- current customers through on-board surveys;
- core Madison service area riders and non-riders; and
- new areas for potential growth.

- Metro Transit does not currently have a procedure for following up on customer complaint files that remain open beyond the 90 day period. It is recommended that this become an item which is routinely reviewed by the Customer Service Group.

- Metro Transit has a valuable service planning tool in the Trip Planner utility of the website. Important data is collected in that riders and potential riders enter information regarding desired trips (i.e., origin, destination, as well as time and day of travel). Metro Transit should develop procedures to extract this data and assemble it into a database that can be queried or mapped for service planning purposes.

Information Technology

- It appears the Metro staff is expecting an unnecessary level of accuracy from APC equipment. The level of expected accuracy provided by the manufacturer should be assumed when using the data. Data should be reviewed for anamolies and anomalies should be discarded, however, not at the expense of all data collected by the APC equipment. Metro should utilize its maintenance contract to determine a calibration schedule to ensure that all equipment is properly calibrated. Staff concerns with APC equipment seem overly exacting. APC equipment APC's are being used by several transit properties throughout the country It is recommended that Metro come to consensus on the role that APCs will play in Metro Transit's operations, and if it is not expanded upon, that a suitable alternative be implemented.

- From an asset management standpoint, the fare collection infrastructure is in need of replacement. It is recommended that a program be developed to replace this equipment.

- As Metro Transit continues to expand on its existing systems and the ITEAM continues its role in identifying and implementing significant IT projects, it is recommended that a formal implementation plan be developed for planned and future projects. The need to have documented operating procedures becomes increasingly important as Metro Transit's operations become more systematic.

- It was not indicated during interviews for this review that existing staffing levels and IT background were insufficient to meet the needs of new systems. However, given the ambitious program planned for this function, the large number of existing systems that the IT department supports, as well as the added data management needs resulting from initiatives such as the video cameras, it is recommended that Metro undertake a detailed staffing level review for this function.

Metro Transit staff expressed the need for significant post-processing of data collected by the APC and GPS/AVL equipment. This is not unique to Metro Transit. Many systems that have implemented this technology have found that they do not have the staff resources for effective post processing. Various systems have created positions in their IT or Planning departments specifically dedicated to post processing, manipulation, and reporting of this data. The APC and GPS/AVL systems are significant capital assets for Metro Transit which can have a significant benefit to operations management and planning. However, without proper staffing resources, Metro Transit cannot realize the full benefit of the tools.

- Based on the above recommendations, as well as recommendations included in the Transit Operations, and Planning and Scheduling reviews, it is recommended that Metro Transit pursue the completion of an Information Management Study that addresses the following issues:

  - Information technology staffing needs;
  - Actions necessary to improve reliability of mobile information technology to desired levels; and
  - Business processes designed to incorporate data collected through mobile information technology into planning and management decision making.

Parts

- Update the current computer system to addresses certain improvements such a establishing a formal cycle count program and bar coding.

- As part of the new facility construction project, emphasis should be placed on better security and access control to the parts room. Also, an effort should be made to centralize the bus parts now found in four or five different places into one or two.

Building and Grounds

- The computerized Buildings and Grounds (B&G) recordkeeping system should be used to track and analyze expenditures on outside contractors. This information should then be used for costing analysis and decision making regarding in-house B&G staffing and the use of outside contractors. For example, after reviewing the amount spent annually on outside electrical contractors, Metro Transit may find it more economical to hire an electrician as part of the in-house staff to perform this type of work. During down-time, this person could also perform other functions that are not related to electrician work.

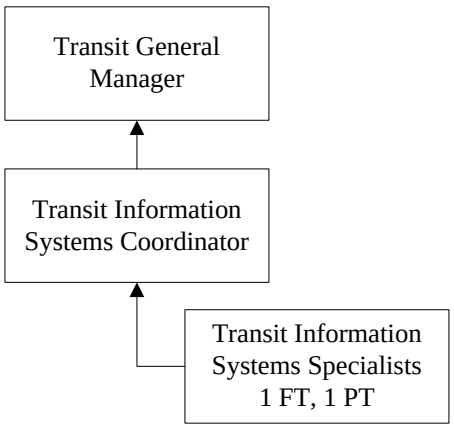
FUNCTIONAL AREA REVIEW
INFORMATION TECHNOLOGY

This section presents a review of the Information Technology function of Metro Transit. This review addresses the organizational structure, operations, oversight, performance, and customer service aspects of the Metro Transit Information Services/Technology.

