WESTERN MINNESOTA TRANSIT LINK

SCOPING STUDY

IMPLEMENTATION PLAN

September 1997

SRF Consulting Group, Inc.

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SCOPING STUDY

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INTRODUCTION

Public transportation in Greater Minnesota is comprised of individual municipal transit systems operating in urban and small urban areas along with county and multi-county rural transit systems. The individual systems do an excellent job of handling local area travel needs but when trip needs go beyond the normal service area, the systems usually have a difficult time meeting those needs. The demand for travel to regional market centers is a crucial link for many rural areas in order to provide access to services not found locally.

In southwest and west central Minnesota, three rural transit systems, Rainbow Rider, WESCAP and Prairie Five Rides, have come together to undertake a project intended to increase coordination among the transit providers. The increase in coordination, brought about in good measure through use of advanced technology components, is expected to greatly improve travel opportunities for area users and should improve the efficiency of operations.

The primary goal of the project is to develop a standardized computer-aided trip management and dispatching system. The system is to be used at all three transit systems independently but also provide access to each others systems in order to facilitate trip reservations and scheduling involving two or more providers for a single trip. Therefore, the system must be able to recognize and keep track of vehicle capacities

and call-takers must be able to determine the vehicle availability within their own transit system and the adjoining systems as well. A necessary component of the new system will be a data management tool that will track vehicle and user trip records in order to prepare billing and management reports.

The initial work has been to complete a project scoping analysis which defines the existing systems, problems and needs; identifies the functional needs for a proposed new system; and includes a plan for system implementation. A project Steering Committee guided this phase of the project. A thorough definition of the hardware and communications requirements for the project should be addressed in a follow-up phase to the scoping study.

SERVICE CHARACTERISTICS

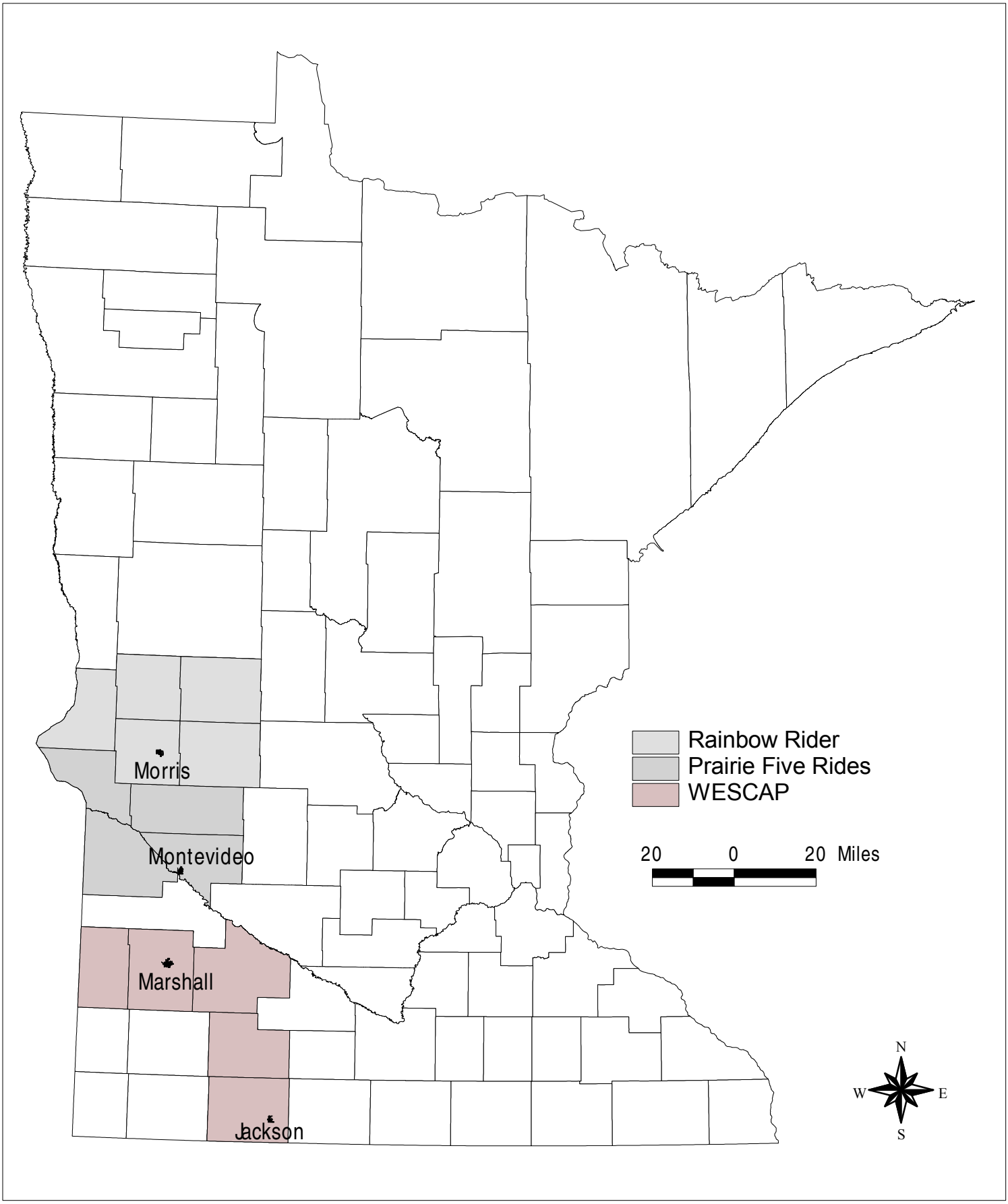
The three rural transit systems that are included in this study are Rainbow Rider, PrairieFive Rides and WESCAP. All serve multiple counties in Western Minnesota as shown in the accompanying figure. Service characteristics are summarized in the following table.

