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FINAL TECHNICAL REPORT

*Demonstration of Enhanced Transportation Models:
Phase I – System Development and Design*

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DEMONSTRATION OF ENHANCED TRANSPORTATION MODELS: PHASE I – SYSTEM DEVELOPMENT AND DESIGN FINAL TECHNICAL REPORT

December 2008

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FOREWORD

Reason for Publishing Document

The Atlanta Regional Commission (ARC) was one of eight communities in the United States that was selected to participate in the U.S. DOT Federal Transit Administration's program, titled Demonstration of Enhanced Human Service Transportation Models: Phase 1 System Development and Design. ARC is publishing this summary of work completed as part of the project. This document is the final report associated with the project.

Short Summary of Contents

The report contains an overview of system development and design documents, as well as a description of the stakeholder involvement process that guided development and design of a Transportation Management Coordination Center (TMCC).

Statement Identifying Audience

This report summarizes the process used to create a deployment-ready, replicable, and scalable system for enhanced human service transportation (HST) delivery. The intended audience is U.S. DOT Federal Transit Administration, HST agencies, providers, and users in the Atlanta Region, and other HST stakeholders interested in developing and designing an enhanced delivery system for HST.

Statement that this is Final Report

This summary of the ARC project is the final report for Demonstration of Enhanced Human Service Transportation Models: Phase 1 System Development and Design.

ABSTRACT

This report summarizes the system development and design work conducted to support a Transportation Management Coordination Center (TMCC) for Human Service Transportation (HST) in the Atlantic region. It outlines the process undertaken, including stakeholder involvement, needs identification, and the TMCC design elements. It also contains a discussion of lessons learned for HST coordination and technology application.

ACRONYMS

AAA	Area Agency on Aging
ADA	American Disability Act
ARC	Atlanta Regional Commission
AVL	Automatic Vehicle Locators
Con-ops	Concept of Operations
CCRTA	Cape Code Regional Transit Authority
CSTA	Coordinated Transportation Services Agency
FASTRAN	Fairfax County, Virginia Coordinated Provider Model
FTA	Federal Transit Administration
GIS	Geographic Information Systems
HST	Human Services Transportation
JARC	Job Access and Reverse Commute
JTA	Jacksonville Transportation Authority
TA	Technical Assistance
TMCC	Travel Management Coordination Center
MARTA	Metropolitan Atlanta Regional Transportation Authority
MDT	Mobile Data Terminal
OCTA	Orange County Transportation Authority

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EXECUTIVE SUMMARY

ARC, with identified support from its HST partners, initiated this demonstration project to serve the HST community in the 10-county metropolitan Atlanta Region. Stakeholder involvement was central to the project process. Two stakeholder committees were formed. One included HST agency and provider staff who were involved in policy-related decisions. The other committee included HST agency staff with expertise in technical matters relevant to enhanced delivery of HST. HST stakeholder also were engaged through one-on-one interviews. Early discussions with the stakeholder committees defined a list of goals and objectives to guide development of a deployment-ready, replicable, scalable TMCC.

A user group was formed, and members were engaged in two user group discussions that formed a basis for identification of customer needs for the project. The second user discussion group assessed how far the TMCC concept was going to meet the needs that had been identified.

Technical work followed a highly structured systems engineering process that began with conducting data collection and inventory of existing HST services, providers, and users followed by a regional needs assessment and then building consensus with stakeholders a vision for a regional TMCC. then proceeded to the development of a Concept of Operations, Systems Requirements, System Design, and System Implementation Plan.

The region's stakeholders understand that ITS can help to integrate numerous transportation systems and can offer significant benefits, including enhanced coordination and improved efficiency. HST stakeholders developed a vision and came to agreement on goals and objectives for the TMCC. The vision statement is:

> *"To create a regional coordinated HST system that maximizes existing and future resources and facilitates accessible and seamless service delivery to customers through technology integration."*

Out of the vision several goals were developed. This Con-Ops defines the goals as qualitative statements that synthesize the vision into attainable components. Supporting each goal are objectives, or quantitative action steps.

During the development of the Concept of Operations, ARC determined that a full-scale TMCC design to meet all the goals and objectives was not feasible at this time. The barriers to full-scale deployment in the short term include financial constraints, programmatic barriers, and HST system fragmentation. Therefore, ARC developed a short-term feasible Concept of Operations.

The feasible Concept of Operations included three subsystems. They are: 1) creation of a central repository of transportation service information, customer data, and service provider information; 2) a technology to support coordinated ADA paratransit services; and 3) single-card fare payment for all ADA paratransit providers. In this preferred con-ops scenario, a number of benefits are realized. Customers will have access to HST service information and

will be able to make trip requests. The participating agencies and providers will have electronic access to the transportation subsystems. The TMCC also will track customer, provider, and program eligibility in order to provide trip cost and payment allocations and track provider performance metrics so that system efficiency can be determined and problems addressed.

A Systems Requirement Report was then developed to support the feasible Concept of Operations. The systems requirements report includes the functional requirements, which describe the activities that customers, agencies, and providers can perform using the TMCC, and the nonfunctional requirements, which describe the manner in which the system will be designed, developed, and deployed.

The feasible TMCC systems requirements provide: a comprehensive technical description of what the TMCC will accomplish; a description of the functions that are required to make the TMCC perform as desired; and a discussion of what minimum standards must be met to accomplish the vision and goals of the TMCC.

At this juncture of the technical systems engineering process, ARC held a number of one-on-one interviews with key stakeholders prior to development of the System Design Report. In these discussions, ARC came to the conclusion that the region is not ready at this time to move forward on two of the three TMCC subsystems: The ADA Paratransit Coordination Subsystem; and The Fare Payment and Management Subsystem. Stakeholder made it clear that additional coordination and collaboration would be needed to address concerns and build trust.

