MART UWR/ MSAA PHASE I – COORDINATED HUMAN SERVICE TRANSPORTATION SYSTEM DESIGN

M-ITS: MART’s Integrated Traveler Services

Bruno Fisher – Chief Operations Officer
Montachusett Area Regional Transit Authority
Fitchburg Site
UWR/MSAA Phase I Project

• M-ITS VISION

Develop a system to simplify and maximize the transportation options available to low income and older adults, persons with disabilities and the general public by utilizing ITS and non-ITS technologies to maximize the use of available public and private resources, while providing a simple point of access through a travel management coordination center (TMCC) model that can be scaled to add more services or programs and replicated in other regions and scenarios.
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- M-ITS is derived from MART’s existing coordination efforts which leveraged ITS and non-ITS technology over the last 6-7 years to provide solutions that are:
  - Innovative (Web, IVR, VoIP, etc.)
  - Scalable (Grew from 1200 trips/day -> 14,000 trips/day)
  - Inclusive (have > 200 entities engaged in electronic commerce)
UWR/MSAA Phase I Project

• This Presentation Describes:
  • MART’s Services
  • M-ITS project Design,
  • Stakeholder Selection and,
  • their Continued Involvement.

• M-ITS’ agenda is to be a repository and a facilitator and NOT the ‘gatekeeper’ of coordination.
UWR/MSAA Phase I Project

- M-ITS system has following features:
  - Open Architecture
  - Can interact with other systems
  - Can be used by
    - any ‘region’ for regional coordination
    - Any ‘program’ for program based coordination
    - Any entity for private, public or mixed mode coordination.

- Separates the ‘dependence’ on ‘owning’ a system to ‘using’ a system.
MART Public Transportation Services

Overview of Services
MART Transit/Paratransit Operations

MART currently operates:

- 29 Fixed Route Buses
- 150 Paratransit Vans

which in FY08 provided:

- 631,116 Fixed Route trips
- 274,774 Demand Response trips
- 37,669 Human Service Transportation trips
- 87,210 Council on Aging trips
MART Human Service
Transportation Brokerage Services
An Overview
Dark Blue Hashed: MART Transit / Paratransit Service Area
Light Blue: Four Areas (3/4/5/9) of MART Brokered HST Transportation which includes MART Service Area
MART Brokerage Operations

- Managing $68+ million of Massachusetts HST brokerage services
- Managing $4+ Million in local Special Education brokerage services
- Brokering 3.4 million HST trips annually
- Brokering 275,000 Special Education trips annually
- Brokers approximately 73% of Massachusetts’ HST Brokered transportation services. In addition, the MART brokerage operations:
  - MassHealth Call Center handles approx. 50,000 calls per month (2500/day)
  - IVR System handles approx. 400-500 calls per day
  - Automated Eligibility Verification System checks 10,000 clients eligibility status on a daily basis
  - Processes over 280,000 billing transactions per month
M-ITS System Design Overview
High Level System Design Overview

- M-ITS TMCC System Concept
- M-ITS Design Evaluation Process
- M-ITS Architectural Elements
- M-ITS Sub Systems
- M-ITS TMCC Goals (selected)
M-ITS Key Stakeholder Identified Needs

- What is in it for me?
- Where’s my bus? Integrated AVL / web-based vehicle tracking
- Fixed Route Trip Planner and Flexible Trip Times
- Trip Coordination / Group Scheduling w/ Multiple Regions / Providers
- Fare Collection/Distribution and Centralized Billing System
- Complaint Management and Dispute Resolution
- Lack of Access to Technology and Technology Integration
- Cost Allocation ~ Multiple Funding Sources / Multiple Providers
- Vehicle Inspections and Driver Verification
System Design Alternatives

Cooperative Distributed Processing System Approach

Pros

• Scalable
• Better control due to local decision making
• Replicable
• Standardized Interface

Cons

• Communication bottlenecking
• Processing bottlenecking
• Access Problems at Public Places
• Not Suitable for funding departments
System Design Alternatives

Airline Reservation System Approach

Pros

• Highly scalable
• Better control due to local decision making
• Highly replicable
• Less IT infrastructure requirements
• Limited Interface with Software Systems
• Local coordination can become very easy
• Limited Processing bottlenecks

Cons

• Processing limitations
• Interface Maintenance
• Not suitable for funding departments
• Higher IT involvement
• Higher skills of the schedulers
• Multi-leg itineraries are hard to build
• Managing financial information
• Reporting features
System Design Alternatives

Bulletin Board/Blackboard System Approach

Pros
- Standardized Interface
- Scalable, Replicable
- Better control due to local decision making
- Lower communication overhead
- A simplified user Trip Planner interface
- Very Suitable for funding department level access
- Multi-leg itineraries easy to build
- Centralized billing easy to implement
- Reporting for funding agencies simplified
- Low dependence on the software systems