RAINBOW RIDER

The Rainbow Rider system is based in Morris and provides services to Douglas, Grant, Pope, Stevens and Traverse counties. Nine small buses are currently in regular service Monday through Friday. Regular service resembles fixed route between cities and demand responsive within the cities. Off-route deviations are facilitated schedule permitting. Service is available to the general public. Currently, bus service does not travel beyond the five county service area.

In addition to the bus service, the Rainbow Rider also coordinates trip requests for some 75 volunteer drivers. Volunteer trips regularly go beyond the five county service area.

Ridership in 1996 for the combined bus and volunteer services was 41,000, with about 33,000 of that on the bus. The system has experienced significant growth and the total 1997 ridership is expected to be about 60,000.



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SERVICE CHARACTERISTICS

System	Annual Rides		Expansion Plans	No. Vehicles		Bus Travels Out of Service Area	Volunteers Travel Out of Service Area
	Bus	Volunteer		Bus	Volunteer		
Prairie Five Rides	18,000 (1) 23,000 (2)	8,000 (1) 4,500 (3)	Potential Montevideo 40,000 (3)	3 6 (3)	70	Yes Mpls./St. Paul Fargo Moorhead St. Cloud Willmar Millbank Watertown	Yes
Rainbow Rider	33,000 (1) Total 60,000 (2)	8,000 (1)	Yes - Morris (60,000)	9	75	No (2)	Yes
WESCAP	15,063(1)	43,494 (1)	Yes Marshall 35,000 (3)	3 6 (3)	181	No (2) Yes (3) Sioux Falls Minneapolis	Yes

(1) 1996
(2) 1997
(3) 1998

Changes are expected for the system in 1998 as the bus service will travel outside of the five county area to serve Sisseton, Fergus Falls, St. Cloud, Fargo/Moorhead and Minneapolis/St. Paul. In addition, the potential exists for the current City of Morris dial-a-ride service, which is operated separately by the City, to be incorporated with the Rainbow Rider. This would add an additional 60,000 annual trips to the system which would require scheduling and dispatching.

PRAIRIE FIVE RIDES

Prairie Five Rides is based in Montevideo and provides service to Big Stone, Chippewa, Lac Qui Parle and Swift counties along with the City of Madison. Three small buses provide flexible fixed route and demand responsive service to the general public. The bus service does travel outside of the four county service area to Fargo/Moorhead, Milbank, Minneapolis/St. Paul, St. Cloud, Watertown and Willmar. All buses are currently based in Madison.

Prairie Five Rides also handles trip requests for a volunteer driver network that includes 70volunteers. Volunteer driver trips regularly travel outside of the primary service area.

Total system ridership in 1996 was about 26,000, with 18,000 on the bus service. Ridership in 1997 is growing rapidly on the bus with some 23,000 expected by years end. Total ridership for 1997 should grow modestly but potential exists to incorporate the

City of Montevideo dial-a-ride and flexible route service into Prairie Five Rides operation during 1998. If this happens, an additional 40,000 annual trips would need to be scheduled and dispatched.

WESCAP

The Heartland Express Transportation Program of Western Community Action, Inc. provides service to Cottonwood, Jackson, Lincoln, Lyon and Redwood Counties. Administrative offices are located in Marshall and Jackson. Three small buses provide the flexible fixed route service for the general public. The bus service currently does not travel outside of its primary service area but plans for 1998 include extending service to Minneapolis/St. Paul and Sioux Falls.

WESCAP service includes a very large volunteer driver network of about 180 volunteers. Volunteers regularly travel outside the primary service area.

Ridership in 1996 was almost 60,000 with about 75 percent of that on the volunteer service. Service in Fall 1997 will change significantly as the City of Marshall Transit Service will be incorporated with the current WESCAP service. This will add about 35,000 annual trips to the system that will require scheduling and dispatching.

CALL-TAKING AND DISPATCH FUNCTIONS

The call-taking and dispatch functions for each of the systems is depicted in the accompanying figure. Only one system, WESCAP, is currently using a computer-aided program to assist call-takers with scheduling trip requests. This program, developed locally to help track and sort trip requests, is a great asset to WESCAP but it has a number of limitations that preclude expansion of its use by other transit systems. Both Prairie Five Rides and Rainbow Rider use extensive paper-based systems to track trip requests.

Rainbow Rider utilizes several means of communication between dispatch staff and the drivers to transmit schedule information. First, a hard copy list of standing order trips or "regular" customers is prepared and then mailed out to the drivers on an infrequent basis. Drivers then on a daily basis must contact dispatch to make necessary changes for the regular customers and to insert new trips that have been recently scheduled. The drivers are responsible for calling in to dispatch using a regular telephone before they start driving to get these last minute schedule changes. Throughout the day, dispatch and drivers regularly communicate to "remind" the drivers of upcoming trips. If out of radio range, drivers can use cell phones in emergencies. At the end of the day, the driver "radios" in the summary of the days activity. Two staff people are shared between the bus and volunteer driver services to handle all trip requests, scheduling, dispatching and record keeping functions. Many paper forms are used to track the trip requests. When the City

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CURRENT DISPATCH FUNCTIONS

Rainbow Rider

BUS

MORRIS
- Two call-takers (shared with Volunteer service)
- Trip requests
- Scheduling
- Administration

Printed copy - Mail
Phone
Cell Phone
Radio

DRIVER
- Drivers receive, via mail, a copy of master manifest with "regular" customers. They insert "demand" trips each day.
- Drivers phone in each day to Morris to get "demand" trips and schedule changes (cancellations).
- Dispatchers send additional trip info throughout the day via radio.
- Drivers also have cell phones for "out-of-range" emergency communications.
- Drivers "radio" in summary data at end of each day.