The key message from stakeholder agencies was that, while they were interested in the TMCC initiative, they felt that the timing of the TMCC demonstration model project was out of step with the timing that would be necessary to incubate various ideas and form the interagency agreements necessary to progress. With HST coordination in Atlanta still in its infancy, there was a strong sentiment that more dialogue and consensus-building would be needed prior to implementation of the paratransit coordination and fare payment/management subsystems. Therefore, the system design document focused primarily on the information management subsystem.

System Implementation Planning thus focused on deployment details for the TMCC Information Management subsystem. Prior to deployment, the TMCC Information System host agency needs to be identified. Ongoing dialogue and discussion also is needed to identify the Federal state, regional, and local funding source that can be dedicated to serve as the local matching funds. Once these items have been addressed, next steps include formation of a TMCC Board and completion of associated administrative and legal tasks.

The subsystems for fare management and regional ADA complimentary paratransit operational coordination are proceeding in more of a mid-range (three- to six-year) timeframe under the direction of MARTA. Therefore, systems implementation planning is proceeding under a model of a phased and incremental approach, with subsystems implemented incrementally, as consensus and funding is obtained with key stakeholders.

The conclusion of this final report is that the Atlanta Region is not ready at this time to advance to deployment of a replicable, scalable demonstration model for enhanced HST delivery.

Additional stakeholder dialogue and HST coordinated planning is needed prior to the application of ITS technology in a coordinated, regional manner. Lessons learned during the process are contained in this final report.

Chapter 1.0 INTRODUCTION

1.1 Background Information on Subject

Human Service Transportation (HST) in the Atlanta region services a wide, diverse, and growing population. HST is planned, funded, and operated by a wide range of Federal, state, county, and local agencies, as well as a variety of public and private transportation service providers. The specific role and responsibility of these agencies and transportation providers in delivering HST depends on the FTA program they are associated with and their mode of operation (i.e., whether they manage and administer the program, broker services, or actually provide transportation services). Actual transit services provided under the banner of HST include fixed-route transit and demand response services.

In response to the need for coordinated HST planning, the Atlanta Regional Commission (ARC) applied for a grant from U.S. Department of Transportation (DOT) to plan, design, and provide implementation details for a deployment-ready, replicable, and scalable Transportation Management Coordination Center (TMCC). When implemented, the TMCC will elevate the region's ability to streamline, integrate, and coordinate human service transportation to meet the needs of HST agencies, customers, and providers. Intelligent transportation system (ITS) technologies are central to the vision of a fully functioning TMCC. The TMCC will thus serve as an example for others interested in using ITS technologies to improve coordination of HST services.

The purpose of the Atlanta Regional TMCC is to create a central point of reference and efficiency for regional HST customers, human services agencies, and transportation providers. The TMCC will allow HST stakeholders to share information, coordinate transportation services, and integrate vehicle and service delivery activities, thus allowing for an enhanced experience for HST customers. It also will allow for growth to accommodate new agencies, providers, and customers as the HST community evolves and grows.

1.2 Scope of Project

The geographic scope of the project was aligned to the Atlanta Regional Commission's (ARC) 10-county area. The topical scope of the project encompassed all aspects of HST planning in the region. ARC organized and hosted a Human Service Transportation Summit on June 1, 2007. It was attended by over 200 people and allowed for discussion about the current state of HST in the Atlanta Region, as well as the opportunities provided by a TMCC. As part of these initial efforts, ARC acquired support from all the major HST providers in the region to pursue development of a TMCC. The organizational scope of the project was led by ARC, who employed key staff from each of their three core human service policy areas, as well as a qualified consultant team, to develop and design a deployment-ready, replicable, and scalable TMCC. The ARC staff, representing Area Agency on Aging (AAA), ARC Workforce Board, and the Transportation Planning Division of the Atlanta MPO, acted as liaisons with their perspective human service partners. The consultant team provided technical expertise in ITS applications and HST planning.

1.3 Organization of Content

The organization of content for this final report mirrors the organization of the project into four phases. First, there is a discussion of stakeholder and public involvement. Then, the main text focuses on technical steps in the systems engineering process and corresponding decisions that were made at those key milestones. Specific phases include: National Best Practices and Scenario Development; Planning and Design of a Preferred Model Alternative; and System Implementation Planning. The central facets of the main discussion are contained in the Planning and Design of a Preferred Model Alternative section, where a description of the Concept of Operations, Systems Requirements, and System Design is located.

Chapter 2.0 METHODOLOGY/RESEARCH APPROACH

The U.S. DOT Federal Transit Administration's Demonstration of Enhanced HST Models Phase 1 grant opportunity facilitates an opportunity for the Atlanta Region to meet its objective of creating better regional communication and coordination amongst the currently disjointed human service transportation system. The project allows for the planning and design of a Transportation Management Coordination Center (TMCC) that, when constructed, will fill three basic roles: streamlined and integrated communication; operational/service delivery coordination; and functional/back office integration.

ARC assembled a diverse team to provide U.S. DOT with a "deployment-ready," replicable and scalable HST model. The methodology for the project consisted of four phases:

Phase 1 – Stakeholder and Public Involvement and Needs Assessment;

Phase 2 – National Best Practices and Scenario Development;

Phase 3 – Planning and Design of the Preferred Model Alternative; and

Phase 4 – System Implementation Planning.