Cons
- Higher degree of IT involvement
- Confirmation Response Time
- Quality of itineraries
Selected System Design Alternative

M-ITS Approach

Pros

• Scalable, Replicable
• Better control due to local decision making
• Simplified User Trip Planner interface
• Very suitable for government funding department level access
• Centralized billing / reporting for funding agencies and providers is simplified
• Low dependence on software systems and individual providers to determine options

Cons

• Higher degree of IT
• Quality of itineraries to depend largely on update frequency of availability
Selected System Design Alternative

M-ITS Approach
Architectural Elements - Scalability

M-ITS Centralized Database
Architectural Elements - Scalability

M-ITS Messaging Network

Message Network for Connectivity and Confirmation

M-ITS Trip Planner

Message Response & New Messages

Communication Helper

Interface Database

Transportation Software (e.g. HBSS)

Communication Helper

Interface Database

Transportation Software (e.g. RMS)

Communication Helper

Interface Database

Transportation Software (e.g. Stratagen)
Architectural Elements - Scalability

M-ITS TripBoard Portal
Architectural Elements - Scalability

M-ITS Distributed Internet Telephony System
Architectural Elements - Scalability

M-ITS Mobile Computing Network

Mobile Computing System for Fare and Service Delivery Reconciliation

M-ITS Scheduling & Dispatch

M-ITS Wireless Gateway

M-ITS Database

Trip/Reconciliation Requests to Drivers

MDT/AVL

Provider Driver

Trip Completion/Vehicle Location Update from Drivers

MDT/AVL

Volunteer Drivers
M-ITS Subsystems

M-ITS Trip Planner: The Traveler Information System

1) Available Transportation Services Information
2) Current Situation Information
3) Trip Planning Service
4) Request Reservation
5) Payment Mechanism
6) User Access
7) Presentation of Unmet Travel Requirements for Vendors Consideration
M-ITS Subsystems

M-ITS Brokerage & Booking System

1) Pass/Ticket and Voucher Management
2) External Points of Sale Centers
3) Contract Creation and Management
4) Dispute Management (arbitration)
5) Rider and Vendor Eligibility Verification
6) Vendor Assignment
7) TMCC Call Center (for last resort help)
8) Trip/Client Management (booking)
M-ITS Subsystems

M-ITS Fare Payment & Billing Management System

1) Payment Management
2) On-line Invoicing – Agency/Provider
3) Fiscal Planning
4) Audit Management
5) Provider Rate Management
6) Centralized Reporting
M-ITS Subsystems

M-ITS Scheduling & Dispatching System with Vehicle Tracking

1) Travel Requests
2) Scheduling
3) Dispatching
4) Tracking
5) Fares
6) Routing
M-ITS Subsystems

M-ITS [Transit] Operations Management

1) Driver management
2) Vehicle management
3) Facilities Management
4) BackOffice Management
5) Revenue Management
M-ITS Subsystems

M-ITS Operations [Resolution]

1) Issue Tracking
2) Incident Management
3) Complaint Management
4) Dispute Resolution
5) Contract Arbitration
M-ITS TMCC Goals and Objectives

- Simplify access to transportation services
- Access for persons with disabilities, lower incomes and older adults
- Coordinated human service transportation system
- Simple point of access for consumers
- Scalable, replicable deployment of TMCC
- Simple, unified, customer-based travel information and trip planning services
- Improved service coordination
- More efficient use of federal human service transportation funding
- Technical and institutional feasibility
- Enhanced accessibility features
- Partner with local communities and/or systems that already possess existing policies and partnership for transportation service coordination
- Have some levels of existing ITS infrastructure and deployment
M-ITS TMCC Goals Met by Design

More/Better Access to Transportation

Accessibility to Lower Income, Disabled folks

M-ITS Concept of Transfer Points (e.g., Intermodal Transportation Centers)

Intermodal Transportation Center

M-ITS Trip Planner

M-ITS Booking

M-ITS Database

Trip Planning Booking Activity

Using Self-Service Kiosk at Popular

Trip Purchase/Information

Transportation Ticket Agent

Volunteer Agency Coordinator

M-ITS Booking @ Library

M-ITS Booking @ Senior Center

M-ITS Booking @ Hospital

M-ITS Booking @ Town Hall

M-ITS Internet Backbone

Client Advocate

Voice Activated Access to Website Via Text to Voice Tools

Individual Rider

Disabled Rider

M-ITS Trip Planner

09/05/2008

09/05/2008
M-ITS TMCC Goals Met by Design

Simple Point of Access for Consumers
M-ITS TMCC Goals Met by Design

Customer -based Travel Services

Improved Services
M-ITS TMCC Goals Met by Design

Increased Efficiency

Partnering for better Transportation Service Coordination
System Phasing & Implementation Plan

• Phase I – Development of Centralized Database System and Associated Core Automation Functions

• Phase II – Development of Web-Based Interface for Providers / Travelers and Associated Functionality

• Phase III – Integration of Provider Third-Party Software Systems and Access Devices (Kiosks / PDA’s / etc.)