VOLUNTEER

MORRIS
- Two call-takers (shared with Bus service)
- Trip requests
- Scheduling
- Administration

Phone

DRIVER
- Writes trip request on form.
- Mails form back to administration on a monthly basis.

Prairie Five Rides

BUS

MONTEVIDEO
- One call-taker (shared with Volunteer service)
- Trip requests
- Scheduling
- Administration

Faxed copy
Cell Phone

DRIVER
- Daily schedule for next day faxed to Head Start office in Madison and walked to bus garage.
- Schedule posted in bus garage each morning.
- Driver responsible to pick up schedule for next day at bus garage.
- Dispatcher notifies driver of changes using cell phone (no radio).
- Driver fills out weekly log. Form dropped of at the office by the driver or picked up at the bus garage by administration.

BUS

MADISON (RESIDENTS)
- Dial-A-Ride Service
- No extra call-takers; all calls go directly to the bus drivers.

Cell Phone
On Bus

DRIVER
- Trip request
- Schedule
- Driver fills out log each week

VOLUNTEER

MONTEVIDEO
- One call-taker (shared with the Bus service)
- Trip requests
- Scheduling
- Administration

Phone

DRIVER
- Writes trip request on form.
- On a monthly basis, mails form back to administration after trip is made.

WESCAP

BUS

MARSHALL
- Three call-takers (shared with Volunteer service)
- Computer program
- Trip requests
- Scheduling
- Administration

Printed copy
Cell Phone
Radio

DRIVER
- Driver picks up next day's manifest in administration office.
- Uses radio or cell phone to communicate same day changes (uses phone if out-of-range).
- Driver delivers daily summary to the administration office the next day.

BUS

JACKSON
- One call-taker (shared with Volunteer service)
- Computer program
- Trip requests
- Scheduling
- Real-time sharing of data with Marshall

Printed copy
Cell Phone
Radio

DRIVER
- Driver picks up next day's manifest in administration office.
- Uses radio or cell phone to communicate same day changes (uses phone if out-of-range).
- Driver delivers daily summary to the administration office the next day.

VOLUNTEER

MARSHALL (Three Counties)
- Three call-takers (shared with Bus service)
- Trip Requests
- Scheduling
- Administration

Phone

DRIVER
- Writes trip request on form.
- Mails form back to administration or drops it off after trip is made.

VOLUNTEER

JACKSON (Two Counties)
- One call-taker (shared with Bus service)
- Trip Requests
- Scheduling
- Administration

Phone

DRIVER
- Writes trip request on form.
- Mails form back to administration or drops it off after trip is made.

of Morris service is incorporated into Rainbow Rider, significant new demands will be placed on these two staff positions.

Prairie Five Rides utilizes a much simpler system to handle trip requests and communicate to drivers. Day ahead schedules are faxed to the Madison Head Start office because no fax machine is available at the bus garage. The schedules are walked over to the bus garage and posted for drivers to pick up. Drivers are responsible to pick up their own schedule. Any trip changes, cancellations or new trip insertions, are communicated to the driver using a cell phone as no radio system is available for Prairie Five Rides. Only one call taker is available for this service and has to handle trip requests, scheduling, dispatching and record keeping for both the bus and volunteer programs. Only paper forms are available to assist in these activities. For service within the City of Madison, customers call directly to the bus using a phone patch system as no extra staff are available to handle calls. A significant expansion is anticipated in 1998 with the inclusion of City of Montevideo service and this will greatly tax the existing call-taking and dispatch functions.

WESCAP has the most advanced call-taking system. A locally developed mainframe computer system is available in Marshall and Jackson to assist call-takers in scheduling service requests. This system tracks pertinent but limited customer and trip information which can be sorted to present different quick check perspectives. From this program, next day driver manifests are printed, which are picked up in person at the administrative

offices. Any same day changes to the manifest are communicated using a radio system or cell phone if the driver is beyond range of the radio. Currently, two staff people are available in Marshall to handle both the bus and volunteer programs and one additional staff person is located in Jackson. In the fall of 1997, when the City of Marshall service is blended into WESCAP, one additional staff person will be added in the Marshall office to handle calls for that service. The existing computer system will continue to be utilized but the system limitations and inability to communicate trip changes directly to drivers will most likely limit the productivity of call-takers.

The attributes of the current trip reservation systems are shown in the accompanying table. In all cases, the people who answer the telephones to log trip requests are also the people who must dispatch trips to the drivers. The number of telephone calls per day currently ranges from about 80 for Prairie Five Rides, 125 for Rainbow Rider and 210 for WESCAP. These numbers will change significantly when all system expansions are completed.

OPERATIONS ISSUES

The project team met several times to discuss current and future system operations. From those discussions several key operations issues emerged:

- There are limited communications links with external agencies to facilitate information sharing.

- Transit providers can not easily coordinate cross-boundary transit trips with other providers.

- Internal call-taking/dispatching processes are inefficient and outdated.

- Significant system expansions and growth are anticipated and current dispatch systems are inadequate to handle these changes.

- Limited standardization exists in the data handling and internal/external reporting capabilities across multiple agencies.

