 842 | Tr | 2 | 7.25 | 0.00 | 0 | 2 | 5 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 5 | 0 |
| | | 18:00 | Rt 1017 | Rn 842 | Tr | 2 | 1.25 | 0.00 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| | | 18:24 | DRIVER LOGGED OFF. | | | | | | | | | | | | | | | | | |
| | | 18:24 | Rt 0 | Rn 0 | Tr | 0 | 0.00 | 0.00 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

FOR: NICOLLET

## COINS, TOKENS, TICKETS, AND PASSES

| BUS # | PRCBE TIME | | PENN | NICK | DIME | QUAR | HALF | SBAS | TTP 1 | TTP 2 | TTP 3 | TTP 4 | TTP 5 | TTP 6 | TTP 7 | TTP 8 | TTP 9 | TTP 10 | TTP 11 | TTP 12 | TOTAL TOKNS | TOTAL TCKTS | TOTAL PASS | TOTAL BILLS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DATA FOR 19 FEB 1996 FOR NICOLLET | | | | | | | | | | | | | | | | | | | | | | | | |
| 1423 | 17:21 | | 3 | 3 | 18 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 12 |
| 16 FEB | 18:55 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 18:55 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 18:55 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17 FEB | 00:00 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18 FEB | 00:00 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 FEB | 00:00 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 06:00 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 07:01 | Rt | 1094 | Rn | 965 | Tr | | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | 09:00 | Rt | 1094 | Rn | 965 | Tr | | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 13:01 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 14:09 | Rt | 1004 | Rn | 256 | Tr | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 15:01 | Rt | 1004 | Rn | 256 | Tr | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| | 15:30 | Rt | 1004 | Rn | 256 | Tr | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | 15:54 | Rt | 1004 | Rn | 256 | Tr | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 5 |
| | 16:28 | Rt | 1004 | Rn | 256 | Tr | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| | 17:07 | Rt | 1004 | Rn | 256 | Tr | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 17:21 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DATA FOR 20 FEB 1996 FOR NICOLLET | | | | | | | | | | | | | | | | | | | | | | | | |
| 1423 | 18:23 | | 5 | 19 | 23 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 |
| 19 FEB | 17:21 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 17:21 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 17:21 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 17:30 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 18:30 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 FEB | 00:00 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 06:00 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 06:45 | Rt | 1004 | Rn | 605 | Tr | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 07:00 | Rt | 1004 | Rn | 605 | Tr | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| | 07:07 | Rt | 1004 | Rn | 605 | Tr | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | 07:30 | Rt | 1004 | Rn | 605 | Tr | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 07:52 | Rt | 1004 | Rn | 605 | Tr | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 08:00 | Rt | 1004 | Rn | 605 | Tr | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| | 08:30 | Rt | 1004 | Rn | 605 | Tr | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 08:31 | Rt | 1004 | Rn | 605 | Tr | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | 09:00 | Rt | 1004 | Rn | 605 | Tr | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 09:00 | Rt | 1004 | Rn | 605 | Tr | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 10:00 | Rt | 1004 | Rn | 605 | Tr | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 11:00 | Rt | 1004 | Rn | 605 | Tr | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