The technical process for developing a model TMCC is highly structured. At the same time, it requires a certain level of creative flexibility to meet stakeholders' needs and to address gaps in the HST system. The ARC team began the TMCC process by discussing regional needs with the HST stakeholder committee members and users. Following the identification of needs, HST stakeholders were introduced to the idea that technology, in the form of a TMCC, could be employed as a means to address gaps in service and communication. As discussion ensued, HST stakeholders in the Atlanta Region began to agree on a high-level vision for a TMCC. This consensus vision was presented in the Concept of Operation, for which a System Requirements document was prepared. Additional stakeholder input helped to shape a System Design for the TMCC. Finally, a phased Implementation Plan was prepared to ready the TMCC for start-up and deployment in a short-term time horizon.

Chapter 3.0 RESULTS/DISCUSSION

ARC received a grant in the amount of $400,000 from the U.S. DOT Federal Transit Administration's Demonstration of Enhanced HST Models Phase 1 grant program. The project schedule was 13 months in duration, and ran from June 1, 2007 to June 30, 2008.

3.1 Stakeholder and Public Involvement

An initial task of the project was to form Stakeholder Committees. Given the extremely diverse nature of the HST community, ARC emphasized stakeholder involvement as a necessity for successful implementation of change. The formation of stakeholder committees served as a first opportunity to develop consensus about what might be needed to improve regional HST coordination, and how ITS technology might be employed to improve coordination. The committee met at key project milestones and served as a strong adjunct to ARC management and the project team.

Committees were divided into two groups. The Stakeholder Advisory Committee was composed of individual representatives of key transportation agencies who brought the perspective of policy-makers and planners to this technology feasibility study. The Technical Advisory Committee provided real-time feedback on the feasibility of various technologies. It was comprised of current users, providers, and key stakeholders of the HST system. Individual interviews and site visits also were held with stakeholders, and their feedback was obtained as the project progressed.

To obtain input from the perspective of HST users, a selected group of users were invited to participate in two user discussion groups. The group represented a full spectrum of perspectives, including older citizens, disabled, and low-income individuals. At the first meeting, users discussed what types of improvements are needed and how ITS technologies might help. They discussed how a TMCC might best serve the community of HST users. At the second meeting, they provided feedback on the system design and implementation plan. Their input was extremely useful in understanding the needs of HST users.

In addition, the ARC team conducted a survey of 91 HST agencies, providers, and brokers to assess HST needs and issues that could be addressed by a TMCC. Responses from survey participants highlighted five primary needs to consider when planning and designing a TMCC.

- **Overall Regional HST Systems Coordination –** From an operations perspective, there is a need to overcome system fragmentation that arises from HST programs and operations being limited by political geography. Vehicles currently are unable to cross county lines. Presently there are four paratransit operators that service four different geographic areas. If a user needs to cross a county line and utilize two paratransit operator services, there is a high probability that the system will not be able to effectively coordinate their trip. Additional geographic and programmatic restrictions are found in transportation services for senior citizens and other HST customers.

- **Operations –** The need for reliability and improved service was a consistent theme of survey respondents. This issue was highly relevant for the Jobs Access Reverse Commute (**JARC**) audience, who rely on transit services to access jobs. From their perspective, there is a need to make service more convenient, to add flexibility in hours or service, and add/increase on-demand service. Concurrently, survey respondents noted a need to make paratransit operation more cost-effective. Paratransit services are particularly challenged, and the inability to keep up with demand for services results in unmet needs for transportation support. Paratransit operational issues also are prevalent. Equipment used for HST, including wheel chair lifts and ramps, are difficult to maintain in good working order.

- **Technology –** Scheduling and routing trips is often inefficient and time-consuming due to program restrictions and the complications of routing/scheduling logistics. There is a need for building redundancy into the task of route scheduling to prevent shut-down if there are software problems. There is a need to use technology to assist with data collection/reporting and coordination of dispatch. There is a need to collect data documenting regionwide unmet HST needs. Communication technology also is needed, with sensitivity given to the needs of special user groups if customers were to have access to them as well.

- **Fare Collection –** There are several fare collection initiatives underway in the Atlanta Region. MARTA has just implemented a breeze card system, though it still needs refinement for the visually impaired. There also is confusion on how to transfer between bus and train with breeze card. A systemwide, regional breeze card is needed to support coordinated transportation in an ideal future.

- **Information and Customer Services –** There is a need for more effective communication. This need is related to a desire to provide seamless service to the community and to eliminate confusion and provide easier access to information and services.

3.2 National Best Practices and Scenario Development

There are a variety of models of human service transportation coordination nationally, including examples in the use of ITS applications and innovative institutional arrangements. These best practices were reviewed and analyzed to identify the most pertinent examples for the Atlanta project.

3.2.1 National Best Practices

Some highlights of national best practices follow. They include models for Centralized and Coordinated Information Centers, computer-assisted scheduling and dispatching, Automatic Vehicle Locators (AVL) and Mobile Data Terminals (MDT), and other forms of coordination to make HST transportation more efficient and to maximize resources across program lines.

- **San Diego MPO Interactive Web Site –** The San Diego MPO manages an interactive web site that offers comprehensive information on public and private specialized transportation services available to older adults and people with disabilities. The site is known as STRIDE (Specialized Transportation Referral and Information for the Elderly and Disabled) (stride.com). A key participant in this effort is the Coordinated Transportation Services Agency (CSTA), the designated coordinating entity mandated by California legislation. CSTAs include transit systems and private entities, though the San Diego County CSTA is administered by the San Diego Association of Governments.