- There is no fast, efficient and error-free method to communicate trip changes to field vehicles.

PROJECT VISION, GOALS AND OBJECTIVES

In response to the key operations issues identified, the project team developed a vision for a potential project.

PROJECT VISION

To implement a trip management system in western Minnesota that will enable local transit services to respond more effectively to requests for service and coordinate cross-boundary trips among various providers in order to improve customer services and better utilize available resources.

PROJECT GOALS AND OBJECTIVES

Achieving the following short-term and long-term goals and objectives will serve to realize the vision.

- **Goal: Develop an integrated and modular advanced transit management system to address existing and future needs**

- Objective: Develop a system architecture that is open, allows for future system expansion and modification, and is consistent with the state and national ITS architectures.

- Objective: Implement technologies that use non-proprietary, adopted industry standards and are consistent with emerging standards and protocols.

- Objective: Implement a communications infrastructure that is sufficient for projected needs and allows for inter-jurisdictional data sharing.

Goal: Implement a trip management system to improve public transit operations and enhance customer access to services

- Objective: Implement a computer-aided scheduling and dispatching system to support service delivery requirements in small city, county and multi-county transit systems.

- Objective: Implement a system that can accommodate expansion and growth.

- Objective: Implement a system that can communicate to field vehicles.

- Objective: Implement a system that can link with existing financial and billing practices, procedures and reporting requirements.

Goal: Improve coordination and linkages among local transit providers

- Objective: Establish a common set of business decision guidelines.

- Objective: Develop standard methods for data handling and reporting.

- Objective: Implement a system that will facilitate sharing of trip reservation information across multiple providers in order to coordinate service provision.

FUNCTIONAL NEEDS

In order to address the operations issues faced by the transit systems, a trip reservation and data management system was sketched out. The key components of the proposed system include:

- Computer-aided trip reservation capability
- Computer-aided trip scheduling capability
- Ability to communicate directly with adjoining transit systems to schedule linked trips
- Expanded data management capability
- PC-based systems
- Ability to generate standard reports for internal and external review
- Ability to connect to existing mainframe billing systems
- Use of mobile data terminals in the buses to communicate schedule changes more efficiently with drivers

The following figure depicts the overall system. It must be noted that caution must be used when allowing transit systems to access other systems databases. The system must include adequate safeguards to protect unauthorized access to restricted information.