FOR: NICOLLET

## COINS, TOKENS, TICKETS, AND PASSES

| BUS # | PROBE TIME | | PENN | NICK | DIME | QUAR | HALF | SBAS | TTP 1 | TTP 2 | TTP 3 | TTP 4 | TTP 5 | TTP 6 | TTP 7 | TTP 8 | TTP 9 | TTP 10 | TTP 11 | TTP 12 | TOTAL TOKNS | TOTAL TCKTS | TOTAL PASS | TOTAL BILLS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 12:00 | Rt | 1004 | Rn | 605 | Tr | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 13:00 | Rt | 1004 | Rn | 605 | Tr | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 13:01 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 15:30 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 16:10 | Rt | 1035 | Rn | 606 | Tr | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 16:30 | Rt | 1035 | Rn | 606 | Tr | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 17:00 | Rt | 1035 | Rn | 606 | Tr | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| | 17:30 | Rt | 1035 | Rn | 606 | Tr | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 18:00 | Rt | 1035 | Rn | 606 | Tr | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | 18:22 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DATA FOR 21 FEB 1996 FOR NICOLLET | | | | | | | | | | | | | | | | | | | | | | | | |
| 1423 | 18:25 | | 0 | 8 | 14 | 52 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 7 |
| 20 FEB | 18:23 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 18:23 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 18:23 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 18:30 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 18:30 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 FEB | 00:00 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 05:14 | Rt | 1087 | Rn | 1431 | Tr | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 05:30 | Rt | 1087 | Rn | 1431 | Tr | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 06:00 | Rt | 1087 | Rn | 1431 | Tr | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 06:00 | Rt | 1087 | Rn | 1431 | Tr | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | 06:18 | Rt | 1087 | Rn | 1431 | Tr | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 06:30 | Rt | 1087 | Rn | 1431 | Tr | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 06:40 | Rt | 1087 | Rn | 1431 | Tr | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | 07:00 | Rt | 1087 | Rn | 1431 | Tr | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 07:09 | Rt | 1087 | Rn | 1431 | Tr | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 07:30 | Rt | 1087 | Rn | 1431 | Tr | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 08:00 | Rt | 1087 | Rn | 1431 | Tr | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 08:30 | Rt | 1087 | Rn | 1431 | Tr | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 09:00 | Rt | 1087 | Rn | 1431 | Tr | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 09:00 | Rt | 1087 | Rn | 1431 | Tr | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 10:00 | Rt | 1087 | Rn | 1431 | Tr | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 11:00 | Rt | 1087 | Rn | 1431 | Tr | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 12:00 | Rt | 1087 | Rn | 1431 | Tr | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 13:00 | Rt | 1087 | Rn | 1431 | Tr | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 13:01 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 15:30 | Rt | 0 | Rn | 0 | Tr | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 15:40 | Rt | 1094 | Rn | 842 | Tr | | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 16:00 | Rt | 1094 | Rn | 842 | Tr | | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| | 16:30 | Rt | 1094 | Rn | 842 | Tr | | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 17:00 | Rt | 1094 | Rn | 842 | Tr | | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

FOR: NICOLLET

## COINS, TOKENS, TICKETS, AND PASSES

| BUS # | PROBE TIME | PENN | NICK | DIME | QUAR | HALF | SBAS | TTP 1 | TTP 2 | TTP 3 | TTP 4 | TTP 5 | TTP 6 | TTP 7 | TTP 8 | TTP 9 | TTP 10 | TTP 11 | TTP 12 | TOTAL TOKNS | TOTAL TCKTS | TOTAL PASS | TOTAL BILLS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 17:00 | Rt | 1017 | Rn | 842 | Tr | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 17:30 | Rt | 1017 | Rn | 842 | Tr | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| | 18:00 | Rt | 1017 | Rn | 842 | Tr | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 18:24 | Rt | 0 | Rn | 0 | Tr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

FOR: NICOLLET

## DIAGNOSTIC DATA

| BUS # | PROBE TIME | PRB CNT | SW VERS | **** CUMULATIVE TOTALS **** COIN COUNT | COIN ERRS | PASS COUNT | PASS ERRS | BILL COUNT | ********** CURRENT TOTALS ********** COIN CNT | COIN ERRS | TOO SML | D/D | D/P | P/P | D/N | P/N | D/Q | P/Q | N/Q | Q/Q | TOO BIG | PASS CNT | PASS ERRS | WRM ST | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DATA FOR 19 FEB 1996 FOR NICOLLET | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1423 | 17:21 | 1 | 4.31 | 396 | 0 | 0 | 0 | 118 | 52 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| DATA FOR 20 FEB 1996 FOR NICOLLET | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1423 | 18:23 | 2 | 4.31 | 476 | 0 | 0 | 0 | 136 | 80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| DATA FOR 21 FEB 1996 FOR NICOLLET | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1423 | 18:25 | 3 | 4.31 | 550 | 0 | 0 | 0 | 144 | 74 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

---- End of Report ----

REFORMATED FAREBOX RECORDS WRITEN IN COBOL

```
EDIT ---- MTC.PROD.COPYLIB(RRFRRFCW) - 01.22 ---------------- COLUMNS 001 072
COMMAND ===>                                                  SCROLL ===> CSR
****** ***************************** TOP OF DATA ***************************
021700
021800         01  WS-FAREBOX-OUTPUT.
021900             05  FRBXOUT-GARAGE -- ----        PIC 9(2).
021910             05  FRBXOUT-DATE.
022000                 10  FRBXOUT-YEAR              PIC 9(2).
022100                 10  FRBXOUT-MONTH             PIC 9(2).
022200                 10  FRBXOUT-DAY               PIC 9(2).
022210             05  FRBXOUT-PEAK-FLAG             PIC X.
022220         *       A = AM PEAK
022230         *       P = PM PEAK
022240         *       N = NON PEAK
022300             05  FRBXOUT-TIME.
022310                 10  FRBXOUT-HR                PIC 9(2).
022400                 10  FRBXOUT-MIN               PIC 9(2).
022500             05  FRBXOUT-DAY-WEEK  SUN=1       PIC X.
022501             05  FRBXOUT-HOLIDAY-CD            PIC X.
022502         *       H = HOLIDAY
022503         *       N = NON HOLIDAY
022510             05  FRBXOUT-SERVDAYS-MO           PIC 9(2).
022600             05  FRBXOUT-PROBE-DATA.
```