• Phase IV – Advanced Brokerage and Call Center Enhancements

• Phase V – Quality Control Management Systems

• Phase VI – Vehicle Tracking and On-Board Computing
STAKEHOLDER SELECTION / INCLUSION

- Oversight and Funding Agencies in Massachusetts Human Service Transportation

- Agencies providing Public Transit /Paratransit Services and/or HST Services in MART Brokerage Areas

- Taskforces and Working Groups

- Agencies providing Transit Planning Services

- Agencies providing Human, Social and Volunteer services in MART Brokerage Areas

- Vendors and Multi-state Providers
STAKEHOLDER SELECTION / INCLUSION

Basis for Stakeholders Selection:

• Experience in Human Service Transportation Field
• Experience in Transit Planning / Coordinating Services
• Experience in Providing Transit, Paratransit, Human / Social Service and Community Transportation Services
• Knowledge of transportation funding mechanisms and opportunities
• Commitment to invest in transportation and community infrastructure
• Expertise in working with underserved populations and advocates
• Proven track record for success in community service, public-private partnerships and systemic change initiatives
Securing Stakeholder Cooperation / Participation

Prototyping Efforts
Funding Source Participation

- **Current Situation:** HST Office represents three agencies in nine regions with six brokers managing transportation, each entity with its own system.

- **Objective of Joining M-ITS:** Development of centralized billing and reporting system for collection and distribution of aggregated information processed through the system.

- **Readiness to Join:** Reviewing current systems to leverage advanced technology without the added capital expense.

Public Provider Participation

- **Current Situation:** MTS provides fixed route, paratransit and human service transportation for MART in its service region and in its brokerage regions.

- **Objective of Joining M-ITS:** Utilize M-ITS tools including AVL/MDC and M-ITS Trip Planner to help transfer paratransit riders to fixed route services.

- **Readiness to Join:** To lead the effort in implementing the sub-systems that focus on public transportation elements.
Taskforce Participation

Central West Regional Employment Solutions Team (C/W REST)

- **Current Situation:** Coordinators perform labor and time intensive, manual searches for transportation options with relatively expensive per trip costs.

- **Objective of Joining M-ITS:** Develop multiple itinerary, cost-effective transportation options for its members.

- **Readiness to Join:** Coordinators will utilize the M-ITS system to obtain multiple itineraries and costs to provide transportation to members.

Private Provider Participation

- **Current Situation:** Visitors and employees of correctional facilities have no transit options between the commuter rail stations and correctional facilities.

- **Objective of Joining M-ITS:** Use the M-ITS project to increase business by identifying unmet transit needs and providing transportation these markets.

- **Readiness to Join:** Private provider will take a leadership role in testing various technologies to be deployed under the M-ITS project.
Multi-State Participation

Easter Seals of NH,VT,ME,RI and NY

Through Partnering with Easter Seals, the M-ITS Project can:

– Achieve regional / statewide cost efficiencies by leveraging purchases from multiple sources to create value-added services and new business opportunities

– Develop new transportation resources including private industry and volunteer networks through the effective use of technology and creative delivery systems

– Increase investment in transportation by business and service sectors

– Maximize transportation options for communities

– Leverage existing MART coordination efforts and expand the scope of the M-ITS project to other New England States and New York in the Easter Seal footprint

– Work with a proven leader in developing new delivery systems and tools for coordinated transportation and efficient use of resources

– Share information and expertise, while creating new networks of transportation that leverages existing funding resources
Supply Touch Screen Kiosks at an Intermodal Center to provide:

- A Trip Planner
- Local / Intra-City Bus Schedules
- Commuter Rail / Train Schedules
- Local Providers and Van Pools
- Livery Services
- Link to Ticket Agent for Services
UWR/MSAA Phase I Project

• This Presentation Described
  • MART’s Preparedness to Develop a Model TMCC system
  • M-ITS Robust Design that is Based on Successful, Industry Strength Design Strategies
UWR/MSAA Phase I Project

- This Presentation Described

- M-ITS Stakeholder’s
  - Belief in M-ITS approach
  - commitment to Implement M-ITS
  - Active Participation to Sort Issues,
  - Detailed Involvement in design process
  - To create a solution that is
    - Scalable
    - Inclusive
    - Of value to all
UWR/MSAA Phase I Project

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