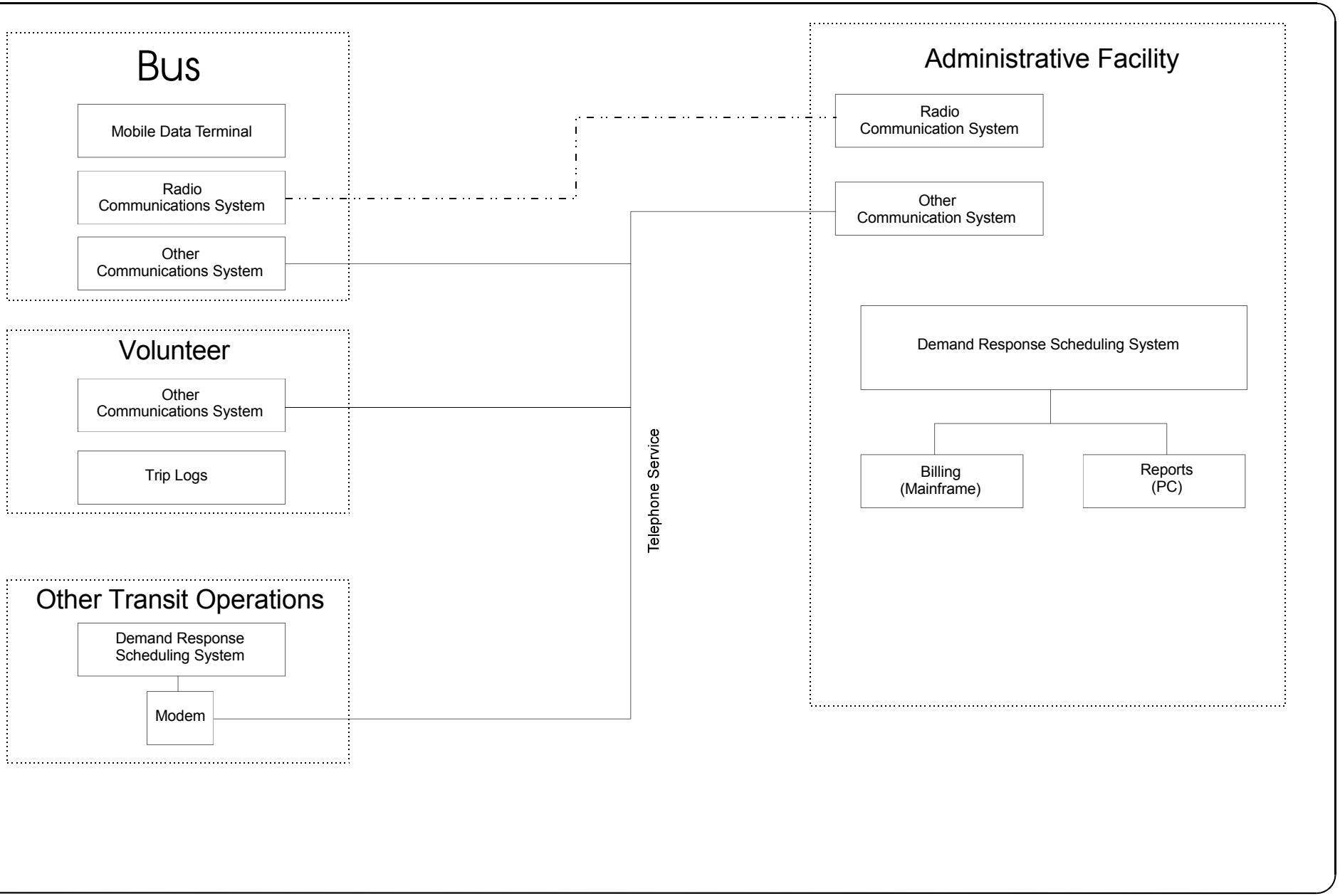
1.0 SCHEDULING AND DISPATCH CAPABILITIES

1.1 General

1.1.1 The system must handle a minimum of 12,000 (and expandable to 20,000) clients.

1.1.2 The system must handle up to 1,000 ride requests per day.

1.1.3 The system must provide a user authorization scheme to ensure that only authorized users can access and modify system data. The types of functions which may be performed should vary according to predefined user privileges, and the system should restrict user access to only those functions for which the user is authorized.



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TRANSIT ITS COMPONENTS

1.1.4 The system user interface must provide for remote access with appropriate password and hardware security.

1.1.5 The system must provide system and user-generated on-line help screens.

1.1.6 The system must allow for the manual override of computer assigned trips at all times.

1.1.7 The system must be set up as a "multi-user, multi-tasking" environment that allows for the simultaneous use of various functions of the system by the maximum number of users assigned to the network without a noticeable degradation in performance. For example, daily trip reservations, manifest printing, and report queries may be progressing simultaneously.

1.1.8 The system must be able to view the trip scheduling functions at all three transit properties at the same time.

1.1.9 The system must be designed to maximize simplicity to the end user. Features such as menu-driven access, pop-up windows, "shortcut keys," mouse-use option, purposeful use of color screens, use of graphic images to depict summary information are desired.

1.1.10 The system must be able to communicate with mobile data terminals via radio, cellular or satellite modems.

1.2 Customer Data

The system shall be capable of storing the following information on each client for report generation, scheduling purposes and easy retrieval. This information will be stored in the customer master file. Authorized users should be able to call up a complete user history, including such items as total trips taken for a user-defined period of time, no-shows, cancellations, trip denials with denial reason, complaints, on-time performance, total value of trips taken, trips by sponsoring agency, passenger fare charged, passenger fare collected, etc.

1.2.1 Customer Identification Number--a unique identifier for each customer.

1.2.2 Name--First, last and middle. When looking up customer information, the reservation agent shall be able to search by last name, as well as ID number and telephone number. Pop-up windows or similar device will be used to show a range of values near the requested name/ customer ID/telephone number.

1.2.3 Home Address--Street address, city, county, state and zip code. This should be used as the default for pick-up address on the entry and drop-off address for return trip.

1.2.4 Mailing Address--Where correspondence should be addressed. On customer data entry, this should default to home address.

1.2.5 Telephone Number

1.2.6 Disability Code—Nature of the customer's disability.

1.2.7 Mobility Aid Type Code--Indicating the type of wheelchair (electric, manual, "scooter," etc.). This would correlate to the types of wheelchairs that various vehicles can handle. Include device footprint size. Other mobility aids might be cane, walker, seeing eye dog, etc.

1.2.8 Payment/Billing Codes--Fields should identify the source of funding based on such parameters as trip purpose, destination, etc. One of the fields should be able to be selected as the default field on trip entry if no parameters are selected to meet other billing criteria.

1.2.9 Third Party Identification Number--Customer identification number used by third party agencies (i.e., Medical Assistance)

1.2.10 Escort Needs--Whether or not the passenger needs to have an escort ride along.

1.2.11 Driver Notes--An unlimited "note" field that would include special instructions to be printed on driver manifests.

1.2.12 Reservation Agent Notes--An unlimited "note" field that would include special instructions that show up only when entering daily trip information for a customer.

1.2.13 Mode of Transportation--Use code to indicate fixed route bus, paratransit service, taxi, volunteer, etc.

1.2.14 Load Time Requirements--Amount of time normally required to load/unload customer.

1.2.15 Off-Route Travel Time--Amount of time normally required to deviate off fixed route to arrive at customer address.

1.2.16 Frequent Destinations--The customer's most frequent trip destinations (non-home).

1.2.17 Zone Code--Geographic zone of the home address. (Optional)

1.2.18 Emergency Contact--Name, address, telephone number and relationship to client. (Optional)

1.3 Trip Requests

The system must allow the following information to be kept for each trip scheduled in the system through data entry screens.

1.3.1 Trip Number--unique identifier.

1.3.2 Client Name

1.3.3 Client ID Number

1.3.4 Date of Trip

1.3.5 Trip Purpose Code

1.3.6 Mobility Data (including mobility device).

1.3.7 Pick-Up Time

1.3.8 Pick-Up Address

1.3.9 Drop-Off Time

1.3.10 Drop-Off Address

1.3.11 Escort(s)--Whether or not the passenger has an escort and how many.

1.3.12 Total Fare--Based on carrier fare structure.

1.3.13 Passenger Co-Pay--Based on sponsoring agency guidelines.

1.3.14 Nature of Trip--Standing order, group trip, individual call-in, etc.

1.3.15 Load/Unload Time

1.3.16 Special Instructions--Reservation agent notes.

1.3.17 Number of Ambulatory/Wheelchair Passengers

1.3.18 Requested Carrier--Requested carrier or run number.

1.3.19 Agency Providing Service

1.3.20 Actual Pick-Up Time (for systems that will use MDTs)

1.3.21 Trip Status--Completed, no-show, late cancel, excused no-show, etc.

1.3.22 Validates each entry according to predefined rules, checks that all required entries have been made, and notifies the system user of any problems and allows correction before the ride request is accepted.