~~[illegible]~~

SUN = 1

MON = 2

TUE = 3

WED = 4

THU = 5

FRI = 6

SAT = 7

```
EDIT ---- MTC.PROD.COPYLIB(RRFRRFCW) - 01.22 ---------------- COLUMNS 001 0
COMMAND ===>                                                  SCROLL ===> CS
022700                 10  FRBXOUT-PROBE-GARAGE    PIC 9(2).
022710                 10  FRBXOUT-PROBE-DATE.
022800                     15  FRBXOUT-PROBE-YY    PIC 9(2).
022900                     15  FRBXOUT-PROBE-MM    PIC 9(2).
023000                     15  FRBXOUT-PROBE-DAY   PIC 9(2).
023010                 10  FRBXOUT-PROBE-TIME.
023100                     15  FRBXOUT-PROBE-HOUR  PIC 9(2).
023200                     15  FRBXOUT-PROBE-MIN   PIC 9(2).
023300                 10  FRBXOUT-PROBE-FAREBOX   PIC 9(6).
023400                 10  FRBXOUT-PROBE-BUS       PIC 9(6).
023500             05  FRBXOUT-TYPE-BUS            PIC 9.
023510       *         1 = ARTIC
023520       *         2 = LIFT
023530       *         3 = ARTIC LIFT
023540       *         4 = OTHER
023600             05  FRBXOUT-RNGD-FOUND-FLAG     PIC X.
023700       *         Y = MATCH
023800       *         N = NO MATCH
023900       *         I = MATCH, TIME WITHIN TOLERANCE LIMITS
024000       *         O = MATCH, TIME NOT WITHIN TOLERANCE LIMITS
024100       *         D = MATCH, BUT DRIVER NUMBER IS DIFFERENT
```

```
EDIT ----- MCT.PROD.COPYLIB(RRFRRFCW) - - 01.22 --------------- COLUMNS 001 07
COMMAND ===>                                                    SCROLL ===> C
024101        *         F = NO MATCH, BUT DEFAULT VALUES INSERTED TO
024102        *             MATCH ROUTE NUMBER
024110        *         L = DRIVER LOGOFF RECORD
024200              05  FRBXPIT-CASH-ALARM          PIC 9.
024300              05  FRBXOUT-BYPASS-ALARM    PIC 9.
024500              05  FRBXOUT-DRVR-NO             PIC 9(6).
024700              05  FRBXOUT-RTE-NO.
024800                  10  FRBXOUT-RTE-FILLER      PIC 99.
024900                  10  FRBXOUT-CITY            PIC 9.
025000                  10  FRBXOUT-ROUTE-NO        PIC 9(3).
025001              05  FRBXOUT-RUCUS-LINE-NO.
025010                  10  FRBXOUT-RUCUS-ROUTE         PIC X(2).
025020                  10  FRBXOUT-RUCUS-LINE          PIC X.
025100              05  FRBXOUT-ROUTE-CLUSTER       PIC X(5).
025110              05  FRBXOUT-ROUTE-SUFFIX        PIC X.
025200              05  FRBXOUT-RUN-NO              PIC 9(6).
025300              05  FRBXOUT-BLOCK               PIC X(4).
025310              05  FRBXOUT-DIVISION            PIC 9.
025400              05  FRBXOUT-TRIP-NO.
025500                  10 FRBXOUT-FILL             PIC 9(5).
025600                  10  FRBXOUT-DIRECTION       PIC 9.
```

```
EDIT ----  MTC.PROD.COPYLIB(RRFRRFCW) - 01.22 ---------------- COLUMNS 001
COMMAND ===>                                                  SCROLL ===>
025700              05  FRBXOUT-RUCUS-PLATEFORM-HRS  PIC  9(4).
025900              05   FRBXOUT-CASH                PIC 9(4)V99.
025000              05  FRBXOUT-ADDL-CASH           PIC 9(4)V99.
026200              05  FRBXOUT-FARESHT-NO          PIC 9(4).
026400              05  FRBXOUT-FARESET-AMT         PIC 9(2)V99.
026401              05 FRBXOUT-PROJECT-CD           PIC X(4).
026410              05  FRBXOUT-SERVICE-TYPE.
026420                  10 FRBXOUT-SERVICE-TYPE1    PIC x.
026430                  10 FRBXOUT-SERVICE-TYPE2    PIC x.
026440                  10  FRBXOUT-SERVICE-TYPE3   PIC x.
026450         *            SERVICE  TYPE L = LOCAL
026460         *            SERVICE TYPE E = EXPRESS
026470         *            SERVICE TYPE P = PEAK
026480         *            SERVICETYPE 0 = OFF PEAK
026490         *            SERVICE TYPE N NO ZONE CROSSING
026500         *            SERVICE TYPE Z ZONE CROSSING
027000
027010                  10 FRBXOUT-FULL-FARE
027100              05  FRBXOUT-RIDER-COUNTS.        PIC 9(4).
027300                  10  FREXOUT-YOUTH            PIC 9(4).
027500                  10  FRBXOUT-DONTOWN-ZN       PIC 9(4).
                        10  FRBXOUT-SRS-LIM-MOB      PIC 9(4).
```