Organizational Structure

At present, Metro Transit has a Transit Information Systems (TIS) Coordinator and now has two (one full time and one part time) Transit Information Systems Specialists. As a unit, they continue to provide leadership as well as support for transit-specific information technology, including both hardware and software applications. They also have provided input and support for the City of Madison as the city is in the process of implementing an Enterprise Resource Planning (ERP) system that would replace DST. The City of Madison is responsible for operational IT support via a $50,000 annual budget paid by Metro Transit. However, on a daily basis, the IT department also provides internal customer service by helping Metro employees with computer issues as they arise.

Organizational Structure - Information Technology Function



The TIS Coordinator is primarily responsible for the major transit-specific applications, he has maintained his presence on the ITEAM, which has representatives from various units including Finance, Planning and Administration, and continues to hold biweekly meetings to discuss the status of major IT projects. He also serves on the Senior Management Team, which allows Metro Transit to minimize duplication of IT efforts.

The full time TIS Specialist is responsible for managing the incidents database as well as unit-specific databases that are not supported by third party vendors. This includes the

development and implementation of an EZ Rider System for the front desk as well as following up on the Phase 1 implemented Docfinity system (see the Initiatives section for more detail on Docfinity).

The part time TIS Specialist is responsible for special projects (see the Initiatives section for more detail), with current emphasis on improving existing reporting features for transit database applications.

IT Implementation

The previous study identified multiple IT projects that were planned for implementation. This section will review the current status of these projects.

- **The Siemens ITS Project –** Since the previous management review, Metro Transit has implemented the Siemens ITS project, using the TransitMaster database application (purchased from Siemens, now owned by Continental), which includes an Automatic Vehicle Locator (AVL) system, a new radio system with data as well as voice communication, annunciators and related digital signage, automatic passenger counters (APCs) on forty buses (out of approximately 200), as well as tracking features to measure performance. As of the third quarter of 2008, the TransitMaster application has undergone a major upgrade. This application interfaces with Trapeze software, which is used for scheduling and operations for both paratransit and fixed route trips.

  The feedback on performance during the interview was that the time and location data was very accurate, and that system polls buses every 60 seconds. Although this is appropriate for management purposes, it is not fully sufficient for real-time public information. It was indicated that there is technology available via the use of a cell network, which would increase frequency of polling to every 30 seconds.

  The decision on how many buses should have APCs was in part driven by the National Transit Database (NTD) reporting requirements (which aim to achieve a certain level of confidence via a large enough sample size). Additionally, the use of APCs on only 40 out of 200 buses is addressed by rotating those buses with APCs to different routes to be able to have available data on the majority of routes.

  It had been indicated during the interview that Metro Transit has experienced certain levels of accuracy issues:

  - Configuration issue related to the interface between the Trapeze paratransit software and the Continental MDT's. It is viewed as a relatively minor problem but, when resolved, will give paratransit drivers better information about the passengers that they are servicing.

  - There are forty (40) APC units installed on Metro Transit's fixed route fleet. They are currently examining the viability of this program because of several

issues. Staff expressed concern that APC units count all people getting on and off of buses whether they ride or not such as drivers or people stepping onto a bus to ask the driver a question. Second, APC devices are difficult to calibrate and there is no clear indication of when a unit is out of calibration. Staff reports that this results in a need for significant post processing of data. Metro Transit's perception is that a lot of manual work is required to receive data from an automatic device.

Continued use of APC devices has not been ruled out, however Metro Transit is looking at this technology and giving consideration to the development of a ridership segment reporting program that may involve a combination of APC data, farebox data, and video data.

- **Maintenance Maximo Software –** The purchase of Maximo to upgrade Metro's existing rolling stock asset management software did not occur because Maximo was identified as an application that was suited for much larger fleet operations. Therefore, Metro Transit opted to upgrade FleetMate to TransitFleet, which was developed by the same software engineer that developed FleetMate. Because of this, they were able to convert historic data as part of the project, and the level of scale was deemed much more suitable for an organization the size of Metro Transit. The feedback was positive and it appears that no defects are affecting operations.

- **Operations (Ops) Software –** Metro Transit has developed applications intended to streamline processes and measure performance against standards.

  - In House OPS: Metro utilizes an in-house browser based database application to manage fixed route driver general pick (quarterly) and vacation pick processes.