1.3.23 Supports the entry of round trips, one-way trips, and multi-legged trips for multiple origins, multiple destinations, over varied times.

1.3.24 Supports ride requests for same day service. (Vendor shall provide the time window for servicing same-day requests.)

1.3.25 Supports ride requests for next-day (24-hours or less) service.

1.3.26 Supports advanced reservations placed up to 90 days before the required service day.

1.3.27 Maintains standing orders. The standing orders may be applicable to each day, each weekday, or selected days of the week, or may be scheduled for defined time periods (specified starting and ending dates) and indefinitely (until removed).

1.3.28 Allows hold periods to be defined for each standing order to accommodate vacations and similar interruptions.

1.3.29 Displays all of a customer's standing orders with a single display request. Authorized users are able to make changes to the standing orders and have the option of updating any daily trips already created from the standing orders which have been changed.

1.3.30 To speed up data entry, the system presents a list of the most common trips made by the customer such that the scheduler can select the applicable trip from the list and allow the system to fill in the appropriate data fields of the ride request screen.

1.3.31 For pick-up and drop-off locations, the system supports the entry of exact street addresses, intersections, and common points of interest (such as hospitals, malls, schools, major employers, libraries, community centers, transit centers, sporting facilities, churches, museums, etc.). (Abbreviated entries are accepted to minimize the required data entry.)

1.3.32 Displays a list of close matches when an exact street or point of interest match cannot be found or when there are multiple occurrences of the same name. The call takers are able to select the appropriate entry from the list for inclusion in the ride request screen.

1.3.33 Provides means to retrieve and display ride requests and the status of the request by entering the customer name, customer number, or the pickup or drop-off location.

1.3.34 Calculates a fare to be charged for each customer per ride, based on a billing and/or fare schedule.

1.3.35 Supports flagging trip requests with agency code that handled initial call, agency that will schedule trip, need to call-back if needed, and disposition of trip for trips that are shared or linked among different providers.

1.4 Trip Generator Information

Information displayed for each major trip designation (i.e., sheltered workshops, shopping centers, senior centers, medical centers, etc.).

1.4.1 ID Number--Unique identifier for the generator.

1.4.2 Name--Name of generator.

1.4.3 Address--Address of generator.

1.4.4 Routing Instructions--Route the vehicle should follow on the grounds of the generator/ entrance at which passengers should be dropped off and/or picked up.

1.4.5 Zone--Geographic zone in which the generator is located. (Optional)

1.5 Scheduling Data

The scheduling capabilities for each trip request.

1.5.1 Optimizes the service for maximum operational efficiency within predefined constraints and parameters defined by the user. The constraints and parameters are easily adjusted by the user and include:

A. Maximum passenger travel time

B. Vehicle capacity

C. Deviation from requested pick-up time (before and after)

D. Driver availability, break and lunch periods.

1.5.2 Allows for selection of specific rides to be scheduled.

1.5.3 Has the capability for "what if" scheduling of standing orders without affecting existing schedules.

1.5.4 Allows for including and excluding specific vehicles from the scheduling process, e.g., exclude a vehicle pulled for maintenance, spare vehicles, etc.

1.5.5 Factors loading and unloading times for the customers, i.e., normal load/unload time by passenger type (electric wheelchair, slow walker, etc.).

1.5.6 Maintains data on each vehicle in the fleet to properly schedule rides according to vehicle capabilities. For example:

A. Vehicle equipment (size of lift, etc.)

B. Passenger capacities (wheelchair and ambulatory passengers)

C. Size of wheelchair tie-downs

D. Vehicle status (in/out of service).

1.5.7 Once the schedules have been created, the system has the means to select, sort, then display/print/ revise schedule information.

1.5.8 Provides scheduling capabilities such that when a demand responsive trip request is received, the request is assigned to a fleet vehicle at an open time slot.

1.5.9 Allows for delivery and connection of rides to multiple providers, i.e., fixed-route transit and shared-ride providers.

1.5.10 Alerts schedulers of ineligible ride requests based upon customer information.

1.5.11 Allows for system user override of any computer-generated recommendations.

1.5.12 Provides a real-time "call back" list of customers needing to be contacted with updated ride information.

1.5.13 Adjusts for unserviced trips due to unexpected driver and/or vehicle shortages.

1.5.14 Is capable of electronically transmitting schedule manifest information to remote locations via MDTs.

1.5.15 Allows processing of origins and destinations by individual street addresses as well as zone to zone. (Optional)

1.5.16 Has the capability of restricting vehicles (type or specific vehicle) from selected addresses or locations. (Optional)

1.5.17 Uses the existing roadway network to calculate time and distance for trip requests. (Optional)

1.5.18 Accounts for topographic features present in the service area (e.g., hills, limited river crossing points, etc.) when estimating trip times. (Optional)

1.5.19 Provides a means for temporary systemwide adjustments of the expected travel times and passenger service schedules to compensate for periods of inclement weather or road closure. (Optional)

1.6 Dispatch Data

The information needed for each run. A run is defined as a piece of work that can be assigned to a single driver. The system must support dispatching through the provision of numerous dispatching tools such as vehicle availability, closest available vehicle, client information, driver assignment to runs, etc.