EDIT MTC.PROD.COPYLIB(RRFRRFCW) - 01.22 ---------- COLUMNS 001 072
COMMAND ===> SCROLL ===> CSR

```
027700                10  FRBXOUT-TICKETS-PASS    PIC 9(4).
027900                10  FRBXOUT-LOWER-FARE      PIC 9(4).
0.  .00               10  FRBXOUT-EXTA-CHARGE     PIC 9(4).
028300                10  FRBXOUT-FREE-RIDE       PIC 9(4).
028500                10  FRBXOUT-TRANSFERS       PIC 9(4).
028700                10  FRBXOUT-SHORT-NOPAY     PIC 9(4).
028900                10  FRBXOUT-SPEC-EVENTS     PIC 9(4).
029001                10  FRBXOUT-SHUTTLE         PIC 9(4).
029003                10  FRBXOUT-SAMPLE          PIC 9(4).
029005                10  FRBXOUT-OPEN2           PIC 9(4).
029007                10  FRBXOUT-OPEN3           PIC 9(4).
029009                10  FRBXOUT-OPEN4           PIC 9(4).
029011                10  FRBXOUT-OPENS           PIC 9(4).
029020            05  FRBXOUT-DUMP-COUNT          PIC 9(4).
029030            05  FRBXOUT-RIDER-COUNT.
029100                10 FRBXOUT-TOKENS           PIC 9(4).
029300                10 FRBXOUT-OPEN6            PIC 9(4).
029500                10  FRBXOUT-PASS1           PIC 9(4).
029700                10  FRBXOUT-PASS2           PIC 9(4).
029900                10 FRBXOUT-PASS3            PIC 9(4).
030100                10 FRBXOUT-PASS4            PIC 9(4).
```

```
EDIT ----- MTC.PROD.COPYLIB(RRFRRFCW) - 01.22 ---------------- COLUMNS 001 (
COMMAND ===>                                                  SCROLL ===> CS
030300                 10  FRBXOUT-OPEN7           PIC 9(4).
030500                 10  FRBXOUT-OPEN8           PIC 9(4).
030700                 10  FRBXOUT-OPEN9           PIC 9(4).
030900                 10  FRBXOUT-SM-CPN          PIC 9(4).
031100                 10  FRBXOUT-MED-CPN         PIC 9(4).
031300                 10  FRBXOUT-LRG-CPN         PIC 9(4).
031500             05  FRBXOUT-CONV-FARES-ADJ.
031600                 10  FRBXOUT-CVF-PASS        PIC V9(4).
031620                 10  FRBXOUT-CVF-TICKETS     PIC V9(4).
031640                 10  FRBXOUT-CVF-YOUTH       PIC V9(4).
031660                 10  FRBXOUT-CVF-SENIOR      PIC V9(4).
031680                 10  FRBXOUT-CVF-TOURIST     PIC V9(4).
031691                 10  FRBXOUT-CVF-JOBSEEK     PIC V9(4).
031693                 10  FRBXOUT-CVF-OPENA       PIC V9(4).
031695                 10  FRBXOUT-CVF-OPENB       PIC V9(4).
031697                 10  FRBXOUT-CVF-OPENC       PIC V9(4).
031699             05  FRBXOUT-SAMPLE-ADJ          PIC 9(4).
031700             05  FRBXOUT-END-FILLER          PIC X(26).
031710
****** ***************************** BOTTOM OF DATA ************************
```