- **Central New York Regional Transportation Authority and Jacksonville Transportation Authority Centralized Location Models –** Several examples feature other forms of a centralized location model where customers can obtain information on the variety of transportation options available to them. The Central New York Regional Transportation Authority in the Syracuse, New York area operates a one-stop mobility management center that offers individualized trip planning and referral to transit bus pass programs and car repair and procurement programs. In Florida, the Jacksonville Transportation Authority (JTA) is the state-designated Community Transportation Coordinator for the area. It acts as a broker of trips for a variety of specialized transportation services in its region.

- **Cape Cod Regional Transit Authority (CCRTA) Automatic Vehicle Locators (AVL) –** CCTRA in Massachusetts was one of the first transit systems to use computer-assisted scheduling and dispatching. All CCRTA vehicles are equipped with Automatic Vehicle Locators (AVL) and Mobile Data Terminals (MDT) to provide real-time vehicle location. This travel information is then available on-line and accessible through PDAs and cell phones to the provider and the traveling public.

- **Orange County (California) Transportation Authority (OCTA) Coordination Model –** OCTA initiated coordination efforts with multiple community organizations in the effort to build a senior mobility program that would help fill the gap between local fixed-route buses and ADA paratransit. This coordination includes services funded by OCTA but operated by local, community-based transportation providers, and agreements between OCTA and nonprofit transportation operators to offer more cost-effective specialized transportation services.

- **Delaware Statewide Coordination –** Coordinating ADA and specialized transportation services is the focus of the Delaware statewide effort. Through this coordination, paratransit services (that predate ADA transportation requirements) are provided statewide. Technology is an important component of this system, with the use of a computerized scheduling and dispatch system, AVLs, MDTs, as well as Internet access that enables customers to make changes to their scheduled trips.

- **FASTRAN in Fairfax County, Virginia Coordinated Provider Model –** FASTRAN is a coordinated transportation provider, the result of the consolidation of transportation offered by 14 local human service agencies. Managed and scheduled by county government, actual provision of trips is contracted out to two private providers.

FASTRAN operates a fleet of over 150 vehicles, and uses computerized scheduling to efficiently schedule customers' rides and to bill the appropriate sponsoring agency.

While there are no HST system examples that serve as a comprehensive role model for the Atlanta Region, there are several best practice examples that can be applied to various components of the HST system. From the front office tasks of sharing information about programs to the back office tasks of scheduling trips and managing financial accounting, there are a number of regions that have begun to move toward greater efficiency and coordination. In some regions, technology also is helping with operations when the HST agencies have worked together to overcome obstacles and improve service to HST customers.

3.2.2 Scenario Development

Scenarios were developed to meet key goals and objectives identified by the Stakeholder Committees. Stakeholders translated identified regional needs into goals and objectives for the TMCC. This process formed a critical link between the needs of the region to goals and objectives that defined and shaped the scenarios developed for a Concept of Operations for the TMCC. These goals and objectives also guided development of subsequent work. Outlined below are the agreed upon goals and objectives.

Table 1: GOALS AND OBJECTIVES FOR SCENARIO DEVELOPMENT

Goal 1 – Increase Access to Information for Customers
Objectives

1.1 Provide a centralized/consolidated source of information on available HST and ADA paratransit services.
1.2 Apply appropriate state-of-the-art information technology for regionwide access to information. Ensure that there is a wide array of technology to allow for a variety of customers' technology needs.
1.3 Educate customers and potential customers about availability of HST services.

Goal 2 – Streamline Customer Referral to Service Providers
Objectives

2.1 Catalog and centrally maintain key service characteristics and requirements, e.g., client eligibility, trip purpose eligibility, etc.
2.2 Apply appropriate state-of-the-art information technology to interconnect HST and ADA paratransit providers and customers throughout the region.

Goal 3 – Enhance Quality of Customer's Experience
Objectives

3.1 Identify opportunities to increase travel choices through integrated customer and trip purpose eligibility, shared vehicle use, and shared funding.
3.2 Identify and apply actions to reduce barriers to enhanced service quality, e.g., removing geographic boundaries, relaxing trip purpose limitations, increasing schedule flexibility, etc.
3.3 Develop and implement means to track service quality and delivery, e.g., complaints, customer satisfaction, service reliability, personnel qualifications.
3.4 Apply appropriate state-of-the-art information technology to support customer service quality improvements.
3.5 Track service quality using a variety of performance measures.

Goal 4 – Improve Cost-Effectiveness and Increase Efficiency
Objectives

4.1 Identify and apply key strategies to increase efficiency and cost-effectiveness among HST program sponsors.
4.2 Identify and implement opportunities for private or nonprofit entities and public/private partnerships, e.g., joint maintenance activities, training, procurement, service provision, etc.
4.3 Identify and test appropriate state-of-the-art information technology to support coordinated and efficient service, e.g., regional scheduling and accounting, integrated financial services, and provider cost/payment allocation system and service delivery accounting.

Goal 5 – Increase Capacity and Coverage to Meet Future Demands for Ridership
Objectives

5.1 Increase service efficiency and provide additional service with savings.
5.2 Increase geographical area of coverage.
5.3 Expand service frequency and reduce waiting periods.
5.4 Expand and maximize resource base – funding, facilities, equipment, personnel – to meet service needs, e.g., taxis.

3.3 Planning and Design of the Preferred Model Alternative

3.3.1 Concept of Operations

The first step in planning and design of the preferred model alternative is development of a concept of operations for the TMCC. Serving as a cornerstone of the TMCC project, the con-ops articulates the vision for applied use of technology in HST and forms the basis of all further TMCC systems engineering in the Atlanta region.

ARC determined that the ultimate vision for a TMCC, one that met all the goals and objectives, would be full regional coordination of all HST services. However, discussions with Atlanta Regional transit providers and HST agencies were clear in delivering the message that this notion was a long-term proposition given existing fragmentation of service provision and the barriers that still remain in place.