  - Customer Feedback Database: This is an in-house developed database utilized to record and manage incidents that are reported from fixed route and paratransit customers. This is a MS SQL Server database with an MS Access front-end developed primarily with Visual Basic (VBA). Feedback is entered by Customer Service Agents and each unit has the responsibility of responding to the customer appropriately.

  - Payroll Functions: Metro Transit currently utilizes four different methods of producing payroll for the various employee groups. All four systems provide an output to the City DST application.

    - *Operations (fixed route bus drivers) payroll*: Weekly and daily assignment of work is managed by an in-house developed system comprising a series of spreadsheets managed by an Operations Supervisor. The product from this generates reports that a payroll clerk edits based on driver submitted "payroll by exception" time-cards. The spreadsheets for payroll editing are combined at the end of the period and output to the DST application.

- *Paratransit driver payroll*: In-house developed Excel spreadsheet contains a template of driver assignments. Paratransit Operations Supervisor modifies this on a daily basis and submits it to the payroll clerk for entry in to the DST program.

- *Shop/Mechanics payroll (including Building and Grounds employees)*: This is a payroll by exception process. There is a single Excel spreadsheet for each week. Time sheets are filled in by mechanics only when there is an exception to their normal working hours. A shop supervisor makes necessary modifications to the spreadsheet and submits it to the payroll clerk for submittal to the DST application.

- *Office employee payroll*: Each office employee has a biweekly Excel spreadsheet template that they fill out and submit to their supervisor for approval. The data from the spreadsheets are directly entered into the DST application by a payroll clerk.

  - Sick/Late Out/No Show Database: Metro utilizes an in-house developed database application to record and manage discipline correspondence related to coach operator and shop employee attendance.

- **Financial Planning Software –** The City of Madison was unsuccessful in agreeing on contract terms to purchase the Cognos Budget/Planning software. Existing methods for budgeting are mostly similar to the conditions during the previous management review, but it is anticipated that the new ERP system that the City of Madison is procuring to replace DST will have budget/planning functionality.

- **New Farebox System –** Due to a capital funding shortfall as well as an analysis that showed Metro Transit could still achieve positive results by upgrading instead of replacing the existing farebox system, Metro Transit upgraded the existing Genfare farebox system. This included adding a magnetic card reader to the top of the farebox, adding a Genfare TRIM unit (transfer issuing unit) to each bus, replacing the system board in each farebox, and upgrading the system software to Genfare's version 7. There have been no indications of upgrade problems and Metro Transit has since added several partners to its unlimited ride pass program. The Genfare System 7 software successfully reconciles cash received in the on board fareboxes and records rides through a combination of driver input and automated recording of fare media.

  However, because the farebox infrastructure was not replaced, it is now 20 years old (with the exception of the TRIM units). To address this, Metro Transit is in the early planning phases of a program that would replace the entire fare collection infrastructure as a capital project.

Additional Systems

In addition to the systems discussed above, Metro Transit's IT unit also identified the following systems:

- **Employee Database**: This is a Metro developed and maintained database application. This is the primary portal to employee information for Metro employees. The DST application is the system of record so periodic validation against the DST database is necessary.

- **ID card Database**: This database application is used to manage and produce ID/bus pass cards for Metro employees, retirees, and dependents. The source data is the employee database application described above.

- **Fixed Asset Database:** This is an in-house developed Access database application used to manage the procurement and use of capital assets. A related application has been developed to manage the preventative maintenance activities for large non rolling stock assets.

After review of our initial draft of this section, Metro Transit listed additional systems that the IT unit supports for other units:

- **Finance Unit**
  - Metro AP
  - G/L Reports
  - Ticket Inventory
  - Ticket Consignment
  - Workers' Comp
  - Uniforms Database
  - Drawdown Database

- **Marketing Unit (in addition to the EZ-Rider DB and Customer Feedback):**
  - Two Ecommerce Databases
  - Lost and Found Database

- **Shop Unit**
  - Sick-Lateout-No Show DB
  - Shop version of the Employee DB

- **Ops Unit**
  - Ops version of Employee DB
  - Training and Performance-Evaluation DB
  - Driver-Reported Incidents DB

- **Building and Grounds Unit**
  - Asset-Tracking and Preventive Maintenance DB

Initiatives

There are several planned projects over the next few years that are intended to correct problems with as well as expand upon and replace existing systems and in some cases implement new systems. They are the following:

- **Correct Data Problem on Paratransit MDT Devices (2008/2009) –** The TIS Coordinator is responsible for correcting the existing MDT related data problem. This has been identified as a short term item as per the provided employee evaluation, and should be followed up upon to confirm that it has been addressed.