5 - 15's
34 - 05's
58 - 10's
16 - Alpha/Numeric
113

ASCII file
Column headings

GFI RECORD "1" COLUMN HEADINGS - MASTER/PROBE RECORD

| | |
|---|---|
| A | GARAGE |
| B | RECORD TYPE |
| C | CASHBOX/BYPASS ALARM |
| D | MONTH/DAY |
| E | HOUR/MINUTE |
| F | BUS # |
| G | FAREBOX # |
| H | CASHBOX # |
| I | N/A |
| J | N/A |
| K | REVENUE(TOTAL FOR BUS) |
| L | UNCLASSIFIED REVENUE |
| M | # OF ROUTE/RUN RECORDS |
| N | # CASH FARES |
| 0 | #OF DUMPS |
| P | KEY 1 |
| Q | KEY2 |
| R | KEY 3 |
| S | KEY 4 |
| T | KEY 5 |
| u | KEY6 |
| v | KEY7 |
| W | KEY8 |
| X | KEY9 |
| Y | KEY' |
| Z | TTP 1 |
| AA | TTP2 |
| AB | TTP3 |
| AC | TTP4 |
| AD | TTP5 |
| AE | TTP6 |
| AF | TTP 7 |
| AG | TTP8 |
| AH | TTP9 |
| AI | TTP 10 |
| AJ | TTP 11 |
| AK | TTP 12 |
| AL | # OF BILLS |
| AM | # OF PENNIES |
| AN | #OF NICKELS |
| A0 | #OF DIMES |
| AP | # OF QUARTERS |
| AQ | # OF HALF DOLLARS |
| AR | # OF SBA DOLLARS |

## GFI RECORD "2" COLUMN HEADINGS ROUTE/RUN RECORD

| | |
|---|---|
| A | GARAGE |
| B | RECORD TYPE |
| C | CASHBOS/BYPASS ALARM |
| D | MONTH/DAY |
| E | HOUR/MINUTE |
| F | BUS # |
| G | DRIVER # |
| H | ROUTE # |
| I | RUN # |
| J | TRIP # |
| K | REVENUE(R0UTE REVENUE FOR ROUTE/RUN RECORD) |
| L | UNCLASSIFIED REVENUE |
| M | FARESET # |
| N | # CASH FARES |
| 0 | #OF DUMPS |
| P | KEY1 |
| Q | KEY2 |
| R | KEY3 |
| S | KEY4 |
| T | KEY5 |
| U | KEY6 |
| V | KEY7 |
| W | KEY8 |
| X | KEY9 |
| Y | KEY' |
| Z | TTP1 |
| AA | TTP2 |
| AB | TTP3 |
| AC | TTP4 |
| AD | TTP5 |
| AE | TTP6 |
| AF | TTP7 |
| AG | TTP8 |
| AH | TTP 9 |
| AI | TTP 10 |
| AJ | TTP11 |
| AK | TTP12 |
| AL | N/A |
| AM | N/A |
| AN | N/A |
| SO | N/A |
| AP | N/A |
| AQ | N/A |
| AR | N/A |

FOR: REVENUE RIDERSHIP MGR

## HARDWARE CONFIGURATION

Type of Computer: IBM XT-286
System RAM 640 kBytes
Type of Printer : HP LaserJet II

Total Disk Space: 520.9 MBytes
Free Disk Space: 129.1 MBytes

## PROGRAM CONFIGURATION

Network Manager Software : Version 4.60
Number of Garages : 5
End-of-transit-day time : Set to 03:00 AM
Information on the modem : A modem has been installed.
The modem is configured for interrupt 3.
The baud rate is set to 2400 bps.
See the Communications Configuration report for more details.

FILES STORED FOR: REVENUE RIDERSHIP MGR

### SYSTEM LIST FILES

| NAME OF FILE | TYPE OF LIST | NUMBERS ON LIST |
|---|---|---|
| c:\gfi\dd\d&uslst.lst | Bus numbers | 1036 |
| c:\gfi\dd\dddmlst.lst | Driver numbers | 1504 |
| c:\gfi\dd\ddrtelst.lst | Route numbers | 150 |
| c:\gfi\dd\ddrunlst.lst | Run numbers | 2196 |
| c:\gfi\dd\ddtrplst.lst | Trip numbers | 5 |