Therefore, a feasible concept of operations was devised to move toward aspects of coordination that could be implemented within the shorter timeframe demanded by the U.S. DOT Federal Transit Administration's Demonstration of Enhanced HST Models grant opportunity. This scaled back version of the long-range vision was necessary to keep the U.S. DOT Federal Transit Administration's Demonstration of Enhanced HST Models Phase 1 grant project moving forward on schedule.

There are at least three key benefits to be garnered from the feasible Atlanta Regional TMCC. They are: 1) creation of a central repository of transportation service information, customer data, and service provider information; 2) a technology to support coordinated ADA paratransit services; and 3) single-card fare payment for all ADA paratransit providers. Customers will have access to HST service information and will be able to make trip requests. The participating agencies and providers will have electronic access to the transportation subsystems. The TMCC also will track customer, provider, and program eligibility in order to provide trip cost and payment allocations and track provider performance metrics so that system efficiency can be determined and problems addressed.

The feasible con-ops contain three subsystems that are described below.

3.3.2 TMCC Information Subsystem

The Information Subsystem is the starting point for the feasible TMCC. It will serve as a one-stop shop for information and referral related to HST. It will have a one-stop telephone information access number and a corresponding one-stop information access web site. This service will allow customers to call one telephone number to obtain information on any type of HST service (Medicaid, ADA, workforce, low-income, elderly), as well as obtain contact information for providers and information about eligibility requirements, service coverage areas, service hours, and access points. The customer also will be able to fill out a detailed profile so that future trip requests can be made without reentering personal data. This interaction may be conducted through an Interactive Voice Recognition (IVR) system or by a

live operator upon request. The information will be available in English and Spanish and access for persons with disabilities will be provided. The same services and information also will be available on a TMCC web site. All profile information will be stored in a database.

The TMCC Information System will inform potential customers of transportation service availability based on their profiles and characteristics, which affect program eligibility, geographic service availability, schedules, routes, and costs through the information and referral function in the TMCC. As customers request information and referral, their calls or Internet requests will be forwarded to the appropriate provider who will book the trip directly with the customer. The transportation providers will then take the trip request, as well as schedule, and dispatch the trip. That trip referral process keeps the three functions of reservations, scheduling, and dispatch together, which is imperative to ensure operational cohesion.

The TMCC Information System also will include a GIS platform to allow for data analysis, such as identification of gaps and duplications in service by location, type, and time of day. These service gaps and duplications can then be used to assess service improvements and coverage and for justification of new and expanded services as the TMCC grows in capacity and function.

The expected benefits of the TMCC Information Subsystem are improved customer service and ease of access for both clients and providers to important and accurate information. In addition, it will improve trip request process for both clients and providers and will increase availability of data on trips for providers to conduct planning and schedule/route improvements.

3.3.3 ADA Paratransit Coordination

The second subsystem, ADA Paratransit Coordination, will better coordinate the existing ADA paratransit services in the region. First, the TMCC will work with the ADA operators to develop a database of all ADA eligible persons that will allow all eligible ADA riders to travel seamlessly throughout the region. Longer term (in later phases), this will become a regional ADA eligibility certification center. Information on all fixed-route and paratransit services available in the region will be maintained and made available through the TMCC Information Subsystem by both telephone and Internet access.

This subsystem currently is being studied under the direction of MARTA. This study of ADA Complimentary Paratransit Services in the Atlanta Region has a number of objectives, including establishment of the baseline conditions for ADA complimentary paratransit services and an examination of ADA complimentary paratransit services in peer agencies in other regions.

This subsystem of the TMCC considers further coordination of ADA paratransit scheduling and operations, vehicle tracking, interjurisdictional trips, and eligibility determination. The expected benefits of coordinated ADA paratransit services are improved operating efficiency, improved customer convenience, seamless regional HST operations, and information sharing among providers.

3.3.4 Fare Payment and Management Subsystem

Thirdly, the feasible TMCC concept will include a regional ADA paratransit fare payment system. The system will be based on the MARTA breeze card and reader system which recently has been implemented for the agency's fixed-route customers.

This subsystem also is under the direction of MARTA. The first phase of the breeze card implementation plan included all types of MARTA fixed-route fare products, including timed, unlimited passes; student and visitor passes; per trip passes; transfers and payment of cash fares; and parking fees. The breeze card replaces tokens, magnetic passes, and magnetic and paper transfers.

The card functions similar to a debit card. Applicable fares or fees are deducted each time you present the card at a bus farebox, rail station fare gate, or (eventually) parking exit gate. The maximum cash balance that can be stored on a breeze card is $100; the minimum amount that can be loaded at one time is $1.75 ($.85 for qualifying half-fare customers). At the present time, stored value can be used to pay MARTA bus and rail fares only, but eventually the system could be used to pay fares for ADA complimentary paratransit.

Breeze cards for bus and rail service can be purchased by number of days or number of trips. Weekly and monthly passes are good for unlimited rides for the number of days purchased. The "clock" for time-based passes starts upon first use of the breeze card at a bus farebox or rail station fare gate. Breeze cards also are available as 10- and 20-trip passes.

Currently, if you choose to pay your fare with stored value or a trip-based pass, you will be entitled to bus-to-bus, bus-to-rail, or rail-to-bus transfer good for three hours from the time you paid your first fare. The transfer is electronically encoded onto your Breeze Card. This same type of service is the basis for regional transfers in later phases of implementation.