1.6.1 The system must allow the following to be easily accessible to dispatchers:

A. Display of run assignments of each vehicle, and each vehicle's current location and status.

B. Notification of where service problems exist, by means of an alarm, such as:

1. Vehicle running x minutes late
2. Standby vehicle not utilized for *x* minutes
3. Breakdown or accident with passengers on board for more than *x* minutes without being transferred.

C. Support for dispatching of and communications with vehicles equipped with MDTs.

D. Updates of revised pick-up/drop-off times and instructions that can be transmitted to MDT-equipped vehicles.

1.6.2 Provides dispatch with accurate information on the status of all open-ended/"will call" trips at any given time, which have not been completed, by time of day or location.

1.6.3 Provides dispatchers with a list of all open "will calls" for a specific day, upon request.

1.6.4 Supports up to 200 vehicles in service at any given time.

1.6.5 Run Number--A unique identifier for each run.

1.6.6 Run Name—Name for run.

1.6.7 Days and Hours of Service--The hours during each day that the run operates.

1.6.8 Vehicle Type Assignment--The vehicle type code that should be assigned to that run.

1.6.9 Driver Assigned--The ID number for a driver, if the run is regularly assigned to an individual. This field should be capable of being broken down into half-day increments (e.g., to allow for both a morning and afternoon driver).

1.6.10 Zones—Geographic zones in which a run operates. (Optional)

1.7 Vehicle Data

The system shall be capable of storing the following information for each vehicle in the system.

1.7.1 Carrier--Code to indicate owner/operator of the vehicle.

1.7.2 Vehicle Number--Code indicating the number designation for that vehicle.

1.7.3 Vehicle Type Code--Code indicating the type of vehicle it is (i.e., transit coach, minivan, taxi cab, raised roof vans, volunteer car, etc.).

1.7.4 Wheelchair Capacity--Number of wheelchair positions.

1.7.5 Wheelchair Accessibility--Indicating the types of wheelchairs that can be accommodated on the vehicle. This would correlate to the same field in the client database.

1.7.6 Ambulatory Capacity--The number of ambulatory passengers the vehicle can hold, with and without wheelchair passengers.

1.7.7 Make and Model Information

1.7.8 Vehicle Identification Number

1.7.9 Fleet Identification Number

1.7.10 Fuel Type

1.7.11 Lift Type

1.7.12 Vehicle License Number

1.7.13 Garage Location

1.7.14 Vehicle Status--In or out of service.

1.7.15 Volunteer Driver Insurance

1.7.16 Zone Restrictions—Codes to indicate geographic areas in which the vehicle should not be scheduled. (Optional)

1.8 Operator Data

Information contained on each driver in the system.

1.8.1 Name--Driver's name.

1.8.2 Driver ID--The ID number assigned to each driver.

1.8.3 Address--Driver's address.

1.8.4 Telephone Number--Drivers' phone number.

1.8.5 Seniority Date

1.8.6 Training History--Code numbers for training completed by each driver. This should correlate to vehicle training codes and run training codes.

1.8.7 License Class--Type of commercial driver's license held by the driver.

1.8.8 License Expiration Date--Date on which the current license is due to expire.

1.8.9 Most Recent Physical--Date on which the driver had their most recent physical.

1.8.10 Date for Next Physical--Automatically calculated by the system on most recent physical examination date and a user-defined parameter for the amount of time between physical. This parameter should be variable based on the age of the driver. It should also be able to be manually overridden.

1.8.11 Driver's Birthdate

1.8.12 Days and Hours Availability--The days and hours during those days that the driver is available for work assignments.

1.8.13 Skill Level--Some type of leveling factor should be applied to each driver based on their experience. This would then be used to assign running times to routes based on the anticipated time it would take the driver to complete the work. Ideally, this would be variable depending on the nature of the work (i.e., run number) undertaken.

1.8.14 Maximum Number of Hours per Week--The maximum number of hours that a particular driver is allowed to work in a given week as dictated by the collective bargaining agreement. When a driver is scheduled for work that pushes him/her over this number, the Operations Supervisor assigning that work will be alerted via an error message.

1.8.15 Operator Notes

2.0 Brokering Capabilities

2.1 General

Brokering herein refers to the agency's ability to effectively segregate trips that exceed their own service limits, or that can be accommodated by the agency with the addition of another agency's resources/vehicles to achieve maximum utilization of all vehicles available. This capability also includes rides provided by other agencies that can be added to the system.

2.1.1 The system will alert the scheduler when a trip origin and/or destination exceeds the service area limits, vehicle limit, "on-time" window limit as well as other qualitative measures to be mutually determined.

2.1.2 The system will allow for and manage the addition of other agencies' vehicles into the system as needed on a "what if" scenario basis to determine if the ride is deliverable with the "brokered" agency's vehicle while maintaining that vehicle's integrity to that agency specifically. The system should allow for the addition of as many of these "what if" vehicles up to the maximum service parameters.

2.1.3 The system will automatically display to the scheduler a list of the potential other transit or paratransit providers that can service trips that exceed the initial service limits. The scheduler shall have the option to select the system to do the "what if" calculation as indicated in Section2.1.2 above or the scheduler can choose to leave the ride in the system. The Vendor shall demonstrate how their system handles or is being developed to provide automated brokering where the ride is

automatically assigned to multiple providers with review capabilities by the scheduler.

2.1.4 Automatically records all pertinent statistical and billing information regarding the trip as defined in the MIS for multiple providers.

2.1.5 Generates statistical and billing information that is completely compatible with reporting capabilities of the system.

3.0 Reporting Capabilities

Provide capabilities to generate reports from any and all datasets.