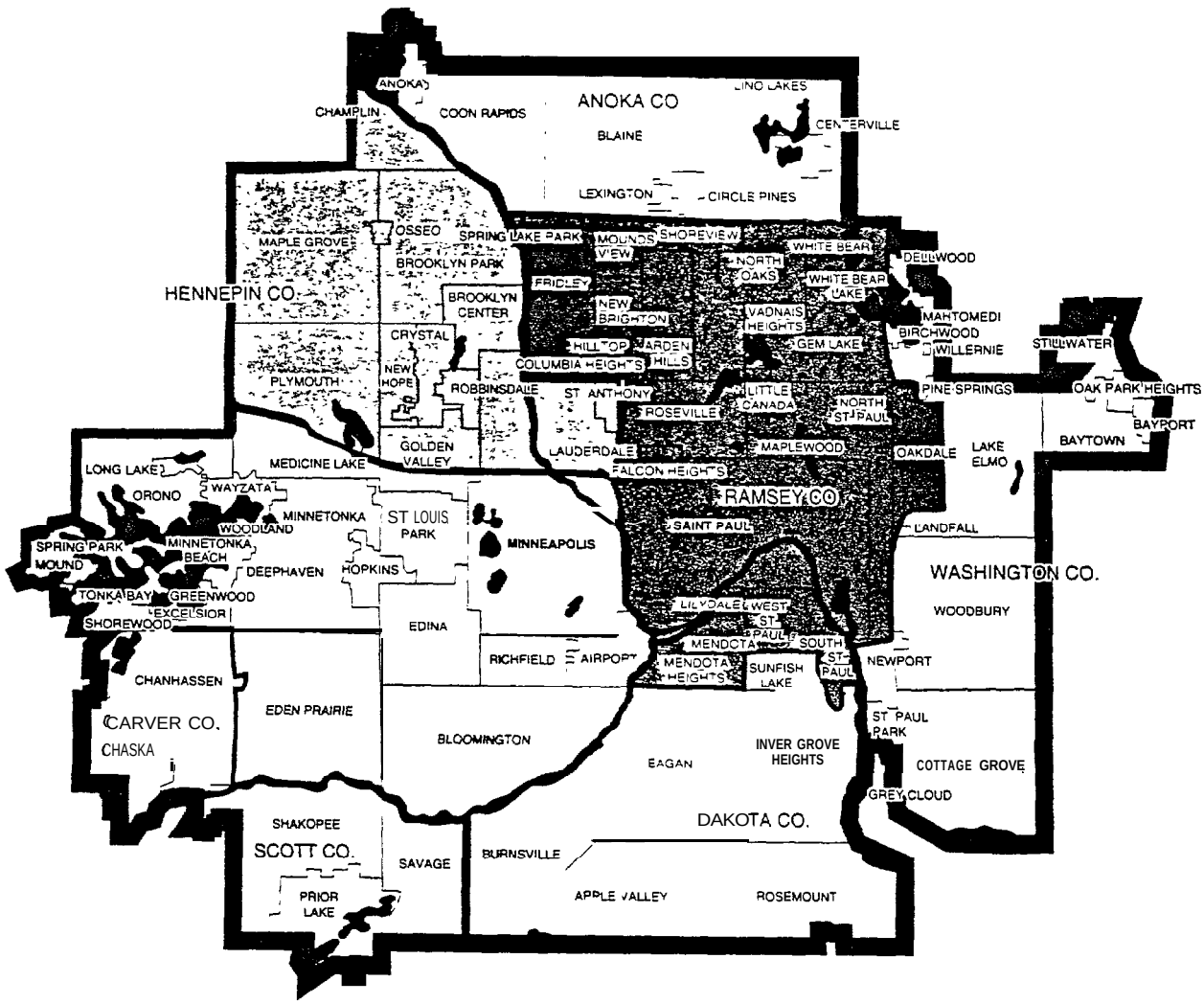
FILES STORED FOR: NICOLLET

### SYSTEM LIST FILES

| NAME OF FILE | TYPE OF LIST | NUMBERS ON LIST |
|---|---|---|
| C:\gfi\AA\AAbuslst.lst | Bus numbers | 281 |
| C:\gfi\AA\AAdrvlst.lst | Driver numbers | 224 |
| C:\gfi\AA\AArtelst.lst | Route numbers | 21 |
| C:\gfi\AA\AArunlst.lst | Run numbers | 391 |
| C:\gfi\AA\AAtrplst.lst | Trip numbers | 5 |