The purpose of the fare payment and management subsystem is to provide HST clients with convenience for paying fares and to provide operators with a greatly improved fare collection system that allows them to track and allocate customer payments and eligibility. The subsystem will provide permanent and temporary cards depending on client eligibility and a cost allocation system for the three ADA complimentary paratransit operating agencies. Customer convenience for fare payment, increased efficiency for providers to track fare payments and allocate reimbursement, and improved eligibility tracking for customers are all anticipated as a result of this subsystem.

3.4 Systems Requirements

These three TMCC subsystems are the subject of a System Requirements document. ARC, with input from key HST stakeholders, determined that the best strategy of TMCC implementation would be to develop the fully coordinated TMCC in an incremental fashion over time. While the feasible TMCC is being constructed and made operational, HST stakeholders will continue to be involved in coordination planning and dialogue about next steps for the long-range TMCC vision.

The feasible TMCC systems requirements provide:

- A comprehensive description of what the TMCC will accomplish;
- A description of the functions that are required to make the Atlanta regional TMCC Concepts of Operations a reality; and
- A discussion of what minimum standards must be met to accomplish the vision and goals of the TMCC.

The Feasible Short-Term TMCC actually is composed of three elements, or subsystems:

1. The HST Information Subsystem, which is an information referral service only and does not include centralized scheduling, dispatching, vehicle tracking or trip booking;
2. Americans with Disabilities Act (ADA) Paratransit Coordination;
3. The HST Fare Payment and Management Subsystem; and
4. The systems requirements report includes the functional requirements, which describe the activities that customers, agencies, and providers can perform using the TMCC, and the nonfunctional requirements, which describe the manner in which the system will be designed, developed, and deployed.

3.5 Overview of System Design

During development of the system design document, ARC came to the conclusion, with input from HST stakeholders that the region is not ready at this time to move forward on two of the TMCC subsystems:

- The ADA Paratransit Coordination Subsystem; and
- The Fare Payment and Management Subsystem.

ARC came to this conclusion as a result of stakeholder meetings and interviews conducted as the project progressed. In these discussions, it was clear that additional coordination and collaboration would be needed to address stakeholder concerns. The key stakeholder agencies, while interested in the TMCC initiative, felt that the timing of the TMCC model project was out of step with the timing that would be necessary to incubate various ideas and form the interagency agreements necessary to progress. With HST coordination in Atlanta still in its infancy, there was a strong sentiment that more dialogue and consensus-building would be needed prior to implementation of the paratransit coordination and fare payment/ management subsystems.

Therefore, the system design document focused primarily on the information management subsystem design. The three subsystems identified in the feasible Concept of Operations remain as the region's comprehensive vision for mid-range TMCC project implementation, but only one, the Information Subsystem, is ready for deployment now. When all the TMCC

subsystems are implemented, each subsystem will perform different tasks. The staggered implementation of the three subsystems will not affect the overall integrity of a full-scale TMCC. Rather, all subsystems will connect to a common data store for information necessary to provide the full range of functionality. The System Design thus details the Information Subsystem as the short-term deployment-ready, replicable, and scalable TMCC. It is the region's starting point for the ultimate TMCC vision.

The Information Subsystem of the TMCC will serve as a one-stop shop for information and referral related to HST. The TMCC will be a centralized system with physical location that will have a one-stop telephone information access number and a corresponding one-stop information access web site. The customer will be able to call one telephone number to obtain information on any type of HST service (e.g., Medicaid, ADA, workforce, low-income, elderly), as well as obtain contact information for providers and information about eligibility requirements, service coverage areas, service hours, and access points. The customer also will be able to fill out a detailed profile so that future trip requests can be made without reentering personal data. This interaction may be conducted through an Interactive Voice Recognition (IVR) system or by a live operator upon request. The information will be available in English and Spanish and access for persons with disabilities will be provided. The same services and information also will be available on a TMCC web site. All profile information will be stored in a database.

As customers request information and referral, their calls or Internet requests will be forwarded to the appropriate provider who will book the trip directly with the customer. The transportation providers will then take the trip request, as well as schedule and dispatch the trip. That trip referral process keeps the three functions of reservations, scheduling, and dispatch together, which is critical to ensure operational cohesion.

The TMCC also will include a GIS platform to allow for data analysis, such as identification of gaps and duplications in service by location, type, and time of day. These service gaps and duplications will then be used to assess service improvements and coverage and for justification of new and expanded services as the TMCC grows in capacity and function.

In summary, the TMCC Information Subsystem design includes the following components:

- An IVR system programmed to perform activities available to public customers;
- A telephone-based system with both English and Spanish capability and with TDD capability for operators to answer calls from public customers;
- A computer-based administrative system to allow operators to perform actions on behalf of public customers;
- A secure Internet-based system for public customers to retrieve information, including referrals for HST providers and trips;
- A secure Internet-based system for authorized HST providers to retrieve and provide update information;

- A secure Internet-based system for authorized TMCC, ARC, and Human Service Agency staff and consultants to manage information and run reports;

- A telephone-based helpdesk and corresponding computer-based helpdesk tracking system that TMCC staff will use to support all users;

- A centralized database that holds TMCC information on customers, programs, service providers, routes, schedules, services hours, service areas, trips, fares, call logs, etc.; and

- Links to an existing Geographic Information System (GIS) for performing geographic operations.

3.6 System Implementation Planning

The TMCC Information Management subsystem is ready for implementation and the other two subsystems are proceeding forward but with a different timeframe and under different leadership. The subsystems for fare management and regional ADA complimentary paratransit operational coordination are proceeding in more of a mid-range (three- to six-year) timeframe under the direction of MARTA. Thus, a phased implementation plan is critical to system implementation planning for the Atlanta TMCC, and the entire TMCC concept will need to be implemented incrementally, as consensus and funding is obtained with key stakeholders. Table 2 outlines the timeline for incremental implementation.