- **Development of Better Data Reporting for Major Database Systems (2008/2009) –** The TIS Coordinator has been tasked with participating in an effort to improve reporting applications for better processing and absorption of data. An example of what will be included in this effort is the following:

  - Converting Farebox Data (2009): Metro Transit has indicated that due to the complexity of interlining routes, it has been difficult to assign ridership at a segment level. At present, this unit's part time Transit Specialist is developing a database that converts farebox data to a network database. This also includes providing a more robust system for the post processing of data and building a data portal for use by relevant transit staff. This is the first phase in a greater effort to give transit management an easier method to access useful data.

- **The Procurement and Implementation of an Employee Work Schedule and Software Program (2009) -** $200,000 has been budgeted to replace the four payroll modules that were discussed in the "IT Implementation" section.

- **Work with Metro Paratransit to Implement "Street Routing" as the Method of Scheduling (2009)** - Currently Metro paratransit has used Trapeze Pass in the Triangulation mode of scheduling. The software draws a straight line from origin to destination and then creates two lines to form a triangle and triangulate a distance for the trip. This has not been an accurate or efficient method as indicated by the Parantransit Program Manager. Year 2009 is the target to switch to another scheduling mode that uses specific street routing, which takes into consideration one-way streets and posted speed limits.

- **Surveillance Camera Systems (2010) -** At present, four cameras (audio and video) are installed in 40 buses. The plan is to equip 48 additional buses each year with the surveillance camera system, which would ensure cameras are installed on all buses by

2010. The TIS Coordinator is responsible for the release of the Request for Proposal (RFP). There is a budget of $140,000 that covers the period of 2008-2010 for the implementation of this initiative.

- **Docfinity System (Long Range Timeframe) -** This is a workflow and document management application which is used to move Metro Transit towards a paperless process. During the third quarter of 2008, the TIS Coordinator has coordinated with staff to deploy phase one of Docfinity (grievance documents).

- **Mission Critical Backup (Long Range Timeframe) –** The TIS Coordinator will be participating in the development and implementation of a plan for continuing operations when mission critical technology applications fail, including backup for in-house developed applications

Conclusions and Recommendations

Metro Transit currently has a multitude of systems and applications that provide operational data aimed at enhancing business processes, maintaining detailed levels of performance tracking, and managing existing staff. It appears that Metro Transit has maintained a central IT presence which has aided in the implementation of several robust technologies such as the Siemens ITS project, all of which are aimed at enhancing performance and accountability. The TIS Coordinator continues to be tasked with identifying emerging technologies that can benefit Metro Transit and the public.

There are several areas that require follow up during the next study:

Transit Specific Status Updates

- Data errors related to APCs and the MDT device
- Paratransit scheduling mode (triangulation vs. street routing)
- New reporting features related to several key database applications including Continental, Trapeze, TransitFleet and Genfare
- Installation of surveillance camera systems on entire bus fleet
- Replacement of existing fare collection infrastructure

IT Related Status Updates

- Replacement of existing payroll system
- ERP System implementation – budget/planning functionality
- Next phases of Docfinity and revisiting phase one efforts to measure reduction in paper processes
- Mission critical backup plan

In addition, there still appears to be lacking a formal IS implementation plan. This includes clear guidelines and approaches when planning for major IT projects. This was an area of question in the previous management review, and continues to be an open item with respect to the IT unit.

The previous management performance audit did not include any recommendations for the Information Technology function. Since that time, the implementation of the Siemens IT project as well the development of additional operational systems has profoundly impacted Metro Transit's operations. Based on the current review, there are four recommendations for this area:

- It appears the Metro staff is expecting an unnecessary level of accuracy from APC equipment. The level of expected accuracy provided by the manufacturer should be assumed when using the data. Data should be reviewed for anamolies and anomalies should be discarded, however, not at the expense of all data collected by the APC equipment. Metro should utilize its maintenance contract to determine a calibration schedule to ensure that all equipment is properly calibrated. Staff concerns with APC equipment seem overly exacting. APC equipment APC's are being used by several transit properties throughout the country It is recommended that Metro come to consensus on the role that APCs will play in Metro Transit's operations, and if it is not expanded upon, that a suitable alternative be implemented.

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