### 3.4.6 METROPOLITAN COUNCIL METRO MOBILITY RESERVATION/SCHEDULING/DISPATCH SYSTEM

# Special Transportation Service Area




**Handicabs**
**North Area**

**Metro Ride**
**South Area**

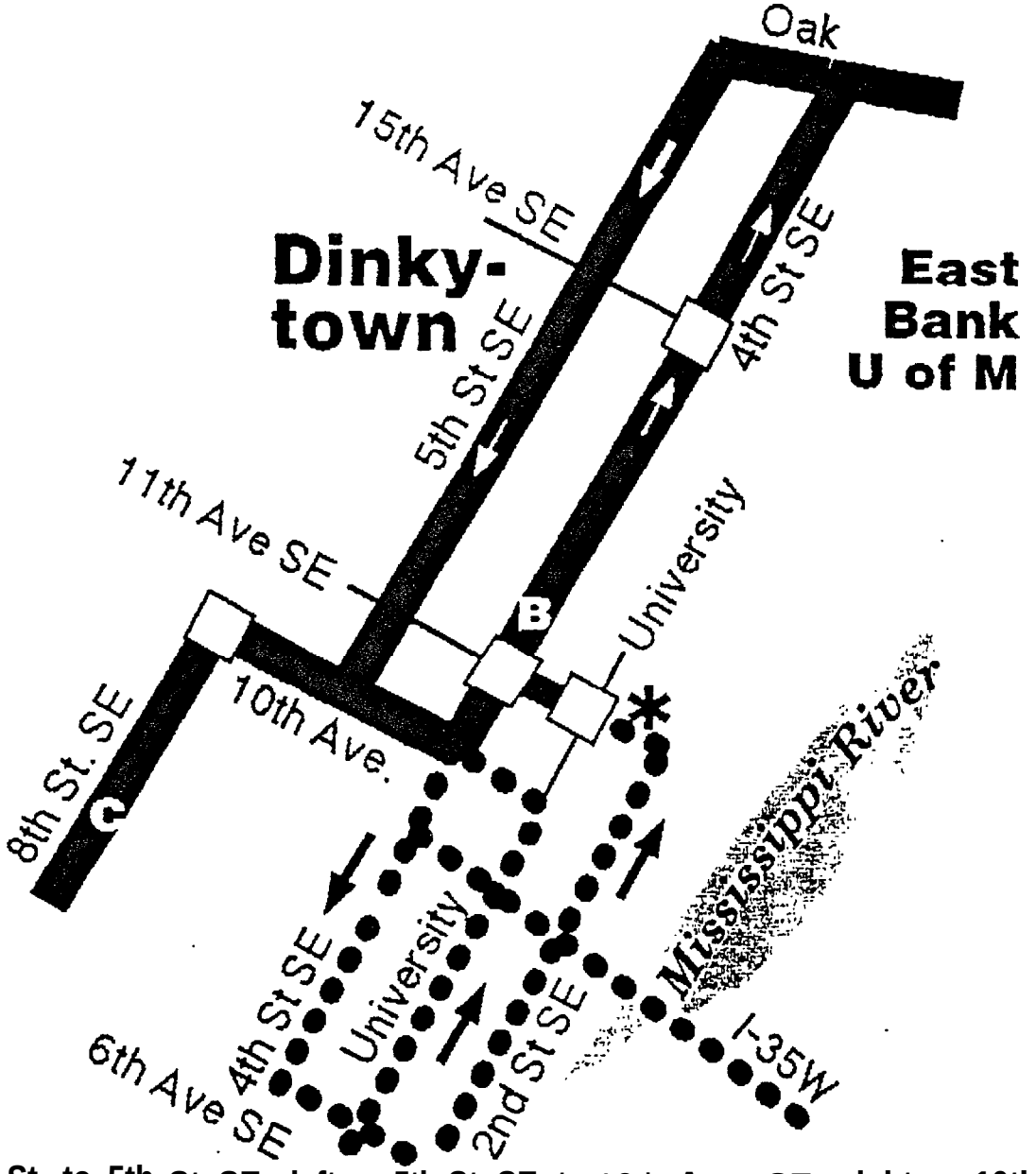
**Mayflower**
**East Area**

**County**
**Programs**

### 3.4.7 MCTO Construction Information System

# ROUTE 2 Dinkytown Construction Detour

Effective: Thursday, February 22
(for approximately one year)




To 2C: **Oak St. to 5th St..SE., left on 5th St. SE. to** 10th **Ave.** SE., **right** on **10th St, SE.** to regular.

From 2C: **10th Ave.** SE, to 4th St. SE, left on **4th** St. SE. to Oak, right on Oak to regular.