Table 2: TIMELINE FOR INCREMENTAL IMPLEMENTATION

TMCC Operational Subsystem	Timeframe for Implementation
Information Management	Short-term (1 to 3 years)
Fare Payment and Management Subsystem	Mid-term (3 to 6 years)
ADA Paratransit Coordination	Mid-term (3 to 6 years)
Additional elements to be added incrementally to reach long-range vision of full HST coordination	Long-term (20 years)

Prior to deployment, the TMCC Information System host agency needs to be identified. Ongoing dialogue and discussion also is needed to identify the Federal, state, regional, and local funding available to serve as the local matching funds. Once these items have been addressed, next steps include formation of a TMCC Board and completion of associated administrative and legal tasks.

The fare payment and management subsystem deployment and start-up plan is under the direction of MARTA, who has initiated a breeze card system on all fixed routes. Since its implementation in 2007, MARTA has been proceeding with phased implementation of additional facets of the system, including regional coordination of fare payment and

management. The application of breeze card technology for ADA paratransit operations is included in their implementation plan, and will occur as the phased sequence unfolds.

ADA paratransit regional coordination deployment and start-up currently is in the planning phases and also is under the direction of MARTA. The goals of their ADA paratransit study include establishment of the baseline conditions for ADA complimentary paratransit services and an examination of ADA complimentary paratransit services in peer agencies in other regions. Ultimately, the goal is to improve efficiency, quality of service, and cost-effectiveness of paratransit operations throughout the region.

3.7 Benefits of TMCC

The expected benefits of the TMCC Information Subsystem are related to improved customer service and ease of access to important and accurate information. In addition, the TMCC will improve trip request process for both clients and providers, and will increase availability of data on trips for providers to conduct planning and schedule/route improvements. Finally, it will provide a foundational platform for additional coordination activities as they become implementable.

Additional benefits to be obtained from the TMCC in a mid-range timeframe include: 1) creation of a central repository of transportation service information, customer data, and service provider information; 2) a technology to support coordinated ADA paratransit services; and 3) single-card fare payment for all ADA paratransit providers. Customers will have access to HST service information and will be able to make trip requests. The participating agencies and providers will have electronic access to the transportation subsystems. The TMCC also will track customer, provider, and program eligibility in order to provide trip cost and payment allocations and track provider performance metrics so that system efficiency can be determined and problems addressed.

Ultimately, the long-range TMCC will provide further benefits, such as: 1) improving multijurisdictional coordination; 2) improving communications and information sharing among agencies; 3) disseminating real-time travel information, including real-time vehicle tracking; 4) improving cost-effectiveness of HST; and 5) greatly improving customer service.

Chapter 4.0 CONCLUSIONS/RECOMMENDATIONS/LESSONS LEARNED

Conclusion

The conclusion of the final report for the Demonstration of Enhanced Human Service Transportation Models: Phase 1 – Systems Development and Design is that the Atlanta Region is not ready at this time to move forward with deployment of a replicable, scalable TMCC to enhance delivery of HST. ARC believes that additional HST coordinated planning and stakeholder dialogue is needed prior to the application of Intelligent Transportation Systems (ITS) technology in a regional context.

Recommendations

ARC does not recommend moving forward with the U.S. DOT Federal Transit Administration Administration's Demonstration of Enhanced HST Models Phase 2 grant opportunity at this time. The reason for this recommendation is due to the project's inability to secure an agency commitment to host the deployment-ready, replicable, scalable TMCC.

Rather, ARC recommends that the region proceed with ongoing HST coordination efforts and focus on strengthening regional collaboration and cooperation among HST providers and agencies. Continued discussions about TMCC development also are recommended.

Lessons Learned

A number of lessons were learned during the TMCC project. These are outlined below.

- **Timing of implementation proved faster than agencies could make decisions –** As stakeholder discussions progressed, it became clear that the schedule for TMCC project completion and implementation was on a faster track than the HST coordination efforts in the region. While all stakeholders agreed that the TMCC was much needed, there was simply not enough time to alleviate everyone's concerns and develop interagency agreements within the constraints of this project's schedule. Some of the main concerns expressed by the stakeholders included:
    - Who would be the lead or host agency of the TMCC?
    - How would the operations and management of the TMCC be sustained?
    - What would the criteria including cost, information sharing and reporting requirements be for agencies to participate in the TMCC?
    - Who would be responsible for providing the local match (operating entity, participating agencies, local governments, etc.)?
    - How would the public be informed about the purpose and benefits of the TMCC?
    - What are the projected cost benefits associated with implementing the TMCC?

- What type of long term support technical and financial would be guaranteed by FTA after the initial 1-3 year deployment phase?

- What commitment and guarantee do we have that will ensure that the TMCC Information Center will evolve into our long term vision of being a One-Stop-Shop for transportation?

In addition to the concerns mentioned above, stakeholders also felt that there was not enough time to address the nine fundamental areas of agreements and memorandum of understandings identified in Section 6 (Enabling Requirements) of the TMCC Systems Requirement Report. Listed below are the nine areas of agreement established in that document which would be required in order to implement the operations and management of the TMCC:

- Agreement to coordinate TMCC operational aspects (receive calls, link to fixed-route services planners);

- Agreement to share eligibility information;

- Agreement to share services information and track trips requested;

- Agreement among ADA providers to coordinate interjurisdictional trips;

- Agreement among ADA providers and MARTA to use the Breeze Card program;

- Agreement on fares and revenue distribution among ADA providers for interjurisdictional trips;

- Agreement between the TMCC and MARTA to provide any needed changes to the Breeze card system and application process that will allow ADA paratransit users to receive a card that reflects their eligibility;

- Agreements among HST agencies and providers to support the TMCC and participate in an ongoing TMCC stakeholder committee;

- Agreement between a selected host agency and the TMCC to provide physical space, permanent staff and ongoing operations and maintenance for the TMCC.