3.1. General

3.1.1 Allow schedulers to record complaints and comments received from customers and other callers. (The call takers can generate an incident report for each caller's complaint. The incident report contains all pertinent data on the complaint and the necessary follow-up/routing information.)

3.1.2 Provide printouts of the incident reports on user demand. A daily printout of all incident reports generated each day is also available.

3.1.3 Enable system users to generate hardcopy printouts of information contained in the system including customer data, trip requests, and scheduling data.

3.1.4 Provides a comprehensive reporting function which allows a wide variety of service data to be accumulated and compiled into reports, including the production of both predefined and "customized" reports.

3.1.5 Maintain an audit trail of all updates made to the customer daily trip and standing order data. This audit trail allows system users to identify changes made, time of changes, and individuals having authorized the changes. The audit trail information pertaining to individual customers is easily accessible by system users.

3.1.6 Track the number of unexcused no-shows on a customer-by-customer basis within rolling 30-day periods.

3.1.7 Retain trip data on-line for, at a minimum, the current month.

3.1.8 Provide means for the entry and recording of the driver manifest data obtained at the end of each driver's shift and includes the following:

A. Driver name/number

B. Vehicle departure time

C. Time of first pick-up

D. Time begin/end lunch break

E. Time of last drop-off

F. Vehicle return time

G. Beginning odometer reading

H. Ending odometer reading

I. Refueling information

3.1.9 Provide a general ASCII text format import/export capability such that data may be transferred to word processing and spreadsheet software.

3.1.10 The system should provide maximum flexibility for the creation of new reports in the future through the use of relational databases, easy export to third-party software packages, etc.

3.1.11 The system should include print buffers that allow a user to print lengthy reports and return to other systems functions while report(s) are printing.

3.1.12 Based on customer name or ID number, the system automatically retrieves customer registration information and selected trip request data fields with the known data (i.e., name, home address, phone numbers, eligibility data, special instructions, etc.).

3.1.13 Displays a brief summary of the customer's ride history to the scheduler upon request.

3.1.14 Provides means of retrieving information on a particular vehicle by specifying the vehicle license or ID number, or driver name/ID number and date.

3.1.15 Maintains a file of billing codes used by the system.

3.1.16 Provides a means of determining which billing codes are authorized for specific customers (customer may have one or many billing codes).

3.1.17 Maintains a log of all contacts made with each customer. System users can note all calls placed to and received from each customer as well as all written correspondence with each customer. System users are also able to display this log information on a customer-by-customer basis. (Optional)

3.2 Required Reports

The following represents a list of required reports. The (same) transit computer system will be used simultaneously by three transit agencies. The system must have the capability to separate transit agencies for each reporting item below.

3.2.1 Number of passenger trips by:

A. Time periods (hours, days, weeks or months)

B. Passenger type (adult, elderly, disabled, student, child, etc.)

C. City or County

D. Provider type (fixed route, dial-a-ride, volunteer, taxi, etc.)

E. Fare type (cash, donation, contract, etc.)

F. Trip purpose

G. Trip type (standing order, demand, group, etc.)

3.2.2 Number of trip cancellations by:

A. Time periods

B. Passenger type

C. City or County

D. Provider type

E. Fare type

3.2.3 Number of no-shows by:

A. Time periods

B. Passenger type

C. City or County

D. Provider type

E. Fare type

3.2.4 Number of trip denials

3.2.5 Average ride time

3.2.6 Complaints received, nature of complaint and disposition.

IMPLEMENTATION PLAN

The Implementation Plan looks at the project requirements beyond the Scoping Study.

NEXT STEPS

The project team met to discuss the steps necessary to implement the project. Following are the key components:

. No additional study and/or research is needed to complete the definition of the functional requirements of the proposed system. The primary system is essentially ready for procurement.

. The trip reservation, scheduling and data management system needs to be deployed in four locations: Jackson, Marshall, Montevideo and Morris.

. The primary system consists of:

- PC-based hardware at the four call centers for call-taking and system administration (minimum of ten workstations).
- Hardware that will allow connections via telephone lines to other transit systems.
- Trip reservation, scheduling and data management software.
- Mobile data terminals (MDTs) for combined fleet of 24 (includes spares) vehicles for 1998 operation (nine Mentor MDTs already available at Rainbow Rider).

- Communications path for data transmission between administrative centers and vehicles (450 MHz radio systems preferred but will consider cellular path – extra radio channel already available at Rainbow Rider).
- Software security system at each call-center to limit access by other transit systems to trip schedules only.
- Text messaging capability between call-centers to facilitate scheduling of linked trips.
- Capability of connecting new system databases with existing finance department billing processes through connection to mainframes.

. No new staff will be added to manage, administer or operate the proposed systems. Furthermore, existing staff will be capable of handling the anticipated growth and expansion in services in future years.

. Procurement should use an RFP process most likely through the Minnesota Department of Administration.

. Evaluation plans will be formalized when the system procurement is underway.

Schedule

. All of the key components of the proposed systems should be available at start-up. Staging of the procurement is not a viable alternative.

. All components of the systems should be fully operational by June 1, 1998 to ensure adequate capabilities for the upcoming transit service expansions and to give adequate learning time for operators prior to the Fall/Winter 1998.

Responsibilities

. It is recommended that the all components of the system be bid as one procurement. This will make the vendor responsible for successful set-up and system acceptance.

. The vendor should be responsible for completing detailed system design as necessary for the project.

. The vendor will be responsible for installation of all components.

. The vendor will be responsible for working with local finance departments to determine appropriate connections to mainframe billing processes.