To 2B & Nicollet P.O.:Oak St. **to** 5th St. SE., left on 5th St. SE to 10th Ave. SE., **10th Ave. SE. to 4th St. SE., right on** 4th St. **SE. to** 6th Ave. SE., **left on 6th Ave. SE. to** 2nd St. SE., left on 2nd St. SE. to layover on 11 th Ave. SE. nearside of University Ave.

Form **2B: After layover, cross University Ave. to 4th St. SE., right** on 4th St. SE **to Oak** to regular,

th 02/12/96

Routes: M2
Primary: University Ave closure/realignment
Start Date: 02/22/96 Start Time: 04:00a End Date: INDEF End Timer

University Ave will closes between SE 10th Ave and Oak St on Thursday February 22, 1996 at 4:00 am. Buses will detour as follows:

2-C
EASTBOUND:
Regular on Oak St to 4th St SE
Continue on Oak St to 5th St SE
Left on 5th St SE to 10th Ave SE
Right on 10th Ave SE and regular

WESTBOUND:
Regular on 10th Ave SE to 4th St SE
Left on 4th St SE to Oak St (4th St SE will become a one-way roadway going EAST)
Right on Oak St to, University Ave.
Continue on Oak St and regular

2-B
EASTBOUND:
Regular on Oak St to 4th St SE
Continue on Oak St to 5th St SE
Left on 5th St SE to 10th SE
Left on 10th Ave Se to 4th St SE
Right on 4th St Se to 6th Ave SE
Left on 6th Ave SE to 2nd St SE
Left on 2nd St Se to 11th Ave SE
Left on 11th Ave SE and lay over 175 feet back from University Ave(by the sign)

2-B
WESTBOUND from layover:
Continue to 11th Ave SE to 4th St SE
Right on 4th St SE to Oak St
Right on Oak St to University Ave
Continue on Oak St and regular

BUS STOPS See following page

B U S  S T O P S

EASTBOUND:
On northbound Oak St NS of 4th St SE
On northbound Oak St. NS of Transit Way
On 5th St SE NS 18th Ave SE
On 5th St SE NS 17th Ave SE
On 5th St SE MB 15th to 14th Aves SE
On 5th St SE MB 14th to 13th Aves SE
On 5th St SE NS 11th Ave SE
NO STOPS ON 10th AVE SE
On 4th St SE NS 8th Ave SE
On 6th Ave SE NS Univ. Ave B only
On 6th Ave SE NS of 2nd St SE B only
On 11th Avs SE NS Univ. Ave 175 ft back B only

WESTBOUND:
On eastbound University Ave NS 8th Ave SE
NO STOPS ON 10TH AVE SE
On 4th St SE NS 11th Ave SE
On 11th Ave SE NS Univ. Ave 175 ft back B only
On 4th St SE NS 13th Ave SE
On 4th St SE NS 15th Avp SE
On 4th St SE NS 17th Ave SE
On 4th St SE NS 18th Ave SE
On 4th St SE NS 19th Ave SE
On 4th St SE NS Oak St
On Oak St AX Beacon

LBennett

DATE RUN: 030196 MTC INF SYSTEM PAGE 1
TIME RUN: 16:22:22 MTC DETOUR
M-960063
SUPERSEDES

Routes: M2
Summmary: University Ave closure/realignment
Start Date: 02/22/96 Start Time: 04:00a End Date: INDEF End Timer

University Ave will closes between SE 10th Ave and Oak St on Thursday February 22, 1996 at 4:00 am. Buses will detour as follows:

NORTHBOUND:
Regular on University Ave to 10th Ave SE
Left on 10th Ave SE to 4th St SE
Right on 4th St SE to 15th Ave SE (4th St Se will become a one-way)
Roadway going East)
Left on 15th Ave SE and regular

SOUTHBOUND:
Regular on 15th Ave SE to 5th St SE
Right on 5th St SE to 10th Ave SE
Left on 10th Ave SE to 4th St SE
Right on 4th St SE and regular

BUS STOPS

NORTHBOUND:
On easbound University Ave NS 8th Ave SE
NO STOPS on 10th Ave SE
No 4th St SE NS 11th Ave SE
On 4th St SE NS 13th Ave SE
On 15th Ave SE FS 4th St SE
On 15th Ave SE FS 5th St SE

SOUTHBOUND:
On 15th Ave SE NS 6th St SE
On 5th St SE MB 15th to 14th Aves
On 5th St SE MB 14th to 13th Aves
On 5th St SE NS 11th Ave SE
NO STOPS on 10th Ave SE
On 4th St SE NS 8th Ave SE

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