Stakeholders agreed that the Enabling Requirements listed above could not be met within the established project timeline.

- **Timing of planning versus timing for TMCC design –** Similarly, additional time was needed for coordination planning and developing stronger ties among the various HST agencies in the Atlanta Region. While initial agreement on the benefits of the TMCC was evident, it did not translate to a sense of ownership for the TMCC as planning talks moved to systems engineering and implementation. As continued efforts were made to identify potential candidates to host the TMCC Information

Center the Area Agency on Aging (AAA) a division of ARC and the United Way were identified as possible champions. Follow up meetings were scheduled with each agency to further explore their ability and capacity to operate and manage the TMCC Information Center. Both the Area Agency on Aging and the United Way considered the possibility of integrating the TMCC Information Center as an extension of current programs that were already operational. However, neither of the agencies was comfortable making a commitment, as more time than the project schedule would allow would be needed to take their proposal of the TMCC Information Center through their established organizational processes to obtain financial support and final approval.

Also as documented above in Section 3.6 (System Implementation Planning), the successful deployment and implementation of the TMCC Information Center would require:

- A phased and incremental approach of 1 to 3 years;
- Identification of a host agency;
- Identification of federal, state, regional and local Funding to meet 50/50 local match requirement ;
- Establishment of TMCC Board;
- Identification and completion of administrative and legal tasks.

Finally, the ARC initially dedicated five months in our original TMCC project scope to provide for planning, public involvement, and consensus buildings as we assessed these elements to be essential in building an adequate institutional framework to ensure success of the TMCC project. The planning phase for the TMCC project was collapsed into one month as FTA advanced to the design phase of the project. This condensed schedule hindered our ability to thoroughly address the questions raised and documented in this section to the satisfaction of upper management and policymakers.

- **Scale of region's size and corresponding complexity hindered project –** In hindsight, the geographic size of the region and the project's study area brought a level of complexity to the project that made it difficult to advance to a deployment-ready, scalable TMCC quickly. It may have been more prudent to begin in a smaller geographic area and build a model of technology assisting coordination efforts from that vantage point.

  Because the TMCC project study area included 10 counties and over 80 municipalities, with all the attendant agencies providing human service transportation within those entities, stakeholders agreed it was impossible to gain the political will and financial support necessary to implement the TMCC Information Center on a regional basis within the established project timeline. On the other hand, stakeholders also agreed since most HST agencies provide services across jurisdictional boundaries and many

clients have to travel across these boundaries to receive services, scaling back the TMCC project study area once the study was underway was not desirable either. As the TMCC project progressed, ARC identified other HST coordination efforts going on concurrently in the region involving many of the same stakeholders. This made it difficult for some participants to see the TMCC project as a priority when compared to the other ongoing initiatives.

- **Agency resources are very strained already –** Stakeholders expressed much hesitation about assuming additional responsibilities given the already strained nature of funding and resources. This issue became even more pressing as gas prices rose rapidly and transit providers expended their entire annual fuel budget long before the year was over.

  Transit operator participants expressed that they found it difficult to think collectively while they were all fighting just to stay in existence and maintain their current services. As the national and local economies continued to rapidly deteriorate in 2008, the focus on maintaing core services and staying solvent led to an attitude among key agencies where assuming any additional financial risk was simply not an option. Stakeholders agreed that given the current economic environment, their executive management and agency boards would not be receptive to any proposal requiring the need for additional agency resources.

  Although this initiative likely would result in long-term cost savings for many agencies, more time was needed in order to conduct a cost/benefit analysis to demonstrate the financial implications of the TMCC project for the region. And in order to achieve a long-term savings, the ability to invest funds in the short-term was a critical element that was lacking at the time this study was completed.

- **There is not much incentive for agencies to cooperate on a regional basis –** Presently, funding streams and regulatory requirements inhibit incentive to cooperate on innovative ideas that involve interagency cooperation. For example, paratransit operators are concerned about eligibility requirements and their different manifestation in urban and suburban communities. Much discussion will be needed to work through the perceived issues concerning equity among agencies.

  Stakeholders expressed that regional coordination is important, but from a practical standpoint on a day to day basis, their primary goals are to efficiently manage their agency's programs and to meet the needs of their clients. Stakeholders agreed in order to gain the momentum to encourage and incentivize agencies to adequately coordinate services, federal, state, and local funding for programs should be contingent upon documented and proven coordination efforts. Stakeholders also agreed the best way to incentivize regional coordination would be to demonstrate the financial benefit to agencies on both the individual and regional level. Listed below are additional barriers to regional cooperation within the Atlanta region:

  - The regional transportation system is very fragmented and unstable (the "regional" transit agency MARTA services only two counties and receives no state financial support, with independent county-based systems in three other

jurisdictions and a state-managed express bus system operated by the Georgia Regional Transportation Authority that has no sustained funding source);

- Historical background and territorialism in the provision of transportation services;
- Department of Human Resources (DHR) has a completely separate process for transportation, information, and referral for Section 5310 services;
- Individual agency agendas;
- Lack of interest in this initiative from key regional transportation stakeholders, such as DHR and GRTA;
- No state mandate on coordination of HST services.

- **FTA Oversight and TA –** FTA oversight and TA support has been extensive. They were very engaged and responsive to the project team throughout the process especially with our monthly calls.

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